ICLO 2026 Advance Program

Report date: May 21, 2026 22:00

Section PL. Plenary

MoPL-01
Monday, June 22, 2026; 11:15-12:00
Towards remote photonic brain computer interface *(Plenary)*
Zeev Zalevsky; Faculty of Engineering and the Nanotechnology Center, Bar-Ilan University, Israel

MoPL-02
Monday, June 22, 2026; 12:00-12:45
Illuminating brain connectivity with AI and advanced optical imaging *(Plenary)*
Francesco Saverio Pavone; Laboratory for advanced biological sensing, University of Florence, Italy
Artificial intelligence (AI) is transforming biophotonics by enhancing the analysis of complex biological structures and functions. Here, we present two experiments combining advanced imaging with machine learning for data analysis and brain connectivity reconstruction.

MoPL-03
Monday, June 22, 2026; 12:45-13:30
Ultrafast science with optical and X-ray lasers *(Plenary)*
Majed Chergui; Elettra Sincrotrone Trieste S.C.p.A., Italy and Lausanne Centre for Ultrafast Science (LACUS), École Polytechnique Fédérale de Lausanne (EPFL), Switzerland
Ultrafast science has witnessed dramatic developments since its birth in the early 1990s. One of these developments was the advent of X-ray Free Electron lasers (XFELs) around 2010. With ultrashort pulses, high photon flux/pulse, degree of coherence and photon energy range, these sources enable probing dynamics of matter at the atomic-scales of time (femtoseconds) and length (Ångströms). This is a game changer for describing photoinduced processes in (bio)chemical and material systems.

Section R01. Solid State Lasers

TuR01-01
Tuesday, June 23, 2026; 15:00-15:30
Advanced optical ceramics for solid-state laser applications *(Invited)*
Jiang Li[1,2], Tingsong Li[1,2]; [1]Transparent Ceramics Research Center, Shanghai Institute of Ceramics, Chinese Academy of Sciences, [2]Center of Materials Science and Optoelectronics Engineering, University of Chinese Academy of Sciences, China
Rare earth ion doped garnet based transparent ceramics and their composite structures were designed and prepared, and the tailoring and optimization of laser ceramic properties were realized.

TuR01-02
Tuesday, June 23, 2026; 15:30-15:45
Dynamic processes in low-lying states of the Er^{3+} ion in the $BaY(1.8)Lu(0.2)F_8$ crystal
A.V. Astrakhantseva, T.M. Minnebaev, A.S. Nizamutdinov; Institute of Physics, Kazan Federal University, Russia
Here we present the energy transfer parameters W11 and W22 determined within the Förster-Dexter theory, which tend to depopulate 4I13/2 state of Er3+ ion at high doping. Gain at 2.7 μm of Er3+ ion at different pump powers estimated with a system of rate equations is seen to increase for the highly concentrated sample.

TuR01-03
Tuesday, June 23, 2026; 15:45-16:00
The key features of stimulated emission in NV^-, C: HPHT diamond
V.F. Lebedev[1], T.S. Misnikova[1], E.A. Vasiliev[2], Ya.A. Ryvkina[1], I.V. Klepikov[3], A.V. Koliadin[3]; [1]St.Petersburg State University of Aerospace Instrumentation; [2]Mining University; [3]LLC "New Diamond Technology", Russia
The characteristic features of stimulated emission underlying pulsed laser generation on synthetic HPHT diamond with NV- color centers have been experimentally determined. Obtaining a smooth spectrum and a short radiation pulse is determined by the presence of a sufficient concentration of single nitrogen centers in the crystal, the absolute concentration of NV- centers, the volume of the active medium with population inversion, and the energy of the pumping pulse.

TuR01-04
Tuesday, June 23, 2026; 16:00-16:15
Mitigation of amplified spontaneous emission via optimization of the reflectivity at the gain medium-heat sink interface.
D.A. Kuzin, I.I. Kuznetsov, A.N. Mitrofanov, E.A. Perevezentsev, A.V. Starobor, and O.V. Palashov; [1]Federal Research Center A.V. Gaponov-Grekhov Institute of Applied Physics of RAS, Russia
Amplified spontaneous emission (ASE) limits performance of laser with simultaneously high average and peak power. A novel mitigation method using optimized dielectric mirrors to guide ASE into the heatsink is proposed. Numerical and experimental studies demonstrate that this approach, combined with direct bonding, significantly enhances gain and stored energy density compared to traditional mounting methods with non-optimized optics.

TuR01-05
Tuesday, June 23, 2026; 16:15-16:30
Compositional dependence of the Verdet constant in As-S-Se and As-Se-Te glasses
Ilya Snetkov[1], Roman Blagin[2], Ella Karaksina[2], Vladimir Shiryaev[2]; [1]Federal Research Center A.V. Gaponov-Grekhov Institute of Applied Physics of RAS, [2]G.G. Devyatykh Institute of Chemistry of High-Purity Substances of RAS, Russia
A systematic investigation of the influence of the composition of chalcogenide As(40)S(60-x)Se(x) (x=0, 15, 30, 45, 60) and As(40)Se(60-x)Te(x) (x=0, 10, 20, 30, 40, 50) glasses on the Verdet constant value in the wavelength range 1310 nm – 1940 nm is carried out.

TuR01-06
Tuesday, June 23, 2026; 16:30-16:45
Cr^{4+}-doped YAG ceramic Q-switch modulators with varying dopant concentrations
A.V. Kiselev[1], V.V. Ionin[1], A.A. Burtsev[1], A. Y. Kanaev[2], V.A. Mikhalevsky[1], A.A. Lotin[1,3]; [1]NRC "Kurchatov Institute", [2]Lebedev Physical Institute of RAS, [3]Mendeleev University of Chemical Technology, Russia
Investigations of the optical and lasing characteristics of a solid-state laser based on a YAG:Nd^{3+} (1 at.%) ceramic active medium operating in the passively Q-switched regime have been conducted. Laser pulse trains with individual pulse durations of 50 ns and 450 ns were obtained using ceramic passive Q-switches with chromium ion concentrations of 0.1 at.% and 1 at.%.

TuR01-07
Tuesday, June 23, 2026; 16:45-17:00
Generation efficiency in the passive Q-switch mode of a 2-micron KYW:Tm, Ho laser using PbS QD doped glass as a Q-switcher
V.N. Ivanov[1,2], M. Salhab[2], T.V. Zotova[1], A.A. Onushchenko[1], A.N. Titov[1], A.V. Shashkin[1], A.V. Vasilieva[2], K.V. Dukelskiy[1]; [1]JSC RPC S.I. Vavilov State Optical Institute, [2]St.Petersburg Electrotechnical University "LETI", Russia
Estimation of the generation efficiency in the passive Q-switch mode of a 2-micron KYW:Tm, Ho laser using PbS QD doped glass as a Q-switcher (a generation energy of 6 mJ, 22 ns) by comparing with the generation parameters in the active Q-switch mode (8 mJ, 25 ns) carried out.

TuR01-08
Tuesday, June 23, 2026; 17:30-18:00
Rare earth doped chalcogenide fiber lasers emitting at λ > 5 μm *(Invited)*
V.V. Koltashev[1], V.V. Likhov[1], A.G. Okhrimchuk[1], V.G. Plotnichenko[1], M.V. Sukhanov[2], A.P. Velmuzhov[2], E.N. Lashmanov[2], B.I. Denker[3], B.I. Galagan[3], S.E. Sverchkov[3], M.P. Frolov[4]; [1]Prokhorov General Physics Institute of RAS, Dianov Fiber Optics Research Center, [2]Devyatykh Institute of Chemistry of High-Purity Substances of RAS, [3]Prokhorov General Physics Institute of RAS, [4]P.N. Lebedev Physical Institute of RAS, Russia
We demonstrate chalcogenide glass fiber lasers emitting at 5.0-5.8 μm. The fibers had Ø4-20 μm selenide core with of Tb3+, Ce3+ or Nd3+ doping and undoped Ø240-250 μm sulfide cladding. Temperature tunable narrowband laser oscillations at 5 μm wavelength region were obtained in Tb-doped chalcogenide glass fiber due to feedback from the Bragg grating inscribed in it.

TuR01-09
Tuesday, June 23, 2026; 18:00-18:15
Linear cavity Raman dissipative solitons generator
V.M. Volosi[1,2], V.D. Efremov[1,2], D.S. Kharenko[1,2]; [1]Institute of Automation and Electrometry SB RAS; [2]Novosibirsk State University, Russia
We experimentally and numerically investigated the generation of Raman dissipative solitons in a linear cavity configuration with synchronous pumping by highly chirped dissipative solitons. In the experiment, pulses with an energy of 6 nJ and a repetition rate of 15.4 MHz were obtained at 1.14 mkm. The possibility of increasing the energy to 12 nJ was demonstrated numerically.

TuR01-10
Tuesday, June 23, 2026; 18:15-18:30
Raman dissipative solitons generation in a synchronously-pumped all-fiber ring cavity
V.M. Volosi[1,2], A. M. Patrashkov[1,2], N.A. Koliada[1,3], D.S. Kharenko[1,2]; [1]Institute of Automation and Electrometry SB RAS, [2]Novosibirsk State University, [3]Institute of Laser Physics SB RAS, Russia
In this work, we experimentally showed the generation of a picosecond Raman dissipative solitons with an output energy of 7 nJ at the central wavelength of 1.66 mkm in an all-fiber scheme. Particular attention is given to the use of a fiber laser with picosecond-duration pulses and a narrow optical spectrum as synchronous pump for a ring fiber cavity.

TuR01-11
Tuesday, June 23, 2026; 18:30-18:45
Gas-discharge fiber lasers: plasma laser parameter measurement using microwave discharge Instability
I.A. Bufetov, A.V. Gladyshev, D.G. Komissarov, A.P. Mineev, S.M. Nefedov, A.F. Kosolapov, V.V. Velmiskin; Prokhorov General Physics Institute of RAS, Russia
The instability of microwave discharge in a hollow core fiber located in the region of interference of microwave fields was observed. In the scheme of a gas-discharge fiber laser this instability manifests itself as variation of the active medium length with characteristic time of ~1 ms. Using this phenomenon, the laser parameters of plasma in a hollow fiber were measured.

TuR01-12
Tuesday, June 23, 2026; 18:45-19:00
Continuous-wave tunable holmium laser with an intracavity optical filter based on a tapered PM fiber
A.V. Shirmankin, A.I. Lobanov, V.A. Kamynin, V.B. Tsvetkov; Prokhorov General Physics Institute of RAS, Russia
This study investigates of a PM tapered fiber (20 μm diameter of the waist, 4 mm length) as an optical filter in a holmium laser. The implementation of mechanical bending in the tapered fiber enabled a wavelength tuning range of up to 34 nm. The laser operation was demonstrated in both single-wavelength generation and three-wavelength generation

TuR01-13
Tuesday, June 23, 2026; 19:00-19:15
Frequency doubling of a Raman-pumped Yb-doped fiber laser to 489 nm
E.A. Evmenova[1], E.K. Kashirina[1], K.V. Kolosova[1], A.V. Dostovalov[1,2], S.I. Kablukov[1,2]; [1]Institute of Automation and Electrometry SB RAS, Russia; [2]Novosibirsk State University, Russia
We report a simple, cost-effective, linearly polarized Yb-doped fiber laser at 978 nm delivering 2 W. It uses a standard active fiber pumped in a nearly single-mode regime by a diode-pumped Raman laser at 954 nm. Single-pass frequency doubling of this source in a PPLN crystal generated about 70 mW at 489 nm, enabling applications in spectroscopy and biomedicine.

WeR01-14
Wednesday, June 24, 2026; 09:30-10:00
High power kilohertz thin disk amplifier with 616mJ pulse energy and 586 fs pulse duration *(Invited)*
Huang Zhou[1], Renchong Lv [1,2], Lei Feng[1], Sen Tian[1], Jiangfan Pan[1], Yong Zhen[1,3], Peng He[1], Wenlong Tian[3], Jiangfeng Zhu[3], Xinkui He[1,2], Zhiyi Wei[1,2]; [1]Songshan Lake Materials Laboratory, [2]Institute of Physics, CAS, [3]School of Optoelectronic Engineering, Xidian University, China
Addressing OPCPA's demand for high-energy pump sources, we are developing a kHz thin-disk Yb:YAG amplifier system. The broadband seed laser integrating a solid-state oscillator and a spectrum-shaped Yb:CALGO pre-amplifier (>5 nm BW) feeds sequential amplification stages: a regenerative amplifier and three multi-pass amplifiers, achieving pulse energy of 616 mJ. Grating compression (1740 l/mm, 93% throughput) yields 586-fs pulse length with PW-scale applicability.

WeR01-15
Wednesday, June 24, 2026; 10:00-10:15
High aperture Yb:YAG single crystal disk laser head for noncryogenic high energy lasers: design and study
E.A. Perevezentsev, M.R. Volkov, A.I. Gorokhov, G.A. Kurnikov, I.B. Mukhin; Federal research center A.V. Gaponov-Grekhov Institute of Applied Physics of RAS (IAP RAS), Russia
This work presents a novel room-temperature laser head using a Yb:YAG single crystal as a high-aperture active mirror, designed to replace costly, cryogenically-cooled ceramic amplifiers. Pumped by a 70kW diode module at 940nm, 11J of stored energy at 10Hz was achieved. The two laser head system is intended for a 10J, 10Hz laser under development at IAP RAS.

WeR01-16
Wednesday, June 24, 2026; 10:15-10:30
Energy scaling of Yb:YAG thin-disk amplifier utilizing a novel multi-pass telescopic scheme
A.I .Gorokhov, E.A .Perevezentsev, M.R. Volkov, I.B.Mukhin; Federal Research Center A.V. Gaponov-Grekhov Institute of RAS (IAP RAS), Russia
A new unique multi-element amplifier employing a multi-pass telescopic scheme including two Yb:YAG thin-disk AEs, each pumped by 2.5kW diode is constructed. SSG 1.7 per pass with good beam quality was obtained after 8 passes. 245mJ output signal was obtained within 7mJ input signal. 10% optical-to-optical efficiency for output signal ~500mJ is expected after increasing input signal to 15mJ.

WeR01-17
Wednesday, June 24, 2026; 10:30-10:45
Subnanosecond NV-diamond laser for shadow registration of fast processes
E.D. Zaloznaya, A.D. Savvin, A.E. Dormidonov; Dukhov Automatics Research Institute (VNIIA), Russia
The report demonstrates for the first time the use of a subnanosecond megawatt laser based on NV color centers in diamond as an illumination source for shadow recording of fast processes. A significant increase in the resolution of the shadow method is shown due to the low temporal coherence of the light illuminated the object under study.

WeR01-18
Wednesday, June 24, 2026; 10:45-11:00
Dual-wavelength generation via angular filtering in mode-locked Nd:YVO_4 lasers
S. Alipour, M. Jandaghi, E. Barati, Z. Mohammadzahery, M. Abrishami; Iranian Institute of Laser Science and Technology, Iran
We demonstrate wavelength switching in a mode-locked Nd:YVO4 laser by selectively amplifying spontaneous-emission photons using angular filtering with a dual-pinhole aperture. Without altering the cavity design, the laser switches between 1064 nm and 1086 nm. At 3.5 W pump power, the two configurations generate a 9 nJ and 4 nJ pulses, respectively, at ~79 MHz repetition rate.

WeR01-19
Wednesday, June 24, 2026; 11:30-12:00
Femtosecond Cr:ZnS(e) mid-infrared lasers *(Invited)*
Ka Fai Mak; School of Optical and Electronic Information, Huazhong University of Science and Technology, China

WeR01-20
Wednesday, June 24, 2026; 12:00-12:15
Tapered planar waveguide Yb:YAG laser amplifier
I.I. Kuznetsov, S.A. Chizhov, O.V. Palashov, I.B. Mukhin; Nonlinear Dynamics and Optics Department, A.V. Gaponov-Grekhov Institute of Applied Physics of RAS, Russia
Simple design of Yb:YAG amplifier based on a tapered planar waveguide geometry is implemented. High beam quality preservation after amplification is demonstrated despite the multimode structure of the waveguide. 87 W output power is achieved, and great potential for the further average and peak power scalability is visible.

WeR01-21
Wednesday, June 24, 2026; 12:15-12:30
1.6-Watt femtosecond Cr^{2+}:ZnSe laser for Raman soliton generation
E.A. Kozlova, D.T. Batov, V.S. Voropaev, M.K. Tarabrin; Science and Education Center for Photonics and IR-Technology, Bauman Moscow State Technical University, Russia
This study presents the development of a 1.6-W femtosecond Cr2+:ZnSe laser with a pulse duration of 83 fs at 2.44 μm. This source enabled the generation of a Raman soliton at 2.7 μm via the self-frequency shift in a ZBLAN fiber, with an output power of 240 mW.

WeR01-22
Wednesday, June 24, 2026; 12:30-12:45
Luminescence and laser generation dynamics in Fe^{2+}:ZnSe crystal under a two-photon ionization
A.A. Ushakov[1], A.A. Sirotkin[1], P.A. Chizhov[1,2], V.V. Bulgakova[1], T.V. Dolmatov[1], E.M. Gavrishchuk[3], Yu.L Kalachev[1], I.G. Kononov[1], S.V. Podlesnykh[1,4], K.N. Firsov[1];[1] – Prokhorov General Physics Institute of RAS; [2]Moscow Institute of Physics and Technology; [3]G.G. Devyatykh Institute of Chemistry of High-Purity Substances of RAS; [4]Vernadsky Institute of Geochemistry and Analytical Chemistry, Russia
The effect of two-photon ionization by femtosecond laser pulses with a central wavelength of λ = 800 nm on the luminescence and generation parameters in the spectral range λ = 3.5 – 5 μm of a Fe2+:ZnSe crystal optically pumped by Cr3+:Yb3+:Ho3+:YSGG has been studied. Fe2+:ZnSe crystal ionization significantly affected the shape and amplitude of the luminescence and generation pulses.

WeR01-23
Wednesday, June 24, 2026; 12:45-13:00
1.94 μm Tm^{3+}:YAP laser beam profiling through upconversion in $LiYF_4$:Ho^{3+} ceramic
K.E. Sumachev, A.P. Savikin, V.V. Sharkov; Lobachevsky State University of Nizhny Novgorod, Russia
The spatial-energy parameters measurement of 1.94-μm Tm3+:YAP laser through upconversion in LiYF4:Ho3+ ceramics was presented. The energy transfer processes responsible for upconversion luminescence of Ho3+ in LiYF4:Ho3+ ceramics were analyzed. The beam intensity profile of 1.94-μm Tm3+:YAP was obtained using CCD. The dependence of the luminescence intensity profile of LiYF4:Ho3+ ceramics on the excitation radiation power was investigated.

WeR01-24
Wednesday, June 24, 2026; 15:15-15:45
Acousto-optic control for ultrashort laser pulses *(Invited)*
K.B. Yushkov; Univ. MISIS, Russia
Various acousto-optic devices have become essential components of high-power ultrashort-pulse lasers. We overview different advanced acousto-optic techniques for controlling femtosecond lasers. They include adaptive dispersion management, regenerative gain narrowing control, high-resolution pulse shaping, carrier-envelope-phase stabilization, multi-GHz chirped pulse modulation, and spatial beam shaping.

WeR01-25
Wednesday, June 24, 2026; 15:45-16:00
Experimental evidence for low-frequency phase noise caused by spontaneous emission in amplified fiber lasers.
S.P. Nikitin[1], G.Y. Ivanov[1], A.Y. Danilov[1,2], O.E. Nanii[1,3], and V.N. Treshchikov[1,4]; [1]T8 Company Group, [2]MEPhI National Nuclear Research Univ, [3]M.V. Lomonosov Moscow State Univ., Phys. Dept., [4]V.A. Kotelnikov Institute of Radio Engineering and Electronics, Russia
Measurements of Erbium doped fiber laser phase noise has been performed in a broad frequency range from 1 Hz to 100 MHz by using modified delayed self-heterodyning interferometric technique. An observed excessive flicker phase noise at sub-kHz frequencies is shown to be consistent with thermal perturbations caused by spontaneous emission earlier suggested theoretically in addition to thermorefractive and thermomechanical noises.

WeR01-26
Wednesday, June 24, 2026; 16:00-16:15
Portable system for laser frequency stabilization in metrology and quantum computing applications
M.I. Shakirov[1], K.S. Kudeyarov[1], D.S. Kryuchkov[1], K.Yu. Khabarova[1], and N.N. Kolachevsky[1,2]; [1]P.N. Lebedev Physical Institute of RAS, [2]Russian Quantum Center, Skolkovo, Russia
A transportable frequency stabilization system based on a high-finesse optical cavity was implemented. A laser with a wavelength of 1550 nm, stabilized by the system, achieved a fractional frequency insta-bility of less than 2×10^{-15} for averaging times from 0.2 to 4 seconds and can be utilized for quantum metrology, sensing, and communications.

WeR01-27
Wednesday, June 24, 2026; 16:15-16:30
Compact single-polarization single-frequency DBR laser at 978 nm
A.N. Abramov[1], A.A. Rybaltovsky[2], D.A. Davydov[2], M.E. Likhachev[2], A.S. Lobanov[1], D.S. Lipatov[1]; [1]Institute of Chemistry of High-Purity Substances of RAS; [2]Prokhorov General Physics Institute of RAS, Dianov Fiber Optics Research Center, Russia
A single-polarization single-frequency fiber laser operating at 978 nm has been obtained using a photosensitive ytterbium-doped polarization-maintaining fiber embedded with a distributed Bragg reflector (DBR) resonator as short as 14 mm long. Record-breaking continuous-wave lasing for the developed fiber laser has been demonstrated (30% overall pump-to-single-frequency conversion efficiency, 17% in one direction).

WeR01-28
Wednesday, June 24, 2026; 16:30-16:45
Application of machine learning methods for stabilization of single-frequency fiber laser
A.S. Gemuzov[1], P.A. Itrin[2], A.E. Bednyakova[1], I.S. Panyaev[2], A.A. Redyuk[1], D.A. Korobko[2], A.A. Fotiadi[2], M.P. Fedoruk[1]; [1]Novosibirsk State University, [2]Ulyanovsk State University, Russia
Stabilization of a single-frequency fiber laser using a ring fiber cavity for self-injection locking of a standard DFB laser has been demonstrated. The classical PID controller was replaced by neural network controllers, including an LSTM-based behavioral cloning model and a TD3 reinforcement learning agent for PID gain optimization, with their performance compared on experimental data.

WeR01-29
Wednesday, June 24, 2026; 16:45-17:00
Laser wavelength stabilization based on an optoelectronic oscillator
G.S. Voronkov, V.V. Ivanov, V.S. Lyubopytov, I.V. Stepanov, E.P. Topolskaya; [1]Ufa University of Science and Technology, Russia
An optoelectronic-oscillator-based control loop is proposed for laser wavelength stabilization, converting laser–filter frequency offset into a microwave error signal processed to drive the laser. Noise from the oscillator, photodetector, and amplitude detector is calculated, and the Allan variance analysis shows instability comparable to that of Pound-Drever-Hall systems with a simpler implementation and no precision resonator temperature control.

WeR01-30
Wednesday, June 24, 2026; 17:30-18:00
Multi-center heterogeneous-core Bismuth-doped fibers for multi-band lasers and amplifiers *(Invited)*
S.V. Alyshev[1], S.A. Ostrikov[1], A.V. Elopov[1], D.I. Oleinik[2], A.A. Umnikov[2], A.V. Kharakhordin[1], A.M. Khegai[1], E.G. Firstova[1], M.A. Melkumov[1], S.V. Firstov[1]; [1]Prokhorov General Physics Institute of RAS, Dianov Fiber Optics Research Center; [2]G.G. Devyatykh Institute of Chemistry of High Purity Substances of RAS, Russia
A concept for a multi-center bismuth-doped fiber with a heterogeneous glass core is proposed as a promising active medium for multi-band lasers and amplifiers. We demonstrate Bi-doped fibers with the cores made of P2O5-SiO2, GeO2-SiO2, and Al2O3-SiO2 glass layers. This provides favorable conditions for the formation of each type of BAC, enabling the achievement of good performance.

WeR01-31
Wednesday, June 24, 2026; 18:00-18:15
Thermal activation of "hidden" capabilities as a new approach to increasing optical gain in bismuth-doped fibers
A.V. Kharakhordin[1], K.E. Riumkin[1], S.V. Alyshev[1], A.M. Khegai[1], E.G. Firstova[1], A.A. Umnikov[2], M.A. Melkumov[1], S.V. Firstov[1]; [1]Prokhorov General Physics Institute of RAS; [2]G.G. Devyatykh Institute of Chemistry of High-Purity Substances of RAS, Russia
We propose a new approach to improving the gain properties of bismuth-doped fibers by increasing the content of bismuth active centers (BACs) through intelligent thermal processing. As a result, 90% of Bi ions containing in a fiber can be transformed into BACs, where ~60% of the BACs is thermally converted from "dark" forms, while 30% BACs are formed during fabrication.

WeR01-32
Wednesday, June 24, 2026; 18:15-18:30
Bi-doped fibers with a GeO_2 -Al_2O_3 -P_2O_5 -SiO_2 core for lasers and amplifiers in the T+O-telecom bands
D.S. Lipatov[1], D.F. Burmistrov[1], F.V. Afanasiev[1], A.N. Abramov[1], A.S. Lobanov[1], S.A. Ostrikov[2], A.V. Kharakhordin[2], K.E. Riumkin[2], E.G. Firstova[2], S.V. Alyshev[2], A.M. Khegai[2], S.V. Firstov[2], M.A. Melkumov[2]; [1]G.G. Devyatykh Institute of Chemistry of High-Purity Substances of RAS; [2]Prokhorov General Physics Institute of RAS, Dianov Fiber Optics Research Center, Russia
Bi-doped fibers with a germanoaluminophosphosilicate glass core were fabricated using the MCVD process. In such fibers, a new type of bismuth active center (BAC) with a gain band peaked at 1240 nm was revealed. The fibers with discovered BACs was used as the active media for a 30-dB amplifier and a watt-level laser operating in the T+O-telecom band.

WeR01-33
Wednesday, June 24, 2026; 18:30-18:45
Triggering and control of different pulsed regimes in all-fiber lasers by using negative optical feedback
B.N. Nyushkov[1,2], M.D. Radchenko[1,2], I.I. Korel[1,2]; [1]Novosibirsk State Technical University, [2]Institute of Laser Physics SB RAS, Russia
We explored pulsed regimes accessible in rare-earth-doped all-fiber lasers with negative optical feedback (NOF). We demonstrate that the dynamics of NOF-induced cross-gain modulation and the resulting pulsed generation can be controlled by varying the optical lengths of the NOF and laser cavity. This enables the selection of different lasing regimes to generate either pulse bursts, single pulses, or multi-pulse trains.

WeR01-34
Wednesday, June 24, 2026; 18:45-19:00
Bidirectional pulse generation in fiber laser using Yin-Yang double-feedback resonator
B.N. Nyushkov[1,2], M.D. Radchenko[1,2], I.I. Korel[1,2]; [1]Novosibirsk State Technical Univ., [2]Inst. of Laser Physics SB RAS, Russia
We demonstrate synchronous bidirectional pulse generation in a minimalistic, continuously pumped Yin-Yang fiber laser without the use of modulators or saturable absorbers. Its Yin-Yang resonator provides both positive and negative feedback to the gain medium. This enables self-sustained cross-gain modulation and pulsed lasing, which were explored numerically for various rare-earth-doped fiber lasers and experimentally investigated in an Er-doped fiber laser.

WeR01-35
Wednesday, June 24, 2026; 19:00-19:15
Amplitude, phase and polarization analysis of ultrashort pulses from non-PM fiber laser
D.T. Batov[1], V.S. Voropaev[1], S.I. Mizgirev[1], R. Trebino[2], V.A. Lazarev[1], M.K. Tarabrin[1]; [1]Science and Education Center for Photonics and IR-Technology, Bauman Moscow State Technical University, Russia; [2]School of Physics, Georgia Institute of Technology, USA
The importance of the full vectorial characterization of ultrashort pulses generated by non-PM fiber lasers was shown. The pulse characteristics are measured using TURTLE principle and SHG FROG setup directly at the mode-locked thulium-doped fiber laser output and after an isolator with polarization mode dispersion. The complex polarization, intensity, and phase evolution across the ultrashort pulse were demonstrated and analyzed.

ThR01-p01
Thursday, June 25, 2026; 10:00-13:30
Nd:YAG end-diode-pumped amplifier efficiency related to the terminal laser level relaxation rate *(Poster)*
V.B. Morozov, A.N. Olenin, D.V. Yakovlev; Physics Faculty of M.V.Lomonosov Moscow State University, Russia
Two-pass amplifiers are important structural components of energy-effective amplifiers based on Nd-doped materials. When the terminal level lifetime is longer than pulse duration, gain efficiency meets limitation due to “bottleneck” effect. This is why its lifetime value is important parameter for picosecond and short nanosecond amplifiers. Partial recovery of amplifying ability due to fast relaxation should be taken into account

ThR01-p02
Thursday, June 25, 2026; 10:00-13:30
Suppression of thermally induced depolarization in Faraday isolators using a specially designed magnetic field profile *(Poster)*
D.A. Kochkin, E.A. Mironov; A.V. Gaponov-Grekhov Institute of Applied Physics of RAS, Russia
Solid-state lasers delivering both high peak and high average power have become indispensable tools for fundamental and applied research. A significant constraint on advancing these laser technologies and their application is the lack of high-performance Faraday isolators (FIs) capable of operating under such challenging conditions. The key limitation arises from the heating of the magneto-optical element (MOE) by laser radiation.

ThR01-p03
Thursday, June 25, 2026; 10:00-13:30

Pulsed joule-level Cr^{2+}:CdSe laser tunable from 2.22 to 3.65 μm *(Poster)*

Ya.K. Skasyrsky, M.P. Frolov, Yu.V. Korostelin, V.I. Kozlovsky, S.O. Leonov; P.N. Lebedev Physical Institute of RAS, Russia

Tunable and femtosecond IR lasers based on transition-metals-doped crystals of II-VI compounds are demand in medicine, environmental monitoring, spectroscopy and metrology. The most developed lasers in this class use Cr2+:ZnSe and Fe2+:ZnSe crystals. The tuning curves of these lasers (1.88-3.349 μm and 3.76-5.29 μm, respectively) do not overlap. The laser based on Cr2+:CdSe crystal allows you to partially master the problematic range.

ThR01-p04
Thursday, June 25, 2026; 10:00-13:30

Pulse-splitting suppression in a diode-pumped Ti:Sa. *(Poster)*

K.E. Reznikov[1,2], M.N. Esaulkov[1], A.V. Naumov[2]; [1]Avesta Ltd., [2]P.N. Lebedev Physical Institute of RAS, Russia

We demonstrate a diode-pumped Ti:Sa oscillator where modulation instability (MI), limiting high-power KLM, is controlled by pump focusing (lens focal length - F). Experimentally, when stable pulses (9.9 fs) reached 300 mW at 8 W of pump power, shorter focal lengths improved stability and output power with 7.5 fs pulse duration, eliminating MI. This offers a simple route to stable and efficient diode-pumped KLM Ti:Sa oscillators.

ThR01-p05
Thursday, June 25, 2026; 10:00-13:30

Single-frequency laser system with ultra-low amplitude and frequency noise. *(Poster)*

K.A. Zagorulko, A.V. Kozlov, M.K. Brazhnikov; Russian Metrological Institute of Technical Physics and Radio Engineering, Russia

We report the complete suppression of the relaxation oscillation peak and RIN reduction of a single-frequency fiber laser to the level of a DFB laser diode using optical injection. A laser system with the frequency noise of a fiber laser and the RIN of a DFB laser diode is presented.

ThR01-p06
Thursday, June 25, 2026; 10:00-13:30

Cladding-pumped Bismuth-doped multi-core phosphosilicate fiber laser at 1.31 μm *(Poster)*

A.V. Kharakhordin[1], V.V. Velmiskin[1], A.A. Umnikov[2], F.V. Afanasiev[2], D.I. Oleinik[2], A.N. Denisov[1], A.M. Khegai[1], A.N. Abramov[2], S.V. Alyshev[1], E.G. Firstova[1], V.A. Agakhanova1, D.S. Lipatov[2], S.L. Semjonov[1], M.A. Melkumov[1] and S.V. Firstov[1]; [1]Prokhorov General Physics Institute of RAS, Dianov Fiber Optics Research Center, [2]G.G. Devyatykh Institute of Chemistry of High-Purity Substances of RAS, Russia

The first laser at 1.31 μm based on Bi-doped multicore fiber (MCF) with strongly coupled-core structure in a hexagonal pattern was developed in cladding-pumped configuration using multimode laser diodes at 793 nm. Supermode lasing using a 190-m-long bismuth-doped MCF in a Fabry-Perot cavity with ≈100%- and 4%-reflective mirrors was obtained.

ThR01-p07
Thursday, June 25, 2026; 10:00-13:30

Compact DPSS green laser for interferometry with frequency stability better then 10-12 *(Poster)*

V.V. Naumova, O.A. Orlov, E.P. Krivtsov; D.I. Mendeleev Institute for Metrology, (VNIIM), Russia

this paper is devote to development and investigation a compact high efficiency DPSS SLM laser at 532 nm. It was shown that the optical pumping by powerful multimode laser diodes stimulate additional amplitude noise of output power. Single longitudinal mode diode pump laser allows increase laser frequency stability about one order of magnitude comparing with multimode pumping

ThR01-p08
Thursday, June 25, 2026; 10:00-13:30

1-W -level soliton molecule generation in an Erbium-doped chirped pulse amplification fiber system *(Poster)*

A. Ismaeel[1,2], I.O. Orekhov[1], N.A. Sorokin[1], A.O. Prudnikov[1], V.M. Bogomolov[1], G.V. Pshenichnikov[1], P.V. Aleksandrov[1], S.G. Sazonkin[1], D.A. Dvoretskiy[1], A.A. Krylov[3], V.E. Karasik[1]; [1]Bauman Moscow State Technical University, [2]Moscow Institute of Physics and Technology, [3]Prokhorov General Physics Institute of RAS, Dianov Fiber Optics Research Center, Russia

We report the amplification of soliton molecules (SM) in an erbium-doped fiber chirped pulse amplification (CPA) system. We achieved 1.73 W average power for an 11-pulse SM with 1.48 ps pulse duration and 3.1 ps pulses separation.

ThR01-p09
Thursday, June 25, 2026; 10:00-13:30

Growing bulk β-BBO crystals in the BaB_2O_4 -$NaBaBO_3$ -Bi_2O_3 system *(Poster)*

E.A. Simonova[1], D.M. Ezhov[2], A.A. Goreyavcheva[1], D.M. Khramtcova[1], A.E. Kokh[1]; [1]V.S. Sobolev Institute of Geology and Mineralogy SB RAS, [2]Tomsk State University,Russia

The primary crystallization region of β-BBO was determined in the BaB2O4-NaBaBO3-Bi2O3 system. The study demonstrated that the system is promising for growing β-BBO single crystals (the grown crystal weighed 165 g, while the melt solution weighed 750 g) due to its wide range of crystallization concentrations and temperatures. The Na+ and Bi3+ impurity content in the grown crystals was below detection limits, as determined by microprobe analysis.

ThR01-p10
Thursday, June 25, 2026; 10:00-13:30

Balancing heat and dispersion: how pump power shapes femtosecond pulse generation in SESAM-assisted Kerr-lens mode-locked Ti:Sapphire oscillators *(Poster)*

Z. Mohammadzahery, M. Jandaghi, M. Abrishami, S. Alipour, Zahra Mohammadzahery; Iranian Institute of Laser Science and Technology, Iran

We analyze how pump-induced thermal lensing reshapes intracavity mode size and perturbs the nonlinear–dispersion balance in a SESAM-assisted Kerr-lens mode-locked Ti:sapphire oscillator. By quantifying thermal lens strength via knife-edge profiling, we identify the pump-power window where thermal focusing, effective nonlinearity, and dispersion compensation jointly enable stable sub-40-fs pulse generation.

ThR01-p11
Thursday, June 25, 2026; 10:00-13:30

Laser micromachining for the fabrication of micron-scale target components *(Poster)*

M.A. Rogozhina, I.A. Chugrov; RFNC-VNIIEF, Russia

This paper presents the results of creating a stand for laser micro-processing of materials and manufacturing micron-sized target components on it.

ThR01-p12
Thursday, June 25, 2026; 10:00-13:30

High-repetition-rate Q-switched lasing with a composite ceramic YAG:Nd^{3+}/YAG:Cr^{4+} element *(Poster)*

M.N. Ershkov[1], S.A. Solokhin[1], T.A. Nazarova[1], A.E. Shepelev[1], S.N. Smetanin[2]; [1]KSTA named after V.A. Degtyarev; [2]Prokhorov General Physics Institute of RAS, Russia

The results of experimental studies of a high-repetition-rate Q-switched oscillation of a compact laser based on a composite all-ceramic YAG:Nd3+ / YAG:Cr4+ element at a wavelength of 1.064 μm are presented. 290 kHz repetition-rate laser oscillation with 4.52 W output power and 5.6 ns pulse duration was achieved.

ThR01-p13
Thursday, June 25, 2026; 10:00-13:30
Efficiency of cw-end-pumped Q-switched single mode Nd:YLF - laser *(Poster)*
A.J. Abazadze; Polyus Research and Development Institute named after M.F.Stelmakh, Russia
A theoretical and experimental study of a single - mode Nd:YLF laser with a Q-switched resonator and longitudinal pumping by continuous radiation from laser diodes was carried out, during which the parameters of the pump beam and the resonator configuration were varied.

ThR01-p14
Thursday, June 25, 2026; 10:00-13:30
Optical properties of diffusion-doped Cr:CdTe crystals *(Poster)*
S.V. Kurashkin[1,2], D.V. Savin[2], V.B. Ikonnikov[2], O.V. Martynova[1]; [1]Lobachevsky State Univ. of Nizhny Novgorod, Russia; [2]Devyatykh Inst. of Chemistry of High-Purity Substances of RAS, Russia
Infrared optical properties of diffusion-doped Cr:CdTe crystals were studied. Cr doping of CdTe single crystals was achieved by thermal diffusion from metallic thin films. All samples demonstrated strong intracenter absorption bands characteristic of Cr2+ ions and had a wide emission spectrum from 1.8 to 3.1 μm. The room-temperature luminescence lifetime in the Cr:CdTe samples ranged from 2.4 to 3.2 μs.

ThR01-p15
Thursday, June 25, 2026; 10:00-13:30
A study of the influence of background radiation of the sky on the registration of a useful signal in a laser ranging system *(Poster)*
D.V. Kovalev; Lomonosov Moscow State University, branch in Sarov, Russia
This study evaluates how background sky radiation affects signal detection in laser ranging systems. By analyzing sky background power variations, the research determines the system's maximum operating range under both laboratory and field conditions. Finally, the authors validate their performance model by successfully comparing the calculated theoretical limits with experimental range data.

ThR01-p16
Thursday, June 25, 2026; 10:00-13:30
5 J 10 Hz Nd:YAG laser with near-bandwidth-limited nanosecond pulses *(Poster)*
A.F. Kornev, R.V. Balmashnov, Yu.V. Katsev, V.V. Koval, A.M. Makarov; "Lasers and Optical Systems" Co. Ltd., Russia
We developed a 1064 nm Nd:YAG MOPA-laser with passively Q-switched diode-end-pumped master oscillator and two-pass flashlamp-pumped power amplifier with SBS mirror. The laser produces 7 ns near-bandwidth-limited pulses with 5 J pulse energy at 10 Hz pulse repetition rate. The output beam is flat-top with near-diffraction-limited beam divergence (<1.3xDL). The laser is designed as a compact monoblock unit with an integrated power supply and cooling system.

ThR01-p17
Thursday, June 25, 2026; 10:00-13:30
Low-energy transmission coefficient investigation of the NPE-based saturable absorber in an all-fiber laser *(Poster)*
S.V. Chirkov[1,2], N.N. Smolyaninov[1], V.D. Efremov[1,2], D.S. Kharenko[1,2]; [1]Inst. of Automation and Electrometry, [2]Novosibirsk State Univ., Russia
We report a study of the saturable absorber's low-energy transmission coefficient (LETC) through numerical simulation of a mode-locked ytterbium fiber laser using the vector nonlinear Schrodinger equation. A range of achievable laser output parameters of the fundamental mode-locking regime and the influence of the LETC on them was investigated and compared with experimental results.

ThR01-p18
Thursday, June 25, 2026; 10:00-13:30
Highly efficient 915 nm single-mode Nd-doped all-fiber laser with ASE suppression near 1060 nm *(Poster)*
D.A. Davydov[1], S.S. Aleshkina[1], V.V. Velmiskin[1], A.S. Lobanov[2], M.V. Yashkov[2], D.F. Burmistrov[2], D.S. Lipatov[2], D.V. Przhiialkovskii[3], O.V. Butov[3], and M. E. Likhachev[1]; [1]Prokhorov General Physics Institute of RAS, Dianov Fiber Optics Research Center, [2]G.G. Devyatykh Institute of Chemistry of High-Purity Substances of RAS, [3]Kotelnikov Institute of Radioengineering and Electronics of RAS, Russia
We report an all-fiber 915 nm laser with a slope efficiency of ~37%, the highest reported to date among near-diffraction-limited all-fiber lasers. For this purpose, a novel Nd-doped fiber with cladding-embedded absorbing high-index rods, designed to enhance 915 nm lasing by spectrally filtering amplified spontaneous emission (ASE) near 1064 nm, was fabricated. Strong ASE suppression was observed, with a signal-to-ASE ratio >50 dB.

ThR01-p19
Thursday, June 25, 2026; 10:00-13:30
A spectroscopic study of a CaF_2:Tm^{3+}, Dy^{3+}crystal *(Poster)*
L.V. Gafurova, A.A. Sirotkin, V.A. Konyushkin, P.A. Chizov, V.Kh. Bagdasarov, Yu.L. Kalachev, B.D. Ovcharenko; Prokhorov General Physics Institute of RAS, Russia
The spectroscopy of a CaF2 crystal co-doped with Tm3+ and Dy3+ ions with varying concentrations was performed. The experimental data analysis provided the lifetimes, energy transfer coefficients, and absorption and luminescence cross-sections. Our researcher demonstrated that the CaF2:Tm3+,Dy3+ crystal promising for MID-IR lasing.

ThR01-p20
Thursday, June 25, 2026; 10:00-13:30
AIIBVI crystals doped with transition metals *(Poster)*
A.S. Azhgalieva, D.S. Denisenko, E.B. Borisenko, A.V. Timonina, N.N. Kolesnikov; Osipyan Institute of Solid State Physics RAS (ISSP RAS), Russia
ZnSe, CdSe, and Cd0.88Zn0.12Te crystals doped with transition metals at the level of 1018x1020 cm-3 were grown by vertical zone melting under argon pressure. As a result of the study, experimental data were obtained on the distribution of ions of the alloying additive in the grown crystals.

ThR01-p21
Thursday, June 25, 2026; 10:00-13:30
Nanosecond 2.94 μm KTA OPO system for biological tissue ablation *(Poster)*
D.A. Nazarov, A.A. Teslenko, M.K. Tarabrin; BMSTU, Russia
Laser sources in the 2.7 to 3 μm spectral range have found numerous applications in laser surgery due to the strong absorption peaks of water, collagen, and hydroxyapatite. However, the ablation process performed by commercial systems is often followed by collateral damage. To reduce it, a 2940 nm nanosecond OPO with pulse energy of more than 15 mJ was developed.

ThR01-p22
Thursday, June 25, 2026; 10:00-13:30
Diagnostics of C, NV^-: HPHT diamond as a new laser material *(Poster)*
T.S. Misnikova, V.F. Lebedev; St.Petersburg State University of Aerospace Instrumentation, Russia
Two optical schemes for recording the spectral-temporal characteristics of the stimulated emission (SE) of HPHT-diamond with NV-- centers are proposed. The analysis of radiation propagating inside and outside the crystal is carried out, including an analysis of the directivity of the radiation beam exiting the sample and the intensity distribution in its cross-section.

ThR01-p23
Thursday, June 25, 2026; 10:00-13:30
Spectral-kinetic study of Tb^{3+} ions in two-component CaF_2 -SrF_2 systems doped with Yb^{3+} ions *(Poster)*
P.G. Zverev, A.V. Nekhoroshikh, V.A. Konyushkin; Prokhorov General Physics Institute, RAS, Russia
Alkaline earth metal fluorides CaF2-SrF2 doped with terbium Tb3+ ions are important Materials for laser technology, bioimaging, and dosimetry. The study of terbium Tb3+ ions in CaF2-SrF2 crystals doped with Yb3+ ions is aimed at understanding the energy transfer between ions and the spectroscopic characteristics of laser materials. Yb3+ acts as a sensitizer, increasing the efficiency of terbium luminescence due to the long excited state lifetime.

ThR01-p24
Thursday, June 25, 2026; 10:00-13:30
Single-frequency generation in a short-cavity Nd doped phosphosilicate fiber laser *(Poster)*
A.V. Shirmankin[1], A.I. Trikshev[1], V.A. Kamynin[1], A.A. Rybaltovsky[1], S.E. Sverchkov[1], B.I. Denker[1], V.B. Tsvetkov[1], V.V. Velmiskin[2]; [1]Prokhorov General Physics Institute RAS, [2]E.M. Dianov Fiber Reseach Center of IOF RAN, Russia
This paper presents a fiber laser based on a short phosphosilicate fiber with a high neodymium concentration. The laser demonstrated stable single-frequency operation at a wavelength of 1066 nm.

ThR01-p25
Thursday, June 25, 2026; 10:00-13:30
Photoluminescence of KTP crystal excited by nitrogen laser *(Poster)*
D.S. Chunaev, S.B. Kravtsov, P.G. Zverev; Prokhorov General Physics Institute of RAS, Russia
Luminescence of KTP crystal irradiated by pulsed nitrogen laser at wavelength of 337 nm has been studied. Two wide bands were recorded at 470-650 and 750-850 nm. The decay curve exhibits dual-exponential behavior with characteristic lifetimes of 1.7 and 4.3 μs.

ThR01-p26
Thursday, June 25, 2026; 10:00-13:30
Modelling of thermal lenses in inhomogeneously doped Cr:ZnSe laser rods *(Poster)*
D.A. Nuzhdin[1], O.V. Martynova[1], A.P. Savikin[1], S.V. Kurashkin[1,2]; [1]Lobachevsky State University of Nizhny Novgorod, [2]Devyatykh Institute of Chemistry of High-Purity Substances of RAS, Russia
The study investigates thermal distortions in a Cr:ZnSe laser rod with a radially symmetrical doping profile under continuous-wave (CW) pumping. Modelling of the induced temperature fields was performed using the COMSOL for uniformly and non-uniformly doped rods, considering the effect of pump absorption saturation.

ThR01-p27
Thursday, June 25, 2026; 10:00-13:30
Thermal broadening of Yb^{3+} luminescence spectra in ceramic and single-crystal gain media *(Poster)*
V.Yu. Zhmykhov[1], D.A. Guryev[1], E.A. Dobretsova[1], S.V. Kuznetsov[1], V.A. Tarala[2], V.B. Tsvetkov[1]; [1]Prokhorov General Physics Institute of the RAS, Moscow, [2]Scientific and Laboratory Complex Clean Room, North Caucasus Federal University, NCFU, Russia
The temperature-dependent luminescence properties of Yb^{3+}-doped scandium-containing YAG-based laser ceramics were investigated in the temperature range from 77 K to 400 K. A broadening of the luminescence lines with increasing temperature was observed, which is attributed to enhanced electron–phonon interaction, while the spectral peak positions remained nearly unchanged, demonstrating the structural stability of the ceramic materials.

ThR01-p28
Thursday, June 25, 2026; 10:00-13:30
Thermal distortions in multi-pass and multi-channel scheme of pumping for a disk laser *(Poster)*
A.L. Koromyslov[1], I.M.Tupitsyn[1], K.V.Prochorchuk[1,2], E.A.Cheshev[1]; [1]P.N. Lebedev Physical Institute of RAS, [2]National Research Nuclear University MEPhI, Russia
This paper presents the results of a numerical study of thermo-optical effects in a composite disk laser with multi-pass and multi-channel pumping scheme. A form of distribution and the proportion of a contribution of components to the formation of a thermal lens are demonstrated.

ThR01-p29
Thursday, June 25, 2026; 10:00-13:30
Stretched pulse generation in an all-fiber Erbium-doped oscillator with hybrid mode-locking *(Poster)*
A. Ismaeel[1,2,3], A.A. Krylov[1], E.D. Obraztsova[1,4]; [1]Prokhorov General Physics Institute of RAS, Dianov Fiber Optics Research Center, [2]Moscow Institute of Physics and Technology, [3]Bauman Moscow State Technical University, [4]Prokhorov General Physics Institute of RAS, Russia
We report the generation of stretched pulses in an erbium-doped fiber laser. A Gaussian spectrum with 28 nm width, corresponding to 111 fs pulse duration, is achieved via hybrid mode-locking combining single-walled carbon nanotubes (SWCNTs) and nonlinear polarization evolution (NPE). We also demonstrate the transformation of this regime into a similariton-like state upon increasing the pump power.

ThR01-p30
Thursday, June 25, 2026; 10:00-13:30
Solid state YAG:Cr^{4+} laser gyroscope with mode locking and features of frequency biasing via KTP electro-optic modulator *(Poster)*
Yu.Yu. Broslavets, A.A. Fomichev, E.A. Polukeev, V.G. Semenov, A.B. Mordvinova, E.S. Ivanina; Moscow Institute of Physics and Technology (National Research University), Russia
This work presents the development of a YAG:Cr4+ solid-state laser gyroscope with a frequency bias generation via KTP electro-optic phase modulator. The modulator was optimized considering its electro-optic characteristics, dispersion properties, and geometry. Numerical modeling of bidirectional lasing in a ring laser under mode-locking and applied frequency bias was performed. The region of stable bidirectional generation and mode-locking was determined.

ThR01-p31
Thursday, June 25, 2026; 10:00-13:30
Transient dynamics of short-cavity Erbium fiber lasers *(Poster)*
A.M. Smirnov[1,2], M.P. Bazakutsa[1], A.S. Shikin[1], A.V. Dorofeenko[1,3,4,5], O.V. Butov[1]; [1]Kotelnikov Institute of Radioengineering and Electronics of RAS, [2]Faculty of Physics of Lomonosov Moscow State University, [3]Moscow Institute of Physics and Technology, [4]Institute for Theoretical and Applied Electromagnetics RAS, [5]Dukhov Research Institute of Automatics, Russia
The operation dynamics of erbium fiber lasers with short cavities are experimentally investigated as a function of erbium concentration and pump power. The study is extended to the L-band spectral region. The transition from pulsed to continuous-wave (CW) regimes is analyzed by varying the active fiber composition, fabrication technology as well as when shifting the lasing wavelength toward 1625 nm.

ThR01-p32
Thursday, June 25, 2026; 10:00-13:30
Heat generation in Yb:YAG crystalline sample under laser irradiation at 1030 nm wavelength *(Poster)*
D.Yu. Demushkin[1], D.A. Denisov[1], A.V. Konyashkin[2]; [1]Moscow Institute of Physics and Technology (State University), [2]Fryazino Branch of Kotelnikov Institute of Radioengineering and Electronics of RAS, Russia
We present the measurement results of the heat dissipation in an Yb:YAG active element during interaction with the pulsed nanosecond laser radiation at 1030 nm wavelength. The absorbed power and its proportion relative to the pump radiation were calculated by solving the heat conduction equation.

ThR01-p33
Thursday, June 25, 2026; 10:00-13:30
Efficient UV active medium and distribution coefficient of Ce^{3+} ions in $LiSr(x)Ca(1-x)AlF_6$ *(Poster)*
A.A. Shavelev[1], T.M. Minnebaev[1], A.M. Zubareva[1], A.A. Shakirov[1], A.G. Kiiamov[1], I.D. Sidorov[1], S.L. Korableva[1], V.V. Semashko[1,2], K.R. Minnebaev[1], B.I. Gareev[1], A.S. Nizamutdinov[1]; [1]Kazan Federal University, [2]Kazan Research Center of RAS, Russia
In this paper we study the distribution of Ce3+ ions in LiSrxCa1-xAlF6:Ce3+ depending on the ratio of Ca2+/Sr2+ cations. In a series of single crystal samples with Ce3+ and different x values, an optimal crystal composition of LiSr0.5Ca0.5AlF6:Ce3+ was established with the distribution coefficient of Ce3+ ions 6 times higher than in the known UV active medium – LiCaAlF6:Ce3+ crystal.

ThR01-p34
Thursday, June 25, 2026; 10:00-13:30
Influence of different laser cladding modes on invasion of carbide powders in stainless steel studied by LIBS *(Poster)*
E.L. Surmenko, T.N. Sokolova, P.N. Ustinov, D.A. Bessonov, I.V. Rodionov; Yuri Gagarin State Technical University of Saratov, Russia
Pulsed laser cladding of titanium carbide powder on different modes was used in the restoration of steel parts. The process of cladding with changing laser parameters was implemented on laser commercial setup Bulat LRS 50A. The efficiency of titanium powder invasion was studied by LIBS-method.

ThR01-p35
Thursday, June 25, 2026; 10:00-13:30
Combined laser exposure initiating stimulated emission in synthetic C, NV^-: HPHT diamond *(Poster)*
T.S. Misnikova, V.F. Lebedev, Ya.A. Ryvkina; St.Petersburg State University of Aerospace Instrumentation, Russia
The effect of combined pumping on narrow-band stimulated emission (SE) in HPHT diamond with high concentrations of NV^- and C-centers. The sample was pre-irradiated continuously (λ=365, 405, or 532 nm) and then pulsed (λ=532 nm). The maximum SE was observed at λ=405 nm, while λ=365 nm yielded lower intensity. These findings require further investigation of absorption at λ<450 nm.

ThR01-p36
Thursday, June 25, 2026; 10:00-13:30
Microchip quasi-CW single-frequency tunable Nd:YVO_4 laser generating at 1064.5 nm *(Poster)*
A.F. Kornev, S.S. Terekhov; "Lasers and Optical Systems" Co. Ltd., Russia
We developed a single-frequency 30 mW microchip 1064 nm Nd:YVO4 laser with long-term wavelength stability of 0.2 pm and wavelength tunability of ±0.1 nm. The laser was end-pumped at 808 nm by a 1 W laser diode with 50 µm emitter size.

ThR01-p37
Thursday, June 25, 2026; 10:00-13:30
Application of 1064 and 532 nm fiber lasers for coupling with laminar water jet *(Poster)*
G.N. Dubrovin, P.E. Samarin; VPG Laserone, Russia
This paper investigates the propagation characteristics of a laser beam inside a laminar water jet. The influence of laser wavelength on the efficiency of laser radiation input into the jet is assessed. Different types of pulsed fiber lasers are considered.

Section R02. High Power Lasers: Fiber, Solid State, Gas and Hybrid

WeR02-01
Wednesday, June 24, 2026; 11:30-12:00
High-power narrow-band lasers based on multimode and multicore fibers and components for high-power lasers *(Invited)*
S.A. Babin; Institute of Automation and Electrometry SB RAS, Russia
We review recent developments on multicore/multimode fiber lasers with direct LD pumping and fiber components allowing for their high-power operation, all-fiber performance and comprehensive spatio-spectral control, which reveal new physical effects such as combined Raman and Kerr beam cleaning, spatio-spectral filtering by regular and random refractive-index structures in multimode graded-index fibers, beam localization and spectrum collapse in multicore fibers.

WeR02-02
Wednesday, June 24, 2026; 12:00-12:30
Passively mode-locked ultrashort pulse fiber lasers *(Invited)*
Li Li[1], Bin Zhang[2], Song Yang[3], Lei Jin[2]; [1]Harbin Institute of Technology, [2]Harbin Engineering University, [3]Institute of Semiconductors, Chinese Academy of Sciences, China;
Ultrashort infrared pulse sources were widely applied in the fields of industrial processing and optical communication. My presentation introduces the recent development of passively mode-locked Er- and Tm-doped fiber lasers for generation of pico- and femto-second pulses at 1.5 m and 2.0 m band, particularly with two-dimensional materials and mixed-dimensional heterostructure as saturable absorber.

WeR02-03
Wednesday, June 24, 2026; 12:30-12:45
Tapered Er -Yb-doped fiber amplifier
E.K. Mikhailov[1], A.E. Levchenko[1], V.V. Velmiskin[1], T.S. Zaushitsyna[1], M.M. Bubnov[1], D.S. Lipatov[2], M.E. Likhachev[1]; [1]Prokhorov General Physics Institute of RAS, Dianov Fiber Optics Research Center of RAS, [2]G.G. Devyatykh Institute of Chemistry of High Purity Substances of RAS, Russia
We demonstrate the first tapered Er-Yb-doped fiber amplifier. The fiber had single-mode input with a core/cladding diameter of 8.5/85 μm and an enlarged output of 25/250 μm (to provide a high threshold of non-linear effects). To achieve pump-to-signal conversion efficiency, comparable to Er-Yb-doped fiber analogs high co-doping of Yb2O3 and P2O5 was performed alongside M-shaped core refractive index profile optimization.

WeR02-04
Wednesday, June 24, 2026; 12:45-13:00
Determination of the mode composition of the output radiation of a multimode fiber laser
F.R. Iakupov[1], R.I. Shaidullin[2]; [1]"VPG Laserone", [2]Fryazino Branch of Institute of Radio Engineering and Electronics RAS, Russia
A method of determining the mode composition of the output radiation of a multimode fiber laser based on the analysis of its spectral characteristics has been developed. An experimental study of a multimode fiber laser showed that it maintains from 2 to 4 transverse modes depending on the pump power, while the waveguide itself supports the propagation of 17 modes.

WeR02-05
Wednesday, June 24, 2026; 13:00-13:15
Pulse duration evolution in ytterbium ultrafast fiber laser with nonlinear optical loop mirror
D.V. Khudyakov, A.A. Semirenchenkov; Prokhorov General Physics Institute of RAS, Russia
In our work we present the ytterbium ultrafast fiber laser on wavelength 1030 nm with a nonlinear optical loop mirror which built entirely on polarization maintaining fibers for pulse stabilization against changes in ambient conditions. The method of changing the output pulse duration by changing of the length of fiber segment in input channel of the beam splitter was proposed.

WeR02-06
Wednesday, June 24, 2026; 13:15-13:30
Modeling of amplification processes in optical fibers with an ultra-high concentration of ytterbium ions in the core
K.O. Ionkina[1,2], E.K. Mikhailov[1], S.S. Aleshkina[1], M.E. Likhachev[1]; [1]Prokhorov General Physics Inst. of RAS, Dianov Fiber Optics Research Center of RAS, [2]National Research Univ. Higher School of Economics, Russia
An improved model explaining efficiency degradation in optical fibers with ultra-high ytterbium concentrations is proposed. We show that standard rate equations fail for aluminophosphosilicate fibers with high Yb doping. The model introduces "good" Yb^{3+} ions contributing to amplification and two types of "bad" ions with fast non-radiative decay, enabling accurate gain modeling without artificial parameter adjustment.

WeR02-07
Wednesday, June 24, 2026; 15:00-15:30
Research progress of high performance large aperture laser optics at SIOM *(Invited)*
Jianda Shao, Zhu Meiping, Yunxia Jin, Yanzhi Wang, Chaoyang Wei, Shijie Liu; [1]Shanghai Institute of Optics and Fine Mechanics, CAS, [2]China-Russia Joint Laboratory on Laser Science, China
In this talk, we will present the research progress of high performance large aperture laser optics for high-power laser systems at Shanghai Institute of Optics and Fine Mechanics(SIOM), Chinese Academy of Sciences.

WeR02-08
Wednesday, June 24, 2026; 15:30-16:00
Fabrication and research of yttrium oxide -based laser ceramics *(Invited)*
V.V. Lisenkov, V.V. Osipov, V.A. Shitov; Institute of Electrophysics UrB RAS, Russia
Ceramic samples (Nd:Y2O3, Yb:Y2O3, Nd:YAG, Yb:YAG, Yb:(Lu,Y)2O3) were studied. Our experiments yielded stable laser output with a power of up to 80 W (in short-term mode) and a slope efficiency of up to 78.8%. The decay kinetics of the (Yb^{3+}) ion emission was studied. It was found that defects in the ceramics can be an additional pump source, prolonging the emission.

WeR02-09
Wednesday, June 24, 2026; 16:00-16:30
Bimorph multy-piezo element deformable mirrors for wide aperture laser beam correction *(Invited)*
A.V. Kudryashov; Sadovsky Institute of Geosphere Dynamics of RAS, Russia
The design and application of several wide-aperture bimorph mirrors would be considered in the presentation.

WeR02-10
Wednesday, June 24, 2026; 16:30-17:00
Laser microwelding of metals and glass with high-intensity laser sources in VPG Laserone *(Invited)*
M. Murzakov; Laser Complex department, VPG Laserone, Russia
This paper presents an review of the results of a study conducted at VPG Laserone on laser microwelding of borosilicate glass to glass and to metals. The laser intensities required to form welded joints between both homogeneous and dissimilar materials were experimentally determined. The microstructure of the glass-to-metal welded joint was studied.

WeR02-11
Wednesday, June 24, 2026; 17:30-18:00
Optically pumped rare gas laser *(Invited)*
A.P. Torbin, P.A. Mikheyev; P.N. Lebedev Physical Institute, Samara branch, Russia

WeR02-12
Wednesday, June 24, 2026; 18:00-18:30
Features of coupled fluid dynamics and physical optics in high power COIL active medium *(Invited)*
A.V. Savin, A.S. Boreysho; Laser Systems, Russia
Equation for simulation of fluid dynamics and physical optics of supersonic HP COIL active medium are completely different in their computational nature. The former are hyperbolic in flow direction, whereas the latter are elliptic ones. Therefore coupled simulation meet considerable complexities. An computationally effective coupled model is derived in the paper, and example simulations are presented.

WeR02-13
Wednesday, June 24, 2026; 18:30-19:00
Laser-driven shock tube as a novel laboratory device for studies of hypersonic flows, hydrodynamic instabilities and turbulence *(Invited)*
V.D. Zvorykin, N.N. Ustinovskii, A.V. Shutov, Lebedev Physical Inst. RAS, Russia
The laser-driven shock tube (LDST) is based on the acceleration of a thin CH film by ablative plasma pressure, which is created when exposed to UV pulses of the GARPUN KrF laser (100 J & 100-ns). A prism raster and a lens produced irradiation homogeneity ~ 3% with intensity 1 GW/cm2. Continuous 1D or frame-by-frame 2D shadow and Schlieren images of hydrodynamic processes were analyzed.

WeR02-14
Wednesday, June 24, 2026; 19:00-19:15
Krypton laser with wavelengths of 810 and 744 nm pumped by a pulsed inductive discharge
D.S. Churkin, R.A. Tkachenko, E.S. Kargapol'tsev; Inst. of Laser Physics SB RAS, Russia
The spectral and temporal characteristics of krypton laser radiation were studied on transitions of neutral (Kr I) and ionized (Kr II) krypton atoms pumped by a pulsed inductive cylindrical discharge. Laser generation was achieved on the 5p-5s (810 nm) and 4d-5p (744 nm) transitions of Kr I and Kr II. The duration of optical generation pulses reached 21±1 ns (FWHM).

WeR02-15
Wednesday, June 24, 2026; 19:15-19:30
Liquid crystal modulator for CO laser
A.V. Belyanskaya[1], A.A. Ionin[2], Yu.M. Klimachev[2], A.Yu. Kozlov[2], A.V. Kuznetsov[2], O.A. Rulev[2], E.P. Pozhidaev[2]; [1]Bauman Moscow State Technical University, [2]P.N. Lebedev Physical Institute of RAS, Russia
A double pass of radiation through the liquid crystal cell was arranged to simulate its operation inside a laser cavity of CO laser (5.0 - 5.6 μm). By increasing the modulation frequency up to 10 kHz, modulation of CO laser pulse was carried out with switching time of ~20 μs. The best contrast ratio was 3.2:1 at 5 kHz.

WeR02-16
Wednesday, June 24, 2026; 19:30-19:45
Active mode-locking in a rubidium vapor laser
A.A. Babin[1], A.V. Zakhryapa[1], V.O. Pautov[1], A.A. Sirotkin[2], A.V. Strakhov[1]; [1]Institute of Laser Physics Research, Russian Federal Nuclear Center – VNIIEF, [2]Prokhorov General Physics Institute of RAS, Russia
We demonstrate stable mode-locking in a rubidium vapor laser operating in the Gaussian transverse mode regime without an intracavity diaphragm. The maximum energy in a single synchronized pulse is 100 nJ, the minimum pulse duration is less than 0.4 ns, the lasing pulse period is equal to 10 ns.

ThR02-17
Thursday, June 25, 2026; 09:00-09:30
High-power pulsed broadband solid-state lasers with Bragg gratings *(Invited)*
A.P. Pogoda[1], M.V. Gavrish[1], P.K. Rozanov[1], U.V. Prokhorova[1], A.S. Boreysho[1,2]; [1]Baltic State Technical University "VOENMEH" named after D.F. Ustinov, [2]Laser Systems JSC, Russia
An analysis of the current state of laser technology based on broadband solid-state active media with radiation in the range of 780-900 nm is presented. Methods of using Bragg gratings for radiation control and optical coupling of cavities of laser systems are presented.

ThR02-18
Thursday, June 25, 2026; 09:30-10:00
Mitigating thermally induced depolarization in Faraday isolators using composite structures *(Invited)*
A.V. Starobor; Federal Research Center A.V. Gaponov-Grekhov Institute of Applied Physics of RAS (IAP RAS), Russia
We demonstrate composite magneto-optical elements as an effective method to mitigating thermally induced depolarization in high-power Faraday isolators. By combining a high-Verdet constant medium (TAG/Tb_2O_3 ceramic) with a sapphire heatsink using optical adhesive, significant heat dissipation is achieved. Experimental results confirm a reduction in depolarization by factors of 2.6 and 3.7 respectively, offering a robust solution for high-power laser applications.

ThR02-19
Thursday, June 25, 2026; 10:00-10:15
Design and development of a diode-pumped Nd^{3+}:YAG solid-state laser for laser shock peening
A.S. Shchekin[1,2], E.D. Ishkinyaev[1,2], O.V. Pagaev[1], A.I. Demidchik[1]; [1]LLC LASSARD, [2]National Research Nuclear University MEPhI, Russia
We present the development of a diode-pumped solid-state laser based on a master oscillator power amplifier (MOPA) architecture designed for laser shock peening applications. The system combines a single-frequency master oscillator (wavelength 1.064 μm, $M^2 < 1.5$) with a five-stage power amplifier, delivering stable pulses with energies up to 10 J at a 10 Hz repetition rate and 20 ns pulse duration.

ThR02-20
Thursday, June 25, 2026; 10:15-10:30
T+O+E ultra-wideband Bi-doped fiber amplifier
A.M. Khegai[1], K.E. Riumkin[1], S.V. Firstov[1], D.S. Serenkov[1], A.V. Elopov[1], A.V. Kharakhordin[1], A.S. Lobanov[2], M.A. Melkumov[1]; [1]Prokhorov General Physics Institute of RAS, [2]G.G. Devyatykh Institute of Chemistry of High-Purity Substances of RAS, Russia
We have developed an ultra-wideband amplifier based on bismuth-doped fibers that operates in the T, O, and E telecommunication bands. The amplifier utilizes three types of bismuth-doped fiber, namely germanosilicate, phosphosilicate, and aluminophosphosilicate fibers doped with Bi. The amplifier was backward pumped at 1230 nm and bi-directionally pumped at 1137 nm. The results obtained may be of interest to telecommunications applications, particularly those related to multiband transmission techniques.

ThR02-21
Thursday, June 25, 2026; 10:30-10:45
Temperature-dependent absorption at the gain wavelength in Yb:YAG crystal
A.O. Kuptsova[1,2], G.V. Kuptsov[1,3], V.A. Petrov[1,3], V.V. Petrov[1,2,3]; [1]Institute of Laser Physics SB RAS, [2]Novosibirsk State University, [3]Novosibirsk State Technical University, Russia.
Yb:YAG exhibits temperature-dependent reabsorption of amplified radiation that affects efficiency of laser amplifiers. The dependence of absorption in Yb:YAG crystal on wavelength around 1030 nm in temperature range from 40 to 420 K is studied. The results shows that there is a discrepancy between the measured absorption cross section and the one calculated from published data on luminescence cross section.

ThR02-22
Thursday, June 25, 2026; 11:30-12:00
Formation of carrier-envelope phase stable gigawatt single-cycle pulses for ultrafast spectroscopy *(Invited)*
A.B. Fedotov[1,2], I.V. Savitsky[1], A.A. Voronin[1,2], E.A. Stepanov[1,2], A.A.Lanin[1,2]; [1]Lomonosov Moscow State University, [2]Russian Quantum Center, Russia
We report an overview of the methods for the formation and characterization of single-cycle pulses, as well as approaches to stabilizing the field phase relative to the envelope of laser pulses (carrier-envelope phase (CEP)), with an emphasis on methods for passive stabilization of powerful pulses using nonlinear processes. The features and advantages of using phase-stable single-period pulses for current problems of ultrafast nonlinear spectroscopy are discussed.

ThR02-23
Thursday, June 25, 2026; 12:00-12:30
Resonant high harmonic generation and attosecond pulses production in intense laser field *(Invited)*
V.V. Strelkov[1,2]; [1]P.N. Lebedev Physical Institute of RAS, [2]A.V. Gaponov-Grekhov Institute of Applied Physics of RAS, Russia
We present the four-step model of the resonant high-harmonic generation, where the steps of the process are (i) photoionization, (ii) the photoelectron's motion in the laser field, (ii) trapping of the electron by the parent ion so that the system lands in the AIS, and (iv) transition from the AIS to the ground state leading to XUV emission.

ThR02-24
Thursday, June 25, 2026; 12:30-13:00
Generation of strong magnetic fields and terahertz radiation by irradiation of profiled targets with relativistic laser pulses *(Invited)*
N.D. Bukharskii, Ph.A. Korneev; National Research Nuclear University MEPhI, P.N.Lebedev Physical Institute of RAS, Russia
The work presents theoretical and experimental studies investigating the possibility of using intense laser-driven discharge currents for generation of strong quasi-stationary magnetic fields and powerful terahertz radiation pulses with controllable characteristics. For this purpose, we propose the use of profiled micro-targets of different geometries, where the currents are excited by ultra-short relativistically-intense laser pulses.

ThR02-25
Thursday, June 25, 2026; 13:00-13:15
Metrological support for high power laser radiation
S.B. Buchkov, S.V. Tikhomirov, S.A. Moskaluk; The All Russian Research Institute of Optical and Physical Measurements, Russia
The report describes the results of R&D work on creating a metrological support system for measuring high levels of optical power. This includes reference installations, an upgraded State Primary Standard GET28 2022, and developed powermeters operating in the spectral range of 1,07–10,6 μm and the dynamic range of 1–500 kW, which meet the requirements of manufacturers of technological and special laser equipment.

ThR02-p01
Thursday, June 25, 2026; 15:00-18:30
Adaptive system for simultaneous aberration correction of multiple high-energy laser beams using a single wavefront sensor *(Poster)*
D.A. Fedorino[1], A.L. Rukosuev[1], J.V. Sheldakova[1], A.V. Kudryashov[1,2]; [1]Sadovsky Institute of Geosphere Dynamics RAS, [2]Moscow Polytechnic University, Russia
An adaptive system for simultaneous aberration correction of four high-energy laser beams using a single wavefront sensor is presented. Each beam forms a spot pattern in a dedicated subregion of the detector, enabling independent correction. The approach eliminates redundant hardware, significantly simplifying the multi-beam system while preserving independent channel functionality.

ThR02-p02
Thursday, June 25, 2026; 15:00-18:30
Dynamic chaos in a CO_2 laser with mechanical feedback modulation *(Poster)*
A.P. Mineev, S.M. Nefedov, P.A. Goncharov; Prokhorov General Physics Institute of RAS, Russia
The transition to dynamic chaos in the output radiation pulsations of a single-frequency planar CO2 laser with continuous RF excitation and additional feedback achieved through mechanical modulation (changing the optical path length) and subsequent injection of a small fraction (~1%) of the output radiation into the peripheral region of the unstable laser cavity was studied.

ThR02-p03
Thursday, June 25, 2026; 15:00-18:30
Multi-frequency broadband tunable dye lasers *(Poster)*
A.P. Mineev, S.M. Nefedov, P.A. Goncharov; Prokhorov General Physics Institute of RAS, Russia
The spectral and energy characteristics of lasers with active media on several dyes located in separate coaxial cuvettes and excited by pulsed laser radiation at 532 nm were studied. This configuration allowed for flexible modification of the active medium composition, working with various dyes, solvents, and their concentrations, while avoiding potential interactions between the mixture components. The R6G and DCM dye laser, in separate cuvettes, features wavelength tuning within the 551-693 nm range.

ThR02-p04
Thursday, June 25, 2026; 15:00-18:30
Numerical analysis of time-frequency distribution energy in chirped laser beams *(Poster)*
C.A. Yampolskaya, A.G. Yastremskii, Yu.N. Panchenko, V.F. Losev; Institute of High Current Electronics SB RAS, IHCI, Tomsk, Russia
Based on the Cohen and Wigner distribution functions the algorithm for numerical analysis of the time-frequency distribution of photon flux density of a chirped laser beam has been developed. This made it possible to use well-known photon transport equations to study the evolution of the time-frequency distribution of laser energy in high-power laser systems.

ThR02-p05
Thursday, June 25, 2026; 15:00-18:30
Numerical analysis of the stability of a non-uniform KrF laser pump discharge under high power pulsed excitation *(Poster)*
S.A. Yampolskaya, A.G. Yastremskii, Yu.N. Panchenko; Institute of High Current Electronics SB RAS, Russia
This paper presents a numerical analysis of the behavior of non-uniform KrF laser pump discharges excited by high-power current pulses (~10 MW/cm³). It was shown that, for same electrodes roughness, the density of plasma spots on the cathode surface increases with increasing excitation pulse power. In some modes, a localized increase in pump power density in a non-uniform active medium allows for higher output energy compared to a uniform discharge.

ThR02-p06
Thursday, June 25, 2026; 15:00-18:30
Scaling procedure for centrifugal bubbling singlet oxygen generators of high-power chemical oxygen-iodine lasers *(Poster)*
A.S. Boreisho, D.F.Izosimov, I.A. Kiselev, A.V.Savin; JSC "Laser Systems", Russia
A scaling methodology for centrifugal bubbling singlet oxygen generators has been developed to enable the design of high-power chemical oxygen–iodine lasers. The approach preserves five key physical parameters during upscaling from a 1-kW prototype. The 20-kW module is identified as optimal, offering only a 5.5% reduction in singlet oxygen yield despite a twenty fold power increase, while keeping the integrated residence parameter within acceptable limits.

ThR02-p07
Thursday, June 25, 2026; 15:00-18:30
Characterization of the indirect-drive cryogenic target parameters at megajoule laser facility *(Poster)*
E.Yu. Zarubina[1,2], M.A. Rogozhina[1], E.Yu. Solomatina[1], I.A. Chugrov[1]; [1]The Russian Federal Nuclear Center–All-Russian Scientific Research Institute of Experimental Physics (RFNC-VNIIEF), [2]MSU named after M.V. Lomonosov, MSU Branch in Sarov, Russia
This paper presents the results of development of complex of complementary methods for characterization of the parameters of the indirect-drive cryogenic target elements for inertial confinement fusion.

ThR02-p08
Thursday, June 25, 2026; 15:00-18:30
Power enhancement of an optically pumped metastable argon laser via auxiliary pumping *(Poster)*
A.P. Torbin, R.A. Kuramshin, M.I. Svistun, A.K. Chernyshov, P.A. Mikheyev; P.N. Lebedev Physical Institute of RAS, Samara Branch, Russia
This study demonstrates enhanced power scaling in an optically pumped metastable argon laser. Using auxiliary optical pumping at 810.4 nm alongside the primary pump at 811.5 nm mitigates losses from the lower laser level. The output power at 912.3 nm increased from 0.48 W to 0.58 W, confirming the recovery of atoms from the $1s_4$ state into the lasing cycle.

ThR02-p09
Thursday, June 25, 2026; 15:00-18:30
Comparison of the numerical model of the generation dynamics of a laser on vibronic crystals with a real system *(Poster)*
S.S. Makarin, D.A. Gatsko, V.V. Sementin, P.K. Rozanov, M.V. Gavrish, U.V. Prokhorova, A.S. Boreysho, A.P. Pogoda; Baltic State Technical University "VOENMEH" named after D.F. Ustinov, Russia
This paper presents the results of modeling the dynamics of laser generation on vibronic crystals by solving a system of velocity equations and comparing them with a real system. The analysis of the reasons for the discrepancy between the mathematical model and the real system is also carried out.

ThR02-p10
Thursday, June 25, 2026; 15:00-18:30
Vulnerability of 1310-nm quantum key distribution systems to 1550-nm cw light-injection attacks. *(Poster)*
E.V. Borisova[1], A.A. Ponosova[1], D.O. Trefilov[2], M.A. Petrov[2], V. Makarov[1,2,3]; [1]Russian Quantum Center, Russia; [2]Vigo Quantum Communication Center, University of Vigo, Spain; [3]NTI Center for Quantum Communications, National University of Science and Technology MISiS, Russia
This paper examines the possibility of attacks using a high-power CW laser operating at 1550 nm on fiber-optic isolators that are part of QKD systems operating at 1310-nm.

ThR02-p11
Thursday, June 25, 2026; 15:00-18:30
Study of the possibility of increasing the SBS threshold of a fiber laser using the phase modulation method *(Poster)*
V.I. Bolshakova; Lomonosov Moscow State University, branch in Sarov, Russia
A method for suppressing stimulated Brillouin scattering (SBS) in fiber lasers using phase modulation was investigated. By controlling the modulation parameters, the spectral width and coherence of the radiation can be controlled for use in high-power laser systems with spectral combining.

ThR02-p12
Thursday, June 25, 2026; 15:00-18:30
High-power laser at 1(0.25) μm based on bismuth -doped fiber with hybrid active centers *(Poster)*
S.A. Ostrikov[1], A.V. Kharakhordin[1], A.V. Elopov[1], A.S. Lobanov[2], L.D. Lipatov[2], A.M. Khegai[1], S.V. Alyshev[1], K.E. Riumkin[1], M.A. Melkumov[1], and S.V. Firstov[1]; [1]Prokhorov General Physics Institute of RAS, Dianov Fiber Optics Research Center, [2]G.G. Devyatykh Institute of Chemistry of High-Purity Substances of RAS, Russia
A high-power continuous-wave laser operating in the short-wavelength O-band was developed using a bismuth-doped fiber (BDF) with hybrid active centers associated with $AlPO_4$ structural units. The laser provided an output power of ≈11W and a slope efficiency of 30% at room temperature. It was found that the laser efficiency increases to almost 45% when the BDF temperature decreases to –100°C.

ThR02-p13
Thursday, June 25, 2026; 15:00-18:30
Control of the radiation spectrum of a single-frequency laser for stimulated Brillouin scattering thresholds in fiber lasers *(Poster)*
K.G. Aksenov, Y.A. Krykov , S.V. Tytin , V.S. Tsikin , N.A. Zaretsky; RFNC - VNIIEF, Russia
The presented work is devoted to the study of the possibility of controlling the width of the radiation spectrum of a single-frequency fiber laser source using single- and two-stage phase modulation in order to increase the threshold of SBS.

ThR02-p14
Thursday, June 25, 2026; 15:00-18:30
Phenomena in the "afterglow" of a pumping volume discharges and energy parameters of pulse-periodical TEA-CO_2 Lasers *(Poster)*
B.A. Kozlov[1], E.A. Kozlov[1], A.A. Makarenko[1], D.S. Makhanko[2]; [1]Ryazan State Radio Engineering Univ., [2]JCS Plasma, Russia
Local discharges in the "afterglow" of a volume pumping discharge limit the pulse repetition rate and average radiation power of TEA-CO2 lasers. In a TEA-CO2 laser with an active media of 12 cm3 using a CO2:N2:He =1:1:8 mixture, the average radiation power was increased from 30 to 45 Watts by the effective elimination of mismatch voltages.

ThR02-p15
Thursday, June 25, 2026; 15:00-18:30
Active all-glass microstructured optical fibers with a reduced core refractive index *(Poster)*
A.N. Denisov, S.L. Semjonov; Dianov Fiber Optics Research Center, Prokhorov General Physics Institute of RAS, Russia
This paper presents the results of a theoretical study of active all-glass leakage channel microstructured optical fibers (MOFs) containing two layers of fluorine-doped silica glass elements in the cladding and a doped core with a diameter of 20 μm and a reduced refractive index. The proposed active MOFs can be used in high-power fiber lasers and amplifiers.

ThR02-p16
Thursday, June 25, 2026; 15:00-18:30
Temperature and concentration profiles in the discharge channel of a low-pressure nitrogen laser *(Poster)*
B.A. Kozlov, Z.V. Shvets, A.A. Makarenko; Ryazan State Radio Engineering University, Russia
Analytical profiles of the temperature and concentration of molecular nitrogen in a low-pressure N2-laser were obtained under various discharge channel parameters. Quantitative information about the maximum temperature in the channel (3000 ºC), as well as the change in the concentration of nitrogen molecules near the walls of the discharge gap and on its axis, was established.

ThR02-p17
Thursday, June 25, 2026; 15:00-18:30
High power laser marking of hot metal slabs *(Poster)*
A. Perestoronin[1,2], D. Arbuzov[1], N. Grezev[1], I. Ryashko[1], S. Shmelev[1]; [1]Laser Complex department, VPG Laserone, Russia; [2]Bauman Moscow State Technical University, Russia
This paper presents the results of an experimental study on laser marking of hot metal slabs. Marking was performed using a high-power pulsed laser source with an output power of 5 kW. The experiments were conducted on hot metal preheated to a temperature of 900-1000°C. The process parameters for laser marking of QR and Data Matrix codes were experimentally determined.

ThR02-p18
Thursday, June 25, 2026; 15:00-18:30
Second harmonic generation of optical pumped laser on metastable argon atom at 456 nm *(Poster)*
A.A. Kalacheva, Yu.A. Adamenkov, M.A. Gorbunov, V.A. Shaidulina, A.V. Yuriev; FSUE "Russian Federal Nuclear Center - VNIIEF", Russia
The paper presents laser generation of the second harmonic at a wavelength of 456 nm of a laser with optical pumping on rare gases (OPRGL) with power 2 mW. The conversion of continuous radiation of the main frequency of OPRGL (912nm) into the second harmonic using a nonlinear element (LBO crystal) was experimentally shown.

ThR02-p19
Thursday, June 25, 2026; 15:00-18:30
Experimental investigation of injection seeded in a passively Q-switched and gain-switched Yb-doped all-fiber laser *(Poster)*
E.D. Maslova[1,2], I.V. Obronov[2], S.V. Larin[2], A.A. Gagarin[2]; [1]National Research Nuclear University MEPhI, [2]VPG Laserone, Russia
We demonstrate injection-seeding of a passively Q-switched and gain-switched (QSGS) Yb-fiber laser. The slave laser's pulse repetition rate is synchronized to a tunable master oscillator. Synchronization yields a 2–2.5-fold peak power increase and enables two operational regimes: phase-locked synchronization and a regime where the master pulse is coherently amplified within the slave cavity.

ThR02-p20
Thursday, June 25, 2026; 15:00-18:30
Study of the interaction between two crossing laser beams in plasma using a new generation laser facility *(Poster)*
D.V. Bakaykin, D.D. Barinova, S.V. Bondarenko, V.N. Derkach, L.A. Dushina, S.Yu. Golovkin, E.A. Kartaeva, V.V. Murylev, S.F. Popov, L.F. Potapkina, V.N. Pugacheva, V.Yu. Romanova, A.I. Sharafutdinova, I.R. Smagin, K.V. Starodubtsev, L.P. Vylomov; FSUE RFNC-VNIIEF, Russia
Experiments were conducted at the MIK laser complex to investigate the Cross-Beam Energy Transfer (CBET) effect. Two laser beams with nanosecond duration (pump and probe) were crossed in a hydrocarbon-based plasma layer. The experiments demonstrated a several-fold increase in probe beam peak power due to CBET. We also present modeling results obtained in the quasi-stationary approximation.

ThR02-p21
Thursday, June 25, 2026; 15:00-18:30
MW-class diode pump source at 0.87 μm for multichannel Nd:glass zig-zag slab amplifier *(Poster)*
M.I. Gavrilenko[1,2], D.V. Sizmin[1], M.G. Kuzin[1], A.A. Marinin[1]; [1]Russian Federal Nuclear Center - All-Russian Research Institute of Experimental Physics, [2]Physics Department, Lomonosov Moscow State University, Russia
A MW-class diode pump source at 0.87 μm for a multichannel Nd:glass zig-zag slab amplifier is presented. The source's spatio-temporal and spectral-energy characteristics were measured under various currents (50-200 A) and pulse durations (200-400 μs). The wavelength shifts with coolant temperature (~0.3 nm/°C) and current (~0.015 nm/A). The 4-5 nm spectral width falls entirely within the Nd:glass absorption band.

ThR02-p22
Thursday, June 25, 2026; 15:00-18:30
Precision absolute distance measurement method based on laser with mode locking *(Poster)*
A.Y. Fedorenko, S.G. Sazonkin, I.O. Orekhov, V.E. Karasik; Bauman Moscow State Technical University, Russia
The paper presents a methodology for indirect absolute distance measurement based on the frequency of laser pulses with mode locking. The principle of distance measurement in this method is described. A schematic representation of a laser rangefinder, capable of achieving accuracy within 1 μm, is provided.

ThR02-p23
Thursday, June 25, 2026; 15:00-18:30
The influence of the active medium composition on the radiation characteristics of pulsed ultraviolet inductive nitrogen laser *(Poster)*
D.S. Churkin, I.A. Trunov, R.A. Tkachenko, E.S. Kargapol'tsev; Inst. of Laser Physics SB RAS, Russia
Experimental study results of the inert gases (He, Ne) and hydrocarbons (propylene, benzol) additives influence on the energy, spectral and temporal characteristics of the inductive UV nitrogen laser radiation are presented. The use of propylene additives increased the pulse duration and extended the service life by 1.3 times. The decrease of the Lewis-Rayleigh afterglow duration was observed.

ThR02-p24
Thursday, June 25, 2026; 15:00-18:30
976 nm lasing efficiency improvement in Yb-doped fiber with cladding-embedded absorbing rods *(Poster)*
D.A. Davydov, S.S. Aleshkina, M.E. Likhachev; Prokhorov General Physics Institute of RAS, Dianov Fiber Optics Research Center, Russia
An improved Yb-doped fiber design featuring cladding-embedded Tm-doped absorbing rods is proposed to enhance 976 nm signal amplification by suppressing ASE near 1030 nm. Numerical modeling in COMSOL and MATLAB shows a ~2 times increase in power conversion efficiency compared to standard fiber, achieved through optimized rod sizes and positioning.

ThR02-p25
Thursday, June 25, 2026; 15:00-18:30
Numerical modeling of Yb-doped fiber amplifier pumped at 1005-1040 nm *(Poster)*

M.M. Iakovlenko[1,2], I.V. Obronov[1], N.N. Evtikhiev[1,2]; [1]LLC VPG LASERONE, [2]National Research Nuclear University MEPhI, Russia

A numerical model has been developed for simulation of beam amplification in a Yb-doped fiber amplifier. It takes into account amplified spontaneous emission generation, a signal beam propagation in pulsed mode and the cross sections dependence on wavelength. The dependence of the output parameters such as central amplified wavelength and small signal gain on the pumping wavelength was investigated.

ThR02-p26
Thursday, June 25, 2026; 15:00-18:30
Method of characterization of laser cleaning performance *(Poster)*

S.V. Larin, N.A. Broytman, I.V. Obronov; VPG Laserone, Russia

Various laser-cleaning systems currently can be found on the market. Despite of huge combination of laser parameters, output optics parameters and surface contamination composition can be realized, there is a demand for simple and stable test method to compare a laser cleaning process performance for given solution. In this paper a simple approach using mass-defect measurement is described, some results provided and analyzed.

ThR02-p27
Thursday, June 25, 2026; 15:00-18:30
Modeling of thermal lens compensation in Yb:YAG crystal using Yb:CaF_2 crystal *(Poster)*

E.D.Tulnikov[1,2], A.S.Burkov[1,2], N.V.Tereshchenko[1], I.V.Obronov[1]; [1]VPG Laserone, [2]MIPT, Russia

This paper explores thermal lens compensation in a Yb:YAG crystal using a Yb:CaF2 crystal. The propagation and amplification of radiation were modeled, taking into account thermal lensing. The simulation showed that the sequential arrangement of crystals allows for complete compensation of the thermal lens at a selected pump power, and significantly reduces its optical power at lower pump powers.

ThR02-p28
Thursday, June 25, 2026; 15:00-18:30
UV laser generation in Ar-N_2-He mixture in the afterglow *(Poster)*

G.N. Lelyavsky[1,2], V.D. Zvorykin[1], I.G. Rudoy, A.M. Soroka, N.N. Ustinovsky[1], L.I. Karmazin[1], A.V. Shutov[1]; [1]Lebedev Physical Institute, RAS, [2]National Research Nuclear University "MEPhI", Russia

Ultraviolet laser generation on the nitrogen second positive system at $\lambda \approx 358$ nm is experimentally demonstrated in the afterglow of electron-beam pumping in high-pressure Ar–N_2–He mixtures. Laser pulses with energies up to ~50 mJ and durations up to ~110 ns were obtained. The emission maximum occurs in the afterglow region, with an energy conversion efficiency of approximately 2–3%.

Section R03. Semiconductor Lasers, Materials and Applications

TuR03-01
Tuesday, June 23, 2026; 09:00-09:30
Optical gain, two-state lasing and dynamic characteristics of InAs/AlGaAs quantum well-dot lasers *(Invited)*
M.V. Maximov[1], G.O. Kornyshov[2], A.A. Beckman[2], A.A. Kharchenko[1], V.V. Dyudelev[2], V.V. Podoprigora[2], A.A. Nikitin[2], A.S. Payusov[2], S.A. Mintairov[2], N.A. Kalyuzhnyy[2], N.Yu. Gordeev[2], Yu.M. Shernyakov[2], G.S. Sokolovskii[2]; [1]Nanophotonics Laboratory, Alferov University, [2]Ioffe Institute, Russia
Ground state modal gain as high as 100 cm-1 is demonstrated in edge-emitting lasers with active region based on a single layer of quantum well-dots. Material gain is estimated as 2.2×104 cm-1, which exceeds the values reported for quantum well lasers. In 200 μm long lasers, pure ground state lasing occurs up currents greater than the threshold by 17.5 times.

TuR03-02
Tuesday, June 23, 2026; 09:30-10:00
Internal optical loss and light-current characteristic in quantum dot lasers *(Invited)*
L. Asryan; Virginia Tech, USA
The operating characteristics of semiconductor quantum dot lasers are reviewed considering the internal optical loss that varies with the density of injected carriers. The second mode of generation (that emerges due to carrier-density-dependent internal loss) is discussed in addition to the first (conventional) mode (that oscillates both in absence and presence of such loss).

TuR03-03
Tuesday, June 23, 2026; 10:00-10:15
Optically pumped III -nitrides microdisk lasers with high temperature stability of spectral characteristics
N.V. Kryzhanovskaya[1], E.I. Moiseev[1], S.D. Komarov[1], K.A. Ivanov[1], A.F. Tsatsul'nikov[2], E.V. Lutsenko[3], A.G. Vainilovich[3], A.V. Sakharov[2,4], D.S. Artemyev[2,4], A.E. Nikolaev[4], E.E. Zavarin[2,4], D.A. Masyutin[1], A.A. Pivovarova[4], N.D. Ilyinskaya[4], I.P. Smirnova[4], L.K. Markov[4], A.E. Zhukov[1]; [1]HSE University, [2]Submicron Heterostructures for Microelectronics, Research and Engineering Center, Russia; [3]B.I. Stepanov Institute of Physics of the National Academy of Sciences of Belarus, Belarus; [4]Ioffe Institute, Russia
Whispering gallery mode microlasers have been developed using an InGaN/GaN/AlGaN epitaxial semiconductor structure grown on a silicon or a sapphire substrate. Lasing has been demonstrated in 5-8 μm-diameter microlasers, operating under pulsed optical pumping from room temperature to 100 degrees Celsius. High temperature stability of the emission wavelength near 420 nm, described by the coefficient $d\lambda/dT = 0.0115$ nm/K is achieved.

TuR03-04
Tuesday, June 23, 2026; 10:15-10:30
Compact sources of high peak power sub-ns laser pulses based on vertical laser diode-heterothyristor switch assemblies
S. Slipchenko, A. Podoskin, I. Shushkanov, A. Rizaev, M. Kondratov, V. Shamakhov, V. Kapitonov, K. Bakhvalov, A. Grishin, T. Bagaev, M. Ladugin, A. Marmalyuk V. Simakov, N. Pikhtin; Ioffe Institute, Russia
A compact laser source has been developed based on a vertical laser diode-heterothyristor switch assembly. To increase peak power, a laser heterostructure with a volume active region and high-speed, high-current heterothyristor switch were designed. Laser pulses with a peak power of 30 W and a duration of 64 ps at a wavelength of 880 nm have been demonstrated.

TuR03-05
Tuesday, June 23, 2026; 10:30-10:45
Energy-efficiency performance of the 1550 nm MBE-grown wafer-fused VCSELs
Ya.N. Kovach[1], S.A. Blokhin[1], M.A. Bobrov[1], A.A. Blokhin[1], N.A. Maleev[1], A.V. Babichev[2], D.S. Papylev[2], P.E. Kopytov[2], V.V. Andryushkin[2], A.G. Gladyshev[2], I.I. Novikov[2], L.Ya. Karachinsky[2], E.S. Kolodeznyi[2], K.O. Voropaev[1], A.Yu. Egorov[2], G.A. Sapunov[3], Si-Cong Tian[3], Dieter Bimberg[3]; [1]Ioffe Institute, [2]ITMO University, Russia; [3]Bimberg Chinese-German Center for Green Photonics, CIOMP, CAS, China
Dynamic performance and energy-efficiency of MBE-grown wafer-fused long-wavelength C-band VCSELs were studied. For dispersion-limited data transmission line of 10 km fiber energy-efficiency of ~100 fJ/(bit·km) was demonstrated for 10 Gbps.

TuR03-06
Tuesday, June 23, 2026; 10:45-11:00
Abrupt switching of two-state lasing modes in coupled-cavity InAs/InGaAs/GaAs quantum dot lasers
F.I. Zubov[1], Yu.M. Shernyakov[2], M.V. Maximov[1]; [1]Alferov Univ., [2]Ioffe Inst., Russia
We report on abrupt lasing switching from ground to excited state and vice versa in coupled-cavity InAs/InGaAs/GaAs quantum dot lasers of equal lengths, which occurs with much smaller current change than in individual devices. We attribute this effect to the relative shift of the longitudinal mode combs under pumping, which are nominally identical in the cold resonators of both chips.

TuR03-07
Tuesday, June 23, 2026; 11:00-11:15
Impact of pump current on the stability of a micro-ring-stabilized semiconductor laser
D.E. Artemov[1], A.A. Kondakov[1], G.Y. Ivanov[1], A.Y. Danilov[1,2], V.N. Treshchikov[1]; [1]T8 Company Group, [2]MEPhI National Nuclear Research Univ., Russia
The frequency noise spectrum of a semiconductor laser, stabilized to an external micro-ring resonator via self-injection locking, has been characterized over a broad frequency range.

TuR03-08
Tuesday, June 23, 2026; 14:45-15:15
Single-photon sources: Хороший, плохой, злой *(Invited)*
F. Laussy; Instituto de Ciencia de Materiales de Madrid, Spain

TuR03-09
Tuesday, June 23, 2026; 15:15-15:45
Single-photon C-band sources for quantum cryptography *(Invited)*
A. Toporov; Ioffe Institute, Russia

TuR03-10
Tuesday, June 23, 2026; 15:45-16:00
Zero-field cross-relaxation resonances in ensembles of NV centers in diamond for fully optical magnetometry
D.S. Filimonenko, A.P. Nizovtsev, S.Ya. Kilin; B.I. Stepanov Institute of Physics, Belarus
We studied the zero-field level-anticrossing resonance in NV-center ensembles, analyzing its response to magnetic modulation frequency and laser pump power. For the [111] crystal orientation, cross-relaxation spectra enable fully optical vector magnetometry, reconstructing the magnetic field vector. The simplest design of a microwave-free magnetic sensor is demonstrated.

TuR03-11
Tuesday, June 23, 2026; 16:00-16:15
Russian polariton laser
V.A. Stolyarov[1], A.S. Kurdyubov[1], A.V. Trifonov[1], M.Yu. Petrov[1], I.V. Ignatiev[1], M.S. Lozhkin[2], S.A. Eliseev[2], Yu.P. Efimov[2], V.A. Lovtcius[2], A.V. Kavokin[1,3,4]; [1]Spin Optics Lab., St. Petersburg State Univ., [2]Nanophotonics Research Center, St. Petersburg State Univ., [3]Abrikosov Center for Theoretical Physics, Moscow Center for Advanced Studies, [4]Russian Quantum Center, Skolkovo, Russia.
We report the realization of a polariton laser in a high-Q GaAs/AlGaAs planar microcavity grown by molecular beam epitaxy using a digital-alloy-based Bragg mirror design. The structure exhibits an ultrahigh quality factor of up to 54 000 and a low polariton lasing threshold. We demonstrate strong light-matter coupling and polariton condensation under non-resonant optical pumping.

TuR03-12
Tuesday, June 23, 2026; 16:15-16:30
Post-processing in optoelectronic reservoir computing
A.V. Kovalev, V.V. Vitkin, E.A. Viktorov; ITMO Univ., Russia
We investigate the parameter space of nonlinear functions used in a post-processing stage of a reservoir computing system based on a laser with optoelectronic feedback. We demonstrate how changing the scaling and offset coefficient of sine squared, hyperbolic tangent, and logistic functions can improve solving the Santa Fe time-series prediction task.

TuR03-13
Tuesday, June 23, 2026; 16:30-16:45
Watt-range InGaAs/GaAs superluminescent diodes based on grazing stripe waveguide
N.Yu. Gordeev[1], A.S. Payusov[1], G.O. Kornyshov[1], Yu.M. Shernyakov[1], A.A. Beckman[1], Yu.A. Salii[1], S.A. Mintairov[1], N.A. Kalyuzhnyy[1], M.V. Maximov[2], [1]Ioffe Inst., Russia; [2]Alferov Univ., Russia
We designed and investigated superluminescent diodes with the active region based on InGaAs quantum well-dots emitting at a wavelength of ~1 μm. The devices have shown spectra as broad as 20 nm and output CW optical power as high as 1 W limited by catastrophic optical mirror damage. The work was supported by the Russian Science Foundation (project No 23-72-00038).

TuR03-14
Tuesday, June 23, 2026; 16:45-17:00
Fabrication of optical microcavities coated with perovskite materials for laser sourses
L.N. Dvoretckaia[1], V.V. Volosatova[2], S.P. Ilin[1], E.A. Vyacheslavova[2], A.M. Mozharov[2], D.V. Miniv[2], A.K. Kaveev[2,3], V.V. Fedorov[2], S.V.Makarov[1], I.S.Mukhin[2]; [1]ITMO University, [2]Laboratory of Renewable energy sources, Alferov University, [3]Ioffe Institute, Russia
This work is aimed at experimental study of the integration of perovskite materials with A3B5-based microresonators for the development of laser radiation sources.

TuR03-15
Tuesday, June 23, 2026; 17:30-18:00
QCL-pumped DFB-laser based on a quasirelativistic-momentum-law HgCdTe quantum well structure with a third-order Bragg grating *(Invited)*
S.V. Morozov, O.M. Litovchenko; Institute for Physics of Microstructures, Russia
Single-frequency lasing at a wavelength of 13.5 μm was demonstrated from a waveguide structure with HgCdTe QWs pumped by an infrared quantum cascade laser due to the formation of a periodic system of ridges on the structure's surface, realizing DFB.

TuR03-16
Tuesday, June 23, 2026; 18:00-18:15
Quantum cascade detectors for 8 μm spectral range
V.V. Dudelev[1], A.D. Andreev[1], D.V. Chistyakov[1], V.V. Podoprigora[1], A.A. Nikitin[1], D.A. Mikhailov[1], E.D. Cherotchenko[1], I.I. Vrubel[1], V.Yu. Mylnikov[1], S.N. Losev[1], N.N. Deryagin[1], S.H. Abdulrazak[1], A.V. Babichev[1], A.V. Lyutetskiy[1], S.O. Slipchenko[1], N.A. Pikhtin[1], A.G. Gladyshev[2], K.A. Podgaetskiy[3], A.Yu. Andreev[3], I.V. Yarotskaya[3], M.A. Ladugin[3], A.A. Marmalyuk[3], D.S. Papylev[2], I.I. Novikov[2,4], E.A. Kognovitskaya[1,6], V.I. Kuchinskii[1], L.Ya Karachinsky[2,4], A.Yu. Egorov[2], G.S. Sokolovskii[1]; [1]Ioffe Institute, [2]Connector Optics LLC, [3]M.F. Stelmakh POLYUS Research and Development Institute, [4]ITMO University, [5]D.I. Mendeleyev Institute for Metrology VNIIM, Russia
Quantum cascade detectors (QCDs) for 8μm spectral region fabricated from a high-power quantum cascade laser (QCL) structure comprising 50 cascades demonstrate RF signal bandwidth exceeding 1GHz and maximum responsivity above 100mA/W. Integration of QCD and QCL on a single heat sink represents compact and cost-effective concept for power-stabilized laser design.

TuR03-17
Tuesday, June 23, 2026; 18:15-18:30
Control of THz quantum cascade laser intermode spacing by microvawe modulation of bias
R.A. Khabibullin[1,2], S.S. Pushkarev[1,2], D.A. Belov[3], A.V. Ikonnikov[3], I.N. Glinskiy[2], A.V. Zuev[1], D.L. Gnatyuk[1]; [1]National Research Centre "Kurchatov Institute", [2]Moscow Institute of Physics and Technology, [3]Lomonosov Moscow State University, Russia
The emission spectra of 3.3 THz quantum cascade laser with a 2.0 mm Fabry–Perot cavity were measured. The supplied DC bias was modulated by a microwave signal with a few μW power. It was demonstrated that the spacing between adjacent peaks in the spectrum is pulled (or even locked) to the synthesizer frequency within significant frequency range from 19.0 to 23.2 GHz, and outside this range returns to the value typical for a free-running laser.

TuR03-18
Tuesday, June 23, 2026; 18:30-18:45
Spectral characteristics of terahertz quantum cascade lasers with first and third order distributed feedback
D.A. Belov[1], A.V. Ikonnikov[1], D.R. Khokhlov[1], D.V. Ushakov[2], A.A. Afonenko[2], B.A. Zhmud[3], I.E. Rykov[3], M.V. Vinokurov[3], F.I. Zubov[4], A.Yu. Pavlov[3,5], R.R. Galiev[3,5], R.A. Khabibullin[3,5]; [1]Lomonosov Moscow State Univ., Russia; [2]Belarussian State Univ., Belarus; [3]Moscow Inst. of Physics and Technology, [4]Alferov St. Petersburg National Research Academic Univ. RAS, [5]National Research Centre "Kurchatov Institute", Russia
Practical application of THz QCLs often requires robust single-mode operation, hence, a certain method for frequency selection. In this work, we present the emission spectra of 1– and 3–order DFB THz QCLs, where DFB is formed by λ/4-shifted lateral ridge corrugations and split antennas, respectively. The lasers demonstrate single-mode emission close to the design frequency up to high biases.

TuR03-19
Tuesday, June 23, 2026; 18:45-19:00
An open-path Eddy-covariance laser spectrometer for simultaneous monitoring of CO_2, CH_4, and H_2O

V. Meshcherinov[1,2], I. Gazizov[3], B. Pravuk[1,2], V. Kazakov[1,2], M. Spiridonov[2], Sh. Gazizov[1], G. Suvorov[4,5], O. Kuricheva[5], S. Zenevich[1], Yu. Lebedev[2], I. Vinogradov[2], A. Rodin[1]; [1]Moscow Institute of Physics and Technology (MIPT), [2]Space Research Institute of RAS (IKI RAS), Russia; [3]Institute of Chemical Technologies and Analytics, TU Wien, Austria; [4]Institute of Forest Science of RAS, Russia; [5]A.N. Severtsov Institute of Ecology and Evolution of RAS, Russia

We present a compact laser-based open-path mid-IR spectrometer for simultaneous measurements of CO_2, CH_4, and H_2O, designed for eddy-covariance flux studies. The instrument demonstrates high linearity, good precision at 10 Hz, and agreement with commercial analyzers in field tests. Its multi-gas capability provides a practical advantage for outdoor greenhouse gas monitoring.

TuR03-20
Tuesday, June 23, 2026; 19:00-19:15
Temporal ghost imaging with VCSEL-based controllable thermal source

A. Smaliakou, V. N. Chizhevsky, D. Mogilevtsev, S. Kilin; B.I. Stepanov Institute of Physics, NAS of Belarus, Belarus

Temporal ghost imaging reconstructs fast temporal objects using detectors that cannot resolve them directly. We demonstrate standard and computational schemes based on a VCSEL-based generator of bunched and super-bunched light. Imaging is achieved with a slow detector, and reconstruction quality is optimized by tuning the laser's noise bandwidth, illustrating the potential of controllable pseudothermal sources for temporal ghost imaging.

TuR03-21
Tuesday, June 23, 2026; 19:15-19:30
Image edge detection by optoelectronic spiking neural network based on VCSEL and SPAD

V. N. Chizhevsky, M. V. Lakhmitski, S.Ya. Kilin; B.I. Stepanov Institute of Physics, NAS of Belarus, Belarus

The paper presents the results of an experimental study on the feasibility of image edge detection using a hardware-software implementation of a convolutional network. This network employs a 2×2 kernel based on optoelectronic artificial spiking neurons with probabilistic neuron responses consisting of VCSEL and SPAD.

WeR03-p01
Wednesday, June 24, 2026; 10:00-13:30
Room temperature pillar cavity lasers *(Poster)*

A.V. Babichev[1], I.S. Makhov[2], N.V. Kryzhanovskaya[2], Y.M. Zadiranov[1], Yu. A. Salii[1], M. M. Kulagina[1], A.A. Blokhin[1], M.A. Bobrov[1], A.P. Vasiliev[1], S.A. Blokhin[1], N.A. Maleev[1], L.Ya. Karachinsky[3], I.I. Novikov[3], A.Yu. Egorov[3]; [1]Ioffe Inst., [2]HSE Univ., [3]ITMO Univ., Russia

A planar microcavity structure with low-absorbed mirrors was grown using molecular-beam epitaxy. Micropillar cavities were fabricated using dry etching process. For 15-μm-diameter pillars, lasing was demonstrated at room temperature with a threshold of 37 mW and an emission wavelength of 961 nm.

WeR03-p02
Wednesday, June 24, 2026; 10:00-13:30
Modeling of micropillar lasers with antireflective coating *(Poster)*

A.V. Babichev[1], S.A. Blokhin[1], N.A. Maleev[1], L.Ya. Karachinsky[2], I.I. Novikov[2], A.Yu. Egorov[2]; [1]Ioffe Inst., [2]ITMO Univ., Russia

960 nm-range micropillar cavity laser with low-absorbed mirrors and an antireflective coating was examined. Close to zero reflectivity was realized in the range of 780–810 nm. The use of an antireflective coating allowed to increase the power conversion efficiency by approximately 7% compared to a semiconductor vertical microcavity.

WeR03-p03
Wednesday, June 24, 2026; 10:00-13:30
High-voltage thyristor current switch based on GaAs/AlGaAs for pulsed pumping of high-power IR lasers: quasi-1D drift-diffusion model analysis *(Poster)*

I.V. Oreshko, S.O. Slipchenko, A.A. Podoskin, I.V. Shushkanov, N.A. Pikhtin; Ioffe Inst., Russia

Simulation of high-voltage heterothyristor current switch based on GaAs/AlGaAs shows that the current amplitude and the turn-on front weakly depend on the design of the n-p-n equivalent transistor and are ~70 A and 1.5-1.6 ns, respectively, at a maximum voltage of 180 V. Minimum turn-on delay and residual voltage of 5.5 ns and 1.86 V are observed for the n-collector structure thinned to 0.2 μm.

WeR03-p04
Wednesday, June 24, 2026; 10:00-13:30
Surface-emitting semiconductor IR laser with resonator based on 2D photonic crystal *(Poster)*

I.V. Oreshko, V.V. Zolotarev, S.O. Slipchenko, A.S. Nekrasov, N.A. Pikhtin; Ioffe Inst., Russia

Calculations of output losses of laser resonator based on 2D photonic crystal with square symmetry show that holes with C2 rotational symmetry are characterized by the presence of high-Q modes with low radiative efficiency. On the other hand, trapezoidal holes, which do not possess C2 symmetry, demonstrate the greatest mode discrimination between low-threshold modes.

WeR03-p05
Wednesday, June 24, 2026; 10:00-13:30
Characterization of metal halides as optical materials for the THz range *(Poster)*

I.V. Yuzhakov[1], A.A. Yuzhakova[1], N.A. Nikolaev[2], A.A. Rybak2, A.E. Lvov[1], L.V. Zhukova[1]; [1]Ural federal university, UrFU, [2]Institute of Automation and Electrometry, Siberian Branch of RAS, IAE SB RAS, Russia

A transmission window has been identified in the 0.2–1.2 THz range for metal halide-based single crystals. Their absorption coefficient and refractive index were measured, showing an increase from 3.7 to 4.0. The results indicate the potential application of these materials as THz optics.

WeR03-p06
Wednesday, June 24, 2026; 10:00-13:30
Internal quantum efficiency in optically pumped InGaN/GaN quantum-well microdisk lasers *(Poster)*

S.D. Komarov[1], N.V. Kryzhanovskaya[1], E.I. Moiseev[1], K.A. Ivanov[1], D.A. Masyutin[1], I.S. Makhov[1], A.F. Tsatsul'nikov[2], A.V. Sakharov[2,4], D.S. Arteev[2,4], E.V. Lutsenko[3], A.G. Vainilovich[3], A.E. Nikolaev[4], E.E. Zavarin[2,4], A.A. Pivovarova[4], N.D. Ilyinskaya[4], I.P. Smirnova[4], L.K. Markov[4], N. Cherkashin[5], A.E. Zhukov[1]; [1]International Laboratory of Quantum Optoelectronics, HSE University, [2]Submicron Heterostructures for Microelectronics, Research and Engineering Center, RAS, Russia; [3]B.I. Stepanov Institute of Physics, National Academy of Sciences of Belarus, Belarus; [4]Ioffe Institute, Russia, [5]CEMES-CNRS, Université de Toulouse, France

Optically pumped InGaN/GaN quantum-well microdisk lasers on Al2O3 were investigated, focusing on internal quantum efficiency (IQE) versus disk size and pump energy. Room-temperature lasing was observed for radii of 2.5–6 μm with Q factors above 2300. Power-dependent photoluminescence enabled extraction of relative IQE curves and separation of the contributions of competing recombination mechanisms from QCSE-related effects.

WeR03-p07
Wednesday, June 24, 2026; 10:00-13:30
Analysis of beam divergence angles of Terahertz quantum cascade lasers based on the method of second order moments *(Poster)*
I.E. Rykov, M.V. Maytama, D.A. Belov, A.V. Ikonnikov, R.A. Khabibullin; Moscow Institute of Physics and Technology, Russia
We present the results of calculating the beam divergence angles of terahertz (THz) quantum cascade lasers (QCL) with operating frequencies of 2, 3.75 and 4 THz by utilizing the method of second order moments. The obtained values are compared with the more traditional method of evaluation by the ratio of full width at half maximum (FWHM) to the distance to the laser.

WeR03-p08
Wednesday, June 24, 2026; 10:00-13:30
Calculation of facet reflection coefficients for AlGaInAs/InP superluminescent diodes with tilted waveguide and anti-reflective coatings *(Poster)*
D.A. Frolov, O.L. Astarkina, K.A. Podgaetskii, A.V. Lobintsov, A.A. Marmalyuk; Stelmakh Research Institute "Polyus", Russia
A study of combined implementation of tilted waveguide and anti-reflection coatings for manufacturing SLD samples was made. It is shown that there are combinations of waveguide tilt angles and compositions of anti-reflection coatings that enable the achievement of the lowest values of the reflection coefficient. Theoretical calculations were used in the experimental work on the manufacturing of SLD samples.

WeR03-p09
Wednesday, June 24, 2026; 10:00-13:30
Heat source localization and the thermal impedance spectrum of laser diode *(Poster)*
A.E. Chernyakov[1], A.L. Zakgeim[1], A.A. Beckman[2]; [1]Submicron Heterostructures for Microelectronics, Research and Engineering Center, RAS, [2]Ioffe Institute, Russia
The thermal properties, including thermal resistance Rth, capacitance Cth, and time constant τth of high-power laser diodes, have been investigated and analyzed over a wide current range. The transient thermal behavior was modeled using a multi-exponential function, where each time constant corresponds to a specific thermal resistance Rth,i and capacitance Cth,i component of the laser structure.

WeR03-p10
Wednesday, June 24, 2026; 10:00-13:30
Application of free-standing wire-grid polarizers for Terahertz spectroscopy *(Poster)*
Yu.I. Borisov, K.B. Dolganov, Yu.G. Goncharov, I.E. Spector, S.V. Garnov, G.A. Komandin; Prokhorov General Physics Institute of RAS, Russia
This paper presents the core design solutions for a Terahertz Time-Domain Spectroscopy (TDS-THz) system based on photoconductive antennas (PCA). Transmission characteristics are modeled for free-standing wire-grid polarizers with various geometric parameters, designed to produce linearly polarized radiation in the 0.1–3.0 THz range. The obtained is crucial for investigating the optical properties of anisotropic materials within the THz range.

WeR03-p11
Wednesday, June 24, 2026; 10:00-13:30
Optimization of heterostructure and laser diode chip parameters based on InGaAsP/InP for different operating current ranges *(Poster)*
A.E. Rizaev, A.A. Podoskin, I.V. Shushkanov, A.E. Grishin, M.I. Kondratov, S.O. Slipchenko, N.A. Pikhtin; Ioffe Institute, Russia
A numerical model accounting for transverse carrier transport and longitudinal photon distribution was used to optimize heterostructure design and laser cavity parameters for different pulsed current ranges. It is shown that optimizing chip parameters enables comparable output power levels from lasers with distinct heterostructures, each originally optimized for a different current range.

WeR03-p12
Wednesday, June 24, 2026; 10:00-13:30
Synthesis of high-purity gallium arsenide with high carrier mobility *(Poster)*
L.A. Mochalov, E.A. Slapovskaya, A.S. Belousov; Lobachevsky State University of Nizhny Novgorod, Russia
A technology has been developed for the synthesis of polycrystalline GaAs for growing high purity GaAs ingots with a diameter of 100 mm, a carrier mobility of 5.55 × 10^3 cm^2/(V×sec) and a dislocation density of 2.8 × 10^3 cm^2 by the VGF method. As and Ga of the 4N grade of purity were used as raw materials.

WeR03-p13
Wednesday, June 24, 2026; 10:00-13:30
Investigation of the AgBr - TlCl(0.74)Br(0.26), AgCl(0.25)Br(0.75)-TlBr(0.46)I(0.54) and AgCl(0.25)Br(0.75)-TlI systems radiation resistance *(Poster)*
S.E. Barykina, E.Y. Kabykina, V.O. Kosmachev, P.V. Pestereva, S.K. Shvartz, D.D. Salimgareev, L.V. Zhukova; Ural Federal University, UrFU, Russia
The dependence of the transmittance of the AgBr – TlCl0.74Br0.26, AgCl0.25Br0.75 – TlBr0.46I0.54, and AgCl0.25Br0.75 – TlI systems samples under the influence of β-irradiation up to 1000 kGy was studied. High radiation resistance and clearing observed at irradiation doses of 100–300 kGy.

WeR03-p14
Wednesday, June 24, 2026; 10:00-13:30
Enhanced fiber-optic sensor with artificial reflectors inscribed by femtosecond laser pulses *(Poster)*
I.S. Pochtarev[1,2], D.M. Bengalskii[1], D.R. Kharasov[1], K.A. Akmarov[1], K.A. Emelyanov[1], V.N. Treschikov[1]; [1]T8 LLC, [2]National Research Nuclear University MEPhI, Russia
A novel method based of enhancing performance of fiber-optic sensors interrogated by phase-sensitive optical time-domain reflectometer is investigated. The method based on artificial reflectors, which are inscribed in standard single mode fiber wounded around sensor using femtosecond laser. Signal processing allows us to adjust both sensitivity and dynamic range using multi gauge lengths algorithm. Sub-pulse gauge length is successfully utilized.

WeR03-p15
Wednesday, June 24, 2026; 10:00-13:30
Metrological support of the technology of creating photonic integrated circuits *(Poster)*
N.L. Istomina[1], K.S. Nepeina[2]; [1]NRU MAI, department. Innovation Management, Russia; [2]Kyrgyz State Technical University (Polytechnic Institute), Kyrgyzstan
Metrological support for monitoring layer parameters during the creation of semiconductor lasers is relevant for their mass production. The sources of instrumental errors, including the error of calibration of measuring equipment when using optical methods of non-destructive testing, are considered.

WeR03-p16
Wednesday, June 24, 2026; 10:00-13:30
Minimal excitable laser-neuron network for handwritten digit classification *(Poster)*
I.S. Mamaev, A.V. Kovalev; ITMO Univ., Russia
A minimal neuromorphic-photonic classifier based on an excitable semiconductor-laser neuron modeled by normalized Yamada rate equations is evaluated. Using standard gradient training on amplitude-encoded MNIST and EMNIST (digits), accuracies of 89.6% and 91.0% are obtained in deterministic simulations, while 88% accuracy is achieved on noisy EMNIST by averaging 10 stochastic runs.

WeR03-p17
Wednesday, June 24, 2026; 10:00-13:30
All-optical modulation of SHG intensity in metal-organic frameworks single crystals *(Poster)*
N.A. Zhestkij[1], A.V. Lubimova[1], A.O. Larin[1], S.A. Shipilovskikh[1], D.A. Zuev[1], V.A. Milichko[2]; [1]ITMO Univ., Russia; [2]New Uzbekistan Univ., Uzbekistan
We demonstrate direct all-optical modulation of second harmonic generation (SHG) in single crystals of a non-centrosymmetric erbium-based metal-organic framework (Er-BTC). Modulation is achieved by simultaneous irradiation with a continuous-wave 532 nm laser inducing thermal lattice dynamics and a femtosecond 1050 nm laser generating the SHG signal. The approach enables reversible, in-situ control of nonlinear optical response in crystalline hybrid materials.

WeR03-p18
Wednesday, June 24, 2026; 10:00-13:30
Study of the amplification of an external optical signal in a $CsPbBr_3$ quantum dots thin film *(Poster)*
F. Kuzikov, E. Menshikov, D. Gets, S. Povarov, A. Kokhanovskiy; ITMO Univ., Russia
In this work an amplification of an external optical signal in CsPbBr3 quantum-dot thin films under UV femtosecond excitation is studied. We analyze pump-probe measurement using rate equation model to evaluate recombination parameters to create a numerical model describing the gain as a function of material and sample parameters and input intensity.

WeR03-p19
Wednesday, June 24, 2026; 10:00-13:30
Characterization of heat dissipation in quantum cascade lasers using an effective thermal diffusivity *(Poster)*
E.D. Cherotchenko[1], I.I. Vrubel[1], V.V. Dudelev[1], A.D. Andreev[1], D.V. Chistyakov[1], V.V. Podoprigora[1], A.A. Nikitin[1], D.A. Mikhailov[1], V.Yu. Mylnikov[1], S.N. Losev[1], N.N. Deryagin[1], S.H. Abdulrazak[1], A.V. Babichev[1], A.V. Lyutetskiy[1], S.O. Slipchenko[1], N.A. Pikhtin[1], A.G. Gladyshev[2], K.A. Podgaetskiy[3], A.Yu. Andreev[3], I.V. Yarotskaya[3], M.A. Ladugin[3], A.A. Marmalyuk[3], D.S. Papylev2, I.I. Novikov[2,4], E.A. Kognovitskaya[1,5], V.I. Kuchinskii[1], L.Ya Karachinsky[2,4], A.Yu. Egorov[2], G.S. Sokolovskii[1]; [1]Ioffe Institute, [2]Connector Optics LLC, [3]M.F. Stelmakh POLYUS Research and Development Institute, [4]ITMO University, [5]D.I. Mendeleyev Institute for Metrology VNIIM, Russia
This work presents an experimental and analytical method for characterizing transient heat dissipation in QCLs using an effective thermal diffusivity constant. The approach combines time-resolved analysis of Fabry–Perot mode chirp with a Green's-function-based analytical model, providing a compact and physically transparent metric for benchmarking thermal performance of QCL designs and post-growth processing techniques.

WeR03-p20
Wednesday, June 24, 2026; 10:00-13:30
Study of pulsed cathodoluminescence of silver and monovalent thallium halides *(Poster)*
A.E. Ivov, P.V. Pestereva, I.V. Yuzhakov, N.A. Karavanskiy, D.D. Salimgareev, L.V. Zhukova; Ural Federal University, UrFU, Russia
This work is devoted to the study of the cathodoluminescent properties of single crystals and optical ceramics based on solid solutions of the AgCl0.25Br0.75 – TlI system. The samples have emission in the range of 500–700 nm.

WeR03-p21
Wednesday, June 24, 2026; 10:00-13:30
Frequency stabilization of external cavity diode laser E-LAS by Pound-Drever-Hall technique. *(Poster)*
A.V. Reznikov[1], N.O. Zhadnov[2], D.R. Kharasov[1], S.P. Nikitin[1], S.A. Voronchenko[1], E.A. Fomiryakov[1], G.Y.Ivanov[1], A.Yu. Danilov[1], Yu.M. Sokolov[1], O.E. Nanii[1,4], V.N. Treshchikov[1,3]; [1]T8 Company group, [2]Lebedev Physical Inst., RAS, [3]Fryazino branch of the V.A. Kotelnikov Inst. of Radio Engineering and Electronics, RAS, [4]Department of Physics, Lomonosov Moscow State Univ., Russia
It is shown that the frequency of external cavity diode laser (ECDL) manufactured by T8 LLC can be locked to a high-finesse optical cavity by Pound-Drever-Hall (PDH) technique making possible ultrastable laser operation.

WeR03-p22
Wednesday, June 24, 2026; 10:00-13:30
Analysis of radiative and thermal properties of Al -containing and Al-free heterostructures for high-power laser bars in the spectral range of 780-810 nm *(Poster)*
N.V. Gultickov, T.A. Bagaev, A.Yu. Andreev, I.V. Yarotskaya, K.Yu. Telegin, A.A. Marmalyuk, M.A. Ladugin; Polyus Research and Development Institute named after M.F. Stelmakh, Russia
This work is devoted to the comparison of the radiative characteristics of Al-containing and Al-free heterostructures in the spectral range of 780–810 nm, as well as the numerical simulation of thermal resistance for laser bars based on the studied heterostructures.

WeR03-p23
Wednesday, June 24, 2026; 10:00-13:30
Green InGaN LED-based entropy source for cryptographic applications *(Poster)*
I.A. Kotov[1], H. Lin[1], W. Niu[1], T.K. Ng[1], B.S. Ooi[1,2]; [1]Electrical and Computer Engineering Program, Computer, Electrical and Mathematical Sciences and Engineering Division, King Abdullah University of Science and Technology (KAUST), Saudi Arabia; [2]Department of Electrical, Computer, and Systems Engineering, Rensselaer Polytechnic Institute, USA
Quantum random number generation is an important task in cryptography due to its fundamental randomness. A green InGaN LED, in combination with silicon avalanche photodiodes, was used to generate information entropy. The estimated generation rate is already comparable to that of the physical entropy source used in integrated digital random number generators, but provides an unpredictability of quantum nature.

WeR03-p24
Wednesday, June 24, 2026; 10:00-13:30
Single-frequency mid-infrared quantum cascade laser for detection of methane *(Poster)*
D.A. Mikhailov[1], V.V. Dudelev[1], D.V. Chistyakov[1], E.D. Cherotchenko[1], I.I. Vrubel[1], V.Yu. Mylnikov[1], S.N. Losev[1], N.G. Deryagin[1], S.Kh. Abdulrazak[1], A.V. Babichev[1], A.V. Lyutetskiy[1], S.O. Slipchenko[1], N.A. Pikhtin[1], A.G. Gladyshev[2], K.A. Podgaetskiy[3], A.Yu. Andreev[3], I.V. Yarotskaya[3], M.A. Ladugin[3], A.A. Marmalyuk[3], D.S. Papylev[4], I.I. Novikov[2,4], E.A. Kognovitskaya[1,5], V.I. Kuchinskii[1], L.Ya. Karachinsky[2,4], A.Yu. Egorov[2], G.S. Sokolovskii[1]; [1]Ioffe Institute, [2]Connector Optics LLC, [3]"Polyus" Research Institute of M.F. Stelmakh Joint Stock Company, [4]ITMO University, [5]D.I. Mendeleev Institute for Metrology, Russia
We report on the detection of methane using a quantum cascade laser (QCL) with an external resonator in the Littrow configuration operating in 7550-7750 nm range, demonstrating sensitivity at 165 ppm, which is more than 250-fold below the lower limit of the explosive methane concentration in the atmosphere.

WeR03-p25
Wednesday, June 24, 2026; 10:00-13:30
Nozaki-Bekki holes in long cavity 1550 nm laser *(Poster)*
E.E. Popov, Y.N. Kovach, G.O. Danilenko, V.V. Vitkin, E.A. Viktorov, A.V. Kovalev; ITMO University, Russia
We study the dynamics of a fiber ring laser, which has a semiconductor optical amplifier as the active medium and a distributed fiber grating with a reflection peak near 1548 nm, which is optically injected by a semiconductor distributedfeedback laser. We report the observation of Nozaki-Bekki holes in this configuration

WeR03-p26
Wednesday, June 24, 2026; 10:00-13:30
Fluorescence-based direct detection of nitrogen dioxide for environmental, industrial, and security applications *(Poster)*
A.V. Shelaev, A.V. Baryshev; Dukhov Automatics Research Institute, Russia
Accurate, selective, and sensitive detection of NO2 is essential for ambient air quality monitoring, industrial safety and security applications. We report on a compact, fluorescence-based system for the real-time direct NO2 detection with a high selectivity and the ppt level sensitivity.

WeR03-p27
Wednesday, June 24, 2026; 10:00-13:30
Improvement of the thermal mode of a high-power laser diode using non-injection window *(Poster)*
V.S. Vyazankin, N. V. Gultikov, A.A. Marmalyuk, A.V. Podkopaev; Stelmakh Research Institute «Polyus», Russia
This study demonstrates effective suppression of catastrophic optical mirror damage (COMD) using a non-injection window (NIW) structure near the laser diode facet. Simulations and experiments show that NIW reduces current density and carrier concentration at the facet, decreasing influence of key heat sources. Laser emitters with NIW demonstrate higher output optical power in comparison with ones without NIW.

Section R04. Laser Beam Control

TuR04-01
Tuesday, June 23, 2026; 15:00-15:30
Structural stability of tightly focused optical vortices with different polarization state *(Invited)*
S.S. Stafeev[1,2], V.V. Kotlyar1,2; [1]Image Processing Systems Institute, NRC "Kurchatov Institute", [2]Samara National Research University, Russia
In this paper, we investigate the stability of an optical vortex with respect to the relative directions of polarization and phase rotation. It is shown theoretically and numerically that a focused beam with opposite handedness of polarization and phase rotation (i.e., circular polarization opposite to the vortex topological charge) exhibits greater stability against such distortions.

TuR04-02
Tuesday, June 23, 2026; 15:30-16:00
Generation of scalar and vector optical vortices in polarization Mach-Zehnder interferometer with corner-cube reflectors *(Invited)*
M.E. Pavelina[1], D.D. Reshetnikov[1], A.A. Ryzhaya[2], E.V. Malyutina[1], A.A. Sevryugin[2], E.A. Vashukevich[1], V.M. Petrov[1], V.Yu. Venediktov[1,2]; [1]St.Petersburg State Univ., [2]St.Petersburg Electrotechnical Univ. "LETI", Russia
We present an experimentally implemented scheme for the controllable generation of scalar and vector optical vortices using a polarization Mach–Zehnder interferometer with corner-cube retroreflectors. The method enables stable generation and fast switching of vortex states without spatial light modulators and provides low angular divergence of the generated beams.

TuR04-03
Tuesday, June 23, 2026; 16:00-16:15
Forming of vortex Bessel beams using gyrotron radiation at 263 GHz
N.A. Bazdyrev[1,2], V.V. Gerasimov[1,3], V.P. Nazmov[1,4], V.S. Pavelyev[5], A.N. Agafonov[5], V.I. Platonov[5], A.V. Kirsanov[6], M.V. Morozkin[6], A.P. Fokin[6], A.V. Chirkov[6]; [1]Budker Institute of Nuclear Physics of the SB RAS, [2]Institute of Automation and Electrometry of the SB RAS, [3]Novosibirsk State University, [4]Institute of Solid State Chemistry and Mechanochemistry of the SB RAS, [5]Samara University, [6]Institute of Applied Physics of the RAS, Russia
This paper presents an investigation of vortex Bessel beams at 263 GHz formed with a reflective phase plate. The obtained experimental data are compared with simulations.

TuR04-04
Tuesday, June 23, 2026; 16:15-16:30
All-fiber polarization-dependent optical vortex generation via nonlinear acousto-optic interaction
D. Vikulin, B. Sokolenko, D. Yavorsky, C. Alexeyev, M. Yavorsky; [1]V.I. Vernadsky Crimean Federal University, Russia
We report on a novel type of vector optical mode conversion in circular fibers with a nonlinear acousto-optic interaction. The possibility of generation of optical vortices with topological charge -2 or +2 is theoretically predicted. Such a process is found to be polarization dependent: both the vortex topological charge and polarization are governed by the circular polarization of the input mode.

TuR04-05
Tuesday, June 23, 2026; 16:30-16:45
Focused optical vortices with extended DOF via flat multilevel diffractive lens
Anita Kumari[1], Tina M. Hayward[2], Rajesh Menon[2,3], Vishwa Pal[1]; [1]Department of Physics, Indian Institute of Technology Ropar, India; [2]Department of Electrical and Computer Engineering, University of Utah, USA; [3]Oblate Optics, Inc., USA
We present a novel method for generating focused optical vortices with extended depth of focus using an inverse-designed, compact flat multilevel diffractive lens. The MDL focuses incident optical vortices at a prescribed working distance while enhancing the depth of focus by several times. Moreover, increasing the vortex size further enhances the DOF, while introducing rings that depend on topological charge.

TuR04-06
Tuesday, June 23, 2026; 16:45-17:00
Measurements of stable field configurations in tightly focused laser beams using subwavelength probes
M.A. Zolotavin[1], K.F. Burdonov[1], A.A. Sidnev[1], I.B. Mukhin[1], A.E. Pestov[2], A.A. Soloviev[1]; [1]A.V. Gaponov-Grekhov Institute of Applied Physics of RAS (IAP RAS), [2]The Institute for Physics of Microstructures of RAS (IPM RAS), Russia
The research is devoted to measurements of the optical field structure arising from counterpropagating focusing of laser channels using subwavelength probes. Particular attention is given to probe diagnostic methods. The research is conducted within the framework of the XCELS project.

TuR04-07
Tuesday, June 23, 2026; 17:30-18:00
Quantum optical vortices for atmospheric communication channels: methods and features of generation and detection *(Invited)*
D.D. Reshetnikov[1], E.V. Malyutina[1], T.K. Korol[1], V.M. Petrov[1]; [1]St. Petersburg State University, Russia
The work explores the potential applications of vector quantum optical vortices in free-space communication channels. Particular emphasis is placed on the techniques for rapid generation, detection, and analysis of quantum polarization states with spatial structures. We investigate the statistical characteristics of various sources of vector optical vortices, as well as the feasibility of employing higher-order vortices in turbulent atmospheric communication links.

TuR04-08
Tuesday, June 23, 2026; 18:00-18:30
Linear Bragg diffraction as a method for research and parameter checkout of regular domain structures in ferroelectric crystals *(Invited)*
S.M. Shandarov[1], E.N. Savchenkov[1], D.E. Belskaya[1], A.V. Dubikov[1], K.P. Melnik[1], N.I. Burimov[1], M.A. Chuvakova[2], A.R. Akhmatkhanov[2], V.Ya. Shur[2]; [1]Tomsk State University of Control Systems and Radioelectronics, [2]Ural Federal University, Russia
We report the results of the experimental studies and theoretical analysis for different aspects of nondestructive method of linear Bragg diffraction on RDS created in ferroelectric crystals 5%MgO:LiNbO3 and 1%MgO:LiTaO3, which have been intended for second harmonic generation.

TuR04-09
Tuesday, June 23, 2026; 18:30-18:45
Multi-layer holographic optical elements for wavefront correction, laser writing and imaging: individual specialization of technologies
R.I. Kuts, V.P. Korolkov, D.A. Belousov, V.E. Zaytseva; Institute of Automation and Electrometry of SB RAS, Russia
Holographic optical elements (HOE) play an important role in the modification and control of laser radiation. A special task in creating diffraction structures is to increase spatial resolution, minimize errors in the topology of structures, simplify and reduce the cost of technological stages of production. This paper presents the practical results of studies of HOE creation, using laser writing on multilayer thin films, obtained in IA&E SB RAS.

TuR04-10
Tuesday, June 23, 2026; 18:45-19:00
The control of transverse modes of laser beam by a tunable diffractive optical element based on lithium niobate
A.R. Akhmatkhanov[1], A.A. Esin[1], V.S. Pavelyev[2, 3], V.Ya. Shur[1]; [1]Ural Federal University, [2]Samara University, [3]Image Processing Systems Institute, NRC "Kurchatov Institute", Russia
We have used ferroelectric lithium niobate (LiNbO3) crystals with static domain structure corresponding to the required phase function for creation of diffractive optical elements (DOEs), which can be switched on and off by the action of external electric field. DOEs for generation of TEM01 mode and for generation of the beam with orbital angular momentum (OAM) are fabricated and studied.

TuR04-11
Tuesday, June 23, 2026; 19:00-19:15
Features of holographic optical elements for high-power lasers
M.V. Gavrish[1,2], P.K. Rozanov[1,2], D.A. Gatsko[1], S.S. Makarin[1], U.V. Prokhorova[1], V.V. Sementin[1], A.P. Pogoda1, N.V. Nikonorov[2]; [1]Baltic State Technical University "VOENMEH" named after D.F. Ustinov, [2]ITMO University, Russia.
This paper examines holographic Bragg gratings and diffusers recorded in photothermorefractive (PTR) glass - key elements for high-power lasers. Their uniqueness lies in the combination of high diffraction efficiency and high laser-induced damage threshold, unattainable in other media. The principles of recording, advantages for managing high-energy beams, and promising applications in laser systems are presented.

TuR04-12
Tuesday, June 23, 2026; 19:15-19:30
Laser beam wavefront control: self-consistent Fourier analysis and adaptive digital holography
V.V. Kabanov, A.O. Nehryienko; Institute of Physics NAS of Belarus, Belarus
We show that using digital hologram in combination with the high resolution of their Fourier transforms allows us to identify individual structural components corresponding to the initially generated laser beam and the accompanying speckle structure, eliminate interference caused by the speckle structure and imperfections of optical-electronic components, improve the quality of the digital hologram, and accurately determine the amplitude and phase profile of the signal beam.

ThR04-13
Thursday, June 25, 2026; 09:00-09:30
Ghost imaging microscopy: theory, implementation and perspectives *(Invited)*
A.M. Vyunishev[1,2], N.N. Davletshin[1,2], A.S. Chirkin[3]; [1]Kirensky Institute of Physics, Federal Research Center KSC SB RAS, [2]Siberian Federal University, [3]M.V. Lomonosov Moscow State University, Russia
Ghost imaging microscopy is an innovative microscopic technique based on spatially correlated light fields. Here we report that the ghost imaging microscopy is less susceptible to spreading and blurring images than using standard optical microscopy. The results have the potential to be used for a wide-field, label- and scan-free imaging of complex biological tissues.

ThR04-14
Thursday, June 25, 2026; 09:30-10:00
Dynamics of a nanosecond pulse optical limiting by amorphous carbon nanoparticles in water *(Invited)*
I.M. Kislyakov[1], A.Yu. Vlasov[2], A.Yu. Venediktova[2], Bin Zhang[1], Jun Wang[1]; [1]Shanghai Institute of Optics and Fine Mechanics, CAS, China; [2]St. Petersburg State University, Russia
Carbon nanoparticle suspensions are widely considered as effective nanosecond optical limiters. However, kinetics of the effect spanning the laser pulse is still a debatable issue. By combining thermodynamic modeling with data from the high-speed detectors, we analyze this complex process, revealing the inter-relation of a sharp drop in transmission with multiple explosive boiling of water around a carbon particle.

ThR04-15
Thursday, June 25, 2026; 10:00-10:15
Advances in TAG and YIG magneto-optic ceramics for high-power optical isolators
Jie Chen; Shanghai Institute of Optics and Fine Mechanics, CAS, China
This report highlights advances in TAG and YIG ceramics, two key magneto-optic materials for Faraday isolators at 1-μm and 2-5 μm mid-infrared bands, respectively. Pioneered by SIOM in 2011, TAG ceramics offer a Verdet constant ~1.5 times that of TGG crystals. Recent progress in Mg^{2+}-Si^{4+} co-doping has further enhanced its optical quality. Meanwhile, emerging YIG ceramics demonstrate exceptional performance in the mid-infrared, promising to address the lack of high-performance materials in this spectral region for high-power isolators.

ThR04-16
Thursday, June 25, 2026; 10:15-10:30
Reconfigurable vector-field generation of polychromatic light from photopatterned twisted nematics
E. Grigoryan, H.H. Harutyunyan, H. Hakobyan, S.A. Shvetsov, T. Orlova, M. Rafayelyan, V. L. Grigoryan; Yerevan State Univ., Armenia
Adiabatic light propagation in twisted nematic liquid crystals enables wavelength-independent polarization structuring of polychromatic beams. Rewritable photoalignment provides spatial control of the director without dynamic phase modulation. Broadband probe light follows the twisted director, forming vector fields with polarization singularities and high linear polarization across the visible spectrum.

ThR04-17
Thursday, June 25, 2026; 10:30-10:45
Multifunctional Ferroelectric PMN-PT Crystals for Electro-Optic Modulation and Domain-Engineered Optical Phased Array Beam Steering
A.D. Ushakov[1], J. Li[2], W. Huang[2], X. Liu[2], A.P. Turygin[1], Y. Zhang[2], Y. Zhang[2], Q. Hu[2], Y. Zhuang[2], V. Shur[1], X. Wei[2]; [1]Ural Federal University, Russia; [2]Xi'an Jiaotong University, China
PMN–PT ferroelectric crystals enable fast electro-optic modulation and solid-state beam steering through domain and phase engineering. Reversible R-O phase switching in PIN–PMN–PT provides optical intensity modulation at moderate fields without high-temperature poling. Cascaded domain optical phased arrays in tetragonal PMN–PT achieve beam steering with 0.32 deg/V/μm efficiency, highlighting PMN–PT as a multifunctional platform for photonics

ThR04-18
Thursday, June 25, 2026; 10:45-11:00
Quasi-distributed strain sensor based on weakly reflecting fiber Bragg gratingswith a large number of sensing elements in a single fiber
K.I. Koshelev, A.B. Pnev, E.M. Rubtsov, A.D. Potapova, A.V. Sibircev, S.A. Nizelnik, V.V. Kuklin, A.R. Vavilov, S.D. Utkin, T.M. Volkov; Scientific Education Center Photonics and IR Techniques, Bauman Moscow State Technical University, Russia
A method for interrogating sensing elements based on weakly reflecting fiber Bragg gratings (FBGs) using a phase-sensitive reflectometer is proposed. The approach enables recording signals from several hundred sensing elements in a single fiber with high sensitivity.

ThR04-19
Thursday, June 25, 2026; 11:30-12:00
Methods for in-situ monitoring and quantitative stability metrics in volume hologram recording *(Invited)*
P.K. Rozanov[1,2], M.V. Gavrish,[1,2], D.A. Gatsko[1], U.V. Prokhorova[1], V.V. Sementin[1], S.S. Makarin[1], N.V. Nikonorov[2], A.P. Pogoda[1]; [1]BSTU "VOENMEH" named after D.F. Ustinov, [2]ITMO University, Russia
This work presents a set of methods for in-situ monitoring of phase drift, vibrations, and intensity fluctuations during the recording of volume holographic elements. We introduce quantitative metrics to assess setup stability and demonstrate their direct correlation with the final hologram's diffraction efficiency and uniformity. The implemented monitoring and stabilization system enables highly reproducible fabrication of high-quality optical elements.

ThR04-20
Thursday, June 25, 2026; 12:00-12:30
High-power Terahertz radiation beam control of the NovoFEL using diffractive optical elements *(Invited)*
N.D. Osintseva[1], Yu.Yu. Choporova[1], V.V. Gerasimov[1,2], V.S. Pavelyev[3], A.N. Agafonov[3], K.N. Tukmakov[3], S.A. Degtyarev[3], A.S. Reshetnikov[3], M.S. Komlenok[4], T.V. Kononenko[4], G.A. Komandin[4], V.I. Konov[4], B.A. Knyazev; [1]Budker Inst. of Nuclear Physics of SB RAS, [2]Novosibirsk State Univ., [3]Samara National Research Univ., [4]Prokhorov General Physics Inst. of the RAS Russia
NovoFEL is a unique high-power frequency tunable terahertz radiation source. It enables advanced techniques like real-time imaging, pump-probe, and holography to be applied to many areas, including heritage studies and semiconductor inspections. The report reviews specific optical elements for controlling high-power THz beams, including focusing optics and advanced beamforming components (Laguerre–Gaussian, Hermite–Gaussian, and Bessel modes) and their applications.

ThR04-21
Thursday, June 25, 2026; 12:30-13:00
Optimization of a predictive adaptive correction algorithm on inhomogeneous atmospheric paths *(Invited)*
I.P. Lukin, V.P. Lukin; V.E. Zuev Institute of Atmospheric Optics, SB RAS, Russia
In this paper we develop phase control methods for adaptive optics systems, in particular, the efficiency of such systems is improved by developing algorithms that use the prediction of fluctuations in correctable wavefront distortions. The possibilities of optimization in the construction of adaptive phase correction algorithms that take into account the evolution of the wave front caused by the wind movement of turbulence across the propagation path of optical waves on inhomogeneous atmospheric paths are analyzed.

ThR04-22
Thursday, June 25, 2026; 13:00-13:15
Karhunen-Loève-Lukosz functions in model-based control algorithms for adaptive optics
D.A. Yagnyatinskiy; V.E. Zuev Institute of Atmospheric Optics, SB RAS, Russia
In existing model-based control algorithms (for adaptive optics) operating via minimizing the root-mean-squared focal spot radius, Karhunen–Loève–Lukosz functions can be used as control modes. In case of 10th-order modal correction of Kolmogorov wavefronts, their use instead of Lukosz polynomials, provides an increase of the Strehl ratio by 2.4 times (at turbulence levels 40-45) and a decrease of the effective spot size (laser beam quality β-factor) by 1.4 times (at a turbulence level of 5).

ThR04-23
Thursday, June 25, 2026; 13:15-13:30
Correlations of the phase gradients of the wave propagating in a turbulent inhomogeneous atmosphere in the weak scintillations regime
A.V. Nemtseva[1,2], F.A. Starikov[1,3]; [1]KATC-VNIIEF, [2]Lomonosov Moscow State University, [3]MEPhI, SarPhTI, Russia
We investigate the non-diagonal component of matrix of correlations between gradients of the phase of the light wave propagating through the turbulent atmosphere. The turbulent path is inhomogeneous. For such conditions, we conduct numerical experiment and extract the information about the Rytov variance up to values of 1, i.e. in the weak scintillations regime.

ThR04-24
Thursday, June 25, 2026; 13:30-13:45
Self-powered smart contact lenses with microfabricated loop antennas for adaptive optical control
P. Salzenstein[1], B. Guichardaz[1], A.M. Bessou[1], L. Salzenstein[2], M.V. Pogumirsky[3]; [1]CNRS, FEMTO-ST, Besancon, France; [2]Universite Marie et Louis Pasteur, Besancon, France; [3]FAREXPORT Ltd., Russia
We present self-powered smart contact lenses integrating microfabricated 900 MHz–1.1 GHz loop antennas and miniaturized energy sources for adaptive optical control. These lenses enable real-time beam shaping, aberration correction, and optical modulation directly on the ocular surface. Simulations and experiments demonstrate compact, efficient antennas supporting wireless power and communication, providing a platform for wearable, autonomous adaptive optics in laser beam applications.

ThR04-25
Thursday, June 25, 2026; 15:00-15:30
Structured fields based on coherent beam combining *(Invited)*
V.V. Dudorov, E.V. Adamov, V.P. Aksenov, G.A. Filimonov, V.V. Kolosov, M.E. Levitskiy; V.E. Zuev Institute of Atmospheric Optics of SB RAS (IAO SB RAS), Russia
This paper proposes a new approach using coherent beam combining technology to control the shape (intensity distribution), polarization structure, orbital angular momentum, and spatial coherence of the optical field. In this approach, the synthesized field is the result of interference of a matrix of subbeams. Control of the amplitude, phase, and polarization of the matrix subbeams is based on a modification of the well-known SPGD method using phase and polarization elements in the feedback loop.

ThR04-26
Thursday, June 25, 2026; 15:30-15:45
Dyakonov surface waveguide modes in interfacial waveguide with asymmetric metal-air boundaries
O.V. Borovkova[1], I.I. Stepanov[1,2], S.A. Dyakov[3], D.A. Chermoshentsev[1,2]; [1]Russian Quantum Center, Skolkovo, [2]Moscow Institute of Physics and Technology, [3]Skolkovo Institute of Science and Technology, Russia
We report Dyakonov surface waveguide modes (DSWMs) that propagate along a flat strip interfacial waveguide formed by two anisotropic materials, bounded by metal on one side and air on the other. Due to asymmetric metal/air boundary conditions, surface waves can exist in such a system regardless of the type of optical anisotropy.

ThR04-27
Thursday, June 25, 2026; 15:45-16:00
Calculation of the effect of the lensed fiber tip displacement on the shape of the focal spot
L.O. Zhukov, R.S. Ponomarev; Perm State University, Russia
A numerical study was conducted to investigate the effect of the vertical displacement of the fiber lens tip on the focal spot of a conical lens. The results show that an increase in the height displacement shifts the focus away from the optical axis, while the lens self-corrects the focus position. (проверь текст)

ThR04-28
Thursday, June 25, 2026; 16:00-16:15
Effects of whispering gallery modes cleaning in microsphere by using surface defects
H.A. Rizk, V.A. Simonov, V.S. Terentyev, V.E. Fedyaj, A.E. Simanchuk, A.V. Dostovalov; Institute of Automation and Electrometry, Russia
Spectral cleaning with a maximum Q-factor 1.2*10^5 of a microsphere was experimentally achieved by suppressing the excitation of higher-order modes through the ablation of grooves on its surface using a femtosecond laser.

ThR04-29
Thursday, June 25, 2026; 16:15-16:30
Fabrication-tolerant data-driven on-demand programming of interlaced multimode interferometer photonic circuits
V.S. Beliaeva[1,2], I.V. Kondratyev[2,3], A.E. Shitikov[1], D.A. Chermoshentsev[1,4], I.A. Bilenko[1,2]; [1]Russian Quantum Center, [2]Faculty of Physics, M.V. Lomonosov Moscow State University, [3]Quantum Technology Centre, M.V. Lomonosov Moscow State University, [4]Moscow Institute of Physics and Technology, Russia
We report an optimization routine that constructs a digital model of a universal unitary converter. By training a regression model on experimental transmission data, we reconstruct the device's transformation landscape. This approach enables on-demand reconfiguration while automatically accounting for thermal crosstalk and fabrication imperfections. The resulting model demonstrates high fidelity, enabling precise on-demand reconfiguration.

WeR04-p01
Wednesday, June 24, 2026; 10:00-13:30
Shack-Hartmann sensor with an arbitrary oriented lenslet array for optical communication applications *(Poster)*
I. Galaktionov[1,2], D. Chizhin[1], V. Toporovsky[1], O. Kolesnikov[1]; [1]Moscow Technical University of Communications and Informatics, [2]Moscow Polytechnic University, Russia
Shack-Hartmann wavefront sensor is widely used device in a large number of applications. Though it's calibration and assembly are well-described, there are a few issues left. One of the issues is the necessity to orient the lenslet array precisely to the sensor of the camera. We developed the algorithm that allows to overcome this issue.

WeR04-p02
Wednesday, June 24, 2026; 10:00-13:30
A multi-stage laser beam focusing optimization algorithm for free-space optics communications *(Poster)*
I. Galaktionov[1,2], V. Toporovsky[1], O. Kolesnikov[1]; [1]Moscow Technical University of Communications and Informatics, [2]Moscow Polytechnic University, Russia
Thermal flows and imperfections in optical components can induce wavefront aberrations that severely degrade wireless optical communication links. This study investigates a novel combined stochastic gradient descent optimization algorithm designed to compensate for such optical distortions. The results indicate a substantial improvement in performance: the algorithm increased the total collected power of a beam focused onto a 10 μm fiber core from 0.3 mW to 2 mW, corresponding to a potential rise in coupling efficiency from 0.1 to 0.6.

WeR04-p03
Wednesday, June 24, 2026; 10:00-13:30
Fiber-end surface analysis using non-phase-shifting interferometry *(Poster)*
I. Galaktionov[1,2], V. Toporovsky[1], O. Kolesnikov[1]; [1]Moscow Technical University of Communications and Informatics, [2]Moscow Polytechnic University, Russia
We introduced an alternative algorithm that integrates Moving Average and Fast Fourier Transform (MAFFT) techniques with Polynomial Fitting. The proposed method achieves results comparable to a Zygo interferometer under standard conditions, with an error margin under 2%.

WeR04-p04
Wednesday, June 24, 2026; 10:00-13:30
Error budget atmospheric horizontal path laser radiation transferring estimation using adaptive optics *(Poster)*
V.V. Toporovsky[1], I.V. Galaktionov[1,2], D.D. Chizhin[1], O.V. Kolesnikov[1]; [1]Moscow Technical University of Communication and Informatics, Russia; [2]Moscow Polytechnic University, Russia
Theoretical estimation of error budget for laser radiation propagated over the atmospheric turbulence with horizontal transmission is presented. The model is based on the fit and temporal error caused phase fluctuations. The output recommendations for the adaptive optics parameters (bandwidth, control elements number) are estimated with Strehl ratio value.

WeR04-p05
Wednesday, June 24, 2026; 10:00-13:30
Stroke optimization for piezoelectric modal wavefront corrector *(Poster)*
V.V. Toporovsky[1], I.V. Galaktionov[1,2], V.V. Tatyanin[3], M.V. Koryachko[2,3]; [1]Moscow Technical University of Communication and Informatics, [2]Moscow Polytechnic University, [3]MIREA - Russian Technological University, Russia
Predictive analysis of corrector parameters is vital for adaptive optics. This paper presents theoretical estimation of spatial stroke for a modal bimorph deformable mirror. The model accounts for substrate and piezo materials, dimensions, and control electrode area to predict the amplitude of reflective surface deformation.

WeR04-p06
Wednesday, June 24, 2026; 10:00-13:30
Effect of atmospheric turbulence on the wandering of a vortex beam: an experiment on a 500-meter path *(Poster)*
V.V. Kuskov[1], R.M. Makhmanazarov[1,2]; [1]V.E. Zuev Institute of Atmospheric Optics SB RAS, [2]National Research Tomsk State University, Russia
The results of an experimental study on the effect of atmospheric turbulence on the propagation of superpositions of vortex beam modes are presented. It was shown that increasing the maximum topological charge in the superposition leads to larger transverse beam sizes at the end of the propagation path, reducing the amplitude of beam wander.

WeR04-p07
Wednesday, June 24, 2026; 10:00-13:30
Demodulation of superpositions of vortex beam modes after propagation through a turbulent medium *(Poster)*
V.V. Kuskov[1], R.M. Makhmanazarov[1,2], L.O. Gerasimova[1]; [1]V.E. Zuev Institute of Atmospheric Optics SB RAS, [2]National Research Tomsk State University, Russia
The results of atmospheric experiments on the demodulation of laser radiation representing a superposition of vortex beam modes are presented. The atmospheric propagation path length was 150 meters. The experimental results demonstrate the feasibility of demultiplexing vortex laser beams after their propagation through a randomly inhomogeneous medium.

WeR04-p08
Wednesday, June 24, 2026; 10:00-13:30
Zonal piezoelectric wavefront corrector characteristics framework *(Poster)*
V.V. Toporovsky[1], I.V. Galaktionov[1,2], O.V. Kolesnikov[1]; [1]Moscow Technical University of Communication and Informatics, [2]Moscow Polytechnic University, Russia
Estimation of the key parameters of the wavefront corrector is important task for the adaptive optical system performance. The paper presents the theoretical estimation of the of zonal piezoelectric wavefront corrector parameters – stacked-actuator deformable mirror with cylindrical piezostacks. The model takes into consideration the substrate and piezostack materials, linear dimensions, blocking force, actuator stiffness

WeR04-p09
Wednesday, June 24, 2026; 10:00-13:30
Block -type Shack-Hartmann wavefront sensor with configurable focal length of microlens array *(Poster)*
V.V. Toporovsky[1], I.V. Galaktionov[1,2], O.V. Kolesnikov[1]; [1]Moscow Technical University of Communication and Informatics, [2]Moscow Polytechnic University, Russia
Quality of the measurement of the phase fluctuations defines the wavefront correction efficiency. The accuracy of the Shack-Hartmann wavefront sensor depends from the lenslet array choice and camera selection. However, there are numerous applications requiring various dynamic range and accuracy. We propose the block-type Shack-Hartmann wavefront sensor with configurable focal length of microlens array.

WeR04-p10
Wednesday, June 24, 2026; 10:00-13:30
The diffraction-driven evolution of singular beams upon reflection from the rough surfaces *(Poster)*
B.V. Sokolenko, Yu.A. Egorov, N.V. Shostka; Institute of Physics and Techniques, V.I. Vernadsky Crimean Federal University, Russia
We present a numerical study of singular beam diffraction by surfaces with inhomogeneities. These defects induce vortex displacement and generate detectable phase singularities moving on closed loops trajectories. This phenomenon enabling sensitive surface defect diagnostics with singular beams. Self-reconstruction of diffracted beams, particularly Laguerre-Gaussian and Bessel-Gaussian types, allows accurate surface profile retrieval from interferograms using straightforward software processing.

WeR04-p11
Wednesday, June 24, 2026; 10:00-13:30
Modeling of lensed optical fiber polishing defects *(Poster)*
R.S. Ponomarev, L.O. Zhukov, F.E. Khasnullin; Perm State University, Russia
This study models the impact of polishing defects in lensed optical fibers, specifically apex-axis misalignment. Using COMSOL simulations, it shows that for lenses with an apex angle exceeding 110°, a misalignment of up to 10 μm is non-critical, preserving a Gaussian output profile. However, for angles below 110°, even minor defects significantly distort the beam profile and alter its direction. The findings highlight stringent precision requirements for manufacturing narrow-angle lensed fibers used in integrated photonics coupling.

WeR04-p12
Wednesday, June 24, 2026; 10:00-13:30
High-OAM deep ultraviolet twisted light for relativistic vortex electrons source *(Poster)*
A.S. Dyatlov[1,2], D.M. Dolgintsev[1], V.V. Gerasimov[3,4], V.V. Kobets[2], V.P. Nazmov[3,5], M.A. Nozdrin[2], A.N. Sergeev[1], D.S. Shokin[2], K.E. Yunenko[2], D.V. Karlovets[1,6]; [1]School of Physics and Engineering, ITMO University, [2]Joint Institute for Nuclear Research, [3]Budker Institute of Nuclear Physics SB RAS, [4]Department of Physics, Novosibirsk State University, [5]Institute of Solid State Chemistry and Mechanochemistry SB RAS, [6]St.Petersburg Nuclear Physics Institute of NRC "Kurchatov Institute", Russia
We demonstrate deep-ultraviolet (266 nm) high–orbital-angular-momentum (OAM) vortex beams generated using fabricated diffractive optical elements: fork gratings, a spiral phase plate, and binary axicons. The SPP produces a Laguerre–Gaussian mode with l = 64 and ~80% efficiency, while axicons generate quasi-Bessel beams up to m = 10. These beams enable structured photocathode illumination for electron accelerator applications.

WeR04-p13
Wednesday, June 24, 2026; 10:00-13:30
Temporal modal piezoelectric wavefront corrector characteristics theoretical analysis *(Poster)*
V.V. Toporovsky[1], I.V. Galaktionov[1,2], A.R. Kalimullina[3], M.V. Koryachko[2,3]; [1]Moscow Technical University of Communication and Informatics, [2]Moscow Polytechnic University, [3]MIREA – Russian Technological University, Russia
Predictive analysis of the wavefront corrector parameters is crucial task for estimation of the adaptive optical system performance. The paper presents the theoretical estimation of the temporal of modal piezoelectric wavefront corrector – mainly bimorph deformable mirror. The model takes into consideration the substrate and piezoelectric plate materials, diameters, thicknesses and boundary conditions.

WeR04-p14
Wednesday, June 24, 2026; 10:00-13:30
A setup for measuring delays in bidirectional optical amplifiers *(Poster)*
O.V. Kolmogorov, S.S. Donchenko, D.V. Prokhorov, P.M. Gunin; FSUE Russian National Research and Development Institute of Physicotechnical and Radiotechnical Measurements (VNIIFTRI), Russia
A measurement setup for high-precision determination of signal delays in bidirectional optical amplifiers is presented. The setup reproduces nominal bidirectional operating conditions and uses a two-stage calibration procedure. Experimental results show that delay measurements with an uncertainty of several tens of picoseconds are achievable.

WeR04-p15
Wednesday, June 24, 2026; 10:00-13:30
Conversion of two-micron radiation into the visible spectral range using ZBLAN:Er^{3+}/Ho^{3+} fluoride glass *(Poster)*
V.A. Egolin, A.P. Savikin, S.V. Kurashkin, A.V. Marugin; Lobachevsky Nizhny Novgorod State Univ., Russia
Up-conversion luminescence of ZBLAN:Er3+/Ho3+ fluoride glass under excitation by 2 μm region radiation was investigated, interionic energy transfer was studied. In the visible part of the spectrum, luminescence bands were observed in the regions of 545 and 655 nm. The visualization threshold power density of Tm3+:YAP laser radiation (λ = 1.94 μm) was 30 W/cm2 in the ZBLAN:1%Er3++1%Ho3+ sample.

WeR04-p16
Wednesday, June 24, 2026; 10:00-13:30
Bessel beam eigenmodes in a gyrotropic medium *(Poster)*
Yu.A. Egorov, V.B. Mostovskoy, B.V. Sokolenko; Institute of Physics and Techniques, V.I. Vernadsky Crimean Federal University, Russia
The propagation of non-diffracting electromagnetic beams in crystals whose properties are described by diagonal permittivity and optical activity tensors is considered. It is shown that a Bessel beam with initial linear polarization exhibits a cross-shaped conoscopic pattern in the orthogonal component, formed by an array of optical vortices. Along with the initial polarization, the conoscopic pattern also changes during beam propagation, and it tends to recover at lengths equal to a quarter of the beat length.

WeR04-p17
Wednesday, June 24, 2026; 10:00-13:30
Control of laser beam parameters for measuring the refractive index of liquid media with an accuracy of 0.00005 using an Anderson differential cuvette *(Poster)*
V.V. Davydov[1,2], D.S. Provodin[1], M.A. Yakusheva[3], A.D. Kurkova; [1]Peter the Great St.Petersburg Polytechnical University, [2]St.Petersburg Electrotechnical University "LETI", [3]St.Petersburg State University of Telecommunications, Russia
It has been established that in differential refractometers the refractive index measurement error depends on the position of the laser radiation optical axis on the photodiode array. Accurate localization of the optical axis within a single pixel requires control of the laser beam parameters. This paper presents results of studying the dependence of the beam width on the photodiode array on the laser power after transmission through an Anderson differential cuvette.

WeR04-p18
Wednesday, June 24, 2026; 10:00-13:30
Metrological assurance of frequency-stabilized lasers. National standards *(Poster)*
Z.V. Fomkina, K.V. Chekirda, N.A. Kononova, Yu.G. Zackharenko; D.I. Mendeleyev Institute for Metrology (VNIIM), Russia
The report is about the metrological assurance of frequency-stabilized lasers.

WeR04-p19
Wednesday, June 24, 2026; 10:00-13:30
The calculation of the actuators influence functions of a rectangular deformable mirror with free edges *(Poster)*
D.A. Yagnyatinskiy, V.N. Fedoseyev; Luch JSC, Russia

WeR04-p20
Wednesday, June 24, 2026; 10:00-13:30
Pattern formation and control in broad-area VCSELs with nonlinear gain *(Poster)*
E.A. Yarunova[1,2], A.A. Krents[1,2], N.E. Molevich[1,2]; [1]Samara National Research University, Russia; [2]Lebedev Physical Institute, Russia
Broad-area VCSELs tend to produce irregular emission as modulation instabilities arise from the interaction of many transverse modes. Optical injection of a weak external beam is a known method for suppressing these instabilities and obtaining spatially uniform output. This study provides generalized calculations using the Maxwell-Bloch model with radiative recombination. Our results show that adding nonlinear gain does not disrupt the stabilization mechanism.

WeR04-p21
Wednesday, June 24, 2026; 10:00-13:30
Laser beam control in differential measurements for determining interfaces between media in hydrocarbon mixtures *(Poster)*
V.V. Davydov[1,2], R.P. Klimenko[3], V.I. Danilova[3], A.D. Kurkova[3]; [1]Peter the Great St.Petersburg Polytechnical University, [2]St.Petersburg Electrotechnical University "LETI", [3]St.Petersburg State University of Telecommunications, Russia
The necessity of studying the dynamics of phase separation boundary formation in hydrocarbon mixtures is substantiated. A new differential method has been developed using a triangular cuvette with a sealed lid to enable long-term measurements of the refractive index n when working with volatile hydrocarbons. The proposed method implements control of laser radiation parameters, including wavelength and power variation. The results of investigating changes in the phase separation boundary are presented.

WeR04-p22
Wednesday, June 24, 2026; 10:00-13:30
Beam-specific phase masks for beam shaping of diode lasers *(Poster)*
D.A. Radnatarov, I.V. Gromov, Zh.E. Munkueva, Y.S. Fedotov, S.M. Kobtsev; Novosibirsk State University, Russia
A beam-specific phase-mask-based method is presented for shaping diode laser emission into predefined intensity profiles or for effective collimation prior to focusing. The phase masks are individually designed based on beam characterization, enabling compensation of astigmatism, intensity asymmetry, and complex spatial structure with minimal optical loss.specially made phase mask that creates a beam with a specified intensity profile or effectively collimates it for subsequent focusing.

WeR04-p23
Wednesday, June 24, 2026; 10:00-13:30
Binary-phase filtering of tightly focused vector petal laser beams for overcoming the diffraction limit *(Poster)*
A.G. Sedukhin, R.I. Kuts; Institute of Automation and Electrometry of SB RAS, Russia
It is shown numerically that using optimization and a binary-phase spatial filtering of the initial field of tightly focused vector petal laser beams, one can reduce the size of these beams in their waist, with overcoming the diffraction limit. The focused intensity patterns of super-resolved beams with 6 petals, taken as examples, were generated and analyzed for radial and azimuthal polarization of the initial field.

WeR04-p24
Wednesday, June 24, 2026; 10:00-13:30
Neutral atom entanglement with non-Gaussian beams *(Poster)*
A. Gordeev[1,2], D. Kuzmenok[1,2], I. Iukhnovets[1,2,3], O. Bychkova[1,2], I. Bobrov[1], G. Struchalin[1], S. Straupe[1,4]; [1]Faculty of Physics, Lomonosov Moscow State University, [2]Lebedev Physical Institute RAS, [3]Moscow Institute of Physics and Technology, [4]Russian Quantum Center, Russia
We study quantum computing technology based on neutral atoms of rubidium where atomic entanglement is achieved with effect of Rydberg blockade. Rubidium atoms are placed in optical lattice and cooled. Residual thermal motion of atoms increases error of entangling operations, which can be suppressed using non-Gaussian beams. Theoretical analysis and experimental results will be presented.

WeR04-p25
Wednesday, June 24, 2026; 10:00-13:30
Formation of Bessel beams and Laguerre-Gaussian modes selection in an Nd:YAG laser using immersed axicons *(Poster)*
E.A. Cheshev[1], A.L. Koromyslov[1], V.A. Petukhov[1], K.V. Prokhorchuk[1,2], Yu.V Senatsky[1]; [1]P.N. Lebedev Physical Institute of RAS, [2]National Research Nuclear University (MEPhI), Russian
Data on the formation of Bessel beams and Laguerre-Gaussian modes selection in an LD-pumped Nd:YAG laser using immersed axicons are presented. Experiments and calculations have shown that immersing complements the functionality of axicons (including acute-angled ones) with lasers.

WeR04-p26
Wednesday, June 24, 2026; 10:00-13:30
Megajoule-class laser facility aberrations correction by means of a modal algorithm *(Poster)*
R.A. Shnyagin, F.A. Starikov; Russian Federal Nuclear Center – VNIIEF, Russia
The numerical-theoretical investigation on the performance of a modal algorithm for static phase aberrations correction of the megajoule-class laser facility radiation employing a wide-aperture 61-channel adaptive mirror within an adaptive optics system without a wavefront sensor has been carried out. Modal correction can significantly reduce the root-mean-square wavefront error in several algorithm iterations. A hybrid correction method has been proposed.

WeR04-p27
Wednesday, June 24, 2026; 10:00-13:30
Coherent beam combining of multichannel fiber laser radiation by the combined aperture method using a two-stage stochastic parallel gradient algorithm. *(Poster)*
N.M. Rakcheev, S.V. Tyutin, O.L. Techko, A.A. Lastovkin, N.A. Zaretsky, M.I. Konovaltsov; Russian Federal Nuclear Center All-Russian Research Institute of Experimental Physics, Russia
The paper demonstrates two methods of coherent combining of continuous fiber laser beams on beam-splitting mirrors. In the first method, three beams are connected to the reference one in series, and in the second, the radiation from four channels is combined into two groups of two channels each, and then the combined radiation is added to the combining element.

WeR04-p28
Wednesday, June 24, 2026; 10:00-13:30
Evaluation of the metrological characteristics of the two-wave laser interferometer *(Poster)*
E.A. Lavrov; Russian National Research and Development Institute of Physicotechnical and Radiotechnical Measurements (VNIIFTRI), Russia
The paper presents the results of studies the metrological characteristics of the developed two-wave laser interferometer based on the State primary special standard of the unit of length GET 199– 2024. The optical scheme of the device is shown in the work. A device for increasing the resolution of the laser interferometer is also described.

WeR04-p29
Wednesday, June 24, 2026; 10:00-13:30
Gauge-invariant analysis of angular momentum in vector vortex beams *(Poster)*
E.V. Malyutina, D.D. Reshetnikov, E.V. Vashukevich, T.U. Golubeva; St.Petersburg State University, Russia
A method for constructing a gauge-invariant transverse potential for vector vortex beams is proposed. Explicit expressions are obtained for the values of the spin and orbital angular momenta. It is shown that the ratio J_z/W generalizes the classical result for scalar vortices. The possibility of experimental investigation of orbital angular momentum in such beams is described.

WeR04-p30
Wednesday, June 24, 2026; 10:00-13:30
Multistage pure silica core optical fiber tapering *(Poster)*
S. Vlasov[1], T. Gorshkov[1,2], A. Timur[3], S. Arkhipov[4], A. Lazareva[5], D. Myasnikov[5], A. Ivanov[1], M. Popov[1], D. Chermoshentsev[1], K. Min'kov[1,6]; [1]Russian Quantum Center, [2]Skoltech Center for Photonic Science and Engineering, Skolkovo Institute of Science and Technology, [3]Project Center for Applied Photonics and Quantum Technologies, Skolkovo Institute of Science and Technology, [4]Research Facilities Center, Skolkovo Institute of Science and Technology, [5]VPG Laserone, [6]Russian Metrological Institute of Technical Physics and Radio Engineering, Russia
A multistage tapering technique for pure silica core optical fibers is demonstrated for efficient whispering gallery mode excitation at 405 nm. The method suppresses mode leakage into the secondary cladding, improves optical transmission, and preserves a short, mechanically stable sub-micron waist region, achieving up to 40% transmission in tapered S405-XP fibers.

Section R05. Super-Intense Light Fields and Ultra-Fast Processes

WeR05-01
Wednesday, June 24, 2026; 09:00-09:30
Recent developments of a laser-driven ion acceleration beamline at SIOM *(Invited)*
J. H. Bin; Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences, Shanghai, China
Laser driven ion acceleration provides a route to achieve high quality ion beams, which could be superior for specific applications. In this talk I will present recent development of a laser driven ion acceleration beam line based on a homemade table-top 200 TW laser system at Shanghai Institute of Optics and Fine Mechanics (SIOM). Our major motivation is the potential application of such pulsed ion sources.

WeR05-02
Wednesday, June 24, 2026; 09:30-09:45
Acceleration of ions with laser pulse self-trapping propagation
S.G. Bochkarev[1,2], A.J. Castillo[1,3], M.G. Lobok[1,2], V.Yu. Bychenkov[1,2]; [1]P. N. Lebedev Physics Institute RAS, [2]Center for Fundamental and Applied Research, All-Russian Research Institute of Automatics, [3]Peoples' Friendship University of Russia (RUDN University), Russia
Numerical modeling of relativistic acceleration of electrons and protons (2.2 J, 6–20 fs) in relativistic self-trapping (RST) from near-critical density targets has been performed. Self-trapping propagation forms an exploding cavern, during whose explosion a combined accelerating field (double layer field and electron bunch) is generated, providing proton injection and Coulomb explosion. The achieved proton acceleration efficiency is 10–20 MeV/J — higher than that of foils.

WeR05-03
Wednesday, June 24, 2026; 09:45-10:00
Direct observation of the ion Weibel instability in femtosecond -laser-driven plasma expansion
A.V. Korzhimanov, R.S. Zemskov, S.E. Perevalov, A.V. Kotov, A.A. Murzanev, A.I. Korytin, K.F. Burdonov, V.N. Ginzburg, A.A. Kochetkov, S.E. Stukachev I.V. Yakovlev, I.A. Shaikin, A.A. Kuzmin, E.V. Derishev, A.A. Soloviev, A.A. Shaykin, A.N. Stepanov, M.V. Starodubtsev, E.A. Khazanov; Gaponov-Grekhov Inst. of Applied Physics RAS, Russia
We report the direct observation of the long-lived filaments attributed to ion Weibel instability in a femtosecond-laser-driven plasma. Filaments (~80 μm) persisted for 20 ns, generating megagauss fields. Supported by modeling, this demonstrates an ion-scale kinetic instability, relevant to astrophysical collisionless shocks.

WeR05-04
Wednesday, June 24, 2026; 10:00-10:30
Enhanced laser-ion acceleration using nano structure *(Invited)*
Zhang Hui; Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences, China
Here, we present the recent progress on laser-driven ion acceleration carried out on the Shanghai Superintense Ultrafast Laser Facility (SULF), where two types of nano structures are used to enhance the proton acceleration. In experiment, using 3D-printed nano-wire array structure, the conversion efficiency from laser to protons reaches up to 9%, 3.5 times higher than that of the planar target. Meanwhile, by employing carbon-nano-tube foam, the proton energy is increased by 130%.

WeR05-05
Wednesday, June 24, 2026; 10:30-10:45
Laser triggered ion acceleration from layered targets
A.V. Brantov[1,2], S.I. Glazyrin[2,1], M.A. Rakitina[1], V.Yu. Bychenkov[1,2]; [1]P.N. Lebedev Physical Institute of RAS, [2]Dukhov Research Institute of Automatics (VNIIA), Russia
Based on 3D PIC modeling, this paper compares the ion acceleration efficiency of short laser pulses from various targets (thin foil, layered targets with a low-density layer). The contributions of different acceleration mechanisms (TNSA, radiation pressure acceleration, synchronized acceleration by slow light) are discussed. The influence of preplasma on ion acceleration is considered.

WeR05-06
Wednesday, June 24, 2026; 10:45-11:00
Low-divergence proton beams from interaction of high-intensity laser pulses with thin solid targets
K.V. Safronov, A.A. Bushukhin, S.A. Gorokhov, V.A. Flegentov, N.N. Shamaeva, I.N. Shishkov, D.O. Zamuraev, A.L. Shamraev, S.F. Kovaleva, N.A. Fedorov, S.N. Pakhomov, A.V. Savelyev, A.V. Potapov; Russian Federal Nuclear Center — All-Russian Research Institute of Technical Physics named after Academician E.I. Zababakhin, Russia
We present experimental results on the generation of low-divergence proton beams using a 100 TW Ti:Sa femtosecond laser. Two methods for divergence reduction were investigated: ultra-thin 100 nm DLC targets to suppress hot electron flux filamentation and employment of long-focus (f/10) optics to increase the laser interaction spot size on 6 μm aluminum foils.

WeR05-07
Wednesday, June 24, 2026; 11:30-12:00
High-field laser solitons and generation of extreme electron beams *(Invited)*
V.Yu. Bychenkov; Center for Fundamental and Applied Research, Dukhov Research Institute of Automatics (VNIIA) and P.N. Lebedev Physics Institute, RAS, Russia
Relativistic self-trapping (RST) of an electromagnetic beam in plasma is a promising soliton-like regime of stable channeled propagation of laser lights. The RST theory presented overcomes the unsubstantiated or incomplete previous theories and formulates the conditions for implementing RST at a quantitative level. The developed theoretical approach is applicable to a wide, practically relevant range of laser powers. Electron acceleration in the RST regime up to sub-GeV energies with multi-nanocoulomb charge carried by the accelerated electron bunch is discussed.

WeR05-08
Wednesday, June 24, 2026; 12:00-12:15
Focusing ultrashort laser-accelerated electron beams for medical applications
M.G. Lobok[1,2], V.Yu. Bychenkov[1,2]; [1]VNIIA, [2]LPI RAS, Russia
Ultrashort laser-accelerated VHEE electron bunches are investigated for medical irradiation with improved lateral dose gradients. A Ti:sapphire driver (0.8 μm, 20 fs) with circular polarization enhances acceleration efficiency, enabling therapeutically relevant bunch charge before electrons reach the decelerating phase of the plasma cavity. PIC phase space is imported into GEANT4 to assess in-phantom focusing, depth–dose, and penumbra reduction.

WeR05-09
Wednesday, June 24, 2026; 12:15-12:45
Generation of collimated quasi-monoenergetic electron beams on a terawatt laser system *(Invited)*
I.N. Tsymbalov[1,2], E.M. Starodubtseva[1], K.A. Ivanov[1,3], A.B. Savel'ev[1,3]; [1]Faculty of Physics, Lomonosov Moscow State University, [2]Institute for Nuclear Research of RAS, [3]Lebedev Physical Institute of RAS, Russia
We demonstrated experimentally and numerically how the blast-wave modification of the gas target can be used to form a quasimonoenergetic electron bunch with controlled energy and improved divergence as well as tracking changes in the bunch parameters during laser wakefield acceleration.

WeR05-10
Wednesday, June 24, 2026; 12:45-13:00
Multi-stage direct laser acceleration of electron beams in plasma channels
E.M. Starodubtseva[1], S.D. Solntsev[2], I.N. Tsymbalov[1,3], K.A. Ivanov[1,4], A.B. Savel'ev[1,2,4]; [1]Lomonosov Moscow State University, [2]Lomonosov Moscow State University, Sarov Branch, [3]Institute for Nuclear Research of RAS, [4]Lebedev Physical Institute of RAS, Russia
A multi-stage scheme for direct laser acceleration (DLA) of electrons in plasma channels is proposed to overcome dephasing and pump depletion limits. An analytical model defines optimal stage parameters. The scheme is successfully validated via quasi-3D Particle-in-Cell simulations, demonstrating GeV-energy, high-charge electron beam generation, with practical feasibility for modern high-power laser systems like XCELS.

WeR05-11
Wednesday, June 24, 2026; 13:00-13:15
Breit-Wheeler pair production in a strong laser field assisted by a copropagating ultrashort pulse
I.A. Aleksandrov[1,2], A.A. Andreev; [1]St. Petersburg Univ., Russia; [2]Ioffe Institute, Russia
We explore the nonlinear Breit-Wheeler mechanism for electron-positron pair production induced by a high-energy photon in a strong laser field. Our analysis specifically emphasizes the dynamical enhancement of this process through the application of a relatively weak subattosecond pulse. We identify the parameter regime in which the presence of this ultrashort pulse significantly amplifies pair production.

WeR05-12
Wednesday, June 24, 2026; 13:15-13:30
The influence of preplasma and focusing point position on ion acceleration during laser irradiation of a flat target
M.A. Rakitina[1], A.V. Brantov[1,2], S.I. Glazyrin[1,2]; [1]Lebedev Physical Institute, RAS, [2]Dukhov Research Institute of Automatics (VNIIA), Russia
It is shown that the efficiency of laser acceleration of protons can be increased by controlling the parameters of the pre-plasma by shifting the focusing point of the laser pulse onto the target pre-plasma at a fixed pre-pulse energy.

ThR05-13
Thursday, June 25, 2026; 09:00-09:30
Advanced compressor designs for ultra high power laser *(Invited)*
E.A. Khazanov, A.G. Vyatkin; Gaponov-Grekhov Institute of Applied Physics of RAS, Russia
We propose a new compressor geometry – a full-aperture two-grating slanted-groove compressor, consisting of two parallel Littrow-mounted gratings with slanted grooves. The angle of slanting is chosen so as to ensure decoupling of the input and output beams. The gratings and the beam on the first grating have the same size.

ThR05-14
Thursday, June 25, 2026; 09:30-09:45
Coherent beam combining in high average and peak power Yb:YAG laser
I.I. Kuznetsov, I.V. Ponomarev, S.A. Chizhov, O.V. Palashov, N.I. Karpov; Nonlinear Dynamics and Optics Department, A.V. Gaponov-Grekhov Institute of Applied Physics of RAS, Russia
The multichannel Yb:YAG laser with high average and peak power is under development. Coherent beam combination is demonstrated using tiled aperture scheme. Intensity fluctuations of the combined beam were successfully suppressed using the digital phase controller down to <1% standard deviation. Pulse energy of 17 mJ and average power of 20 W were achieved at the laser output.

ThR05-15
Thursday, June 25, 2026; 09:45-10:15
High-power lasers for the prospective Compton radiation sources *(Invited)*
I.B. Mukhin[1,2], S.Yu. Mironov[1], M.V. Starodubzev[1], I.Yu. Kostyukov[1], S. G. Rykovanov[2,3], V.V. Kaminsky[2,4,5], Ya.V. Getmanov[4,5]; [1]Federal Research Center A.V. Gaponov-Grekhov Institute of Applied Physics RAS (IAP RAS), [2]National Center for Physics and Mathematics, [3]Skolkovo Institute of Science and Technology (Skoltech), [4]Budker Institute of Nuclear Physics SB RAS, [5]Novosibirsk State University, Russia
The inverse Compton scattering is one of promising approaches to produce a monoenergetic and high brightness fluence of gamma quants. The detailed investigation of specificities of suitable laser systems is presented for linear and nonlinear Compton scattering processes.

ThR05-16
Thursday, June 25, 2026; 10:15-10:45
Magnetic stagnation of two counterstreaming plasma jets induced by intense laser *(Invited)*
R.S. Zemskov, S.E. Perevalov, A.V. Kotov, A.A. Murzanev, A.I. Korytin, K.F. Burdonov, V.N. Ginzburg, A.A. Kochetkov, S.E. Stukachev, I.V. Yakovlev, I.A. Shaikin, A.A. Kuzmin, E.V. Derishev, A.V. Korzhimanov, A.A. Soloviev, A.A. Shaykin, A.N. Stepanov, E.A. Khazanov, M.V. Starodubtsev; A.V. Gaponov-Grekhov Institute of Applied Physics of RAS, Russia
Experimental observations of the stagnation and redirection of colliding counterpropagating laser plasma flows generated by intense laser pulses with an intensity of $I \sim 2 \times 10^{18}$ W/cm^2 are presented. Hybrid PIC-fluid simulations demonstrate the compression of colliding toroidal self-generated magnetic fields embedded in the counterpropagating plasma flows that leads to stagnation and the redirection of plasma flows.

ThR05-17
Thursday, June 25, 2026; 10:45-11:00
Numerical estimation of the number of femtosecond laser accelerated ions from solid targets and clusters
I.M. Mordvintsev[1,2], K.A. Ivanov[1,2], T.A. Semenov[4], A.V. Lazarev[3], R.V. Volkov[1], V.M. Gordienko[1], A.B. Savel'ev[1,2]; [1]Physics faculty, M.V. Lomonosov Moscow State University, [2]P.N. Lebedev Physical Institute of RAS, [3]Faculty of chemistry, M.V. Lomonosov Moscow State University, [4]National Research Centre "Kurchatov Institute", Russia
It was demonstrated that it is possible to estimate the absolute number of ions detected in a specific region of the MCP array if the ion count is small and the MCP is used in single-pulse mode at maximum gain. it was demonstrated a significant increase temperatures and maximum energies of C1+, C2+ and C3+ ions (from 150 keV/charge to 2 MeV) when using cluster targets

ThR05-18
Thursday, June 25, 2026; 11:30-12:00
Few- and half-cycle electromagnetic pulses: formation, characterization, and interaction with quantum objects *(Invited)*
N.N. Rosanov[1], I.A. Aleksandrov[1,2], M.V. Arkhipov[1], R.M. Arkhipov[1], S.V. Fedorov[1], N.A. Veretenov[1]; [1]Ioffe Inst., [2]St.Petersburg State Univ., Russia
An analysis of the interaction of extremely short pulses with quantum objects confirms that their main characteristic is their electric area. The vector structure of the pulse field is described by the hodograph of the electric field and the temporal polarization surface. Experiments demonstrate the formation of quasi-unipolar pulses when irradiating metal wires with femtosecond laser pulses.

ThR05-19
Thursday, June 25, 2026; 12:00-12:15
Generation of sub-attosecond pulses by structured relativistic laser plasma targets
A.A. Andreev[1,2], K.Yu. Platonov[3]; [1]St.Petersburg State Univ., [2]Ioffe Phys. Tech. Institute, [3]St.Petersburg Tech. Univ., Russia
The possibility of effective generation of thin dense relativistic electron sheets and its (sub)attosecond radiation is shown by analytical modeling and multidimensional simulations of intense laser pulse interaction with structured over-dense plasma targets (in particularly ultra-thin layers). It was shown that the maximum electron energy and minimal duration of the radiated pulses can be gained by optimal tuning between the target and laser parameters.

ThR05-20
Thursday, June 25, 2026; 12:15-12:30
Generation of synchrotron radiation in various sub-regimes of the relativistic self-trapping of a laser pulse
O.E. Vais[1,2]; M. G. Lobok[1,2]; V. Yu. Bychenkov[1,2]; [1]VNIIA, [2]LPI RAS, Russia
Synchrotron-like radiation source based on the laser-plasma acceleration of electrons has unique features: small size, short duration and low divergence. Here, we consider the generation of this radiation during the relativistic self-trapping regime of laser propagation through plasmas of different densities.

ThR05-21
Thursday, June 25, 2026; 12:30-12:45
Inverse Compton scattering at a plasma film in the field of counter-propagating relativistic laser pulses
V.V. Kulagin[1], V.N. Kornienko[2], V.A. Cherepenin[2]; [1]Sternberg Astronomical Institute of Lomonosov Moscow State University, [2]Kotel'nikov Institute of Radio-Engineering and Electronics of RAS, Russia
The formation of X-ray and gamma-ray pulses through inverse Compton scattering using a laser system with a power of up to tens of petawatts and a plasma film is investigated analytically and using 2D numerical simulations. The energy of the photons produced can reach hundreds of MeV, while a needle beam with an angular width of less than one degree is formed.

ThR05-22
Thursday, June 25, 2026; 12:45-13:00
Improved approximation of dipole focusing in a multi-beam configuration using a system of parabolic and ellipsoidal mirrors
D.N. Bulanov, A.A. Soloviev, A.V. Korzhimanov; Federal Research Center A.V. Gaponov-Grekhov Institute of Applied Physics of RAS, Russia
A combination of parabolic and ellipsoidal mirrors was tested for a dipole focusing system via numerical simulation. The intensity above 3.8×10^26 W/cm^2 was found obtainable using 12 beams of 50 PW each — a 23% improvement from parabolic only configuration. 90% of the value is realistically achievable; both systems show similar aberration stability. The calculated fields' structure is analyzed through multipole expansion.

ThR05-23
Thursday, June 25, 2026; 13:00-13:30
Multispecies laser-driven plasma source with versatile liquid sheet target *(Invited)*
K.A. Ivanov[1], S.A. Shulyapov[1], I.N. Tsymbalov[1,2], I.P. Tsygvintsev[3], E.M. Starodubtseva[1], A.S. Samsonov[1,4,5], S.N. Klopov[1,4], D.A. Gorlova[2], R.V. Volkov[1], A.B. Savel'ev[1]; [1]Physics Faculty, M.V. Lomonosov Moscow State University, [2]Institute for Nuclear Research of RAS, [3]Keldysh Institute of Applied Mathematics of RAS, [4]Russian Federal Nuclear Center - VNIIEF, [1]Branch in Sarov, M.V. Lomonosov Moscow State University, Russia
The use of special converging nozzle forms a quasi-flat liquid stream with easily adjustable thickness from tens down to a sub-micrometer level to fulfil specific requirements of highly efficient energy transfer from relativistically intense femtosecond laser to particles beams. It is demonstrated, that introducing a prepulse one may form an undercritical plasma slab in the interaction area, dynamically evolving on the nanosecond time scale.

ThR05-24
Thursday, June 25, 2026; 15:00-15:30
Instabilities and magnetic structuring of plasma flows generated by high-power nanosecond and femtosecond laser pulses at PEARL facility *(Invited)*
K.F. Burdonov, R.S. Zemskov, S.E. Perevalov, A.V. Kotov, A.A. Murzanev, A.I. Korytin, V.N. Ginzburg, S.E. Stukachev, I.V. Yakovlev, A.A. Kuzmin, A.V. Korzhimanov, A.A. Soloviev, A.A. Shaykin, A.N. Stepanov; E.A. Khazanov, M.V. Starodubtsev; Institute of Applied Physics of RAS, Russia
Experiments with laser-produced high-velocity plasma flows propagating in an externally applied strong magnetic field can help to improve our understanding of the mechanisms behind some astrophysical phenomena. We present here the overview of our laboratory astrophysics investigations devoted to the formation of instabilities and magnetic structuring of plasma flows generated by high-power nanosecond and femtosecond laser pulses at PEARL facility.

ThR05-25
Thursday, June 25, 2026; 15:30-15:45
Plasma inhomogeneities impact on the development of parametric instabilities in ICF targets corona
S.I. Glazyrin[1,2], A.V. Brantov[1,2], V.Yu. Bychenkov[1,2]; [1]FSUE VNIIA, [2]LPI RAS, Russia
The paper considers the parametric instabilities development in the presence of plasma inhomogeneities in the near-critical region of corona. Due to refraction and filamentation of laser beams, local regions of increased intensity may arise, exceeding the thresholds for the development of parametric instabilities, while the average laser intensity remains below the threshold. The paper refines the criteria for the development of parametric instabilities in such conditions.

ThR05-26
Thursday, June 25, 2026; 15:45-16:15
Long-wavelength reshaping of high harmonic spectrum generated by intense multi-cycle near-IR laser field in gas: the route to time-resolved x-ray absorption spectroscopy *(Invited)*
F.V. Potemkin; Faculty of Physics M.V. Lomonosov Moscow State University, Russia
This study demonstrates coherent control of high-order harmonic generation by combining mid-IR and terahertz fields with a near-IR driver. The THz field breaks symmetry, producing even harmonics via altered recombination. The mid-IR field broadens the spectrum to 200 eV in helium by enabling efficient electron acceleration on extended trajectories. This two-color method enables tailored attosecond light sources and novel spectroscopic applications.

ThR05-27
Thursday, June 25, 2026; 16:15-16:30
Features of high-order harmonic generation in gases under normal and strongly overdriven regimes
V.I. Trunov[1,2,3], S.V. Avtaeva[1,2], V.V. Petrov[1,2,3], S.A. Frolov[1], A.V. Kirpichnikov[1], V.A. Vasiliev[1], K.V. Gubin[1]; [1]Institute of Laser Physics SB RAS, [2]Novosibirsk State Technical University, [3]Novosibirsk State University, Russia
We present the results of experimental and theoretical studies of the features of high-order harmonic generation in argon jet in a wide range of exciting femtosecond radiation intensities, including the "strongly overdriven regime" mode

ThR05-28
Thursday, June 25, 2026; 16:30-17:00
Laser-plasma EUV source for the new generation lithography *(Invited)*
A.A. Soloviev[1], A.N. Nechay[2], A.A. Perekalov[2], V.E. Guseva[2], S.E. Perevalov[1], E.S. Blinov[1], I.S. Abramov[1], I.I. Kuznetsov[1], O.V. Palashov[1], I.B. Mukhin[1], S.V. Golubev[1], M.V. Starodubtsev[1], and N.I. Ckhalo[2]; [1]IAP RAS, [2]IPM RAS, Russia
This paper presents an experimental and theoretical study of the efficiency of a laser-plasma source operating at a wavelength of 11.2 nm for a next-generation lithography machine. Key fundamental and technological aspects of achieving the required efficiency are discussed: the architecture and parameters of the laser system, the formation of a vacuum xenon jet and diagnostics of its flow, and ionization dynamics under laser pulses.

ThR05-29
Thursday, June 25, 2026; 17:30-17:45
Optimization of laser-plasma EUV source parameters for the next generation lithograph at 11.2 nm
S.E. Perevalov, E.S. Blinov, R.S. Zemskov, A.V. Kotov, K.F. Burdonov, M.A. Zolotavin, S.E. Stukachev, I.B. Mukhin, A.A. Soloviev; Federal Research Center A.V. Gaponov-Grekhov Institute of Applied Physics of RAS (IAP RAS), Russia
The work describes experimental setup for optimizing the parameters of the laser-plasma EUV source, which includes wide diagnostics set for gas target, laser source and laser breakdown. We used a 1-7 ns up to 1 J laser. Experiments with argon and xenon showed that laser pulse temporal shape, EUV spectra and conversion efficiency varies with pulse length and energy.

ThR05-30
Thursday, June 25, 2026; 17:45-18:00
Possible mechanisms of deeply subwavelength silicon structuring by intense terahertz pulses
I.V. Oladyshkin, D.I. Kulshin, K.S. Kotova; A.V. Gaponov-Grekhov Institute of Applied Physics of RAS, Russia
We propose a mechanism of deeply subwavelength structuring of silicon by intense THz pulses via stimulated Raman scattering. Ionization creates a conductive layer, which support surface plasmon polaritons at anti-Stokes combination frequency. SPP standing wave heats the surface periodically and create LIPSS with periods of 2–4.5 μm parallel to the pump polarization. We derive the threshold condition for SRS regime and discuss alternative mechanisms.

ThR05-31
Thursday, June 25, 2026; 18:00-18:15
Features of nuclear isomer generation during the interaction of an intense femtosecond laser pulse with a gas cluster jet
M.V. Sedov[1,2], I.Yu. Skobelev[1,2]; [1]Joint Institute for High Temperatures of RAS (JIHT RAS), [2]National Research Nuclear University MEPhI (Moscow Engineering Physics Institute), Russia
We numerically investigated the optimal conditions for generating nuclear isomers using three-dimensional particle-in-cell simulations. This approach could provide an alternative method for producing nuclear isomers without accelerators or nuclear reactors. We studied the interaction of femtosecond (30 fs) laser radiation with a krypton cluster of 50–100 nm diameter. The optimal laser intensity and cluster size for generating the 83mKr isomer have been determined, and the calculation results have been verified by comparison with recent experiments.

WeR05-p01
Wednesday, June 24, 2026; 15:00-18:30
Transition radiation of a single attosecond pulse from multi-layer target irradiated by relativistic laser pulse *(Poster)*
K.Yu. Platonov[1,3], A.A. Andreev[2,3]; [1]Peter the Great St.Petersburg Polytechnic University, [2]St.Petersburg State University, [3]Ioffe Institute, Russia
An (sub)attosecond-duration electromagnetic pulse of transition radiation generated when a thin (a few nanometers) dense first target electron bunch accelerated by a laser pulse hits a second metallic target is being considered. The pulse duration and the conversion coefficient of laser energy into coherent transition radiation energy are determined. Conditions are found for distinguishing the transition radiation pulse from other secondary radiation channels generated when the electron bunch and laser pulse hit the second target.

WeR05-p02
Wednesday, June 24, 2026; 15:00-18:30
Simulation of laser acceleration with a decomposition in azimuthal modes *(Poster)*
N.N. Nikiforov[1,3], I.N. Tsymbalov[1,2], A.B. Savel'ev[1,3]; [1]Faculty of Physics, Lomonosov Moscow State Univ., [2]Inst. for Nuclear Research of RAS, [3]Branch of Lomonosov Moscow State Univ. in Sarov, Russia
We numerically investigated electron acceleration by the interaction of a femtosecond laser pulse with a plasma with density 0.1-1% of critical value. PIC simulation was performed in cylindrical geometry with a decomposition in azimuthal modes. The simulation results obtained with different numbers of modes used were compared with three-dimensional modeling.

WeR05-p03
Wednesday, June 24, 2026; 15:00-18:30
Enhancement of quasi-stationary magnetic fields by orders of magnitude viaoptimization of the plasma transverse density profile in the regime of relativisticself-channeling *(Poster)*
V.A. Kuleshova[1], A.V. Korzhimanov[2]; [1]Faculty of Physics and Sarov Branch, Lomonosov Moscow State University, [2]Gaponov-Grekhov Institute of Applied Physics of RAS, Russia
This research enhances quasi-stationary magnetic fields generated via the inverse Faraday effect during relativistic laser self-channeling. Introducing a tailored plasma density peak overcomes field saturation by concentrating electrons, boosting currents, and amplifying the axial magnetic field over tenfold.

WeR05-p04
Wednesday, June 24, 2026; 15:00-18:30
The 3D numerical optimization of gas-jet targets for acceleration of electrons and protons by picosecond laser pulse with intensity of 5·10^19 W/cm2 *(Poster)*
V.A. Lykov, G.N. Rykovanov, D.V. Torshin; Russian Federal Nuclear Center – Zababakhin All-Russian Scientific Research Institute of Technical Physics, Russia
The 3D simulation results of charge particles acceleration at the irradiation of gas jet targets with subcritical density by the picosecond laser pulse with intensity of 5·1019 W/cm2 are discussed. It is predicted that the use of gas jet target with optimal parameters instead of solid-state foils can raise considerably a brightness of laser based source of MeV gamma-rays in experiments at the SOKOL-P facility

WeR05-p05
Wednesday, June 24, 2026; 15:00-18:30
Femtosecond laser point-by-point inscription of apodized chirped fiber Bragg gratings *(Poster)*
P.A. Elizarova[1,2], Z.E. Munkueva[1,2], V.M. Volosi[1,2], D.S. Kharenko[1,2], N.A. Koliada[1,3], A.V. Dostovalov[1,2], S.A. Babin[1,2]; [1]Inst. of Automation and Electrometry of the SB RAS, [2]Novosibirsk State Univ., [3]Inst. of Laser Physics of the SB RAS, Russia
We demonstrate an experimental realization of a dome-spectrum apodized chirped FBGs (ACFBGs) fabricated by femtosecond point-by-point inscription technique in a polarization-maintaining fiber. Our approach combines the inscription techniques for chirped FBGs and apodized FBGs to fabricate ACFBGs. Moreover, we present the implementation of dome-spectrum ACFBGs applied for mode-locked fiber laser as a dispersion component and a spectral filter.

WeR05-p06
Wednesday, June 24, 2026; 15:00-18:30
The dynamics of motion of a relativistic electron emitted from a thin foil during an intense laser pulse, with foil interaction. *(Poster)*
A.S. Kuratov[1,2], A.V. Brantov[1,2], V.Yu. Bychenkov[1,2]; [1]VNIIA, [2]LPI RAS, Russia
The present study investigates the process of high-energy electron formation resulting from the interaction between a high-intensity femtosecond laser pulse and a thin metal foil. The formation and motion characteristics of these electrons play a pivotal role in the generation of terahertz radiation. The characteristic electron spectra, the characteristics of their formation, energy gain and loss, and motion outside the foil are examined based on numerical simulations using the particle-in-cell method and theoretical estimates.

WeR05-p07
Wednesday, June 24, 2026; 15:00-18:30
Optimizing the Compton radiation source in linear and weakly nonlinear regimes using GPU-accelerated code *(Poster)*
A.S. Samsonov[1], A.A. Zakharova[2], I.Yu Kostyukov[1]; [1]Federal Research Center A.V. Gaponov-Grekhov Institute of Applied Physics of RAS, [2]Lomonosov Moscow State University, Sarov Branch, Russia
We report on development of GPU-accelerated code aimed at optimizing Compton source parameters in realistic conditions, accounting for electron beam and laser pulse focusing, energy spreads, weakly nonlinear effects, etc. The optimization process yields optimal laser parameters for maximum photon yield and spectral monochromaticity. The code is also used to validate effectiveness of a flying-focus technique to enhance source performance.

WeR05-p08
Wednesday, June 24, 2026; 15:00-18:30
Experimental study of the interaction of femtosecond laser pulses with targets of near-critical density *(Poster)*
A. Kotov[1], S. Perevalov[1], R. Zemskov[1], E. Blinov[1], K. Burdonov[1], V. Ginzburg[1], A. Kuzmin[1], S. Stukachev[1], I. Yakovlev[1], N. Bukharsky[2], N. Borisenko[2], A. Shaikin[1], E. Khazanov[1], M. Starodubtsev[1], O. Rozmey[3], N. Andreev[4], A. Soloviev[1]; [1]Institute of Applied Physics, RAS, [2]Lebedev Physical Institute, RAS, Russia; [3]GSI Helmholtz Centre for Heavy Ion Research, Germany; [4]Joint Institute for High Temperatures, RAS, Russia
This paper presents an experimental study of secondary radiation generation from the interaction of femtosecond laser pulses (60 fs, 12 J, 910 nm) with thin aluminum foil and a cellulose triacetate foam target with an average density of 2-4 mg/cm³, including preionization by a nanosecond pulse.

WeR05-p09
Wednesday, June 24, 2026; 15:00-18:30
Spectral features of high-power femtosecond radiation scattering on plasma dust structures *(Poster)*
A.A. Andreev[1,2], V.Yu. Karasev[1], K.Yu. Platonov[3], A.A. Schimko[1]; [1]St. Petersburg Univ., [2]Ioffe Institute, [3]St. Petersburg Tech. Univ., Russia
The paper presents the results of theoretical and experimental studies on the interaction of high-power femtosecond laser pulses with dust plasma particles. Optimization of the conditions for the generation of harmonics of laser radiation from submicron high-density plasma clusters irradiated by 50 fs and energy up to 5 mJ laser pulses is considered.

WeR05-p10
Wednesday, June 24, 2026; 15:00-18:30
High frequency all-diode-pumped Ti:Sapphire laser system for fabrication of photonic devices in transparent materials by femtosecond laser writing *(Poster)*
K.A. Emelyanov[1], K.A. Akmarov[1], A.Yu. Danilov[1], D.M. Bengalskii[1], I.R. Ovsyankin[1], A.V. Reznikov[1], S.P. Nikitin[1,2], O.E. Nanii[1] and V.N. Treshchikov[1]; [1]T8 LLC, [2]FemtoVision LLC, Russia
An all-diode-pumped Ti:Sapphire laser system designed for photonic device fabrication by femtosecond laser writing has been built and tested. The use of sub-100 fs pulses allows to reduce laser energy fluence required for fiber core modification bellow 1,5 J/cm2

WeR05-p11
Wednesday, June 24, 2026; 15:00-18:30
Methods of increasing the maximum recording base using a laser rangefinder *(Poster)*
S.A. Finyushin, A.V. Fedorov, E.A. Chudakov, D.A. Kalashnikov, I.S. Gnutov, E.A. Razumkov; Russian Federal Nuclear Center – All-Russian Research Institute of Experimental Physics, Russia
An experimental method for quasi-continuous laser recording of reflective surface movements has been developed at RFNC-VNIIEF since 2015. The laser rangefinder system developed on this basis enables the study of fast processes by precisely recording the coordinates of the objects being studied. As part of the research, methods for increasing the maximum detection base using the laser rangefinder method have been proposed and experimentally tested.

WeR05-p12
Wednesday, June 24, 2026; 15:00-18:30
Self-consistent account of spectrum formation during filamentation in compressed gases in the mean-field approximation *(Poster)*
Yu.E. Geints[1], A.D. Bulygin[1], V.O. Kompanet[2], S.V. Chekalin[2]; [1]V.E. Zuev Institute of Atmospheric Optics SB RAS, [2]Institute of Spectroscopy RAS, Russia
In this work, the formation of a supercontinuum spectrum is experimentally and theoretically studied during filamentation in compressed nitrogen of chirped femtosecond optical pulses in the mode of sharp focusing.

WeR05-p13
Wednesday, June 24, 2026; 15:00-18:30
Ultrashort-pulse laser interaction with microclusters as a source of hard X-ray radiation *(Poster)*
D.A. Gozhev, S.G. Bochkarev, O.E. Vais, M.G. Lobok, V.Yu. Bychenkov; , Russia
Using 3D PIC simulations, volumetric stochastic heating of submicron-sized cluster plasma composed of heavy atoms was investigated under irradiation by an ultrashort laser pulse of moderately relativistic intensity. The characteristics of the generated hard X-ray radiation were determined for a laser pulse with a given energy (~1 J). The analysis reveals that bremsstrahlung radiation makes the dominant contribution to hard X-ray emission, compared to synchrotron-like emission caused by stochastic electron motion.

WeR05-p14
Wednesday, June 24, 2026; 15:00-18:30
A comparative study of laser-driven electron acceleration in “laser bullet” and “bubble” regimes *(Poster)*
A.J. Castillo[1,3,4], S.G. Bochkarev[1,2], V.Yu. Bychenkov[1,2], M.G. Lobok[1,2]; [1]P.N. Lebedev Physics Institute, RAS, [2]Center for Fundamental and Applied Research, All-Russian Research Institute of Automatics, [3]Pirogov Russian National Research Medical University, [4]Peoples’ Friendship University of Russia (RUDN University), Russia
Extreme charge and conversion efficiency in laser-driven electron acceleration are achieved through relativistic self-trapping in “laser bullet” and “bubble” regimes. 3D PIC simulations show that the laser bullet regime enables enhanced production of 15–30 MeV electrons, applicable to radiation-nuclear technologies.

WeR05-p15
Wednesday, June 24, 2026; 15:00-18:30
Formation and diagnostics of a gas target for a prospective laser-plasma extreme ultraviolet source *(Poster)*
E.S. Blinov, S.E. Perevalov, A.V. Kotov, A.A. Soloviev; IAP RAS, Russia
This work presents a combined interferometric and ionization diagnostic method for accurate density profile calibration of a supersonic xenon gas jet. The intensity of laser-induced breakdown glow is used to determine the local gas concentration profile. The results provide essential data for optimizing the jet as a target for a prospective 11.2 nm laser-plasma EUV source for lithography.

WeR05-p16
Wednesday, June 24, 2026; 15:00-18:30
Femtosecond filamentation and supercontinuum generation in KYW crystal *(Poster)*
K.B. Yushkov, A.I. Chizhikov, V.S. Shcherbakova, V.Ya. Molchanov; Univ. MISIS, Russia
Femtosecond filamentation and supercontinuum generation is observed experimentally in KY(WO4)2 single crystal at pump pulse wavelength of 1030 nm. The regimes of a single filament, periodic refocusing of the filament, and multiple filaments were obtained by increase in pulse energy from 0.35 to 2.9 mkJ. Associated conical emission patterns corresponding to X-pulse generation were observed in the far field.

WeR05-p17
Wednesday, June 24, 2026; 15:00-18:30
Effect of pressure on time-dependent optical Kerr nonlinearity in Ar, N_2 and CO_2 gases *(Poster)*
Y.E. Geints[1], V.O. Kompanets[1,2], S.V. Chekalin[1,2]; [1]V. E. Zuev Institute of Atmospheric Optics SB RAS, [2]Institute of spectroscopy RAS, Russia
We present experimental data on the coefficient n2 for atomic Ar, molecular N2 and CO2 with a pressure change from 1 to 11 bar and optical pulse duration from 50 to 500 fs of propagating femtosecond laser radiation (800 nm). Importantly, all three gases under study possess close n2-values in the short pulse limit over the entire pressure range. Meanwhile, with increasing gas pressure, effective n2 also increases.

WeR05-p18
Wednesday, June 24, 2026; 15:00-18:30
Investigation of THz radiation generated from interaction of relativistic laser pulse with pre-ablated thin-layer liquid jet target *(Poster)*
A.V. Samsonov[1,2,3], I.N. Tsymbalov[1,4], K.A. Ivanov[1], S.A. Shulyapov[1], A.B. Savel'ev[1]; [1]Faculty of Physics, M.V. Lomonosov Moscow State University, [2]Sarov branch, M.V. Lomonosov Moscow State University, [3]Russian Federal Nuclear Center - VNIIEF, [4]Institute for Nuclear Research of RAS, Russia
This paper presents computational-theoretical and experimental studies on the development of methods for generation and detection of THz radiation obtained from the interaction of a relativistic intensity femtosecond pulse with a target pre-ablated by a nanosecond laser pulse. A continuous ethanol jet with a thickness of several micrometers was used as the target, providing the required density, spatial stability, and continuous operation at high pulse repetition rates.

WeR05-p19
Wednesday, June 24, 2026; 15:00-18:30
Broadband and ultra- fast optical switch based on 2D metal-organic framework *(Poster)*
Yu. Kenzhebayeva[1], S. Povarov[1], A.S. Potapov[2], V.A. Milichko[3]; [1]School of Physics and Engineering, ITMO University, [2]Nikolaev Institute of Inorganic Chemistry, Russia; [3]New Uzbekistan University, Uzbekistan
The development of ultrafast and broadband optical switches is a priority area of modern optics and optoelectronics. In our research, we present an optical switch based on a 2D metal-organic framework with a resonant response speed of 1 to 25 GHz in the operating wavelength range of 590-695 nm and a nonresonant response speed of 0.1 THz in the range of 580-685 nm.

WeR05-p20
Wednesday, June 24, 2026; 15:00-18:30
Spherical collapse of an extremely short dipole pulse. *(Poster)*
I.I. Metelskii[1,2], V.Yu. Bychenkov[1,2], V.F. Kovalev[1,3]; [1]Dukhov Automatics Research Institute (VNIIA), [2]Lebedev Physical Institute of RAS, [3]Keldysh Institute of Applied Mathematics of RAS, Russia
An analytical investigation of the spherical collapse of an extremely short single-cycle laser pulse has been performed. Exact nonstationary solutions of Maxwell's equations in a vacuum, which describe converging electromagnetic dipole pulses, are analyzed in detail. These solutions allow for the modeling of highly efficient electromagnetic field focusing, matter compression, charged particle acceleration in extreme fields.

Section R06. Lasers and Systems for Imaging, Green Photonics and Sustainability

TuR06-01
Tuesday, June 23, 2026; 11:30-11:45
Encryption and decryption of images using digital hologram synthesis
V.V. Sementin, A.P. Pogoda, M.V. Gavrish, P.K. Rozanov, U.V. Prokhorova, A.S. Boreysho; Baltic State Technical University "VOENMEH" named after D.F. Ustinov, Russia
This article presents a method for image encryption and decryption based on computer synthesis of digital holograms. The proposed approach models the diffraction field of the image and forms a hologram through the interference of object and reference waves. Successful decryption requires precise matching of the parameters. The method demonstrates high noise immunity and potential for use in laser communication systems.

TuR06-02
Tuesday, June 23, 2026; 11:45-12:00
Ghost image formation in the THz and sub-Thz frequency ranges
D.A. Chernousov, A.S. Sinko, I.A. Ozheredov; Faculty of Physics, Lomonosov Moscow State Univ., Russia
The experimental realization of ghost imaging in the THz and sub-THz frequency ranges using methods of compressive sensing and cross-correlation function calculation is considered. The accuracy of reconstruction with various methods for different objects is compared, taking into account the spatial profile of the scanning beam.

TuR06-03
Tuesday, June 23, 2026; 12:00-12:15
Enchanced-resolution interrogation with random Raman fiber laser
D.V. Nadein, O.A. Gorbunov, I.D. Vatnik, D.V. Churkin; Novosibirsk State University, Russia
We demonstrate super-resolution spectroscopy using a random Raman fiber laser with distributed feedback. By engineering operation with only a few narrow spectral modes and combining a low-resolution grating analyzer with a full-power photodetector, we reconstruct a transmission spectrum substantially narrower than the analyzer resolution, while using a simplified, single-channel measurement scheme suitable for practical implementations.

TuR06-04
Tuesday, June 23, 2026; 12:15-12:30
High-resolution pulsed terahertz microscopy based on solid immersion effect
D.D. Rybnikov[1,2], V.A. Zhelnov[1], S.O. Yurchenko[2], K.I. Zaytsev[1], N.V. Chernomyrdin[1]; [1]Prokhorov General Physics Institute of RAS, [2]Federal State Autonomous Educational Institution of Higher Education "Bauman Moscow State Technical University", Russia
We developed pulsed terahertz solid immersion microscope combining subwavelength spatial resolution of a solid immersion lens and advanced information content of a THz pulsed imaging. Spatial resolution of this microscope was estimated in time and frequency domains. The highest resolution down to 0.047λ was obtained for spectral phase image representation. The method offers potential for biophotonics and materials science applications.

TuR06-05
Tuesday, June 23, 2026; 12:30-12:45
Transformable nadir+oblique/back-to-back multispectral and LiDAR system for green photonics
D.A. Stolyarenko, K.I. Tokar; L-Scan Lab Ltd., Russia
Modern forest management is transitioning from static imaging to dynamic mobile mapping. There is a high demand for cost-effective, lightweight, and automated data processing solutions. Our system addresses these challenges through a transformable design optimized for versatile deployment of multispectral cameras either back-to-back for land use or aerial dual Nadir and 15° Oblique views for aerial use.

TuR06-06
Tuesday, June 23, 2026; 12:45-13:00
Multichannel photonic integrated sensing system: design concept and experimental validation
A.G. Zakoyan[1], V.S. Lyubopytov[1], I.V. Stepanov[1], O. Klimenko[2], G.S. Voronkov[1]; [1]Ufa University of Science and Technology, [2]Laboratory of Advanced Electronic Devices, Center for Engineering Physics, Skolkovo Institute of Science and Technology, Russia
This work demonstrates an experimental implementation of a multichannel sensing scheme on a photonic integrated circuit (PIC). A chip fabricated on a silicon nitride (Si_3N_4) platform employed an asymmetric Mach–Zehnder interferometer and two microring resonators with thermo-optic phase shifters. Experiments confirmed simultaneous on-chip interrogation feasibility, highlighting the potential of compact, scalable, and cost-effective PIC-based sensing systems.

TuR06-07
Tuesday, June 23, 2026; 13:00-13:15
Microresonator clusters for spectral analysis with machine-learning interpreter
I. Saetchnikov, E. Tcherniavskaia, A .Saetchnikov; Belarusian State University, Belarus
We present a compact, scalable, chip-based spectroscopic instrument integrating thousands of optical microresonators within the clusters. By combining a whispering gallery mode resonance phenomenon with a machine-learning interpreter using ensemble methods and variational autoencoder-based data augmentation, the system achieves accurate wavelength identification with 100 fm precision over up to 100 nm visible spectral range.

WeR06-p01
Wednesday, June 24, 2026; 15:00-18:30
Development of a microscope model with three-dimensional visualization and measurement based on dual-wavelength digital holography *(Poster)*
V.V. Sementin, A.P. Pogoda, D.V. Gapon, D.A. Gatsko, S.S. Makarin, A.S. Boreysho; Baltic State Technical University "VOENMEH" named after D.F. Ustinov, Russia
This paper focuses on the design of a three-dimensional microscope prototype based on dual-wavelength digital holography. The design of a modular optoelectronic system, control of reference beam parameters, and alignment of optical elements are discussed. The influence of temperature and laser diode operating mode on wavelength stability is investigated, and the feasibility of three-dimensional surface reconstruction in quasi-real time is discussed.

WeR06-p02
Wednesday, June 24, 2026; 15:00-18:30
The impact of helically-wound cable on signal fidelity using DAS for seismic exploration *(Poster)*
I.S. Ponomarev[1,2], E.A. Fomiryakov[1], D.R. Kharasov[1], O.E. Nanii[1,2], V.N. Treschikov[1]; [1]T8 LLC, [2]Lomonosov Moscow State University, Russia
In this Letter, we developed a prototype of a fiber optic sensor cable with a helically-wound fiber for geophysical applications. Data from a field experiment and a comparison with a straight fiber cable are also provided.

WeR06-p03
Wednesday, June 24, 2026; 15:00-18:30
Use of neural networks for processing the output signal of a ring gas laser *(Poster)*
A.O. Sinelnikov[1], I.A. Smetanin[1], E.A. Smetanin[1], U.F. Bykanova[2]; [1]RUDN University, [2]Lomonosov Moscow State University, Branch in the City of Sarov, Russia
This study compares hybrid neural networks to classical IMU data processing. It evaluates CNN and LSTM architectures. A hybrid CNN-LSTM model achieved 96.2% accuracy in activity classification, a 27% gain over SVM. An LSTM filter also outperformed a Kalman filter in reducing noise. The research confirms these models are viable for efficient, real-time embedded systems in robotics and wearable devices.

WeR06-p04
Wednesday, June 24, 2026; 15:00-18:30
Development of a self-compensated dual-wavelength distributed temperature sensor for well monitoring applications *(Poster)*
E.S. Vissarionova, A.B. Mukhtubaev; ITMO University, Russia
A self-compensated dual-wavelength distributed temperature sensor for oil and gas well monitoring is presented. The method uses two optical wavelengths that generate closely spaced Raman components, allowing compensation of hydrogen-induced spectral losses in optical fibers. The approach improves temperature measurement accuracy without modifying already installed downhole fiber-optic cables.

WeR06-p05
Wednesday, June 24, 2026; 15:00-18:30
Determination method for optimal radiation frequency for measuring N_2O absorption *(Poster)*
Ya.V. Antonenko[1,2], I.V. Sherstov[1,2]; [1]Institute of Laser Physics SB RAS, [2]Novosibirsk State Technical University, Russia
A theoretical assessment of the influence of interfering atmospheric gases absorption on the detection of nitrous oxide absorption near 4.5 μm was performed. An experiment was conducted to select the laser radiation operating frequency. A method for determining optimal radiation frequencies for measuring the absorption of target gases substances using a laser photoacoustic gas analyzer is proposed for nitrous oxide.

WeR06-p06
Wednesday, June 24, 2026; 15:00-18:30
Computer simulation of the fluorescent lidar for monitoring the concentration of NO_2 molecules in gas emissions from ship power plants *(Poster)*
A.N. Popov, V.A. Turkin, V.G. Shemanin; Admiral F.F. Ushakov State Maritime University, Russia
Most of the ship power plants have a large concentration of NO2 molecules in their gas emissions. The computer simulation of a fluorescent lidar for monitoring the NO2 molecules concentration at the ranging distance up to 105 m with these molecules concentration is about of the low permissible concentration and higher has fulfilled.

WeR06-p07
Wednesday, June 24, 2026; 15:00-18:30
Laser-assisted formation of hierarchical Ti-based SERS substrates *(Poster)*
E.Y. Ponkratova[1], A.S. Loshkarev[1], K.A. Maleeva[2], M.P. Sandomirskii[1], A.S. Shtumpf[1], E.I. Ageev[1], D.A. Zuev[1]; [1]Faculty of Physics, ITMO University, [2]International Research and Education Center for Physics of Nanostructures, ITMO University, Russia
Developing simple and inexpensive methods for creating SERS substrates is an important task for their practical application. In this study, we use nanosecond laser irradiation of a titanium plate to create microstructures with various morphologies. Thermal deposition of silver islands on the fabricated structures enhances the SERS signal by up to an order of magnitude compared to the untreated surface.

WeR06-p08
Wednesday, June 24, 2026; 15:00-18:30
Lightweight TCN for robust vibration reconstruction in self-mixing interferometry under deep speckle fading *(Poster)*
A.V. Rybaltovskii, A.V. Kovalev; ITMO Univ., Russia
Industrial SMI usage is limited by signal degradation from speckle modulation and noise. We propose a pooling-free temporal convolutional network (TCN) for vibration reconstruction under deep amplitude fading (up to 80%). Unlike pooling-based convolutional neural networks (CNNs), our architecture retains full temporal resolution. The method achieves sub-wavelength accuracy (mean absolute error 72.5 nm) with low computational cost (21.89 MMACs), enabling nearly real-time embedded implementation.

WeR06-p09
Wednesday, June 24, 2026; 15:00-18:30
Laser-optical systems for registration of ultrafast processes *(Poster)*
A.E. Dormidonov, A.S. Bychkov, V.G. Kamenev, P.V. Kubasov, A.D. Savvin, V.A. Simonova, A.A. Tikhov, V.N. Turkin; Dukhov Automatics Research Institute (VNIIA), Russia
The report presents the lasted developments of the VNIIA in the field of laser-optical systems and instruments for investigation of ultrafast processes in gas-dynamic experiments.

Section R07. Free Electron Lasers

WeR07-01
Wednesday, June 24, 2026; 15:00-15:30
Generation of powerful coherent radiation in the (0.3) - 1.2 THz range in FEL based on a kiloampere beam formed by the linac LIU: design parameters and computer modeling *(Invited)*
N.Yu. Peskov[1,2], A.V. Arzhannikov[1], P.A. Bak[1], N.S. Ginzburg[2], D.A. Nikiforov[1], V.A. Pavlyuchenko[1], E.S. Sandalov[1], A.V. Savilov[2], A.S. Sergeev[2], S.L. Sinitsky[1], D.I. Skovorodin[1], V.Yu. Zaslavsky[1,2]; [1]Budker Institute of Nuclear Physics, RAS, [2]Gaponov-Grekhov Institute of Applied Physics, RAS, Russia
Long-pulse sub-GW power FEL based on the linac LIU 5 MeV / 2 kA / 200 ns is currently being developed. The aim of this project is to achieve a record pulse energy content up to 10 - 100 J at THz frequencies. The report presents design parameters, simulations and “cold” tests of the key components of this FEL.

WeR07-02
Wednesday, June 24, 2026; 15:30-16:00
Compton free electron lasers based on multiple backscattering *(Invited)*
L.A. Yurovskiy; Federal Research Center A.V. Gaponov-Grekhov Institute of Applied Physics of RAS (IAP RAS), Russia
To achieve coherent X-Ray stimulated emission in Compton FEL, we propose using multiple backscattering of optical pump pulse on relativistic electron beam by introducing a resonator for the optical radiation. Simultaneously, energy of scattered X-ray radiation is accumulated in additional resonator consisting of two multilayer X-ray mirrors. The pulses round-trip times in the both resonators are detuned to attain coherence of the generated radiation.

WeR07-03
Wednesday, June 24, 2026; 16:00-16:30
Generation of a terahertz radiation flux in a beam-plasma system using kiloampere REB *(Invited)*
A.V. Arzhannikov[1,2]; [1]Budker Inst. of Nuclear Physics SB RAS, BINP SB RAS, [2]Novosibirsk State University, Russia
This talk devotes to detail analysis of processes in generating terahertz radiation fluxes due to relaxation of a high-current relativistic electron beam in a magnetized plasma column. At a plasma density of 1x10^15 cm^(-3), the frequency of this escaping flux is 0.2 THz at a pulse power 4 MW. Increasing the plasma density in 3 times shifts the flux frequency up to 0.4 THz.

WeR07-04
Wednesday, June 24, 2026; 16:30-16:45
Development of the beam electron-optical system for a terahertz FEL based on the linear induction accelerator
E.S. Sandalov[1], S.L. Sinitsky[1], A.V. Arzhannikov[1], P.A. Bak[1], N.S. Ginzburg[2], V.Yu. Zaslavsky[2], K.I. Zhivankov[1], A.A. Krylov[1], P.V. Logachev[1], N.Yu. Peskov[2], D.I. Skovorodin[1], V.A. Pavluchenko[1]; [1]Budker Institute of Nuclear Physics of SИ RAS (BINP SB RAS), [2]Gaponov-Grekhov Institute of Applied Physics of RAS (IAP RAS), Russia
In this paper we consider the project of a sub-gigawatt free electron laser (FEL) in the subTHz/THz- range based on a high-current electron beam (up to 2 kA, 5 MeV) generated in the new linear inductuion accelerator (LIA)[1]. The main objective of our research is the development and creation of the FEL capable of generating pulses of coherent subTHz/THz (0.3-1.2 THz) radiation with a subGW power level and a record energy content in a pulse of about 10-100 J.

WeR07-05
Wednesday, June 24, 2026; 16:45-17:00
Project of multi-GW power sub-THz band planar FEL with 3D distributed feedback based on the U¯2 accelerator complex
N.Yu. Peskov[1,2], A.V. Arzhannikov[1], E.D. Egorova[1,2], N.S. Ginzburg[2], E.S. Sandalov[1], D.A. Samtsov[1], S.L. Sinitsky[1], V.Yu.Zaslavsky[1,2]; [1]Budker Institute of Nuclear Physics, RAS, [2]Gaponov-Grekhov Institute of Applied Physics, RAS, Russia
The project of an ultra-high power sub-THz band planar FEL-oscillator with 3D distributed feedback is being developed based on the U-2 accelerator 1 MeV / 100 kA / 7 μs forming sheet electron beams with a cross-section of up to 1 cm × 100 cm. The report is devoted to the design and modeling the key components of this FEL.

WeR07-06
Wednesday, June 24, 2026; 17:30-17:45
Novosibirsk free electron laser user facility
Ya.V. Getmanov[1,2,3], O.A. Shevchenko[1], N.A. Vinokurov[1,2], V.S. Arbuzov[1], K.N. Chernov[1], O.I. Deychuli[1], E.N. Dementiev[1], B.A. Dovzhenko[1], Ya.I. Gorbachev[1], A.A. Kondakov[1], E.V. Kozyrev[1,2], S.A. Krutikhin[1], V.V. Kubarev[1], G.N. Kulipanov[1,3], I.V. Kuptsov[1], G.Ya. Kurkin[1], L.E. Medvedev[1], S.V. Motygin[1], V.K. Ovchar[1], V.N. Osipov[1], V.M. Petrov[1], A.M. Pilan[1], V.M. Popik[1], I.V. Popik[1], V.V. Repkov[1], T.V. Salikova[1], I.K. Sedlyarov[1], S.S. Serednyakov[1], A.N. Skrinsky[1], S.V. Tararyshkin[1], A.G. Tribendis[1], V.G. Tcheskidov[1], M.G. Vlasenko[1], V.N. Volkov[1]; [1]Budker Institute of Nuclear Physics, SB RAS, [2]Novosibirsk State University, [3]Novosibirsk State Technical University, Russia
Novosibirsk free electron laser still has the highest in the world average power of narrow-band tunable coherent radiation in its wavelength range (8–400 micron). Status and plans of the facility are described.

WeR07-07
Wednesday, June 24, 2026; 17:45-18:15
Study of metal, carbon and dielectric materials using terahertz radiation of Novosibirsk free electron laser *(Invited)*
V. V. Gerasimov[1,2], V. S. Vanda[1,2], A. G. Lemzyakov[1,2,3], A. G. Kocheneva[1,3], V. P. Nazmov[1,4], A. I. Ivanov[5], I. A. Azarov[2, 5], L. S. Kuznetsova[2, 5], S. G. Bortnikov[5], D. I. Krasnikov[6], N. I. Raginov[6], D. V. Fromichev[7], V. A. Stepanov[7], A. K. Nikitin[8], I. Sh. Khasanov[8], [1]Budker Institute of Nuclear Physics SB RAS, [2]Novosibirsk State University, [3]Synchrotron Radiation Facility SKIF, [4]Institute of Solid State Chemistry and Mechanochemistry, SB RAS, [5]Rzhanov Institute of Semiconductor Physics SB RAS, [6]Skolkovo Institute of Science and Technology, [7]Joint Stock Company " Novosibirsk Factory of Semiconductor Device EAST,Novosibirsk, [8]Scientific and Technological Centre of Unique Instrum. of RAS, Russia
This report will present an overview of studies of metallic, semiconductor, carbon-containing, and dielectric films using terahertz radiation from the Novosibirsk free-electron laser. Both classical optical methods and unique surface plasmon refractometry techniques are used to study the optical properties of thin films (with sizes much smaller than the radiation wavelength). The problems being solved are of both fundamental and applied importance for THz photonics

WeR07-08
Wednesday, June 24, 2026; 18:15-18:45
New methods and results of terahertz molecular spectroscopy in strong magnetic field at the NovoFEL *(Invited)*
V.V. Kubarev[1], A.V. Bragin[1], E.N. Chesnokov[2], P.V. Koshlyakov[2]; [1]Budker Institute of Nuclear Physics SB RAS, [2]Voevodsky Institute of Chemical Kinetics and Combustion SB RAS, Russia
Terahertz and far-infrared free-electron lasers (NovoFEL) and a superconducting solenoid with a magnetic field of up to 7.3 T were used to develop new methods of magnetic molecular spectroscopy. New data on the magnetic moment of highly excited rotational states of molecules have been discovered.

WeR07-09
Wednesday, June 24, 2026; 18:45-19:00

Polarization of the ground Kramers doublet in single-molecule magnets based on Co(II) by pumping the spin system with resonant pulsed THz radiation

A.R. Melnikov[1], A.S. Ishchenko[1,3], Y.V. Getmanov[2], A.S. Samulionis[4], D.S. Yambulatov[4], S.A. Nikolaevskii[4], M.V. Fedin[1], S.L. Veber[1]; [1]International Tomography Center SB RAS, [2]Budker Institute of Nuclear Physics SB RAS, [3]Novosibirsk State University, [4]Kurnakov Institute of General and Inorganic Chemistry RAS, Russia

At the EPR endstation of the NovoFEL facility processes induced by terahertz radiation resonant with the spin system were investigated in Co(II) single-molecule magnets. By changing the wavelength of THz radiation, we demonstrated direct excitation of spin transitions, which led to a non-equilibrium population of the ground state. This work was supported by the Russian Science Foundation 23-73-00042.

WeR07-10
Wednesday, June 24, 2026; 19:00-19:15

A modification of pump probe in experiments with periodic pulses

V.M. Popik; Budker INP, Russia

Pump-probe is a powerful method in modern optical research. The maximum measurable decay time is determined by the optical setup. If the method uses periodic pulses, then by varying the delay of the pump pulse relative to the first probe pulse and using the classic pump-probe setup with a second probe pulse, it is possible to study the decay pattern both before and after the arrival of the pump pulse, which is important for multicomponent decay.

Section R08. Nonlinear Photonics: Fundamentals and Applications

TuR08-01
Tuesday, June 23, 2026; 09:00-09:30
Enhanced frequency comb generation and degenerate optical parametric oscillations in normal-dispersion photonic-crystal microresonators *(Invited)*
V.E. Lobanov[1], O.V. Borovkova[1], A.E. Shitikov[1], N.S. Tatarinova[1,2], D.A. Chermoshentsev[1,2], I.A. Bilenko[1,3]; [1]Russian Quantum center, [2]Moscow Inst. Physics and Technology, [3]Faculty of Physics, Lomonosov Moscow State Univ., Russia
The use of photonic-crystal structures enables the implementation of various nonlinear signal generation regimes in Kerr microresonators with normal group velocity dispersion, including excitation of platicons and triangular pulses, and their effective control. The possibility of platicon propagation direction switching was demonstrated in such microresonators. It was also revealed that it is possible to significantly decrease the threshold for squeezed light generation via bichromatic pump in photonic-crystal microresonators.

TuR08-02
Tuesday, June 23, 2026; 09:30-09:45
Bound solitons in a SNAP microresonator
A.Yu. Kolesnikova, I.D. Vatnik; Novosibirsk State University, Russia
We theoretically study soliton interaction in a nonlinear cylindrical microresonator with a nanoscale radius variation (SNAP). Using numerical simulations of coupled Lugiato--Lefever equations, we show the formation of azimuthal solitons in three coupled axial modes with different axial field profiles. Despite distinct mode dispersions, nonlinear coupling synchronizes the soliton repetition rates.

TuR08-03
Tuesday, June 23, 2026; 09:45-10:00
Generation of stokes microcombs in silicon nitride microresonators
A.E. Shitikov[1], A.N. Golodukhina[1,2], N.Yu. Dmitriev[1], D.M. Sokol[1,3], V.E. Lobanov[1], I.A. Bilenko[1,2], D.A. Chermoshentsev[1,3]; [1]Russian Quantum Center, Skolkovo, [2]Faculty of Physics, Lomonosov Moscow State University, [3]Moscow Institute of Physics and Technology, Russia
We report the first observation of Stokes microcombs, including coherent platicon-like states, in silicon nitride microresonators with normal group-velocity dispersion. Using tunable and self-injection-locked diode laser pumping, we demonstrate efficient broadband Stokes comb generation coexisting with Kerr combs. The results reveals the crucial role of Raman processes in comb initiation and enables deterministic switching between Kerr and Stokes regimes.

TuR08-04
Tuesday, June 23, 2026; 10:00-10:30
Controlled soliton clusters in coupled Kerr microcavities *(Invited)*
A.G. Vladimirov; National Research University Higher School of Economics, Russia
It has been demonstrated that coupled Kerr resonators support multiple soliton cluster types whose stability and separation are controllable via pump phase difference and cavity mismatch. The asymptotic analysis predicts three cluster types, confirmed numerically. These findings provide insights into soliton interactions and enable new approaches for controlling dissipative solitons in photonic integrated circuits.

TuR08-05
Tuesday, June 23, 2026; 10:30-10:45
Solitons in coupled anomalous-normal dispersion microresonators
A. Yu. Kolesnikova, A. A. Gelash; Center of Engineering Physics, Skolkovo Institute of Science and Technology, Russia
We theoretically investigate a system of coupled optical microresonators with normal and anomalous dispersion. Using the Lugiato-Lefever equations in the supermode basis, we analytically study modulation instability of the nonlinear hybridized dispersion system. Our numerical simulations reveal the formation of Kerr soliton frequency combs with a flat spectral profile near the pumped mode, promising broad telecommunication applications.

TuR08-06
Tuesday, June 23, 2026; 10:45-11:00
Formation and control of ordered and disordered dynamic microcavity arrays via colliding single-cycle attosecond pulses in resonant medium
R.M. Arkhipov, M.V. Arkhipov, N.N. Rosanov; Ioffe Institute, Russia
We present creation of spatially ordered and disordered arrays of dynamic microcavities in a resonant medium created via collision of two counter-propagating attosecond single-cycle light pulses in two- and three-level resonant medium

TuR08-07
Tuesday, June 23, 2026; 11:30-12:00
Terahertz time-resolved nonlinear optics of discrete media: from gas to liquid *(Invited)*
A.M. Balakin, N.A. Kuzechkin, P.M. Solyankin, A.P. Shkurinov; Department of Physics, Lomonosov Moscow State University, Russia
We present the results of experimental studies and the theoretical modelling of nonlinear optical experiments on the generation and interaction of THz radiation with “discrete” nanocomposite media. We show that the polarization dependences of THz radiation from nano dispersive medium demonstrates the sensitivity to the subwavelength typical scale of the medium.

TuR08-08
Tuesday, June 23, 2026; 12:00-12:30
Terahertz and second harmonic generation in the air-based femtosecond plasma under loose focusing *(Invited)*
O.G. Kosareva[1,2], I.A. Nikolaeva[1,2], D.E. Shipilo[1,2], N.A. Panov[1,2], G.E. Rizaev[1,2], A.V. Koribut[1,2], D.V. Pushkarev[1], Ya.V. Grudtsyn[1,2], A.B. Savel'ev[1,2], L.V. Seleznev[1,2], A.A. Ionin[2], A.P. Shkurinov[1]; [1]Faculty of Physics, Lomonosov Moscow State University, [2]Lebedev Physical Institute RAS, Russia
We used filamentation of 940 nm, 90 fs, 3.5 mJ pulse to measure the second harmonic and terahertz in comparatively long focusing geometry (40-cm and 100-cm focal lengths, ≥ 1-cm filament). The unified description of the even harmonic emission based on the vectorial second order current shows that the two lobes of the terahertz beam broken along the laser polarization are oriented perpendicularly to the two lobes of the second harmonic beam in agreement with the experiment.

TuR08-09
Tuesday, June 23, 2026; 12:30-12:45
Characteristics of terahertz emission from single-color ultraviolet laser filaments
G.E. Rizaev[1,2], T.A. Dick[1], M.V. Levus[1,2], L.V. Seleznev[1,2]; [1]P.N. Lebedev Physical Institute of RAS; [2]M.V. Lomonosov Moscow State University, Russia
We experimentally investigate terahertz emission from single-color ultraviolet laser filaments in air and compare it with infrared filaments. The angular distributions, spectral, and energy characteristics of terahertz radiation are measured for a wide range of experimental parameters. Unlike infrared filaments, which exhibit an optimal focusing that maximizes terahertz output, ultraviolet filaments demonstrate a monotonic increase of terahertz energy with numerical aperture followed by saturation.

TuR08-10
Tuesday, June 23, 2026; 12:45-13:15
IR shifting light bullet in femtosecond air filament *(Invited)*
D. Pushkarev[1], D. Uryupina[1], E. Mitina[1], M. Ustyuzhanin[1], N. Zdidovtsev[1], A. Bulygin[3], O. Kosareva[1,2], Yu. Geints[3], A. Savel'ev[1,2]; [1]Faculty of Physics, Lomonosov Moscow State University, [2]Lebedev Physical Institute RAS, [3]Zuev Institute of Atmospheric Optics RAS, Russia
During filamentation of a high-power femtosecond laser pulse in molecular gases, Raman spectral components form light bullet. We present series of experimental studies, including the measurement of single-pulse frequency-angular spectra, of the filamentation of a femtosecond laser pulse with terawatt peak power in air under various focusing conditions, chirping, and other parameters.

TuR08-11
Tuesday, June 23, 2026; 13:15-13:30
Surface-plasmon-enhanced terahertz wave generation by mid-infrared laser pulses
M.V. Rozhko[1], Ya.O. Romanovskii[1,2,3], N.V. Yakushkin[1,2,4], A.V. Mitrofanov[1,2,3], A.A. Voronin[1,2], D.A. Sidorov-Biryukov[1,2,3], A.B. Fedotov[1,2]; [1]Russian Quantum Center, [2]Lomonosov Moscow State University, [3]NRC "Kurchatov Institute", [4]Scoltech, Russia
The generation of terahertz radiation from the diffraction grating surface irradiated by mid-infrared laser pulses upon plasmon excitation is demonstrated. The dependence of terahertz radiation energy on laser intensity, while separately varying pulse energy, duration, and target-to-focus position is analyzed. In simulations, the influence of the plasma density gradient on the energy of electrons and terahertz radiation is revealed.

TuR08-12
Tuesday, June 23, 2026; 13:30-13:45
Optical fiber bundle -based superresolution imaging systems for THz range
G.M. Katyba[1,2], A.V. Radivon[2,3], D.V. Lavrukhin[4], D.S. Ponomarev[4], I.N. Dolganova[1,2], A.-E.P. Protopopova[1], V.N. Kurlov[1], K.I. Zaytsev[2]; [1]Osipyan Institute of Solid State Physics of RAS; [2]Prokhorov General Physics Institute of RAS; [3]Moscow Center for Advanced Studies; [4]National Research Center "Kurchatov Institute", Russia
Optical fiber bundles allow for diffraction-free transmission of 2D optical fields, with resolution limited by the individual fiber's diameter. While standard fibers are limited by wavelength (~λ), high-refractive-index fibers, like sapphire bundles in the terahertz (THz) range, can achieve subwavelength resolution (≈ 0.3–0.5λ). This paper introduces a semi-analytical model to analyze image quality using the modulation transfer function (MTF).

WeR08-13
Wednesday, June 24, 2026; 09:00-09:30
Nonlinear multimode fiber photonics for biomedical applications *(Invited)*
V. Cecconi[1], K. Stefanska[1], A. Momenzadeh[1], M. Di Salvo[1], F. Mangini[2], M. Jonard[3], P. Roy[3], F. Gerome[3], E. Okafor[3], M. Fabert[3], C. Lefort[3], U. Arles[3], M. Colas[4], T. Larque[4], C. Strutynski[5], A. Tonello[3], V. Couderc[3], M. Papi[6], I. Boskoski[7], S. Hermanns[8], S. Dammeier[8], S. Wabnitz[1]; [1]Sapienza University of Rome, [2]Niccolo Cusano University, Italy; [3]Université de Limoges, XLIM, UMR CNRS[7252], France; [4]Université de Limoges, IRCER, UMR CNRS[7315], France; [5]ICB Université Bourgogne Europe, UMR CNRS[6303], France; [6]Università Cattolica del Sacro Cuore, Italy; [7]Fondazione Policlinico Gemelli, Italy; [8]Erbe Elekromedizin, Germany
Nonlinear propagation effects in multimode optical fiber-based endoscopic probes permit for a novel teragnostic approach combining real-time biopsy with cold-plasma treatment of cancer cells.

WeR08-14
Wednesday, June 24, 2026; 09:30-10:00
Optomechanical effects in harmonically mode-locked fiber lasers *(Invited)*
V.A. Ribenek[1], P.A. Itrin[1], G.A. Tertyshnikova[1], D.A. Korobko[1], A.A. Fotiadi[1,2]; [1]Ulyanovsk State University, Russia; [2]University of Mons, Belgium
We report optomechanical effects in harmonically mode-locked soliton fiber lasers observed when a cavity pulse repetition rate matches an intrinsic optoacoustic resonance of the cavity fiber.

WeR08-15
Wednesday, June 24, 2026; 10:00-10:30
Wavelength-switchable laser and Raman generation in fiber-microresonator systems *(Invited)*
E.A. Anashkina, A.V. Andrianov; A.V. Gaponov-Grekhov Institute of Applied Physics RAS, Russia
We theoretically and experimentally demonstrate wavelength-switchable Er-doped fiber laser systems with feedback provided by a high-Q silica or tellurite microsphere. Two regimes are achieved: 1) single-mode generation in the C-L-bands; 2) single-mode laser generation in the C-band, initiating simultaneous Raman generation in the U-band in the silica microsphere and two-cascade Raman generation up to 2.1 μm in the tellurite microsphere.

WeR08-16
Wednesday, June 24, 2026; 10:30-10:45
A sensitive dark matter detector based on high nonlinear optical fiber
S.V. Erin[1], A.A. Sysoliatin[2], A.I. Kolbatova[3], G.N. Goltsman[3]; [1]National Research Center Kurchatov Institute– IHEP, [2]Dianov Fiber Optic Research Center, Prokhorov General Physics Institute of RAS, [3]Federal State Budgetary Educational Institution of Higher Education MPGU, Russia
Dark matter is a cornerstone of modern physics, confirmed by astrophysical and cosmological explorations. Among DM candidates dark photons stand out as particularly compelling. Photon conversion into hidden photons in dielectric medium could be carried out via nonlinear effects, e.g. modulation instability in optical fiber. A hidden photon detection via nonlinear phenomena in silica fiber is possible.

WeR08-17
Wednesday, June 24, 2026; 10:45-11:00
Nonlinear Kerr beam reshaping in step-Index few-mode fibres
Z. Mohammadzahery, M. Jandaghi, S. Alipour; National Center for Laser Science and Technology, Iran
We demonstrate Kerr-induced beam self-cleaning in a step-index few-mode fiber at 532 nm. A bell-shaped LP_{01}-like beam emerges above a 6 kW threshold and remains stable up to 25 kW. At higher powers, intermodal four-wave mixing generates spectral sidebands in higher-order modes, limiting spatial purity. Experiments and multimode nonlinear Schrödinger simulations show excellent agreement.

WeR08-18
Wednesday, June 24, 2026; 11:30-12:00
Quantum enhanced stimulated Raman scattering *(Invited)*
N. Kalinin[1], K. Scheffter[1,2], H. Gallop[3], M. Alizadeh[3], A.F. Pegoraro[4], M. Morrison[3], P. Rose[3], L. Ramunno[3], H. Fattahi[1,2], A. Stolow[3], L.L. S´anchez-Soto[1,5,6], G. Leuchs[1,2,3]; [1]Max Planck Institute for the Science of Light, [2]Physik Department, Friedrich-Alexander-Universit¨at Erlangen-N¨urnberg, Germany; [3]Department of Physics, University of Ottawa, [4]Metrology Research Centre, National Research Council Canada, Canada; [5]Departamento de ´ Optica, Facultad de F´ısica, Universidad Complutense, Spain; [6]Institute for Quantum Studies, Chapman University, USA
The sensitivity of stimulated Raman scattering (SRS) is - like all sensors - ultimately limited by quantum uncertainty. We demonstrate signal-to-noise-ratio (SNR) enhancement 3 dB beyond the standard quantum noise limit, which is the shot noise limit.

WeR08-19
Wednesday, June 24, 2026; 12:00-12:15
Mandelstam-Brillouin oscillations in specially made three-dimensional film metamaterials
N.A. Inogamov; Landau Institute for Theoretical Physics, RAS, Dukhov Institute for Automatics, Russia
Mandelstam-Brillouin (MBO) oscillations associated with the reflection of light from a traveling acoustic wave in glass are analyzed

WeR08-20
Wednesday, June 24, 2026; 12:15-12:45
Generation of squeezed light and its quantum mode structure in waveguides with large Kerr nonlinearity *(Invited)*
A.V. Andrianov[1], A.N. Romanov[1,2], E.A. Anashkina[1], A.A. Sorokin[1]; [1]A.V. Gaponov-Grekhov Institute of Applied Physics RAS, [2]Lobachevsky State University of Nizhny Novgorod, Russia
We experimentally studied the generation of polarization-squeezed light in a short highly nonlinear chalcogenide fiber with large normal dispersion and in a microstructured tellurite fiber with near-zero dispersion pumped by a femtosecond laser. Detailed numerical simulation of the quantum signal dynamics and quantum modes structure showed that the large normal dispersion regime provides better squeezing than the near-zero dispersion regime.

WeR08-21
Wednesday, June 24, 2026; 12:45-13:00
Manipulation of quadratic optical nonlinearity in ion-exchanged glasses via Maxwell-Wagner phenomenon
G. Kan[1,2], S.A. Scherbak[1,2], V.P. Kaasik[1,2], A.A. Lipovskii[1,2]; [1]Alferov Univ., [2]Peter the Great St.Petersburg Polytechnic Univ., Russia
We investigate the induction of second-order nonlinearity in soda-lime glass via ion-exchange followed by the application of a DC voltage. The resulting second harmonic was characterized, identifying an optimal thickness for the potassium-enriched layer. Temporal signal evolution allowed us to estimate the ultra-low sodium and potassium ion mobilities in glass at room temperature, providing an alternative approach to glass characterization.

WeR08-22
Wednesday, June 24, 2026; 13:00-13:15
Hysteresis of second harmonic generation in metal-semiconductor Si/Au structures as a manifestation of the memory effect
A.O. Larin[1], A.A. Ermina[2], Yu.A. Zharova[2], D.A. Zuev[1]; [1]ITMO University, [2]Ioffe Institute, Russia
Metal-semiconductor Si/Au structures capable of generating the second harmonic are presented. A hysteresis of the nonlinear optical response was observed during pump power scanning due to deep-level charge traps on the semiconductor surface. This behavior is similar to a memristor, which allows to consider the structure as an element for neuromorphic photonics. The effect has been experimentally demonstrated and operating regimes have been identified.

WeR08-23
Wednesday, June 24, 2026; 13:15-13:30
Nonlinear photonic crystals and thin films with periodical ferroelectric domain structure
V.Ya. Shur, A.R. Akhmatkhanov, M.A. Chuvakova, B.I. Lisjikh, M.S. Kosobokov; Ural Fedral Univ., Russia
The recent progress in fabrication of nonlinear light frequency converters in ferroelectric crystals and thin films by creation of the periodic domain structure will be presented. The second harmonic generation, optical parametric oscillation and spontaneous parametric down conversion for generating of entangled photon pairs have been realized. The domain switching in the bulk by femtosecond laser irradiation will be demonstrated.

WeR08-24
Wednesday, June 24, 2026; 15:00-15:30
Manipulation of nonlinear optical pulses and soliton tomography *(Invited)*
A.A. Gelash; Center of Engineering Physics, Skolkovo Institute of Science and Technology, Russia
We develop novel approaches to manipulating multi-soliton optical pulses using analytical-numerical Inverse Scattering Transform theory. We introduce the framework of soliton eigenvalue response functions (RFs), validated experimentally using a recirculating optical fiber loop system with a Raman amplifier, electro-optic modulators, and homodyne interferometric tools. Our theoretical treatment shows that the RFs approach can be applied to arbitrary-shaped pulses and, most importantly, used in soliton tomography, where solitons probe either external potentials or nonlinear media properties.

WeR08-25
Wednesday, June 24, 2026; 15:30-15:45
Linear and nonlinear light trapping on topological dislocation
S.K. Ivanov[1], A.V. Kireev[2,3], K. Sabour[3], N.S. Kostyuchenko[2,4], S.A. Zhuravitskii[2,4], N.N. Skryabin[4], I.V. Dyakonov[4], A.A. Kalinkin[4], V.O. Kompanets[2], S.P. Kulik[2,4], S.V. Chekalin[2], A. Ferrando[1], V.N. Zadkov[2,5], Y.V. Kartashov[2]; [1]Instituto de Ciencia de los Materiales, Universidad de Valencia, Spain; [2]Institute of Spectroscopy, [3]Moscow Institute of Physics and Technology, [4]Quantum Technology Centre, Faculty of Physics, M.V. Lomonosov Moscow State University, [5]Faculty of Physics, Higher School of Economics, Russia
Topological dislocations are global lattice defects found in various systems from crystalline solids to photonic lattices. We report the first observation at optical frequencies of localized linear modes bound to edge dislocations, along with their nonlinear counterparts—dislocation solitons. These results reveal an interplay between real-space topology and nonlinearity, enabling new approaches to controlling light localization.

WeR08-26
Wednesday, June 24, 2026; 15:45-16:15
Creation of solitons in nonlinear optical fibers with fractional dispersion *(Invited)*
B.A. Malomed; Department of Physical Electronics, School of Electrical and Computer Engineering, Faculty of Engineering, Tel Aviv University, Israel
This talk provides a summary of models for the wave propagation in fractional optical media. The models are based on fractional Schrödinger equations (FSEs) with the diffraction or group-velocity dispersion (GVD) operator represented by the fractional Riesz derivative with Levy index α, usual GVD corresponding to $\alpha = 2$.

WeR08-27
Wednesday, June 24, 2026; 16:30-16:45
Superradiant state stability under exciton-phonon interactions in hybrid perovskites and fundamental soliton *(Invited)*
A.A. Gladkij[1], N.A. Veretenov[1], N.N. Rosanov[1], B.A. Malomed[2,3], V.A. Osipov[4], B.D. Fainberg[5]; [1]Ioffe Physical-Technical Institute, Russia; [2]School of Electrical Engineering, Tel Aviv University, Israel; [3]Instituto de Alta Investigacion, Universidad de Tarapaca, Chile; [4]Institute for Advanced Study in Mathematics, Harbin Institute of Technology, China; [5]Faculty of Sciences, Holon Institute of Technology, Israel
We investigate the stability of the superradiant state concerning exciton-phonon interactions. We derive nonlinear equations in the coordinate space. We perform a linear stability analysis of the superradiant state. Our findings indicate that the superradiant state is modulationally stable. We solve the 2D nonlocal nonlinear Schrodinger equation in the polar coordinates and obtain its fundamental soliton solution, which it stable.

WeR08-28
Wednesday, June 24, 2026; 16:45-17:00
Stable vortex solitons sustained by localized gain in a cubic medium
Chunyan Li[1], Ya.V. Kartashov[2]; [1]School of Physics, Xidian University, China; [2]Institute of Spectroscopy, RAS, Russia
we propose a new simple mechanism of formation of the ringlike dissipative vortex solitons with high topological charges that does not require competing nonlinearities, nonlinear absorption or optical potentials. Instead, it employs a ringlike gain landscape created in a medium with uniform background linear losses and defocusing cubic nonlinearity that in this case prevents an uncontrollable growth of light intensity.

ThR08-29
Thursday, June 25, 2026; 09:00-09:15
Transfer learning for predicting nonlinear pulse evolution in fiber amplifiers with limited experimental data
A.E. Bednyakova[1], A.S. Gemuzov[1], M.S. Mishevsky[2], K.P. Saraeva[1], A.A. Redyuk[1], A.A. Mkrtchyan[2], A.G. Nasibulin[2], Yu.G. Gladush[2]; [1]Novosibirsk State University, [2]Skolkovo Institute of Science and Technology, Russia
We present a novel approach combining Transformer neural network architecture with transfer learning to predict nonlinear pulse evolution in fiber amplifiers under conditions of limited experimental data. The model is pretrained on synthetic NLSE simulations and then fine tuned on a small set of experimental spectra, accurately reproducing various evolution regimes, including the development of modulational instability and the propagation of higher-order solitons.

ThR08-30
Thursday, June 25, 2026; 09:15-09:30
Tunable single frequency fiber random laser operating in the telecommunication band
S.M. Popov[1], A.A. Rybaltovskii[2], A.M. Smirnov[3], A.P. Bazakutsa[3], A.S. Shikin[3], D.V. Ryakhovskii[1], A.O. Kolosovskii[1], V.V. Voloshin[1], I.L.Vorob'ev[1], D.S. Lipatov[4], O.V. Butov[3], Yu.K. Chamorovskii[1]; [1]Kotelnikov Institute of Radio Engineering and Electronics of RAS (Fryazino Branch), [2]Prokhorov General Physics Institute of RAS, [3]Kotelnikov Institute of Radio Engineering and Electronics of RAS (Moscow Branch), [4]Devyatykh Institute of Chemistry of High-Purity Substances of the RAS, Russia
A tunable "random" fiber laser with a cavity based on an erbium-doped optical fiber with an array of chirped fiber Bragg gratings inscribed during the OF drawing process is described. Such laser is tunable in a range of 1546-1548 nm with pumping at the wavelength of 976 nm with a slope efficiency of 10% and a linewidth ~470 Hz.

ThR08-31
Thursday, June 25, 2026; 09:30-09:45
Transition from narrowband generation to turbulent multimode spectrum in a random fiber laser
O.A. Gorbunov, D.V. Kudashkin; Novosibirsk State University, Russia
We study the statistical manifestation of the transition process from narrowband regime to turbulent-like wide spectrum generation in a random fiber laser. We demonstrate the analogy between exponential grown of energy in the spectral mode of a single-mode laser and growth of number of modes in the random fiber laser, and emphasize the role of nonlinear interactions in this process.

ThR08-32
Thursday, June 25, 2026; 09:45-10:00
Mode-locked laser using a silica multicore fiber as a saturable absorber
A.V. Andrianov[1], A.N. Romanov[1,2], E.A. Anashkina[1]; [1]A.V. Gaponov-Grekhov Institute of Applied Physics RAS, [2]Lobachevsky State University of Nizhny Novgorod, Russia
Mode-locking in a ring fiber laser is experimentally demonstrated for the first time using a passive silica multicore fiber as a saturable absorber operating in the nonlinear regime of radiation trapping in one of the cores. Generation of 190 fs, 12 nJ pulses with peak power of 50 kW is achieved at 1030 nm and repetition rate of 6.6 MHz.

ThR08-33
Thursday, June 25, 2026; 10:00-10:15
Nonlinear power equalization of pulse propagating in a weakly-coupled 7-core fiber
N. Bochkarev[1,2], M. D. Gervaziev[1,2], D. S. Kharenko[1,2], A.Y. Kolesnikova[1,2], E.V. Podivilov[1,2], S. A. Babin[1,2]; [1]Novosibirsk State Univ., [2]Inst. of Automation and Electrometry SB RAS, Russia
We experimentally demonstrate nonlinear power equalization at the output of a weakly-coupled seven-core fiber during subnanosecond pulse propagation. Increasing input peak power reduces output power deviation below 5%, and the nonlinear regime shows enhanced stability against mechanical perturbations. A theoretical model supports the observations.

ThR08-34
Thursday, June 25, 2026; 10:15-10:30
Mode analysis of spectral components during supercontinuum generation in multimode GRIN fiber
M.D. Gervaziev[1,2], N. Bochkarev[1,2], D.S. Kharenko[1,2], S.A. Babin[1,2], S. Wabnitz[1,3]; [1]Novosibirsk State University, [2]Institute of Automation and Electrometry SB RAS, Russia; [3]DIET, Sapienza University of Rome, Italy
We experimentally investigate supercontinuum generation in multimode GRIN fiber using sub-nanosecond pulses. Mode decomposition of spectrally filtered output reveals the modal structure of residual pump and Stokes components. Results show that the fundamental mode initiates Stokes generation and depletes via nonlinear processes, providing insight into the spatial dynamics of spectral broadening in multimode fibers.

ThR08-35
Thursday, June 25, 2026; 10:30-10:45
Methods of advanced holographic modal decomposition for revealing fast nonlinear beam dynamics in optical fibers
D.S. Kharenko[1,2], M.D. Gervaziev[1,2], A.A. Revyakin[1,2], K.V. Serebrennikov[1,2], S.A. Babin[1,2]; [1]Institute of Automation and Electrometry SB RAS, [2]Department of Physics, Novosibirsk State University, Russia
To date, a number of mode decomposition methods have been presented, each with its own application areas, advantages, and disadvantages. However, truly new possibilities can arise from combining them. For example, combining holographic and matrix-oriented approaches allows for reduced noise sensitivity and an increased number of simultaneously analyzed modes. This paper explores the details of this approach in the context of studying the fast nonlinear dynamics of laser beams in optical fibers.

ThR08-36
Thursday, June 25, 2026; 10:45-11:00
Ultrafast heterodyning spectral measurement technique for characterization of narrowband regime of a random fiber laser
I.D. Vatnik, O.A. Gorbunov, D.V. Churkin; Novosibirsk State University, Russia
We introduce a fast spectral measurement technique, based on heterodyning method, utilizing a widely tunable narrowband laser. With its scanning range from 1528 nm to 1568 nm, swept within 5 ms, we can accurately register all narrow modes, emerging simultaneously in radiation of a random fiber laser, what is impossible with conventional spectral measurements.

ThR08-37
Thursday, June 25, 2026; 11:30-12:00
Surface solitons and nonlinear stability restoration in non-Hermitian Wadati potentials *(Invited)*
D.A. Zezyulin; School of Physics and Engineering, ITMO University, Russia
Despite their non-Hermitian nature, Wadati potentials support the propagation of stationary nonlinear states that exhibit a remarkable blend of properties from both conservative and dissipative solitons. Our first result is the existence of surface solitons in such potentials. Our second result concerns nonlinearity-induced stability restoration in a waveguide with a parity-symmetric Wadati potential.

ThR08-38
Thursday, June 25, 2026; 12:00-12:15
Observation of topological vortex solitons on disclinations
A.V. Kireev[1,2], K. Sabour[2], V.O. Kompanets[1], S.Y. Alyatkin[3], N.S. Kostyuchenko[1,4], S.A. Zhuravitskii[1,4], N.N. Skryabin[4], I.V. Dyakonov[4], A.A. Kalinkin[4], K.A. Sitnik[3], S.K. Ivanov[5], S.P. Kulik[1,4], S.V. Chekalin[1], P.G. Lagoudakis[3], V.N. Zadkov[1,6], Y.V. Kartashov[1]; [1]Institute of Spectroscopy, RAS, [2]Moscow Institute of Physics and Technology, [3]Hybrid Photonics Laboratory, Skolkovo Institute of Science and Technology, [4]Quantum Technology Centre, Faculty of Physics, M.V. Lomonosov Moscow State University, Russia; [5]Instituto de Ciencia de los Materiales, Universidad de Valencia, Spain; [6]Faculty of Physics, Higher School of Economics, Russia
We experimentally demonstrate stable topological vortex solitons localized at disclination defects in photonic higher order topological insulators. Using laser written aperiodic waveguide arrays and picosecond pulse excitation, we realize thresholdless vortex localization protected by topology. These nonlinear states reveal a strong interplay between orbital angular momentum, lattice geometry, and material topology.

ThR08-39
Thursday, June 25, 2026; 12:15-12:30
Spatiotemporal solitons of self-induced transparency in a medium with amplification and absorption
N.A. Veretenov, S.V. Fedorov, A.A. Gladkij, N.N. Rosanov; Ioffe Inst., Russia
We predict the existence of stable 3D self-induced transparency solitons in an extended medium with absorption-compensating gain. The possibility of creating such solitons in a multimode waveguide with gain is also explored.

ThR08-40
Thursday, June 25, 2026; 12:30-12:45
Dissipative coherent, incoherent, and hybrid solitons
M.V. Arkhipov[1], R.M. Arkhipov[1], A.A. Shimko[2], N.N. Rozanov[1]; [1]Ioffe Institute, RAS, [2]St.Petersburg State University, Russia
We demonstrate simultaneous generation of two distinct dissipative solitons in one laser in hybride mode: Kerr solitons from fast electronic nonlinearity and Self-Induced Transparency (SIT) solitons from slow coherent resonance in cesium vapor. Their coexistence, achieved via spectral-spatial filtering, was previously deemed unfeasible due to contradictory physical requirements. This result breaks the paradigm of single-soliton dominance and pioneers hybrid laser sources combining resonant and non-resonant nonlinearities.

ThR08-41
Thursday, June 25, 2026; 12:45-13:00
Nonlinear vectorial spatio-temporal optical vortices generation in the slab of cholesteric liquid crystal in isotropic state near the temperature of phase transition
G.M. Shishkov, V.A. Makarov; Lomonosov Moscow State University, Russia
We have numerically modeled the nonlinear propagation of an elliptically polarized light pulse in a slab of cholesteric liquid crystal (CLC) in the isotropic state. We investigate how light-induced reorientation of CLC molecules affects the spatiotemporal profile of the pulse and, in particular, the subsequent generation of spatiotemporal optical vortices in the circularly polarized components of the pulse.

ThR08-42
Thursday, June 25, 2026; 13:00-13:15
Subcycle optical solitons in a multi-level resonant medium
A.V. Pakhomov; St.Petersburg State University, Russia
When dealing with a subcycle pulse propagation in a resonant medium, common approximations, such as the two-level model, become invalid due to ultrabroad pulse spectrum. Therefore multiple energy levels in the medium have to be properly considered. We develop the higher-order sudden-perturbation approach to derive the general nonlinear equations for the propagation of subcycle pulses in an arbitrary multi-level medium. Using these equations, we demonstrate the existence of stable subcycle dissipative solitons in non-equilibrium media with multiple resonant transitions.

ThR08-43
Thursday, June 25, 2026; 15:00-15:30
Nonlinear exciton-polaritons in 2D semiconductors as a platform for on-chip optical information processing *(Invited)*
V. Kravtsov; ITMO University, Russia
Our results suggest that nanophotonic waveguides integrated with 2D van der Waals semiconductors provide a promising platform for room-temperature on-chip nonlinear optical and opto-electronic components for next-generation integrated photonic circuits.

ThR08-44
Thursday, June 25, 2026; 15:30-16:00
Supersolidity in optically trapped exciton-polariton condensates *(Invited)*
P. Kozhevin[1,2], A. Liubomirov[1] , R. Cherbunin[1,2], M.A. Chukeev[1], I. Chestnov[3], A. Kavokin[1,2,4], A. Nalitov[4,2]; [1]Department of Physics, St. Petersburg State University, [2]Russian Quantum Center, [3]Department of Physics, ITMO University, [4]Abrikosov Center for Theoretical Physics, Russia
In this work we show that nonequilibrium exciton-polariton condensates, formed in annular optically induced traps, demonstrate emergent supersolidity due to effective attractive interaction, mediated by the normal excitonic component of the system. The competition of the effective potential autolocalization with the kinetic energy provided by the dissipative mode selection mechanism result in the transition to the supersolid phase.

ThR08-45
Thursday, June 25, 2026; 16:00-16:15
Phase locking of exciton-polariton condensates in optically imprinted Penrose quasicrystals
S.Yu. Alyatkin[1], H. Sigurðsson[2], Y.V. Kartashov[1,3], K.A. Sitnik[1], J.D. Töpfer[1], P.G. Lagoudakis[1]; [1]Skolkovo Institute of Science and Technology, Russia; [2]Univ. of Warsaw, Poland; [3]Institute of Spectroscopy of RAS, Russia
We demonstrate condensation of microcavity polaritons in optically imprinted 2D Penrose quasicrystal. Using a spatially structured nonresonant laser excitation, we imprint ballistically propagating polariton condensates co-localized with the vertices of the Penrose mosaic. Realized interferometric techniques confirm formation of macroscopic coherent state across aperiodic Penrose tiling and reveal nontrivial phase locking between the condensates.

ThR08-46
Thursday, June 25, 2026; 16:15-16:30
Coherence revivals and lifetime extension of polariton condensates by mirror-mediated optical feedback
I. Smirnov, S. Alyatkin, P.G. Lagoudakis; Skolkovo Institute of Science and Technology, Russia
We report on coherence control of trapped polariton condensate using reinjection of a fraction of its photoluminescence. We find that such optical feedback enables to diminish phase diffusion and therefore, improves coherence of the condensate. For a long time delay we observe coherence revivals, whereas for a short - increase of coherence time. Developed analytical model supports all experimental observations.

ThR08-47
Thursday, June 25, 2026; 16:30-17:00
Synchronous rotation of the polarization planes in the interacting polariton lasers *(Invited)*
A. Yulin[1], I. Gnusov[2], S. Baryshev[2], S. Alyatkin[2], P. G. Lagoudakis[2]; [1]Department of Physics, ITMO University, [2]Skolkovo Institute of Science and Technology, Russia
Two interacting exciton-polariton condensates are considered, with one of the condensates subjected to a rotating potential. This rotating effective potential arises from the action of an exciton reservoir created by two Laguerre–Gauss laser beams that are slightly detuned in frequency and have angular indices differing by two. The frequency detuning between the beams determines the angular velocity of the rotating potential.

FrR08-48
Friday, June 26, 2026; 09:00-09:30
Polariton lasers for applications in quantum computing *(Invited)*
A.V. Kavokin[1,2,3], R.V. Cherbunin[1,3], A. Lyubomirov[1,3], M. Chukeev[1,3], S.V. Kavokina[1,2,3]; [1]Russian Quantum Center, [2]Abrikosov Center for Theoretical Physics, Moscow Institute of Physics and Technology, [3]Spin Optics Laboratory, Russia
Are driven-dissipative bosonic condensates of exciton-polaritons suitable for implementation of qubits, quantum gates and quantum networks? We show experimentally that the coherence time of a trapped polariton condensate in a superposition state may exceed the single polariton lifetime by at least two orders of magnitude. This allows for the realization of robust qubits and quantum networks based on arrays of trapped bosonic condensates of exciton-polaritons.

FrR08-49
Friday, June 26, 2026; 09:30-09:45
Polariton topological insulator with disclination
K. Sabour[1], Y.V. Kartashov[2]; [1]Moscow Institute of Physics and Technology, [2]Institute of Spectroscopy, RAS, Russia
We study polariton topological insulators formed in aperiodic microcavity pillar arrays containing disclination. Resonant optical pumping allows selective excitation of topological states at the disclination core, including vortex states. Strong polariton-polariton interactions result in tilted resonance curves and bistability. Stability analysis confirms robustness of polariton vortex disclination modes.

FrR08-50
Friday, June 26, 2026; 09:45-10:00
Competitive influence of weak second harmonics on cascading frequency tripling
D.M. Kharitonov, V.A. Trofimov; Lomonosov Moscow State University, Russia
We study cascading third harmonic generation (THG) in a quadratic medium accounting for both ordinary wave and extraordinary one with doubled frequency. High efficiency THG is achievable.

FrR08-51
Friday, June 26, 2026; 10:00-10:15
Lyapunov charts of ring fiber cavity
V.A. Razukov, L.A. Melnikov, P.V. Kuptsov; Yuri Gagarin State Technical University of Saratov, Russia
The Lyapunov exponents method determines the dynamical state of ring fiber cavities. We demonstrate calculating their spectrum and constructing dynamic regime maps for nonlinear optics problems, enabling identification and prediction of special regions in parameter space. The universal approach for counter-propagating waves allows easy inclusion or exclusion of various nonlinear effects.

FrR08-52
Friday, June 26, 2026; 10:15-10:30
PPLN proton exchange waveguides for C-band second harmonics generation
A.R. Akhmatkhanov[1], M.A. Chuvakova[1], E.D. Savelyev[1], A.V. Sosunov[2], R.S. Ponomarev[2], K.V. Maltsev[2], V.Ya. Shur[1]; [1]Ural Federal University, [2]Perm State University, Russia
We report the fabrication of periodically poled waveguides in lithium niobate single crystal. We have fabricated multi-grating periodical domain structure with periods near 18 μm corresponding to room temperature second harmonics generation (SHG) of the C-band pump. Optical testing of obtained SHG device by precision fiber alignment revealed the SHG efficiency up to 85 %/W

FrR08-53
Friday, June 26, 2026; 10:30-10:45
Two-dimensional ultrafast cross-range Fourier spectroscopy of electron-vibrational transitions in dye and fluorescent protein markers
A.S. Shvedov[1], E.A. Stepanov[1,2], G.D. Ivanov[1], A.A. Lanin[1,3], A.A. Voronin[1,2], A.B. Fedotov[1,2]; [1]Lomonosov Moscow State University, Physics Department, [2]Russian Quantum Center, Skolkovo, [3]LIFT Center LLC, Skolkovo Innovation Center, Russia
This study demonstrates realization of cross-range 2D Fourier spectroscopy technique. Combining the visible pump and tunable mid-IR probe femtosecond pulses for the DCM dye, we directly revealed the activation of Franck–Condon vibrational modes (1547 and 1576 cm^{-1}) during electronic excitation. The technique reconstructs nonlinear absorption phase and separates emission from absorption processes, establishing a powerful approach for studying electron-vibrational correlations during protooxidizing in complex fluorescent proteins.

FrR08-54
Friday, June 26, 2026; 10:45-11:00
Electron and X-ray generation from relativistic laser-cluster plasma for radiobiological and diffraction experiments
A.A. Tausenev, T.A. Semenov, P.A. Shcheglov, M.V. Chashchin, V.G. Shuvatova, A.S. Zhirnik, M.M. Nazarov; National Research Centre "Kurchatov Institute", Russia
We demonstrate the results obtained from the use of MeV electron source and characteristic X-ray radiation generated by femtosecond relativistic laser plasma in radiobiological and diffraction experiments. Mouse melanoma B16 cells were irradiated with a beam of accelerated electrons at ultra-high peak dose rate of ≈1010 Gy/s. Diffraction measurements of Kr Kα radiation (12.6 keV) were performed using a Si(111) crystal.

TuR08-p01
Tuesday, June 23, 2026; 15:00-18:30
Ultralinear accumulation of nonlinear noise in multi-span communication lines *(Poster)*
V.S. Anpilov[1,3], R.I. Shaidullin[1,2], Y.A. Tezadov[3], M.A. Golubev[3]; [1]Moscow Institute of Physics and Technology, [2]Fryazino branch of Kotelnikov Institute of Radio-Engineering and Electronics, [3]LLC "VPG Laserone", Russia
A model for determining the influence of nonlinear effects on optical noise generation for multi-span communication lines is proposed. This model allows for the complex nature of nonlinear noise accumulation in long-distance optical communication lines (over 1000 km).

TuR08-p02
Tuesday, June 23, 2026; 15:00-18:30
The influence of nonlinear effects on the maximum transmission range of an optical signal over a fiber *(Poster)*
R.I. Shaidullin[1,2], V.S. Anpilov[1,3], Y.A. Tezadov[3], M.A. Golubev[3]; [1]Moscow Institute of Physics and Technology, [2]Fryazino branch of Kotelnikov Institute of Radio-Engineering and Electronics, [3]LLC "VPG Laserone", Russia
A theoretical dependence is proposed to determine the optimal parameters of an optical signal for transmitting information over a maximum distance.

TuR08-p03
Tuesday, June 23, 2026; 15:00-18:30
From stationary to non-stationary generation of a superradiant laser with a change in its length *(Poster)*
E.R. Kocharovskaya, Vl.V. Kocharovsky; Institute of Applied Physics RAS, Russia
Based on the numerical solution to the Maxwell-Bloch equations, typical dependences of the superradiant lasing modes on a length of a low-Q cavity are established. Particular attention is paid to the transition from steady-state to non-stationary lasing, which is determined by the structure and dynamic properties of the nonlinear polariton mode affected by the self-consistent half-wavelength population-inversion grating.

TuR08-p04
Tuesday, June 23, 2026; 15:00-18:30
Superradiant vs self-modulation lasing of a nonlinear polariton mode in a low-Q Fabry-Perot cavity *(Poster)*
V.V. Kocharovsky[1], E.R. Kocharovskaya[1]; IAP RAS, Russia
It is shown that, over a wide range of superradiant laser parameters, a nonlinear polariton mode exists that alters the transition from steady-state to nonstationary lasing. Instead of the typically assumed transition to a regime of quasi-periodic superradiance of short pulses, a weak quasi-sinusoidal modulation of the polariton mode emerges. The characteristics of both self-modulation and pulse superradiance are analyzed.

TuR08-p05
Tuesday, June 23, 2026; 15:00-18:30
Low-phase-noise microwave generator based on a normal-dispersion Si_3N_4 microresonator *(Poster)*
C. Li[1,2], T.S. Tebeneva[1], V.E. Lobanov[1], D.A. Chermoshentsev1,3, I.A. Bilenko[1,2], A.E. Shitikov[1]; [1]Russian Quantum Center, [2]Faculty of Physics, Moscow State University, [3]Moscow Institute of Physics and Technology, Russia
We obtained a low single-sideband (SSB) phase noise microwave generator at 10.67 GHz from a high-Q (10^7) normal-dispersion integrated Si3N4 microresonator. The SSB phase noise is as low as -85 dBc/Hz at 10 kHz frequency offset.

TuR08-p06
Tuesday, June 23, 2026; 15:00-18:30
Multi-frequency microcomb in normal-dispersion Si_3N_4 microresonators via multi-frequency self-injection locking *(Poster)*
C. Li[1,2], T.S. Tebeneva[1], V.E. Lobanov[1], D.A. Chermoshentsev[1,3], I.A. Bilenko[1,2], A.E. Shitikov[1]; [1]Russian Quantum Center, [2]Faculty of Physics, Moscow State University, [3]Moscow Institute of Physics and Technology, Russia
We report and study a regime of multi-frequency self-injection locking (MF-SIL) in a single-frequency DFB laser. This approach, implemented in a normal group-velocity dispersion (GVD) microresonator, allows the generation of various platicon-like multi-comb patterns, extending the capability of the established self-injection locking technique for laser stabilization and Kerr comb generation.

TuR08-p07
Tuesday, June 23, 2026; 15:00-18:30
Systematics of harmonic mode-locking states in a soliton fiber laser *(Poster)*
V.A. Ribenek[1,2], P.A. Itrin[1], G.A. Tertyshnikova[1], D.A. Korobko[1], A.A. Fotiadi[1]; [1]Ulyanovsk State University, [2]SMC "Technological Centre", Russia
While harmonic mode-locking (HML) in soliton fiber lasers effectively generates multi-gigahertz pulse trains, the simultaneous control of pulse repetition rate (PRR) and optical spectrum width (OSW) remains technically demanding. In this work, we experimentally achieve broad and continuous tunability of both PRR and OSW within an HML soliton fiber laser governed by nonlinear polarization evolution (NPE).

TuR08-p08
Tuesday, June 23, 2026; 15:00-18:30
Control of single-pulse generation and optimization of harmonic mode-locking regime in a PM fiber-based soliton laser *(Poster)*
V.A. Ribenek[1,2], E.P. Kitsyuk[2], D.A. Korobko[1], A.A. Fotiadi[1]; [1]Ulyanovsk State University, [2]SMC "Technological Centre", Russia
This work presents a study of the saturable absorber's role in a polarization-maintaining (PM) fiber laser based on a Semiconductor Saturable Absorber Mirror (SESAM). Numerical simulations revealed a narrow region within the cavity where precise placement of the SESAM ensures stable single-pulse operation at significantly higher gain levels, which was also confirmed experimentally.

TuR08-p09
Tuesday, June 23, 2026; 15:00-18:30
Investigation of optical centers induced by two-photon absorption in KTP crystal *(Poster)*
D.S. Chunaev, S.B. Kravtsov, P.G. Zverev; Prokhorov General Physics Institute of RAS, Russia
Optical centers in KTP crystal induced by irradiation with picosecond laser pulses at a wavelength of 523 nm by two-photon absorption have been studied. Numerical modeling allowed us to obtain the values of the TPA coefficient equal to 0.37 cm/GW and the absorption cross section of the induced optical centers equal to 2.1•10 18 cm2 for E//a polarization.

TuR08-p10
Tuesday, June 23, 2026; 15:00-18:30
Behavior of cavity solitons in long Kerr resonatos at high finesse limit *(Poster)*
G. Semaan, Y. Sun, N. Englebert, C. Simon, S.-P. Gorza, F. Leo; Belgium
We investigate cavity solitons in a fiber Kerr resonator operated at tunable high finesse using distributed Raman gain. By compensating losses we access a long photon lifetime regime where soliton threshold, scaling laws, Raman self frequency shift, and noise properties are directly controlled. Experiments and theory reveal predictive design rules for high finesse soliton resonators.

TuR08-p11
Tuesday, June 23, 2026; 15:00-18:30
From terahertz to near-IR: multiband generation in a nonlinear barium-based crystal platform *(Poster)*
E.A. Migal[1], D.Z. Suleimanova[1], D.V. Badikov[2], F.V. Potemkin[1]; [1]Moscow State University, [2]Kuban State University, Russia
We report recent advances in the development of near-, mid-, and far-infrared laser sources based on optical parametric amplification and difference-frequency generation in ternary and quaternary barium-containing nonlinear crystals. Their high damage threshold, strong nonlinearity, and broad transparency range make these materials highly attractive for developing efficient laser systems.

TuR08-p12
Tuesday, June 23, 2026; 15:00-18:30
Interferometer based on cold rubidium atoms for inertial sensing *(Poster)*
G.V. Osipenko, M.S. Aleynikov; FSUE Russian National Research and Development Institute of Physicotechnical and Radiotechnical Measurements (VNIIFTRI), Russia
Accurate measurement of the absolute value of the free fall acceleration constant finds its application in various fields, such as geophysics, metrology, navigation, and fundamental science. We present the results of the development of an interferometer based on cold rubidium atoms.

TuR08-p13
Tuesday, June 23, 2026; 15:00-18:30
Angular and temperature phase matching curves for type 1 second harmonic generation of 1030 nm pulsed laser radiation in $LiNa_5Mo_9O_{30}$ (LNM) crystal *(Poster)*
D.A. Denisov[1], D.Yu. Demushkin[1], A.V. Konyashkin[2]; [1]Moscow Inst. of Physics and Technology (State Univ.), [2]Fryazino branch of Inst. of Radio Engineering and Electronics RAS, Russia
Type 1 second harmonic generation of pulsed laser radiation at 1030 nm was performed in lithium-sodium molybdate (LiNa5Mo9O30, LNM) crystal. Angular and temperature phase matching tuning curves were studied.

TuR08-p14
Tuesday, June 23, 2026; 15:00-18:30
Tunable optical phase shifter cells based on thin films of phase-change materials *(Poster)*
A.A. Burtsev[1], A.V. Kiselev[1], V.A. Mikhalevsky[1], A.A. Nevzorov[1,2], V.V.Ionin[1], A.A. Lotin[1,3]; [1]National Research Centre "Kurchatov Institute", [2]University of Science and Technology MISIS, [3]Mendeleev University of Chemical Technology, Russia
Experimental results are presented on the optical phase shift of a free-space beam induced by the crystallization of controlled cells based on thin films of phase-change materials: $Ge_2Sb_2Te_5$, $Ge_2Sb_2Se_4Te_1$, Sb_2Se_3, and Bi_2Se_3. Crystallization was initiated by pulsed laser irradiation. A phase shift of the optical beam passing through the controlled phase-change material cell relative to the reference beam in a Jamin interferometer is demonstrated. Estimates of the phase shift based on analytical expressions and mathematical modeling are provided.

TuR08-p15
Tuesday, June 23, 2026; 15:00-18:30
Numerical dynamics of dual self-injection locking *(Poster)*
D.M. Sokol[1,2], A.E. Shitikov[1], I.A. Bilenko[1,3], D.A. Chermoshentsev[1,2]; [1]Russian Quantum Center, Skolkovo, [2]Moscow Institute of Physics and Technology, [3]Faculty of Physics, Lomonosov Moscow State University, Russia
We study soliton microcomb generation using a dual self-injection locking scheme, where two diode lasers are simultaneously locked to different modes of a high-Q microresonator. Numerical results reveal the nonlinear dynamics of dual-pump operation with a frequency separation of 2·FSR, enabling enhanced control of multi-pump microcomb systems.

TuR08-p16
Tuesday, June 23, 2026; 15:00-18:30
Simulation of relaxation of the plasma channel of a filament in air *(Poster)*
S.P. Skorik[1], D.E. Shipilo[1,2], O.G. Kosareva[1,2]; [1]Faculty of Physics, Lomonosov Moscow State University, [2]Lebedev Physical Institute RAS, Russia
We numerically simulate relaxation of femtosecond plasma channel in air in order to determine the effect of the medium response evolution on the sequence of pulses. For the exponentially decaying filament plasma channel we obtained reduction by several times of the maximum electron density after the last pulse in a sequence of six ones sent into air with equidistant 10-ns delay.

TuR08-p17
Tuesday, June 23, 2026; 15:00-18:30
Widely tunable high-pulse energy mid-IR frequency-comb parametric source *(Poster)*
O.L. Antipov, I.D. Eranov, Yu.A. Getmanovskiy, V.V. Sharkov; Institute of Applied Physics of RAS (IAP RAS), Russia
Mid-IR parametric oscillators with intracavity GaAs and Si plates of 30-100 μm thickness operating in nanosecond frequency comb regime were studied. A wide-band tuning of signal and idler frequency combs within 3.4-5.5 μm was implemented using the temperature control of the intracavity etalon. Additional ZGP parametric amplifier provided the pulse energy gain up to 40 mJ in a repetitively-pulsed mode.

TuR08-p18
Tuesday, June 23, 2026; 15:00-18:30
A linear time-invariant based model and experimental validation for optical time-domain reflectometry traces in dense wavelength division multiplexing systems *(Poster)*
V.S. Vazyulya[1,2], A.S. Remizova[1], A.N. Dorozhkin[1], K.A. Beklemysheva[2], V.N. Treschikov[1]; [1]T8 NTC, [2]MIPT, Russia
Optical Time Domain Reflectometry (OTDR) is essential for diagnosing fiber-optic networks. This work presents a numerical simulation framework for OTDR traces, using a Linear Time-Invariant systems approach for arbitrary pulses. The framework was implemented in MATLAB and validated experimentally. It facilitates analysis and enables synthetic dataset generation, which is important for training event-identification algorithms for DWDM system testing.

TuR08-p19
Tuesday, June 23, 2026; 15:00-18:30
Self-starting picosecond pulse formation in laser systems with semiconductor optical amplifier and optoelectronic power feedback *(Poster)*
D.A. Khudozhitkova[1], A.E. Bednyakova[1], S. Boscolo[2], S.K. Turitsyn[2]; [1]Novosibirsk State Univ., Russia; [2]Aston Inst. of Photonic Technologies, Aston Univ., UK
We propose a new fiber laser system based on a semiconductor optical amplifier (SOA) with optoelectronic feedback, which uses a portion of the output radiation to modulate the current in the SOA. Numerical simulations demonstrate picosecond pulse generation from noise in this system without saturable absorbers or modulators.

TuR08-p20
Tuesday, June 23, 2026; 15:00-18:30
Analytical treatment of optical nonlinear susceptibility of atomic gases *(Poster)*
K.V. Lvov[1,2], S.Y. Stremoukhov[1,2]; [1]Lomonosov Moscow State University, [2]National Research Center "Kurchatov Institute", Russia
The quantum-mechanical non-perturbative approach is used to calculate gaseous medium polarization. Through the natural expansion in the laser field of the matrix elements contained in the medium polarization, the analytical expression is obtained for the nonlinear susceptibility of an arbitrary order of a gaseous medium.

TuR08-p21
Tuesday, June 23, 2026; 15:00-18:30
Nonlinear control of high-harmonic generation in a cadmium sulfide crystal via intense terahertz fields *(Poster)*
M.A. Andreeva, E.A. Migal, D.Z. Suleimanova, F.V. Potemkin; Faculty of Physics, M.V. Lomonosov Moscow State Univ., Russia
We demonstrate that an intense terahertz (THz) field enables the generation of even-order harmonics and modulates the yield of high-order odd harmonics in CdS crystal. Semiclassical calculations show that the THz field effectively manipulates the intraband current underlying the nonperturbative light-matter interaction and leads to nonlinear response of the process as the THz field strength increases.

TuR08-p22
Tuesday, June 23, 2026; 15:00-18:30
Non-diffracting propagation of conically refracted low-coherent light *(Poster)*
S.H. Abdulrazak, V.Yu. Mylnikov, N.G. Deryagin, V.V. Dudelev, G.S. Sokolovskii; Ioffe Institute, Russia
We demonstrate that low-coherent illumination enables formation of non-diffracting Raman structures in conically refracted light and find that reduction of spatial coherence extends the distance of non-diffracting Raman structure propagation and decreases separation of Raman spots.

TuR08-p23
Tuesday, June 23, 2026; 15:00-18:30
Random lasing and stimulated Raman scattering in highly porous nanostructured aluminum oxyhydroxide infiltrated with Rhodamine 6G *(Poster)*
M.A. Shevchenko[1], S.A. Savinov[1], N.V. Tcherniega[1], V.V. Voronova[1], S.F. Umanskaya[1], A.N. Maresev[1], A.N. Khodan[2], I.A. Stafeev[2]; [1]Lebedev Physical Institute of RAS, [2]The Institute of Physical Chemistry and Electrochemistry RAS (IPCE RAS), Russia
Stokes lines of stimulated Raman scattering (SRS) in the emission spectra of random laser based on the porous structure of aluminum oxyhydroxides infiltrated with rhodamine 6G were detected. The spectral and temporal characteristics of random laser radiation coupled with SRS were investigated.

TuR08-p24
Tuesday, June 23, 2026; 15:00-18:30
Calibrating the composition of low-alloy steels by Laser Induced Breakdown Spectroscopy and linear and nonlinear Machine Learning models *(Poster)*
M.V. Belkov[1], K.Y. Catsalap[1], M.A. Khodasevich[1], P.S. Kolodochka[1], A.V. Aseev[2]; [1]B.I. Stepanov Institute of Physics of NASB, Belarus; [2]ITMO University, Russia
Linear (partial least squares) and nonlinear (support vector regression) machine learning models are created for calibration the composition of low-alloy steels using low-resolution laser induced breakdown spectra. Nonlinear calibration models are quantitative for 9 of the 12 chemical elements considered. Nonlinear models are characterized by higher prediction accuracy for concentration for 11 of the 12 elements compared to linear ones.

TuR08-p25
Tuesday, June 23, 2026; 15:00-18:30
Modified Fresnel formulas for the case of oblique incidence on an isotropic gyrotropic medium *(Poster)*
V.A. Diukov, K.S. Grigoriev, V.A. Makarov; Lomonosov Moscow State Univ., Russia
Modified Fresnel formulas for the oblique incidence of plane elliptically polarized electromagnetic waves on a flat boundary of a non-absorbing isotropic gyrotropic medium are obtained. We take into account the influence of near-surface inhomogeneity of the matter. Considering the optical activity of the medium and its near-surface layer leads to significant differences between the modified and classical Fresnel formulas.

TuR08-p26
Tuesday, June 23, 2026; 15:00-18:30
Relationship between different approaches to describing three-dimensional laser fields *(Poster)*
O.A. Shoutova, A.V. Andreev, V.R. Sadyrova; Lomonosov Moscow State University, Russia
Vortex optical fields attract attention for their subwavelength light-matter interaction properties. Recent 3D field descriptions include approach using Gell-Mann matrices and nine generalized Stokes parameters, which expands beyond the Poincaré sphere, lacks experimental measurability, and complicates observations. An alternative approach accounts for the longitudinal component with fewer parameters (≤ classical Stokes), offers full field restoration via experiment, but falls short for azimuthally polarized fields—requiring one additional parameter—and consideres both symmetric/antisymmetric coherence matrix terms.

TuR08-p27
Tuesday, June 23, 2026; 15:00-18:30
Third-harmonic generation of two-color femtosecond laser pulses focused into the ambient air *(Poster)*
E. Gospodchikov, D. Fadeev, A. Korytin, A. Silaev, A. Stepanov; Institute of Applied Physics of RAS, Russia
We report both experimental and theoretical study of third harmonic generation (THG) of two-color femtosecond Ti:Sapphire laser radiation in ambient air. An adding a small part of second harmonic to the laser pulses significantly improves efficiency of the THG. Ionization currents dominate the THG at laser intensity above 100 TW/cm/cm, and the resulting laser plasma becomes the limiting factor.

TuR08-p28
Tuesday, June 23, 2026; 15:00-18:30
Numerical simulation of the superradiance pulse train generation in a four-level medium *(Poster)*
I.V. Kuzmin, E.R. Kocharovskaya; Federal Research Center Institute of Applied Physics of RAS, Russia
A model problem (2D+t) of the superradiance pulse train generation in a four-level medium is considered in the work. The generation is achieved under the condition of an inhomogeneous lasing line broadening, a low quality factor of a plane-parallel cavity and a high value of the cooperative frequency.

TuR08-p29
Tuesday, June 23, 2026; 15:00-18:30
Unipolar emitter based on laser-induced surface breakdown *(Poster)*
M.V. Arkhipov[1], O.O. Dyachkova[2], A.A. Shimko[2], R.M. Arkhipov[1], N.N. Rozanov[1]; [1]Ioffe Institute, RAS, [2]St.Petersburg State University, Russia
We present a radio-photonic unipolar emitter based on a femtosecond laser spark on a metal wire. The spark induces a unidirectional current pulse, making the wire a unipolar antenna. We directly observe the emitted pulse transition from unipolar (non-zero electric area) in the near zone to bipolar in the far zone. This mechanism enables a compact source of ultrabroadband radiation with significant DC spectral content.

TuR08-p30
Tuesday, June 23, 2026; 15:00-18:30
Optical breakdown of ZGP crystals under the influence of pulsed laser radiation in the IR range *(Poster)*
N.N. Yudin1, O.L. Antipov[2], E.S. Slyunko[1], M.M. Zinoviev[1], V.S. Kuznetsov[1], D.V. Vlasov [1], M.M. Kulesh[1], S.N. Podzyvalov[1], A.B. Lysenko[1], A.Yu. Kalsin[1], I.D. Eranov[2]; [1]Tomsk State University, [2]Institute of Applied Physics of RAS, Russia
This paper summarizes the mechanisms of the laser-induced damage (LID) of high-purity ZGP crystals under periodically pulsed nanosecond irradiation by a Ho3+:YAG laser at 2.1 μm. The impact of processing techniques and the post-growing methods for polishing and anti-reflective coatings on the LID threshold are discussed. The importance of the defect structure of the crystal lattice and the parameters of transparent coatings for increasing the LID threshold are also discussed.

TuR08-p31
Tuesday, June 23, 2026; 15:00-18:30
Stimulated cascade scattering on polaritons in Mg:$LiNbO_3$ crystal in the high parametric gain mode *(Poster)*
M.A. Seleznev, K.A. Kuznetsov, G.Kh. Kitaeva; Faculty of Physics; M.V. Lomonosov Moscow State University, Russia
We report light scattering by THz polaritons in Mg:$LiNbO_3$ under intense 1064 nm pumping. Frequency–angular spectra near 532 nm reveal periodic emission structures attributed to sum- and difference-frequency generation involving the lowest polariton branch. The results are relevant for compact tunable sources in the visible, near-infrared, and high-power terahertz emitters based on nonlinear photonic materials.

TuR08-p32
Tuesday, June 23, 2026; 15:00-18:30
Optical and nonlinear properties of bismuth-lead-germanate glasses *(Poster)*
V.A. Aseev[1], Yu.K Fedorov[1], A.N. Tsypkin[1], B.S. Demin[1], A.O. Ismagilov[1], E.N. Oparin[1], N.V. Nikonorov[1], M. Ghotbi[2]; [1]ITMO University, Russia; [2]University of Kurdistan, Iran
Glasses based on heavy metal oxides possess high nonlinear refractive index values, which makes them promising materials for Raman amplifiers and optical fibers. The aim of this work was to study the nonlinear properties of glass system Bi2O3-GeO2-SiO2-PbO. The properties of the synthesized glasses were also investigated by differential scanning calorimetry, IR and Raman spectroscopy and Z-scan.

TuR08-p33
Tuesday, June 23, 2026; 15:00-18:30
Revealing quiet regimes for integrated self-injection locked microcombs *(Poster)*
A.K. Vorobyev[1,2], D.V. Morozov[1,2], A.E. Shitikov[1], N.Yu. Dmitriev[1], V.E. Lobanov[1], D.A. Chermoshentsev[1,2], I.A. Bilenko[1,3]; [1]Russian Quantum Center, [2]Moscow Institute of Physics and Technology, [3]Faculty of Physics, Moscow State University, Russia
We experimentally and numerically examine coherent properties of optical frequency combs based on integrated Si3N4 microresonators. Using a self-injection locking technique, we generate frequency combs exhibiting microwave beat note at 21.3 GHz with the phase noise as low as -90 dBc/Hz at 10 kHz. We show that the dominant noise mechanisms arise from the pump frequency fluctuations.

TuR08-p34
Tuesday, June 23, 2026; 15:00-18:30
Active element architecture of solid-state laser with spatially separated Er^{3+} and Yb^{3+} doped zone for implementing optical cooling *(Poster)*
A.S. Ryzhov, A.V. Ivanov; ITMO University, Russia
We propose a novel active element architecture based on a laser crystal with spatially separated Er^{3+} and Yb^{3+} doped zones. This design aims to independently optimize 1.5 μm lasing in the Er^{3+} core and optical cooling via anti-Stokes fluorescence in the Yb^{3+} cladding, mitigating thermal limitations from energy transfer in co-doped systems for improved high-power laser performance.

TuR08-p35
Tuesday, June 23, 2026; 15:00-18:30
High-Q semiconductor crystalline microresonators for mid-IR *(Poster)*
T.S. Tebeneva[1], A.E. Shitikov[1], D.A. Chermoshentsev[1], K.N. Min'kov[1], V.E. Lobanov[1], I.A. Bilenko[1,2]; [1]Russian Quantum Center, [2]Faculty of Physics, Lomonosov Moscow State University, Russia
We demonstrate high-Q whispering gallery mode microresonators from crystalline germanium and gallium arsenide in the mid-IR range. The values of Q-factor are the highest ever recorded at 2.6, 4.6 and 8.6 μm for both materials. The obtained results open new possibilities for developing highly efficient devices for applications in areas like laser stabilization, nonlinear optics, and spectroscopy in the mid-IR.

TuR08-p36
Tuesday, June 23, 2026; 15:00-18:30
On optical mode excitation in metal capillaries *(Poster)*
E.E. Popov[1,2], A.P. Kouzov[1], V.V. Vitkin[2], I.K. Chubchenko[1,3]; [1]St.Petersburg State University, [2]ITMO University, [3]Mendeleyev Institute for Metrology, Russia
The excitation of the E- and H- modes by focusing of a monochromatic beam onto a hollow metal capillary (MC) entrance is theoretically detailed. As found, a numerical aperture sets a bound on the number of excited optical modes. Transmission characteristics calculated provide grounding to use MCs as a means to enhance the Raman signals.

TuR08-p37
Tuesday, June 23, 2026; 15:00-18:30
Laser-induced element redistribution in N-BK7 glass using nanosecond back-irradiation *(Poster)*
H. Saleh[1], M.A. Baranov[2], Y.A. Konin[3], A.A.Petrov[1]; [1]Institute of Laser Technologies, ITMO University, [2]International Research and Education Centre for Physics of Nanostructures, ITMO University, [3]Perm State National Research University, Russia
We investigated the modified region produced in N-BK7 glass by nanosecond laser back-irradiation. The process forms a recondensed track surrounded by a stress-affected zone. Energy-dispersive X-ray spectroscopy (EDX) indicates redistribution of elements: Na and K are enriched in the track core, while Si and O show a relative decrease in the same region.

TuR08-p38
Tuesday, June 23, 2026; 15:00-18:30
Continuous wave up-conversion mirrorless laser on aluminofluoride glass doped by Tm^{3+} and Yb^{3+} ions *(Poster)*
A.S. Grabtchikov[1], G.D. Artykova[1], V.A. Orlovich[1], I.A. Khodasevich[1], L.Yu. Mironov[2], E.V. Kolobkova[2,3]; [1]B.I. Stepanov Institute of Physics, NASB, Belarus; [2]ITMO University, [3]St.Petersburg State Institute of Technology (Technical University), Russia
In this report we describe the preliminary data on room temperature operation of the first continuous-wave up-conversion laser based on aluminofluoride glass with low phosphate content doped by thulium and ytterbium ions with emission generated in the blue, red, and deep red spectral ranges.

TuR08-p39
Tuesday, June 23, 2026; 15:00-18:30
Formation of two- and three-particle quasiparticles in a controlled optomechanical system *(Poster)*
E.A. Tereshchenkov[1,2,3], A.A. Zyablovsky[1,2,3], E.S. Andrianov[1,2,3]; [1]Dukhov Research Institute of Automatics (VNIIA), [2]Moscow Institute of Physics and Technology, [3]Institute for Theoretical and Applied Electromagnetics, Russia
The existence of a third-order exceptional point in hybrid optomechanical systems is predicted and conditions for the implementation of it are found. The developed model offers a mechanism for controlling the composition and properties of quasiparticles. By changing only the frequency and the intensity of pumping, it is possible to "switch" the system between regimes where photonic, excitonic or phononic properties dominate.

TuR08-p40
Tuesday, June 23, 2026; 15:00-18:30
Mode-locking in multicore fibers via controlling spatio-temporal nonlinear dynamics of light *(Poster)*
E.A. Anashkina, A.V. Andrianov; A.V. Gaponov-Grekhov Institute of Applied Physics RAS, Russia
We propose and theoretically investigate ultrafast lasers utilizing active dual-core and multicore fibers (MCFs), functioning simultaneously as amplifying elements and saturable absorbers. We demonstrate that in MCFs with normal dispersion, stable generation of chirped pulses with output energies >10 nJ is achievable. This approach allows for near-infrared operation with silica MCFs and mid-infrared operation with soft glass MCFs.

TuR08-p41
Tuesday, June 23, 2026; 15:00-18:30
Development of AgCl(0.25)Br(0.75) -TlI fibers for infrared lasers and systems *(Poster)*
P.V. Pestereva, A.A. Yuzhakova, E.A. Ermakov, I.V. Yuzhakov, D.D. Salimgarev, L.V. Zhukova; Ural Federal University, Russia
IR fibers based on the AgCl0.25Br0.75 – TlI single-crystal system were developed and manufactured. The fibers exhibit transmission in the 3.5–25.0 μm range and optical losses 0.40±0.05 dB/m in the 12–18 μm wavelengths.

TuR08-p42
Tuesday, June 23, 2026; 15:00-18:30
New water in the skin layer: low-threshold stimulated Raman scattering and optical breakdown *(Poster)*
S.M. Pershin[1], V.A. Orlovich[2], A.I. Vodchits[2], I.A. Khodasevich[2], M.Ya. Grishin[1], G.A. Boldin[1], E.A. Cheshev[3]; [1]Prokhorov General Physics Institute of RAS, Russia; [2]B.I. Stepanov Institute of Physics of NASB, Belarus; [3]Lebedev Physical Institute of RAS, Russia
A near-surface water layer ("skin layer") of ~3 mm thickness was revealed using picosecond probing, showing an exceptionally low optical breakdown threshold (~2 μJ) and reduced thresholds for forward and backward stimulated Raman scattering (SRS). The physical mechanisms responsible for this near-surface restructuring are discussed.

TuR08-p43
Tuesday, June 23, 2026; 15:00-18:30
Frequency and wavelength tunable picosecond laser source in 2.15 -2.35 spectral range *(Poster)*
A.I. Lobanov[1], E.M. Gafurov[1], S.A. Filatova[1], V.A. Kamynin[1], A.E. Bednyakova[2], A.A. Sysoliatin[1], I.A. Lobach[3], Y.G. Gladush[4], D.M. Krasnikov[4], A.G. Nasibulin[4], V.B. Tsvetkov[1]; [1]Prokhorov General Physics Institute of RAS, [2]Novosibirsk National Research State University, [3]Institute of Automation and Electrometry of SB RAS, [4]Skolkovo Institute of Science and Technology, Russia
A laser source generating picosecond pulses in the wavelength range from 2.15 to 2.35 μm with repetition rates from 22 to 108 MHz was demonstrated. The source is based on a master oscillator, which is a mode-locked holmium fiber laser, a holmium fiber amplifier and a nonlinear fiber doped with germanium oxide (GeO2). The maximum achieved pulse energy was 348 pJ.

TuR08-p44
Tuesday, June 23, 2026; 15:00-18:30
2D spatial hole burning in a multicore fiber laser *(Poster)*
A.Yu. Kolesnikova[1], A.G. Kuznetsov[2], E.V. Podivilov[2], S.A. Babin[2]; [1]Novosibirsk State University, [2]Institute of Automation and Electrometry SB RAS, Russia
Strong optical coupling in multicore fibers enables spectrum collapse into a single narrow line, offering a path to extreme linewidth narrowing in high-power lasers. Modeling and experiments confirm that linewidth is controlled by core count, coupling strength, and FBG properties. The modified physics of broadening (spatial-hole-burning, Kerr effects) distinguishes multicore systems from single-core lasers. With many strongly coupled cores, high-power multicore lasers are predicted to achieve unprecedented spectral narrowing.

TuR08-p45
Tuesday, June 23, 2026; 15:00-18:30
Dual-wavelength-tunable nanosecond pulse all-fiber Raman laser *(Poster)*
A.V. Ivanenko[1,2], V. Volosy[1,2]; [1]Novosibirsk State University, [2]Institute of Automation and Electrometry of SB RAS, Russia
This work demonstrates for the first time the efficient generation of synchronized pulses at spaced and synchronously tunable wavelengths in the 1.04-1.07 μm and 1.2-1.25 μm range in an all-fiber laser with a nested cavity.

TuR08-p46
Tuesday, June 23, 2026; 15:00-18:30
Subwavelength model of a multilayer medium: from classical electrodynamics and justified experiment *(Poster)*
M.R. Konnikova[1,2], A.K. Tretyakov[3], Yu.A. Akimov[4], Yu.V. Kistenev[3], A.P. Shkurinov[1]; [1]Faculty of Physics, Lomonosov Moscow State University, [2]National Research Center "Kurchatov Institute", [3]Laboratory of Laser Molecular Imaging and Machine Learning, Tomsk State University, [4]Troitsk Branch, Lebedev Physical Institute, RAS, Russia
The problem of determining the complex dielectric permittivity of subwavelength layers in the terahertz (THz) frequency range is considered. We propose a theoretical approach based on the analysis of THz radiation reflected from and transmitted through the sample under study. The complex dielectric constants of heterostructure elements were recovered over a wide range of dielectric constant values for TE and TM polarizations of THz radiation. The obtained data were used to design and fabricate tunable THz photonic devices.

TuR08-p47
Tuesday, June 23, 2026; 15:00-18:30
Generation threshold reduction in Brillouin laser in hard excitation regime *(Poster)*
A.R. Mukhamedyanov, E.S. Andrianov, A.A. Zyablovsky; VNIIA, Russia
We propose using a low-intensity seed wave to reduce the threshold of hard excitation in a Brillouin laser. The seed wave destabilizes the low-intensity state in the bistable regime, what leads to abrupt switching at lower pump powers. This opens the way for low-power optical transistors and logic elements.

TuR08-p48
Tuesday, June 23, 2026; 15:00-18:30
Investigation of μ-SHG in electron-irradiated glass *(Poster)*
A.N. Terpitskiy[1,2], S.A. Scherbak[1,2], V.P. Kaasik[1,2], I.V. Reshetov[1], A.A. Lipovskii[1,2]; [1]Alferov University, [2]Peter the Great St. Petersburg Polytechnic University, Russia
We studied a micron-scale distribution of second optical harmonic signal generated by e-beam drown patterns in a glass. Experiments with strips of charge provide insight into the electric field distribution within the near-surface region of the glass

TuR08-p49
Tuesday, June 23, 2026; 15:00-18:30
Measurement of optical nonlinearity coefficients of integrated microresonators *(Poster)*
D.V. Morozov[1,2], A.K. Vorobyev[1,2], V.I.Pavlov[1], N.Yu. Dmitriev[1], A.E. Shitikov[1], D.A. Chermoshentsev[1,2], I.A. Bilenko[1,3]; [1]Russian Quantum Center, [2]Moscow Institute of Physics and Technology, [3]Faculty of Physics, Moscow State University, Russia
This paper experimentally measures the optical nonlinearity coefficients in integrated silicon nitride microresonators. By applying slow and fast laser modulation, Kerr and thermal coefficients are separated, revealing that for most microresonators thermal nonlinearity significantly exceeds the Kerr effect. Results emphasize the critical role of thermal effects in microresonator nonlinear dynamics.

TuR08-p50
Tuesday, June 23, 2026; 15:00-18:30
Strong- vs weak-coupling lasing in polymer-film microcavities *(Poster)*
D.A. Sannikov[1], N.M. Urazova[1], M.D. Kolker[1], A.V. Averchenko[1], G.D. Ivanov[1], A.D. Putintsev[1], L.T. Sahharova[2], N.S. Shlapakov[2], V.P. Ananikov[2], P.G. Lagoudakis[1]; [1]Hybrid Photonics Laboratory, Skolkovo Institute of Science and Technology, [2]Zelinsky Institute of Organic Chemistry, RAS, Russia
MeLPPP's rigid backbone, narrow exciton linewidth, and high photostability enable polariton lasing in microcavities. Cavity-length tuning reveals a crossover to photon lasing with a sharp threshold increase, emission energy pulling toward the gain maximum, and vibron-assisted relaxation reducing thresholds at resonances—establishing MeLPPP as a versatile platform for low-threshold coherent light sources.

TuR08-p51
Tuesday, June 23, 2026; 15:00-18:30
Investigating the Mott transition in VO_2 thin films using terahertz time-domain spectroscopy *(Poster)*
G.A. Kazakov, K.A. Kuznetsov; Lomonosov Moscow State University, Russia
Terahertz transmission is investigated in a vanadium dioxide thin film via its thermal-induced metal–insulator phase transition. The experimental results obtained using terahertz time-domain spectroscopy demonstrate a significant change in the transmission function and validate the material's potential for developing terahertz modulators and detectors.

TuR08-p52
Tuesday, June 23, 2026; 15:00-18:30
Evolution of SHG tuning curves during optical poling of Ge-doped silica fibers *(Poster)*
A.Yu. Ostapiv[1], K.V. Zotov[2], N.V. Tereshchenko[2], A.V. Konyashkin[3]; [1]Moscow Institute of Physics and Technology, [2]VPG ``Laserone'' LLC, [3]Kotelnikov Institute of Radio-Engineering and Electronics of RAS, Russia
We studied the evolution of second harmonic generation (SHG) tuning curves in optically poled fibers. Observed curve asymmetry, narrowing, and peak shifting. The phase-matching shift decreased from 30 m^{-1} to 15 m^{-1} over 33 hours, indicating dynamic χ^2 grating changes even with stable SH power. Simulations qualitatively reproduced the asymmetric shapes.

TuR08-p53
Tuesday, June 23, 2026; 15:00-18:30
Tunable narrowband terahertz generation in virtual PPLN *(Poster)*
A.I. Shugurov[1], S.B. Bodrov[1,2], M.V. Sarafanova[1], M.I. Bakunov[1]; [1]University of Nizhny Novgorod, [2]Institute of Applied Physics of RAS, Russia
Generating tens-of-cycles long terahertz pulses by nonlinear mixing of o- and e-components of a femtosecond laser pulse in a bulk LiNbO3 crystal is experimentally demonstrated. The achieved bandwidth is as narrow as 8 GHz at 0.47 THz. The central frequency was varied from 0.37 to 0.76 THz by slightly changing the incidence angle of the pump beam onto the crystal.

TuR08-p54
Tuesday, June 23, 2026; 15:00-18:30
Experimental comparison of microresonator -based radio-frequency generators *(Poster)*
N.S. Tatarinova[1,2], A.E. Shitikov[1], V.E. Lobanov[1], I.A. Bilenko[1,3], D.A. Chermoshentsev[1,2]; [1]Russian Quantum Center, [2]Moscow Inst. of Physics and Technology, [3]Faculty of Physics, Lomonosov Moscow State Univ., Russia
We demonstrate RF generation on a silicon nitride microresonator for compact, low-noise on-chip microwave sources. On the same platform we compare dual self-injection locking of two DFB lasers to adjacent modes, dual SIL to orthogonally polarized modes, microring-feedback-induced four-wave mixing in the laser gain medium, and single pump soliton microcomb generation, highlighting trade-offs in spectral purity, tunability, and experimental complexity.

TuR08-p55
Tuesday, June 23, 2026; 15:00-18:30
Non-principal cascading processes influence on the frequency tripling in quadratic medium *(Poster)*
D.M. Kharitonov[1], V.A. Trofimov[1], A.M. Sapronchev[2]; [1]Lomonosov Moscow State University, [2]Skolkovo Institute of Science and Technology, Russia
We show that the non-principal cascading processes (such as weak fourth harmonic generation followed by difference frequency generation) may influence third harmonic generation occurring at phase matching due to principal cascading process.

TuR08-p56
Tuesday, June 23, 2026; 15:00-18:30
Fabrication of high-Q $BaMgF_4$ microresonators for frequencycombs generation *(Poster)*
K. Min'kov[1,2], A. Vorobyev[1,3], T. Gorshkov[1,4], M. Mishevky[4], A. Mkrtchyan[4], A. Nasibulin[4], Y. Gladush[4], V. Lobanov[1,4], I. Bilenko[1,5]; [1]Russian Quantum Center, [2]Russian Metrological Institute of Technical Physics and Radio Engineering, [3]Moscow Institute of Physics and Technology, [4]Skoltech Center for Photonic Science and Engineering, Skolkovo Institute of Science and Technology, [5]Faculty of Physics, Moscow State University, Russia
Ultra-high-Q whispering gallery mode microresonators based on $BaMgF_4$ crystals are fabricated using diamond turning, annealing, and chemo-mechanical polishing. Quality factors up to 10^9 at 1550 nm enable efficient optical frequency comb generation. The results demonstrate strong potential of $BaMgF_4$ microresonators for UV–visible nonlinear photonics.

TuR08-p57
Tuesday, June 23, 2026; 15:00-18:30
Solution of nonlinear Schrodinger equation by quadrature for optical communications *(Poster)*
P.Ya. Ilyushin[1], D.E. Shipilo[1,2], I.A. Nikolaeva[1,2], N.A. Panov[1,2], O.G. Kosareva[1,2]; [1]Lomonosov Moscow State Univ., [2]Lebedev Physical Inst., Russia
An optical signal propagation model was built based on the Nonlinear Schrodinger Equation. We analyze it in the first approximation of perturbation theory and derive an expression for the solution part, which represents the Intersymbol Interference of the signal. On a set of initial signal shapes we demonstrate its applicability for modeling the nonlinear distortions in the Fiber-Optic Communication Lines.

TuR08-p58
Tuesday, June 23, 2026; 15:00-18:30
Dual-pulse generation in an Er/Yb-doped fiber laser *(Poster)*
I.A. Volkov[1,2], A.V. Sudin[1], S.N. Ushakov[1,3], K.N. Nishchev[1]; [1]National Research Ogarev Mordovia State University, [2]Ulyanovsk State University, [3]Prokhorov General Physics Institute of RAS, Russia
Dual-pulse were generated in a double-clad Er/Yb fiber laser with passive mode locking based on nonlinear polarization rotation (NPR). Their spectral and temporal characteristics are also investigated.

TuR08-p59
Tuesday, June 23, 2026; 15:00-18:30
Bandpass sampling in terahertz time-domain spectroscopy imaging *(Poster)*
A.A. Rybak[1,2], S.A. Kuznetsov[1,2,3], N.A. Nikolaev[1,2]; [1]NSU, Russia, [2]Institute of Automation and Electrometry, [3]Rzhanov Institute of Semiconductor Physics, Russia
We demonstrate the implementation of terahertz time-domain spectroscopy imaging with undersampled data using a custom-designed bandpass filter. The undersampling technique was experimentally tested, showing a reduction in data acquisition time without a noticeable loss in accuracy. The approach can be promising for narrow-band spectral imaging applications, particularly in non-destructive testing, detection of hidden terahertz tags or substances with characteristic fingerprints.

TuR08-p60
Tuesday, June 23, 2026; 15:00-18:30
Optimization of terahertz radiation output from Mg:$LiNbO_3$ crystal via silicon adapters in the Cherenkov generation scheme *(Poster)*
S.A. Kalmanov[1,2], P.A. Chizhov[2], D.A. Safronenkov[1], K.I. Zaytsev[2], G.Kh. Kitaeva[1]; [1]Faculty of Physics, Lomonosov Moscow State Univ., [2]Prokhorov General Physics Inst. of RAS, Russia
We study the ways to optimize silicon adapters for efficient extraction of terahertz radiation from Mg:$LiNbO_3$ crystals. Unlike previous studies, our approach explicitly accounts for the extended spatial nature of the nonlinear-optical source. Results demonstrate that conical adapters provide superior sideways output and collimation for such distributed sources compared to prism-lens or traditional prism systems.

TuR08-p61
Tuesday, June 23, 2026; 15:00-18:30
Wavelength tuning of a random fiber laser via an embedded SNAP active core microresonator controlled by external pumping *(Poster)*
D.V. Kudashkin, O.A. Gorbunov, I.D. Vatnik; Novosibirsk State University, Russia
We demonstrate tunable single-mode operation in a random fiber laser with an integrated SNAP microcavity made of active-core fiber. Laser generation occurs at the microcavity resonance with a linewidth of ~10 MHz. The system is tuned via pump-induced thermal shifts of the microcavity and is capable of tuning by ~15 pm.

TuR08-p62
Tuesday, June 23, 2026; 15:00-18:30
Tilted-pulse-front terahertz generation in a plane-parallel $LiNbO_3$ plate *(Poster)*
S.B. Bodrov[1,2], M.A. Kurnikov[1], M.V. Sarafanova[1], M.I. Bakunov[1]; [1]University of Nizhny Novgorod, [2]Institute of Applied Physics RAS, Russia
A new scheme of optical-to-terahertz conversion of tilted-pulse-front laser pulses in a plane-parallel, rather than commonly used prism-shaped, LiNbO3 crystal is experimentally demonstrated. The scheme has a potential of scaling up the terahertz yield by using large-size LiNbO3 wafers and wide-aperture terawatt-level pump laser beams.

TuR08-p63
Tuesday, June 23, 2026; 15:00-18:30
“Resonant” 3D-trajectories of oblique rays in significantly multimode optical fibers *(Poster)*
A.A. Makovetskii, D.V.Ryakhovskii, S.M.Popov, A.A.Zamyatin; Kotelnikov Institute of Radio Engineering and Electronics of RAS, Russia
A numerical calculation of 3D-ray trajectories with the same "resonant" caustic coefficient χ, but with different angles of radiation entry into the optical fiber θi, was performed. These angles correspond to the propagation angles of a family of hybrid modes with a caustic coefficient close to χ. The ray exit points optical fiber’s end form a "resonant" structure on it.

TuR08-p64
Tuesday, June 23, 2026; 15:00-18:30
TIR-based terahertz output coupler *(Poster)*
M.A. Kurnikov, M.I. Bakunov; Department of Radiophysics, Lobachevsky State University of Nizhny Novgorod, Russia
We present a new element of terahertz photonics for extracting terahertz radiation from semiconductor substrates of photoconductive antennas. The element is a truncated silicon paraboloid. Unlike the commonly used substrate lenses, the radiation is totally internally reflected by the paraboloid’s convex surface and propagates through its cross-section into free space with the 70% efficiency as a parallel beam.

TuR08-p65
Tuesday, June 23, 2026; 15:00-18:30
Photonic microwave generator via laser in gain switch regime stabilised by microresonator *(Poster)*
A.E. Shitikov[1], C. Li[1,2], T.S. Tebeneva[1], V.E. Lobanov[1], I.A. Bilenko[1,2], D.A. Chermoshentsev[1]; [1]Russian Quantum Center, [2]Faculty of Physics Lomonosov MSU, Russia
We have developed a frequency-comb-based tunable microwave generator utilizing a gain-switched self-injection-locked distributed feedback laser diode. A microwave signal is used to modulate the current of the DFB laser. The result beatnote between Kerr comb lines and sidebands of the modulated pump enables the generation of tunable, low phase noise sidebands at modulation frequencies around the platicon repetition rate.

TuR08-p66
Tuesday, June 23, 2026; 15:00-18:30
Half-cycle light pulses in laser induced plasma mirrors: miscroscopic mehanism of generation *(Poster)*
R.M. Arkhipov, M.V. Arkhipov, N.N. Rosanov; Ioffe Institute, Russia
We report a mechanism for generating tailored half-cycle optical transients via reflection of a single-cycle pulse from a plasma with a tailored inhomogeneity. The approach allows deterministic control over the temporal pulse profile by designing the initial spatial density gradient of the target.

TuR08-p67
Tuesday, June 23, 2026; 15:00-18:30

Picosecond stimulated Raman scattering in aqueous solution of sodium nitrate *(Poster)*

A.I. Vodchits[1], V.A. Orlovich[1], I.A. Khodasevich[1], L.E. Batay[1], S.M. Pershin[2], E.A. Cheshev[3]; [1]Institute of Physics, NASB, Belarus; [2]General Physics Institute, RAS, [3]Physical Institute, RAS, Russia

Stimulated Raman scattering (SRS) is investigated in saturated aqueous solution of sodium nitrate using picosecond (50 ps) laser pulses at 532 nm. The SRS generation of four Stokes components (near 564, 599, 639, and 685 nm), and two anti-Stokes components (near 504 and 479 nm) has been obtained. The maximum SRS efficiency for the second Stokes component reached about 30 %.

Section R09. Optical Nanomaterials

TuR09-01
Tuesday, June 23, 2026; 09:00-09:30
Interface-induced symmetry breaking for chirality origination in metal halide perovskite nanoclusters and quantum dots *(Invited)*
J.Z. Zhang; University of California Santa Cruz, USA
We have found that ligand-assisted metal halide molecular clusters, metal halide perovskite magic sized clusters as well as quantum dots exhibit chirality based on circular dichroism measurements. The origin of the chirality has been traced to the liquid-solid or liquid-liquid interface that breaks the symmetry in formation of the two enantiomers, resulting in unequal population of the two.

TuR09-02
Tuesday, June 23, 2026; 09:30-10:00
Theory and simulation of nanostructured materials *(Invited)*
N. Seriani; The Abdus Salam ICTP, Italy
Shape and composition of nanostructured materials are affected by environmental conditions, thus influencing their functional properties. Atomistic simulations give insight into these effects. They contribute to understand phenomena like the shape evolution of nanoparticles, photoabsorption, and chemical and photochemical properties. I will discuss successes, limitations, and perspectives of these techniques, as well as new perspectives offered by artificial intelligence.

TuR09-03
Tuesday, June 23, 2026; 10:00-10:15
Spontaneous core-shell and length-dependent elemental distributions in ternary III-V nanowires
V.G. Dubrovskii; Faculty of Physics, St. Petersburg State University, Russia
Recent experiments reveal spontaneous formation of inhomogeneous elemental distributions during growth of III-V and III-nitride nanowires. We develop a general theoretical approach for understanding and modelling of core-shell and length-dependent compositions in such nanowires and review the available data from this viewpoint

TuR09-04
Tuesday, June 23, 2026; 10:15-10:30
Tuning the length distributions of III-V semiconductor nanowires
V.G. Dubrovskii; Faculty of Physics, St. Petersburg State University, Russia
The key tuning knobs for controlling the length distributions of III-V nanowires are studied theoretically and checked against the available experimental data. It is demonstrated that the shape of the length distributions can be varied within a wide range from sub-Poissonian to a much wider Polya-type or beta-type distributions. In the latter case, the length distributions feature the Family-Vicsek scaling.

TuR09-05
Tuesday, June 23, 2026; 10:30-10:45
Vapor-liquid-solid growth of metal arsenides nanowires with arsenic-rich catalysts
I.V. Shtrom[1,2,3], N.V. Sibirev[1,2], I.V. Ilkiv[1,2,3], I.P. Soshnikov[2,3,4], E.V. Ubyivovk[1]; [1]St. Petersburg State University, [2]Institute for Analytical Instrumentation of RAS, [3]St.Petersburg Academic University, RAS, [4]Ioffe Institute, Russia
We discuss in this report the opportunity of the growth of arsenide NWs, with lead and tin catalysts. Photoluminescence spectra of lead and tin catalyzed NWs were measured. Photoluminescence bands have a lot of peaks, which can correspond to Pb, Sn, Si donor or acceptor impurities.

TuR09-06
Tuesday, June 23, 2026; 10:45-11:00
Graphene quantum dots as a pH-sensitive lifetime sensors for luminescence bioimaging
V.A. Baigildin, A.P. Pavlov, E.V. Durova, N.A. Zharskaia, S.P. Tunik; St.Petersburg State Univeristy, Russia
Graphene quantum dots (gQDs) are the youngest member of carbon-based materials with great potential in biosensing and bioimaging owing to their luminescent properties. GQDs with the edge amino groups were prepared by a one-step hydrothermal method. Prepared gQDs were applied as the fluorescence lifetime pH sensors for intracellular bioimaging with pH sensitivity up to 1 ns per pH unit.

TuR09-07
Tuesday, June 23, 2026; 11:30-12:00
Understanding resonator coupling: coupled mode theory vs. quasinormal mode theory *(Invited)*
P. Lalanne; LP2N, CNRS, Institut d'Optique Graduate School, Univ. Bordeaux, France
Coupled Mode Theory (CMT) has long been a reliable tool for modeling the interaction of light with electromagnetic resonators. However, its dependence on fitted coefficients limits its ability to offer predictive design capabilities. In this work, we review our ongoing efforts to overcome this limitation, with a particular focus on elucidating dissipative coupling.

TuR09-08
Tuesday, June 23, 2026; 12:00-12:30
Visible-light photochemistry with quantum dot-sensitized photon upconversion *(Invited)*
Pramod P. Pillai; Indian Institute of Science Education and Research (IISER) Pune, India
Quantum dot (QD)-sensitized triplet-triplet annihilation upconversion (TTA-UC) systems have been effectively utilized to perform a high-energy UV-driven chemical synthesis with low-energy visible-light.

TuR09-09
Tuesday, June 23, 2026; 12:30-13:00
Photosensitization of molecular catalysts by semiconductor nanocrystals *(Invited)*
Anindya Datta; Department of Chemistry, Indian Institute of Technology Bombay, and Institute of Nano Technology and Science, Mohali, India
Quantum dots are found to effectively photsensitize molecular catalysts, through ultrafast photoinduced electron transfer (PET). Two kinds of QDs have been used: Cu+-doped CdS and CuInS2, with and without a ZnS shell. Cu+-doping facilitates PET and makes the NCs more potent photosensitizers.. The ZnS shell on CuInS2 hinder PET, but aids photosensitization due to surface curingand hindrance of back electron transfer.

TuR09-10
Tuesday, June 23, 2026; 13:00-13:30
What the long-time tails of the photoluminescence decay of semiconductor nanocrystals can tell us *(Invited)*
A.L. Simões Gamboa[1], E.N. Bodunov[2]; [1]ITMO Univ., [2]Emperor Alexander I St. Petersburg State Transport Univ., Russia
We present and compare models for the analysis of the nonexponential photoluminescence decay kinetics of nanocrystals that consider (i) a Poisson distribution of the number of charge carrier traps per nanocrystal, (ii) detrapping of charge carriers, (iii) the traps are not or can be recombination centers, and (iv) a single trap depth or a trap energy distribution (decreasing exponential function).

TuR09-11
Tuesday, June 23, 2026; 13:30-13:45
Wide band gap nanostructured β-Ga_2O_3 -GaN for UV applications
L.A. Mochalov, E.A. Slapovskaya, A.S. Belousov; Lobachevsky State University of Nizhny Novgorod, Russia
PECVD synthesis method was employed for the preparation of nanostructured β-Ga2O3–GaN films with different GaN contents for UV-C photodetectors. Nanostructures were characterized by a higher surface-to-volume ratio and therefore improved photosensitivity compared to thin continuous films. The prepared materials were investigated using various physicochemical methods.

TuR09-12
Tuesday, June 23, 2026; 15:00-15:15
Simulation of optical multiple-focus formation by nanosphere and nanocrater planar arrays
Y.E. Geints[1], I.V. Minin[2], O.V. Minin[2]; [1]V.E. Zuev Institute of Atmospheric Optics SB RAS, [2]Tomsk Polytechnic University, Russia
The formation of patterned optical near-field focusing by microassemblies of nanospheres and nanocraters embedded in a dielectric film is studied. Using theoretical simulation, we demonstrate that spatial modulation of the incident field creates periodic subwavelength field localization regions in the near field. These regions emerge due to phase inhomogeneities formed by ordered microassemblies of scatterers (nanospheres and nanocraters).

TuR09-13
Tuesday, June 23, 2026; 15:15-15:30
Spectral shaping in WSe_2 monolayer: the role of bending geometry in controlling plasmon-enhanced photoluminescence.
A.V. Nikolaeva[1], M.A. Anikina[1], F.M. Maksimov[1], A. Kuznetsov[1], V.M. Kondratev[1], V.A. Sharov[2,3], A.A. Kuchmizhak[4], A.D. Bolshakov[1]; [1]Moscow Institute of Physics and Technology, [2]Alferov University, [3]Ioffe Institute, [4]Far Eastern Federal University, Russia
This work presents a WSe_2 monolayer integrated with plasmonic gold nanobumps. The combined effect of nanoscale deformation and exciton-plasmon interaction enables control over photoluminescence intensity and spectral shape. A direct correlation between the PL spectral profile and the local curvature at the bump is revealed, demonstrating a precise link between nanoscale geometry and optical response.

TuR09-14
Tuesday, June 23, 2026; 15:30-15:45
Screening technique for measuring the confinement of THz surface plasmon polariton field on conducting nanolayers
V.D. Kukotenko[1], V.V. Gerasimov[1,2], V.S. Vanda[1,2], A.G. Lemzyakov[1,3], A.I. Ivanov[4], I.A. Azarov[2,4], A.K. Nikitin[5]; [1]Budker Institute of Nuclear Physics of SB RAS, [2]Novosibirsk State University, [3]Synchrotron Radiation Facility "Siberian Circular Photon Source", [4]A.V. Rzhanov Institute of Semiconductor Physics, SB RAS, [5]Scientific and Technological Centre of Unique Instrumentation of RAS, Russia
This paper presents a shielding method that enables the experimental determination of the penetration depth of surface plasmon polaritons (SPP) in air. Combined with the measured SPP attenuation coefficient along the propagation direction, this parameter enables the reconstruction of the effective optical constants of thin films. The method was tested on gold and graphene nanoparticle composite films in the 0.8–2.1 THz range using radiation from the Novosibirsk free electron laser (NovoFEL).

TuR09-15
Tuesday, June 23, 2026; 15:45-16:00
Ultrafast laser-induced processes in hybrid nanostructures
A.V. Povolotskiy, E.S. Chebanova, Z. Tang, A.S. Konev; Institute of Chemistry, St.Petersburg State University, Russia
This work is aimed at investigating ultrafast processes in core-shell type hybrid nanostructures based on metallic cores to elucidate the mechanisms of physical and chemical processes under laser pumping. The ultrafast processes are studied using data from up-conversion luminescence spectroscopy and transient absorption measured by pump-probe techniques with a resolution of approximately 50 fs.

TuR09-16
Tuesday, June 23, 2026; 16:00-16:15
Dielectric properties of $SrTiO_3$ nanofilms in the Terahertz range
N.A. Nikolaev[1,2], D.S. Gribanov[1,2], A.V. Pavlenko[3]; [1]Novosibirsk State Univ., [2]Inst. of Automation and Electrometry SB RAS, [3]Federal Research Centre "Southern Scientific Centre", RAS, Russia
Quantum ferroelectric SrTiO3 is promising due to its high dielectric permittivity that strongly depends on the external electric field. The effect can be associated with a soft mode near ~2.62 THz. We study the dependence of the dielectric constant in the range of 0.2–8 THz on the thickness of STO films and reveal the nonlinear behavior.

TuR09-17
Tuesday, June 23, 2026; 16:15-16:30
Microfluidics for the separation of colloidal silicon nanoparticles created by laser ablation
S.U. Bikmetova, D.V. Sennikova, D.A. Zuev; ITMO University, Russia
This work presents two microfluidic strategies for the size-selective separation of polydisperse colloidal silicon nanoparticles synthesized via laser ablation. A passive inertial spiral chip and an active centrifugal microfluidic chip were designed to isolate Mie-resonant fractions (target diameter range from 117 nm to 240 nm). The devices successfully extracted target nanoparticle fractions from broader initial dispersions.

TuR09-18
Tuesday, June 23, 2026; 16:30-16:45
Light-driven transformation of photonic properties of liquid-crystalline blue phases
P.V. Dolganov[1], E.A. Maksimov[1], N.V. Balenko[2], V.K. Dolganov[1]; [1]Osipyan Institute of Solid State Physics RAS, [2]Department of Chemistry, Lomonosov Moscow State University, Russia
Tunable three-dimensional photonic crystals (liquid-crystalline Blue Phases) were obtained employing a chiral photosensitive material. Optical and spectral studies of the photonic structures are reported. Temperature – illumination time phase diagrams were determined. Reversible light-driven tuning of structural colors across the whole visible range is achieved.

TuR09-19
Tuesday, June 23, 2026; 16:45-17:00
Development of whispering-gallery-mode microresonators based on microcapillaries for detection and spectroscopy.
N.A. Aprelov, A.D. Novikov, I.D. Vatnik; Novosibirsk State University, Russia
We propose a method to create a silica microcapillary whispering gallery mode microresonator. We calculated optimal geometric parameters for internal medium analysis, developed a wall thinning fabrication technique using commercially available capillaries, and analyzed transmission spectra for various internal media. Results confirm feasibility for sensing applications and open new research prospects on this platform.

TuR09-20
Tuesday, June 23, 2026; 17:30-17:45
Formation of laser-induced periodic surface structures on chalcogenide phase-change materials
V. Fedyaj[1,2], A. Revjakin[1,2], K. Bronnikov[3], V. Simonov[1], A. Kokhanovskiy[3], E. Menshikov[3], P. Lazarenko[4], A. Yakubov[4], K. Okotrub[1], S. Babin[1,2], A. Kuchmizhak[4,5], A. Dostovalov[1,2]; [1]Institute of Automation and Electrometry of the SB RAS, [2]Novosibirsk State University, [3]School of Physics and Engineering, ITMO University, [4]National Research University of Electronic Technology, [5]Institute of Automation and Control Processes of the FEB RAS, [6]Far Eastern Federal University, Russia
We present a comprehensive experimental study on the formation of laser-induced periodic surface structures on various chalcogenide phase-change material thin films (GeTe, Sb2Se3, GST compounds) using femtosecond laser pulses. We also demonstrate the fabrication of complex 2D-LIPSS patterns using a spatial light modulator to generate multiple beams with individual polarization state and intensity distribution, significantly enhancing throughput and pattern diversity.

TuR09-21
Tuesday, June 23, 2026; 17:45-18:00
Vapor-Solid-Solid growth of GaN nanowires in metastable phase
N.V. Sibirev[1,2], O.V. Gridchin[1,2,3], I.P. Soshnikov[2,3], A.M. Dautov[1,2,3], T. Shugabaev[1,3], I.V. Shtrom[1,2,3]; [1]St. Petersburg State University, [2]Institute for Analytical Instrumentation of RAS, [3]St. Petersburg Academic University, RAS, Russia
This report discusses the features of the growth of gallium nitride nanowires with gold and nickel catalysts. The opportunity of the growth of GaN nanowires with cubic, zinc-blende structure is discussed.

TuR09-22
Tuesday, June 23, 2026; 18:00-18:15
Design of wide field of view metalens based on spliced phase profile
Zehao Gao[1,2], Jie Lin[1,2]; [1]Key Laboratory of Micro-systems and Micro-structures Manufacturing, Ministry of Education, Harbin Institute of Technology, [2]School of Physics, Harbin Institute of Technology, China
We propose a 100° field-of-view metalens at 632.8 nm. By splicing central hyperbolic and peripheral quadratic phase profiles, we mitigate off-axis aberrations while maintaining focal sharpness. Simulations confirm high-quality focusing up to ±50° incidence, offering a novel solution for wide-angle imaging.

WeR09-p01
Wednesday, June 24, 2026; 15:00-18:30
Approximation methods for weak polarization-optical responses *(Poster)*
Y.A. Fofanov, V.V. Manoilov; Institute for Analytical Instrumentation RAS, Russia
The results for a comparison of algorithms and methods for processing date of precision laser polarization-optical analysis of matter are discussed. Using the example of weak polarization responses of magnetic nanofluids, the advantages and disadvantages of various algorithms and methods for approximating experimental data from laser polarization-optical diagnostics of structural effects and fluctuations in ordered substances and materials are shown.

WeR09-p02
Wednesday, June 24, 2026; 15:00-18:30
New decene-1 based precurors in the chemistry of chalcogenide colloidal nanocrystals *(Poster)*
I.A. Shuklov, V.V. Lim, A.Yu. Shalagin; Moscow Institute of Physics and Technology, Russia
Dissolution of elemental chalcogens in 1-decene was studied at elevated temperatures and pressures as a route to the novel chalcogen precursors in colloidal nanoparticles synthesis. By the application of these new reagents, we demonstrated the preparation of binary selenide (PbSe, HgSe) and eco-friendly ternary sulfide ABS2 (A = Cu, Ag; B = Ga, In) nanocrystals. The chemical nature of precursors was established.

WeR09-p03
Wednesday, June 24, 2026; 15:00-18:30
Investigation of the photostability and radiation resistance of the AgBr(0.7)I(0.3)-TlBr(0.46)I(0.54) solid solution system *(Poster)*
D.D. Salimgareev, V.S. Kostrov, E.Y. Kabykina, N.T. Shardakov, D.A. Vorobyova, L.V. Zhukova; [1]Ural Federal University, Russia
The photostability and radiation resistance of single crystals and optical ceramics of various compositions in the AgBr0.7I0.3 – TlBr0.46I0.54 system were studied. The samples proved to be photo- and radiation-resistant.

WeR09-p04
Wednesday, June 24, 2026; 15:00-18:30
Metal halides termophysical characteristics and their relationship with structure *(Poster)*
D.D. Salimgareev, I.V. Yuzhakov, F.M. Kucherenko, A.E. Lvov, V.O. Kosmachev, A.A. Yuzhakova, L.V. Zhukova; Ural Federal University, Russia
Temperature dependencies of heat capacity, thermal conductivity, and coefficient of thermal expansion of silver and thallium halides have been investigated. A correlation between the thermophysical properties and the structural-chemical parameters of the materials has been established.

WeR09-p05
Wednesday, June 24, 2026; 15:00-18:30
Saturable absorber based on Fe^{2+}-doped transparent lithium alumino- and lithium galliumsilicate glass-ceramics for passive Q-switching of near IR solid-state lasers *(Poster)*
A.M. Malyarevich[1], V.E. Kisel[1], A.S. Yasukevich[1], K.V. Yumashev[1], O.S. Dymshits[2], S.S. Zapalova[2], Yu.R. Zhokhova[2], I.P. Alekseeva[2], D.P. Danilovich[3], A.A. Zhilin[4]; [1]Department of Laser Technique and Technology, Belarusian National Technical University, Belarus; [2]Glass Department, S.I. Vavilov State Optical Institute, Russia; [3]Department of Refractory Nonmetallic and Silicate Materials, St. Petersburg State Technological Institute, Russia; [4]D.V. Efremov Institute of Electrophysical Apparatus, Russia
Transparent glass-ceramics (GCs) of lithium aluminosilicate, aluminogalliumsilicate, and galliumsilicate systems based on Fe2+-doped nanocrystals with spinel structure were developed by secondary heat-treatments of iron-doped glasses melted in reducing conditions. Their structure and spectral properties are studied. The first results of application of GCs based on Fe2+:γ-Ga2O3 nanocrystals for passive Q-switching of erbium glass laser at 1.53 μm are presented.

WeR09-p06
Wednesday, June 24, 2026; 15:00-18:30
Spectroscopic properties and structure of lithium aluminosilicate glass-ceramics with near zero thermal expansion nucleated by Tm^{3+}-doped and Tm^{3+}/Yb^{3+} co-doped $YNbO_4$ nanocrystals *(Poster)*
O.S. Dymshits[1,2], A.A. Volokitina[1], I.P. Alekseeva[2], M.Ya. Tsenter[2], S.S. Zapalova[2], S. Maltsev[1], K.V. Bogdanov[3], D.P. Danilovich[4], E.V. Vilejshikova[4], K.V. Yumashev[4], A.A. Zhilin[5]; [1]Center of Nanoheterostructure Physics, Ioffe Institute, [2]Glass Department, S.I. Vavilov State Optical Institute, [3]International Research and Education Center for Physics of Nanostructures, ITMO University, [4]Department of Refractory Nonmetallic and Silicate Materials. St. Petersburg State Technological Institute, Russia; [5]Department of Laser Technique and Technology, Belarusian National Technical University, Belarus; [6]D.V. Efremov Institute of Electrophysical Apparatus, Russia
Transparent and opaque lithium aluminosilicate glass-ceramics containing nanocrystals of orthorhombic, tetragonal and monoclinic phases of Tm3+:YNbO4, or Tm3+/Yb3+:YNbO4 (8-15 nm) and β-quartz (β-spodumene) solid solutions (ca. 48 nm) are developed. Variation of their spectroscopic properties follows the phase transformations of the orthoniobate phase. Glass-ceramics can be used for efficient near-infrared down-conversion.

WeR09-p07
Wednesday, June 24, 2026; 15:00-18:30
Numerical simulation of laser imprinted metasurfaces based on chalcogenide phase change materials *(Poster)*
E. Menshikov[1], F. Kuzikov[1], V. Fedyaj[2,3], D. Terekhov[4], A. Dostovalov[2,3], A. Kokhanovskiy[1]; [1]ITMO Univ, [2]Inst. of Automation and Electrometry of the SB RAS, [3]Novosibirsk State Univ., [4]National Research Univ. of Electronic Technology, Russia
: In this work we study the optical response of metasurfaces composed of periodic arrays of crystalline inclusions formed in chalcogenide phase-change material films (PCMs). We analyze the influence of the structure geometry, crystallization depth, and additional cladding layers on the reflection and transmission spectra. We show that local PCM crystallization enables prototyping of tunable optical devices with complex optical responses.

WeR09-p08
Wednesday, June 24, 2026; 15:00-18:30
Aerogel-based synthesis of Nd:YAG nanopowders *(Poster)*
A.A. Efimov[1,2], M.P. Sazhnev[1], A.E. Lebedev[3], M.P. Zykova[1], A.A. Pytchenko[1], I.Kh. Avetissov[1], I.V. Taydakov[4]; [1]D. Mendeleev Univ. of Chemical Technology, [2]Kotelnikov Inst. of Radio Engineering and Electronics (Fryazino Branch) RAS, [3]FSUE RPC "Pharmzashchita" of the Federal Medical and Biological Agency, [4]P.N. Lebedev Physical Inst. RAS, Russia
Yttrium aluminum garnet (YAG) nanopowders were synthesized via novel sol-gel route assisted by supercritical carbon dioxide (CO2) drying. For samples calcined at 850 °C Scherrer crystallite size was 35 nm and the average particle size was 53 nm.

WeR09-p09
Wednesday, June 24, 2026; 15:00-18:30
Study of the modification of Yb^{3+} centers in CeO_2 nanoparticles via Bi^{3+} co-doping using EPR and optical spectroscopy *(Poster)*
A.K. Ginkel[1], R.M. Rakhmatullin[1], O.A. Morozov[1,2], S.L. Korableva[1], V.V. Semashko[1,2] , A.A. Rodionov[1], M.S. Pudovkin[1]; [1]Kazan Federal University, Institute of physics, [2]Zavoisky Physical-Technical Institute, FRC Kazan Scientific Center of RAS, Russia
The impact of Bi3+ co-doping on CeO2 nanoparticles structure was studied with EPR and optical spectroscopy of Yb3+ probe ions. EPR analysis of Yb^{3+} in CeO_2 shows that annealing with 0.1% Bi^{3+} yields cubic sites, whereas 0.5% Bi^{3+} co doping significantly increases trigonal sites. Annealing at 1000°C leads to oxygen vacancy migration and trigonal site formation. Luminescence correlates with EPR results.

WeR09-p10
Wednesday, June 24, 2026; 15:00-18:30
Rare-earth-doped Bi_2O_3 -GeO_2 glasses NIR luminescence *(Poster)*
K.S. Serkina[1], O.V. Knyazkova[1], A.A. Eliseeva[1], E.S. Sektarov[2], I.V. Stepanova[1]; [1]The Department of Chemistry and Technology of Crystals, D. Mendeleev University of Chemical Technology, [2]Institute of Spectroscopy RAS, ISAN, Russia
Rare earth (RE)-doped bismuth-germanate oxide glasses were synthesized and their luminescent characteristics have been investigated. It was revealed that erbium, thulium and holmium doping changes luminescent band due to the appearance of RE ions luminescence. Luminescence mechanisms in synthesized glasses was proposed depending on the rare earth oxide types.

WeR09-p11
Wednesday, June 24, 2026; 15:00-18:30
Laser-modified titanium surfaces for reducing the intensity of reflected signals across a wide temperature range *(Poster)*
M.S. Kuritskij[1], A.A. Kostrina[1], A.V. Tsibulnikova[1], D.A. Artamonov[1], V.A.Slezhkin[1,2], E.S. Zemlyakova[1,2], I.I. Lyatun[1], I.G. Samusev[1], V.V. Bryukhanov[1]; [1]Immanuel Kant Baltic Federal University, [2]Kaliningrad State Technical University, Russia
The paper presents the results of measuring the reflected signal from low-reflection unique laser-modified titanium surfaces in the visible and IR ranges over a wide temperature range.

WeR09-p12
Wednesday, June 24, 2026; 15:00-18:30
Luminescence and emission properties of halide double perovskites tuned by pressure and doping *(Poster)*
Haizhong Guo[1,2], Lingrui Wang[1], Jiaxiang Wang[1], Xueqian Wu[1]; [1]Key Laboratory of Materials Physics, Ministry of Education, School of Physics, Zhengzhou University, [2]Institute of Quantum Materials and Physics, Henan Academy of Sciences, China
To optimize the optical properties of optically inactivity and weak emission of halide double perovskites (HDPs), the strategy by applying high pressure and doping can effectively tune the structural and optical properties of HDPs, offering new avenues for property optimization. We endeavor to comprehensively summarize the luminescence and emission properties engineering of HDPs under high pressure and doping.

WeR09-p13
Wednesday, June 24, 2026; 15:00-18:30
Moiré-based intensity modulator for CO_2 lasers using phase transition vanadium dioxide *(Poster)*
J.F. Calderon, C.A. Galíndez; Universidad del Valle, Colombia
Systems based on the uneven overlap of photonic crystal slabs have introduced the possibility of controlling its guided resonances. Through RCWA simulations of two parallel superimposed vanadium dioxide gratings, we develop an intensity modulator for CO2 lasers, based on splitting of a guided resonance. At 10.6 um these system exhibits smooth tunability, reaching 75.3% reduction of the maximum transmitted intensity.

WeR09-p14
Wednesday, June 24, 2026; 15:00-18:30
Precise trimming of photonic integrated circuits with phase-change material nanofilms *(Poster)*
A.V. Tronev[1], P.M. Agruzov[1], M.V. Parfenov[1], D.Y. Terkhov[2], Y.S. Lebedeva[2], P.I. Lazarenko[2], A. Olihnovich[3], A.A. Bogdanov[1], A.V. Shamray[1]; [1]Ioffe Institute, [2]MIET, [3]St.Petersburg Electrotechnical University "LETI", Russia
An application of GeSbTe phase-change material for trimming of lithium niobate photonic integrated circuits is discussed. Attenuation, phase delay and polarization dependent losses in optical waveguides loaded GeSbTe overlay nanofilm were efficiently controlled by laser irradiation. Optically controllable TM-pass polarizer with extinction ratio over 20 dB and under 1 dB insertion losses was demonstrated on titanium diffused lithium niobate waveguides.

WeR09-p15
Wednesday, June 24, 2026; 15:00-18:30
Energy transfer processes between Nd^{3+} and Yb^{3+} ions in yttrium fluoride matrix affecting the luminescent characteristics *(Poster)*
E.I. Oleynikova[1], M.S. Pudovkin[1], V.V. Semashko[2]; [1]Institute of Physics, Kazan Federal University, [2]Zavoisky Physical-Technical Institute, FRC Kazan Scientific Center of RAS, Russia
Energy transfer processes between Nd3+ and Yb3+ ions determine the temperature dependences of spectral and kinetic characteristics. An increase in the decay time of Nd3+ luminescence with an increase in temperature is associated with the process of radiation trapping between Nd3+ ions. The energy transfer between Nd3+ and Yb3+ in the temperature range of 80-320 K is phonon-assisted. To create temperature sensors, the dependence of luminescence intensity ratio or luminescence decay time on temperature can be used

WeR09-p16
Wednesday, June 24, 2026; 15:00-18:30
Colloidal quantum dots at the air-water interface *(Poster)*
A.L. Simões Gamboa[1], E.N. Bodunov[2]; [1]ITMO Univ., [2]Emperor Alexander I St. Petersburg State Transport Univ., Russia
We examine the behavior of Langmuir films of colloidal semiconductor nanocrystals (colloidal quantum dots) at the air-water interface and the factors influencing the transition occurring when the films are compressed beyond the collapse pressure, consistent with a change from the monolayer to the trilayer state. We compare this behavior with that of other Langmuir film-forming substances displaying similar transitions.

WeR09-p17
Wednesday, June 24, 2026; 15:00-18:30
MoRe superconducting nanowire single-photon detector atop of lithium niobate on insulator *(Poster)*
A. Nevzorov[1], I. Venediktov[2,3], V. Korovin[1,3], S. Svyatodukh[2], N. Titova[2], E. Baeva[1,2], I. Florya[1], D. Kobtsev[1,3], A. Kolbatova[1,2], V.Kovalyuk[1,3], G. Goltsman[3,4]; [1]Laboratory of Photonic Gas Sensors, University of Science and Technology MISIS, [2]Department of Physics, Moscow Pedagogical State University, [3]HSE University, [4]Group of Quantum Photonic Integrated Circuits, Russian Quantum Center, Skolkovo, Russia
An amorphous molybdenum-rhenium (MoRe) film on a thin-film lithium niobate is presented as an efficient superconducting single-photon detector (SNSPD) operating at 2.5K and exhibiting high internal efficiency in a wide spectral wavelength range.

WeR09-p18
Wednesday, June 24, 2026; 15:00-18:30
Extending silicon infrared photoresponse by laser hyperdoping with transition metals *(Poster)*
V.I. Pryakhina[1], D.E. Tkachuk[1], P.A. Paletskikh[1], A.R. Akhmatkhanov[1], S.I. Kudryashov[1,2]; [1]Institute of Natural Sciences and Mathematics, Ural Federal University, [2]Lebedev Physical Institute, Russia
Transition metal laser hyperdoping provided a practical, tunable method to extend silicon photoresponse into the infrared range. Optimized laser processing created sub-bandgap absorption and enabled room-temperature infrared photodetection at 1550 nm.

WeR09-p19
Wednesday, June 24, 2026; 15:00-18:30
Angle-independent structural coloring on laser-induced periodic surface structures (LIPSS) encoded subpixels assisted with laser-induced backward transfer (LIBT) *(Poster)*
V.A. Domakova[1], K.M. Arbuzova[1], A. Ramos-Velazquez[12], K.A. Karelin[1], D.A. Sinev[1]; [1]ITMO University, [2]Laser Center LLC, Russia
This work presents a method for creating an iridescent image viewable from wide observation angles. A pixelated image is recorded combining techniques laser-induced backward transfer (LIBT) and laser-induced periodic surface structures (LIPSS). Each pixel is composed of four subpixels, encoded with different LIPSS orientations by varying the laser polarization. This allows to avoid the usual fixed-angle viewing requirement of LIPSS-based structural colors.

WeR09-p20
Wednesday, June 24, 2026; 15:00-18:30
Femtosecond laser fabrication of antireflection microstructures on $LiInS_2$ and $LiInSe_2$ nonlinear crystals *(Poster)*
V. Fedyaj[1,2], A. Kurus[2,3], L. Lobanov[2,3], A. Eliseev[2,3], A. Dostovalov[1,2], A. Kuchmizhak[4,5], L. Isaenko[2,3]; [1]Institute of Automation and Electrometry of the SB RAS, [2]Novosibirsk State University, [3]Sobolev Institute of Geology and Mineralogy of the SB RAS, [4]Institute of Automation and Control Processes of the FEB RAS, [5]Far Eastern Federal University, Russia
We present a comprehensive study on the direct femtosecond laser fabrication of antireflection microstructures on the surfaces of nonlinear optical crystals $LiInS_2$ and $LiInSe_2$. We explore the effects of laser wavelength, pulse energy, number of pulses per point, and lattice symmetry (square, hexagonal) on the resulting morphology and on the optical transmittance in the infrared spectral range.

WeR09-p21
Wednesday, June 24, 2026; 15:00-18:30
Spectral and kinetic characteristics of crystalline $SrF_2:Ce^{3+}$, Tb^{3+} microparticles *(Poster)*
M.S. Pudovkin[1], S.I. Kalinichenko[1], Yu.A. Ermakova[2], A.A. Alexandrov[2], S.V. Kuznetsov[2]; [1]Kazan Federal University, [2]Prokhorov General Physics Institute of RAS, Russia
We carried out laser spectroscopy of SrF2:Ce3+, Tb3+ microparticles in order to determine the mechanisms of energy exchange between Ce3+ and Tb3+ ions. It was revealed that the shape of the SrF2:Ce3+, Tb3+ spectra was dependent on temperature. The energy exchange is phonon-assisted via excited 5d sate of Ce3+ and 5D3 state of Tb3+. It was shown, that the studied SrF2:Ce3+, Tb3+ microparticles are highly effective in luminescence temperature sensing

WeR09-p22
Wednesday, June 24, 2026; 15:00-18:30
Creation of colloidal solutions of optically resonant silicon nanoparticles by pulsed laser ablation in a liquid in nanosecond and femtosecond regime *(Poster)*
D.V. Sennikova, V.A. Gulinyan, M.A. Viskov, S.U. Bikmetova, D.A. Zuev; ITMO Univ., Russia
his work presents a comparative study of nanosecond and femtosecond laser ablation of a silicon in a flow system. Parameters of colloidal solutions, such as concentration, optical density, size dispersion, stability, and viscosity, are compared for each pulse duration. The optimal ablation mode and liquid flow rate for achieving a higher content of optically resonant silicon nanoparticles in the colloid are demonstrated.

WeR09-p23
Wednesday, June 24, 2026; 15:00-18:30
Moth-eye-inspired vertical unidirectional grating coupler with experimental anisotropy proof *(Poster)*
I.A. Kazakov, I.Y. Popova, A.V. Shipulin; Photonic Integration Research Lab, Skoltech, Russia
We demonstrate a fabrication-friendly, moth-eye-inspired single-etch vertical subwavelength grating coupler (ME-vGC) that enables preferential in-plane routing under normal incidence through transverse symmetry breaking, supporting compact vertical source integration. Experiments show a forward/backward contrast up to 11dB near 1530nm and a peak single-coupler insertion loss of ~9dB.

WeR09-p24
Wednesday, June 24, 2026; 15:00-18:30
Highly ordered formation of perovskite by nanoimprinting method *(Poster)*
F.M. Kochetkov[1], A.A. Yakubova[2], D. Gets[1], A.S. Toikka[1], D.V. Lebedev[3], N.A. Solomonov[2], I.S. Mukhin[2], S.V. Makarov[1]; [1]ITMO University, [2]Alferov University, [3]Institute for Analytical Instrumentation, Russia
A new universal method for synthesizing ordered nanostructures from the halide perovskite $CsPbBr_3$ using nanoimprinting techniques has been proposed and experimentally realized. The method enables the formation of homogeneous areas containing two types of perovskite structures: ordered arrays of isolated nanoparticles and microflakes. Investigation of the optical properties of the synthesized samples revealed narrow resonant emission peaks at 523 nm for the particle array and 525 nm for the flakes.

WeR09-p25
Wednesday, June 24, 2026; 15:00-18:30

Low-dimensional metamaterials in THz photonics *(Poster)*

P.M. Kovaleva[1], K.A. Kuznetsov[1,2], P.I. Kuznetsov[2], D.V. Lavrukhin[3], R.R. Galiev[3], R.A. Khabibulin[3], D.S. Ponomarev[3,4], G.Kh. Kitaeva[1]; [1]Faculty of Physics, Lomonosov Moscow State University, [2]Kotelnikov FIRE RAS (Fryazino Branch), [3]National Research Centre "Kurchatov Institute", [4]Prokhorov General Physics Institute of RAS, Russia

This work investigates enhancing terahertz (THz) emission in photoconductive antennas using topological insulators (BSTS) and InGaAs/InAlAs heterostructures integrated with plasmonic gratings. BSTS-based antennas achieved an expanded 2.5 THz bandwidth due to high carrier mobility, while InGaAs/InAlAs structures improved low-frequency output via internal piezoelectric fields. These results demonstrate that tailoring electronic structures and local field redistribution is essential for developing high-efficiency, compact THz emitters.

WeR09-p26
Wednesday, June 24, 2026; 15:00-18:30

The influence of crystallization on the luminescent properties of rare-earth ions in $PbCl_2$ -TeO_2 glasses *(Poster)*

A. Bakaeva[1], D. Butenkov[2], N. Simonenko[2], P. Loiko[3], O. Petrova[1]; [1]The Department of Chemistry and Technology of Crystals, D. Mendeleev University of Chemical Technology, [2]N.S. Kurnakov Institute of General and Inorganic Chemistry of RAS, Russia; [3]Centre de Recherche sur les Ions, les Matériaux et la Photonique (CIMAP), Université de Caen Normandie, France

The spectral-luminescent characteristics of oxochloride lead-tellurite glasses doped with Dy3+, Ho3+, and Er3+ and glass-ceramics based on them are investigated. The incorporation of rare earth elements into the crystalline phase of PbCl2 during crystallization of the initial glass was studied.

Section R10. Nonlinear Quantum Photonics

TuR10-01
Tuesday, June 23, 2026; 09:00-09:30
Multilayer polaritonic neuromorphic networks with binary convolutional neurons *(Invited)*
E. Sedov; Moscow Institute of Physics and Technology, Russia
We propose multilayer polaritonic neuromorphic networks based on binary convolutional neurons, where local comparison with a convolutional kernel and nonlinear activation are implemented through threshold switching of optically driven exciton-polariton condensates. The architecture processes local features of spatially structured data and transfers optical signals directly between successive condensate-based network layers, enabling compact neural computation within a single polaritonic platform.

TuR10-02
Tuesday, June 23, 2026; 09:30-09:45
Progress in key devices and technologies for on-chip cold atom systems
Jun Wang; Shanghai Institute of Optics and Fine Mechanics, CAS, China
Cold-atom systems offer high precision but their widespread adoption is hindered by bulky setups. Our work advances miniaturization by integrating core components—lasers, magneto-optical traps, and field controllers—using silicon photonics and metasurface technologies. This creates a foundational platform for preparing on-chip cold-atom ensembles and conducting coherent experiments, paving the way for fully integrated systems in sensing and measurement.

TuR10-03
Tuesday, June 23, 2026; 09:45-10:15
Symmetry-driven wave packet dynamics in photonic graphene *(Invited)*
S. Koniakhin; Center for Theoretical Physics of Complex Systems, South Korea
Photonic graphene enables all-optical emulation of quantum transport. Three studies show how symmetry and synthetic fields control dynamics: unidirectional valley-dependent snake states at magnetic domain boundaries, ratchet currents from asymmetric scattering at oriented triangular defects, and symmetry-determined vortex–antivortex arrays from a single Gaussian beam. These findings unify symmetry as the core principle for engineering photonic devices.

TuR10-04
Tuesday, June 23, 2026; 10:15-10:30
Nuclear optical clocks
S.M. Ignatovich[1], M.V. Okhapkin[1,4], O.N. Prudnikov[1,2], A.V. Taichenachev[1,2], V.I. Yudin[1,2,3]; [1]Institute of Laser Physics SB RAS, [2]Novosibirsk State University, [3]Novosibirsk State Technical University, Russia; PTB, Braunschweig, Germany
In this talk we give a brief overview of recent advances in the field of optical clocks based on the transition between ground and isomeric states in the Th-229 nuclear. We outline the main problems that should be solved on the way to creation of nuclear optical clock with relative uncertainty of the order of 10E(–19)–10E(–20). Especial attention will be focused on our proposal on the two-photon optical nuclear clock.

TuR10-05
Tuesday, June 23, 2026; 10:30-10:45
Bichromatic pure-optical trap for capturing and cooling ytterbium-171 atoms
R.Ya. Ilenkov[1], O.N. Prudnikov[1], A.V. Tainchenachev[1,2], V.I. Yudin[1,2]; [1]Institute of Laser Physics SB RAS, [2]Novosibirsk State University (NSU), Russia
The problem of laser cooling and trapping of ytterbium-171 atoms in a bichromatic laser field is considered. The possibility of creating a purely optical deep macroscopic trap of centimeter scale is demonstrated, which allows for simultaneous trapping and cooling of atoms to sub-Doppler temperatures. This cold-atom cell concept is proposed as an alternative to the magneto-optical trap.

TuR10-06
Tuesday, June 23, 2026; 10:45-11:00
Non-Markovian protection of states of a quasi-PT-symmetric system from losses
T.T. Sergeev[1,2], E.S. Andrianov[1,2], A.A. Zyablovsky[1,2]; [1]Dukhov Research Institute of Automatics (VNIIA), [2]Moscow Institute of Physics and Technology (MIPT), Russia
We demonstrate that non-Markovian effects in the quasi-PT-symmetric system can make the states of the system infinitely living, loss-protected states, even in the absence of gain. We show that the boundaries of regions with different numbers of loss-protected states are determined by conditions similar to those for the PT transition in a quasi-PT-symmetric system with Markovian reservoirs.

TuR10-07
Tuesday, June 23, 2026; 11:30-12:00
Theory of coherent light-matter interaction in 2D superconductors *(Invited)*
I. Savenko; Guangdong Technion-Israel Institute of Technology (GTIIT) in Shantou, China
We theoretically investigate anomalous transport in 2D chiral s-, p-, and d-wave superconductors driven by surface acoustic waves (SAWs), demonstrating that SAWs offer a powerful probe for distinguishing unconventional pairing. Using the Boltzmann kinetic equation, we examine the second-order response to an acoustoelectric field from a longitudinal Bleustein-Gulyaev SAW on a piezoelectric substrate. Conventional superconductors produce acoustoelectric current solely along the SAW direction, whereas chiral p-type superconductors generate an additional Hall component.

TuR10-08
Tuesday, June 23, 2026; 12:00-12:15
Challenges in precision quantum metrology
O.N. Prudnikov[1], D.N. Kapusta[1], A.N. Goncharov[1], A.V. Taichenachev[1,2], V.I. Yudin[1,2,3]; [1]Institute of Laser Physics SB RAS, [2]Novosibirsk State University, [3]Novosibirsk State Technical University, Russia
We present the results obtained at the Institute of Laser Physics SB RAS, which open up new possibilities in the field of precision quantum metrology for a wide range of applied and fundamental tasks.

TuR10-09
Tuesday, June 23, 2026; 12:15-12:45
Multimode squeezed light *(Invited)*
P. Sharapova; Theoretical Quantum Optics, Universität Paderborn, Germany
This talk will highlight our recent advances in multimode squeezed light generation and characterization, including new regimes of bright squeezed vacuum generation in waveguides and multimode homodyne detection technique with a broaden local oscillator using microctructured fibers. We will discuss the impact of losses during the state generation and applications of multimode squeezed states in nonlinear interferometry.

TuR10-10
Tuesday, June 23, 2026; 12:45-13:00
Periodically poled silica fibers for generation of polarization-entangled photon pairs
A.V. Gladyshev[1], A.F. Kosolapov[1], V.V. Velmiskin[1], D.G. Komissarov[1], D.S. Dubrovskii[1], Yu.P. Yatsenko[1]; I.A. Bufetov[1], M.A. Smirnov[1,2], O.A. Ermishev[1,2], I.V. Fedotov[3], A.A. Voronin[3], A.B. Fedotov[3]; [1]Prokhorov General Physics Institute of RAS, [2]Kazan Quantum Center, Kazan National Research Technical University named after A.N. Tupolev, [3]Faculty of Physics, Lomonosov Moscow State University, Russia
A special optical fiber is developed and periodically poled to induce second-order nonlinearity. Second harmonic generation and spontaneous parametric down-conversion in the fiber samples are investigated. The results obtained provide a basis for realization of efficient fiber sources of the quantum states of light that are of high interest for quantum information technology.

TuR10-11
Tuesday, June 23, 2026; 13:00-13:15
Two-photon microwave cavity: bistability and decoherence time
V.Yu. Mylnikov[1], S.O. Potashin[1], M.S. Ukhtary[2], G.S. Sokolovskii[1]; [1]Ioffe Institute, Russia; [2]Research Center for Quantum Physics, National Research and Innovation Agency (BRIN), Indonesia
The decoherence time of the qubit based on the two-photon Kerr microwave cavity with two-photon drive and nonlinear dissipation is studied.

TuR10-12
Tuesday, June 23, 2026; 13:15-13:30
Numerical simulation of noise reduction in Raman spectroscopy using squeezed light
A.A. Sorokin[1], A.N. Romanov[1,2], A.V. Andrianov[1]; [1]A.V. Gaponov-Grekhov Institute of Applied Physics of RAS, [2]Lobachevsky State University of Nizhny Novgorod, Russia
We develop a model of quantum-enhanced Raman spectroscopy setup using polarization-squeezed light generated in a nonlinear fiber. In the simulated setup, we observed an improvement in the signal-to-noise ratio of up to 5 times. This model can be used to evaluate the impact of various system parameters on resolution and noise reduction, and to further optimize the setup.

TuR10-13
Tuesday, June 23, 2026; 17:30-18:00
Ring half-solitons in rotating quantum fluid *(Invited)*
N. Voronova; National Research Nuclear University MEPhI, Russia
Rotation of an exciton-polariton condensate gives rise to a synthetic magnetic field coming from TE-TM splitting of photons and optically-induced Zeeman splitting of excitons, allowing for appearance of well-defined ring-shaped domains, followed by formation of ring half-solitons. This regime where spin-orbit coupling, interactions, and orbital flow are comparably strong, offers new means to engineer spin textures in non-equilibrium quantum fluids.

TuR10-14
Tuesday, June 23, 2026; 18:00-18:15
Theoretical model of atomic interferometer in counter-propagating light waves
M.D. Radchenko[1,2,3], V.I. Yudin[1,2,3], M.Yu. Basalaev[1,2,3], O.N. Prudnikov[1,2], A.V. Taichenachev[1,2], V.I. Krotov[1,2], D.N. Kapusta[1]; [1]Inst. of Laser Physics SB RAS, [2]Novosibirsk State Univ., [3]Novosibirsk State Technical Univ., Russia
In this work fully quantum treatment of the atomic Mach-Zehnder interferometer was used to confirm the presence of recently discovered lineshape-asymmetry-caused shift. The theoretical model for compact interferometers-gravimeters with short baseline and relatively small pulse durations was developed from the first principles of quantum mechanics. Bragg transitions were considered due to counter-propagating light waves geometry of the atomic interferometer.

TuR10-15
Tuesday, June 23, 2026; 18:15-18:30
Programming of integrated optical interferometers with a high level of thermal cross-talk interference
A.S. Argenchiev[1], I.V. Kondratyev[1], N.N. Skryabin[1,2], I.V. Dyakonov[1,2], S.S. Straupe[1,2], S.P. Kulik[1]; [1]Lomonosov Moscow State Univ., Quantum Technology Centre, [2]Russian Quantum Center, Russia
We developed a numerical model of a 16-mode interferometer using PyTorch optimization. By reconstructing 1231 internal parameters (including crosstalk), the model achieves high accuracy with a coefficient of determination of 0.9966, fully describing the physical device.

TuR10-16
Tuesday, June 23, 2026; 18:30-18:45
The calculation of the entangling of the solitonpulses in the optical fibers
Yu.A. Mazhirina[1], L.A. Melnikov[1], A.A. Sysolyatin[2], A.D. Zverev[2], K.V. Zotov[3]; [1]Yuri Gagarin Stets Technical University of Saratov, [2]A.M.Prokhorov General Physics Institute of RAS, [3]NPO "Soliton", Russia
We propose to use discerete representation of the pulses, conctructed from these counts autocorrelation matrix, its singular decomposition for calculation and measurement of pulse entanglement parameter - Schmidt information. The entanglement in different propagation regimes were calculated, experiment results for the pulses from ring fiber cavity excited by 6 W 1550 nm cw fiber laser are presented.

TuR10-17
Tuesday, June 23, 2026; 18:45-19:00
Brillouin scattering as a tool for linear operations in optical neural networks.
I.V. Vovchenko[1,2], A.A. Zyablovsky[1,2,3], A.A. Pukhov[1,3], E.S. Andrianov[1,2,3]; [1]Moscow Institute of Physics and Technology, [2]Dukhov Research Institute of Automatics (VNIIA), [3]Institute for Theoretical and Applied Electrodynamics, Russia
Neural networks use analog and digital coprocessors for acceleration. While digital is more precise, analog offers speed and energy efficiency. We demonstrate a novel analog coprocessor using ring resonators with Brillouin photon-phonon interaction coupled to a waveguide. The stationary waveguide mode intensity is proportional to a vector-matrix product, enabling linear computation. This scalable architecture supports parallel processing in the frequency domain with computation time determined mainly by the system's stabilization period.

TuR10-18
Tuesday, June 23, 2026; 19:00-19:15
Controlling strong coupling with high intensity pump field
I.V. Doronin, A.A. Zyablovsky, E.S. Andrianov; FSUE VNIIA, Russia
We consider an optical nano system comprised of dye molecule and plasmon particle interacting in the strong coupling regime. We show that high amplitude coherent pumping of such structure results in restructuring of energy levels in this system, which in turns results in particular, in non-monotone dependence of luminescence intensity and linewidth on pumping intensity.

TuR10-19
Tuesday, June 23, 2026; 19:15-19:30
Dynamics of a two-level system under incoherent modulated microwave excitation
I.A. Gulyaev[1,2,3], V.V. Soshenko[4,5], A.V. Akimov[1,5]; [1]Russian Quantum Center, [2]Kotelnikov Institute of Radioengineering and Electronics RAS, [3]Lomonosov Moscow State University, [4]Lebedev Physical Institute RAS, [5]LLC Diamond Sensors, Russia
To improve the tracking speed of a resonance frequency, it is necessary to take into account the constraints of both the modulation characteristics and the dynamic range inherent in the lock-in detection system. In this work, we present a semi-analytical model that describes the dynamics of a two-level system subjected to modulated microwave excitation field under incoherent pumping conditions.

ThR10-20
Thursday, June 25, 2026; 15:00-15:30
Polariton waveguides *(Invited)*
D. Sanvitto; Istituto di Nanotecnologia - CNR Nanotec, Lecce & Roma, Italy
In this talk I will discuss how guided polaritons can combine on-chip propagation with strong light–matter interactions, offering a route beyond conventional linear optics and present nonlinear photonics, where functionality typically relies on small refractive-index changes.

ThR10-21
Thursday, June 25, 2026; 15:30-16:00
To be announced *(Invited)*
H. Vinck; Departamento de Física, Universidad Nacional de Colombia, Colombia

ThR10-22
Thursday, June 25, 2026; 16:00-16:30
Exciton-polariton quantum circuits *(Invited)*
D. Gerace; Dipartimento di Fisica "A. Volta", Università di Pavia, Italy
Prospective applications of quantized polaritons in integrated circuits are shown to enable quantum nonlinear interferometers with functionalities unattainable in linear photonic circuits, including two-qubit entangling gates with arbitrarily high fidelity. It will be shown that these results remain valid even when considering the finite temporal extent of single-polariton wavepackets, beyond the commonly used single-mode approximation.

ThR10-23
Thursday, June 25, 2026; 16:30-16:45
Dispersive readout technique for NV^- center in diamond
S.V. Bolshedvorskii[1,2], N.E. Salangin[1,3], A.M. Kozodaev[1,3,4], P.G. Vilyuzhanina[1,2,3,4], S.M. Drofa[1,2,3,4], A. Chernyavskiy[1,2,3], B.E. Pak[1,3], I.S. Cojocaru[1,4], A.N. Smolyaninov[2], V.V. Soshenko[1,2], A.V. Akimov[4,1]; [1]Lebedev Physical Institute of RAS, [2]LLC Diamond Sensors, [3]Moscow Institute of Physics and Technology (National Research University), [4]Russian Quantum Center, Russia
Dispersive readout technique propose a strong coupling regime of a high-quality resonator with a quantum system in order to enhance readout fidelity. In this work we provide a qualitative and quantitative comparison of dispersive readout and standard optical readout for NV center.

ThR10-24
Thursday, June 25, 2026; 16:45-17:00
Dispersive readout with two orthogonalmodes of a dielectric cavity
A.M. Kozodaev[1,2,3], I.S. Cojocaru[1,3,4], S.M. Drofa[1,2,3], P.G. Vilyuzhanina[1,2,3], A. Chernyavskiy[1,2,3], N.I. Salangin[2], B.E. Pak[2], V.G. Vins[5], S.Ya. Kilin[6,7], A.N. Smolyaninov[4], S.V. Bolshedvorskii[3,4], V.V. Soshenko[3,4], A.V. Akimov[1,3,4]; [1]Russian Quantum Center, [2]Moscow Institute of Physics and Technology, [3]P.N. Lebedev Institute RAS, [4]LLC Diamond Sensors, [5]LLC Velman, [6]National Research Nuclear University "MEPhI", Russia; [7]B.I. Stepanov Institute of Physics NASB, Belarus
Nitrogen-vacancy color center in diamond recommended themselves as a good sensitive element for measurement of magnetic field. While mainstream of magnetometers based on NV centers is using so-called optically detected magnetic resonance, recently there was a suggestion to use dispersive readout of a dielectric cavity to enhance sensitivity of a magnetometers. Here we demonstrating that dispersive readout approach can be significantly improved if two-channel scheme is considered.

ThR10-25
Thursday, June 25, 2026; 17:30-18:00
Plasma modes of finite thickness superconducting film *(Invited)*
V.M. Kovalev, A.V. Chaplik; Rzhanov Institute of Semiconductor Physics, SB RAS, Russia
Anderson proved superconducting transitions do not alter plasma dispersion. However, recently, a new acoustic plasma mode was experimentally discovered in finite-thickness superconducting films, contrasting with the classic neutral Carlson-Goldman mode. Our theory attributes this discovery to incomplete superconducting and normal densities compensation across the film thickness, which excites bulk charges and long-range Coulomb forces. This theoretical model accurately describes the new mode's linear dispersion and temperature behavior.

ThR10-26
Thursday, June 25, 2026; 18:00-18:15
Metrological uncertainty and international comparisons in Brillouin light scattering and microwave photonic systems
*P. Salzenstein[1], T.Y. Wu[2]; [1]FEMTO-ST, CNRS, France; [2]Agency for Science, Technology and Research (A*STAR), Singapore*
Brillouin Light Scattering enables key functionalities in nonlinear quantum photonics, from precision sensing to low-noise microwave generation. This contribution highlights the importance of rigorous uncertainty evaluation and international comparability. Recent analyses of Brillouin frequency shift measurements using tandem Fabry-Pérot interferometry and phase noise characterization of optoelectronic oscillators are reviewed within a global metrology framework.

ThR10-27
Thursday, June 25, 2026; 18:15-18:30
Entangling two-qudit operations in a Faraday light-atomic interaction
E.A. Vashukevich, R. Surmay, V.A. Leonov; St.Petersburg State University, Russia
The work proposes a protocol for generating entangling two-qudit gates in the QRQ (QND-rotation-QND) protocol. The entanglement power for a unitary two-qudit transformation was derived for an arbitrary dimension of the logical space for a unitary two-qudit transformation in the QRQ protocol for an arbitrary dimension of the logical space. We demonstrate the invariance of these conditions with respect to the system dimension. Furthermore, the work presents an analysis of the probabilities of implementing entangling operations.

ThR10-28
Thursday, June 25, 2026; 18:30-18:45
Quantum noise of axial modes in cylindrical microresonator
A.Yu. Kolesnikova, I.D. Vatnik; Novosibirsk State University, Russia
We derive a theory of the spectrum of quantum fluctuations of nonlinearly interacting whispering gallery modes of a cylindrical microresonator. We reveal that the utilizing the nonuniform distribution of the modes along the cylinder axis helps optimize the position of the coupling element, simultaneously ensuring highly efficient pumping of the central mode and high output rate of the correlated photon pairs in the sidebands.

ThR10-29
Thursday, June 25, 2026; 18:45-19:00
All-optical NV$^-$diamond thermometry: high sensitivity with charge-state-assisted background subtraction
M. Solotenkov[1,2,3,4], I.V.Fedotov[1,2,3,4], A.A.Lanin[1,2,4], D.A. Sidorov-Biryukov[1,2], A.B. Fedotov[1,2,3,4]; [1]Russian Quantum Center, [2]Lomonosov Moscow State University, [3]National Research Nuclear University (MEPhI), [4]LIFT Center LLC, Russia
We demonstrate dual-mode, all-optical NV-diamond thermometry in a fiber-compatible format: a high-sensitivity ZPL-based readout reaching 16 mK·Hz-0.5 (shot-noise limit < 2 mK·Hz-0.5), comparable to all-optical split-vacancy thermometers. We further introduce a charge-state-assisted background-subtraction mode that uses a single-wavelength pulsed pump and early-late time-gated differencing to cancel static or slowly varying optical background, keeping the background-induced temperature shift below 0.1 K even when the background dominates the NV ZPL region.

ThR10-30
Thursday, June 25, 2026; 19:00-19:15
PbTe thin films for Mid-IR high-sensitive photodetectors
L.A. Mochalov, E.A. Slapovskaya, A.S. Belousov; Lobachevsky State University of Nizhny Novgorod, Russia
A novel PCVD synthesis approach was developed to obtain the highly sensitive lead telluride layers. One vacuum cycle was employed for the production and sensitization of the resulting films. The effect of annealing conditions on the surface morphology and photoelectric properties of the prepared films was elucidated.

ThR10-31
Thursday, June 25, 2026; 19:15-19:30
A possible manifestation of dark matter luminescence in our Galaxy
A.T. D'yachenko[1,2]; [1]Kurchatov Inst., [2]St.Petersburg State Transp. Univ., Russia
We show that the contribution of new X17 particles in glow in our Galaxy is approximately twice as large as the temperature spectrum.

ThR10-p01
Thursday, June 25, 2026; 10:00-13:30
Optically detected magnetic resonance spectroscopy of the single NV$^-$center in diamond coupled to the 13C nuclear spin *(Poster)*
P.G. Vilyuzhanina[1,2,3,4], S.V. Bolshedvorskii[1,4], V.V. Soshenko[1,4], I.S. Cojocaru[1,2], A.M. Kozodaev[1,2,3], S.M. Drofa[1,2,3,4], A. Chernyavskiy[1,2,3], B.E. Pak[1,3], N.I. Salangin[1,3], A.N. Smolyaninov[4], A.V. Akimov[2,4]; [1]Lebedev Physical Institute of RAS, [2]Russian Quantum Center, Skolkovo, [3]Moscow Institute of Physics and Technology (MIPT), [4]LLC Diamond Sensors, Russia
Nitrogen-vacancy centers in diamond, coupled to the 13C nuclear spins are promising candidates for solid-state quantum qubits. In this work, we present the results of optically detected magnetic resonance spectroscopy of the single nitrogen-vacancy center coupled to the 13C nuclear spin, resulting in hyperfine splitting.

ThR10-p02
Thursday, June 25, 2026; 10:00-13:30
Treatment of resonant Raman scattering by 2LO phonons in a ZnS crystal *(Poster)*
L.E. Semenova; Prokhorov General Physics Inst. RAS, Russia
Resonant Raman scattering by 2LO phonons in a wurtzite ZnS crystal under excitation below excitonic levels was theoretically studied, taking into account the anisotropy of the hole effective masses.

ThR10-p03
Thursday, June 25, 2026; 10:00-13:30
Multi-parameter optimization of non-classical states in a polariton trimer *(Poster)*
T.A. Khudaiberganov;
We investigate total blockade conditions for polaritonic light in a three-resonator trimer. We developed an algebraic approach using tensor states with fixed particle numbers to satisfy n-particle blockade conditions. By optimizing mixing coefficients in a passive linear optical system, our method enables deterministic engineering of n-particle Fock states in the emitted polariton radiation.

ThR10-p04
Thursday, June 25, 2026; 10:00-13:30
Optimization of $AgGaS_2$ crystal orientation for quantum standardless calibration of the spectral radiance *(Poster)*
A.V. Veselovskiy[1,2], A.V. Paterova[2], G.Kh. Kitaeva[1,2]; [1]Lomonosov Moscow State Univ., [2]South Ural State Univ., Russia
We develop the collinear optical scheme for absolute calibration of the spectral radiance using quantum properties of spontaneous parametric down-conversion (SPDC) in $AgGaS_2$. Results of calculations of the angle between the crystal optical axis and the pump wave vector, required to achieve collinear phase matching, are presented and verified experimentally by recording the frequency-angular distribution of SPDC signal in $AgGaS_2$.

ThR10-p05
Thursday, June 25, 2026; 10:00-13:30
Spontaneous parametric down conversion of vectoroptical vortices *(Poster)*
V.A. Leonov, E.A. Vashukevich; St.Petersburg State University, Russia
This work presents a theoretical model of spontaneous parametric down-conversion for quantum vector optical vortices with inhomogeneous polarization. We show a relationship between orbital angular momentum and the helical topological charge of polarization, with conservation of topological charge during the process. Control of the pump's polarization and spatial structure enables selective generation of entangled states, advancing quantum algorithms using vector vortices.

ThR10-p06
Thursday, June 25, 2026; 10:00-13:30
Ramsey and hyper-Ramsey spectroscopy of the octupole transition of ytterbium-171 ion in small magnetic fields *(Poster)*
D.S. Krysenko[1,2], O.N. Prudnikov[1], V.I. Yudin[1,2,3], A.V. Taichenachev[1,3], S.V. Chepurov[1]; [1]Inst. of Laser Physics, SB RAS, [2]Novosibirsk State Technical Univ., [3]Novosibirsk State Univ., Russia
The comparative analysis of the shifts of the central resonance in Ramsey and Hyper-Ramsey spectroscopy of octupole transition was carried out in small magnetic fields. In particular, Rabi frequencies and magnetic field values have been determined for achievement the influence of non-linear light shift and second-order Zeeman shift on central resonance shift no more than 10^-19.

ThR10-p07
Thursday, June 25, 2026; 10:00-13:30
Non-Gaussian dynamics and quantum correlations in lambda type light-matter interfaces *(Poster)*
J.C.B. Luna-Veronico[1,2], K.S. Tikhonov[1,3,4], P.R. Sharapova[5], O.V. Tikhonova[6]; [1]St.Petersburg State Univ., [2]HSE Univ., [3]Russian Quantum Center, [4]P.N. Lebedev Phys. Inst., Russia; [5]Univ. of Paderborn, Germany; [6]Moscow State Univ., Russia
We present a cumulant expansion framework for characterizing non-Gaussian light in high-photon Lambda-type systems. This method solves the light-matter hierarchy problem without basis truncation, reducing computational complexity by orders of magnitude. By using higher-order cumulants as direct metrics for non-Gaussianity, we bypass full state reconstruction, enabling efficient analysis of macroscopic quantum statistical dynamics in multilevel atomic systems.

ThR10-p09
Thursday, June 25, 2026; 10:00-13:30
On two approaches of noise equivalent power determination for THz superconductor HEB under continuous and pulsed illumination *(Poster)*
T.I. Novikova[1], K.V. Shein[2], S.V. Seliverstov[3,4,5], G.Kh. Kitaeva[1]; [1]Faculty of Physics, Lomonosov Moscow State University, [2]National Research University Higher School of Economics, [3]Telecommunications Research and Development Institute, HSE University, [4]Physics Department, Moscow State Pedagogical University, [5]Laboratory of Photonic Gas Sensors, University of Science and Technology MISIS, Russia
Two different approaches to the sensitivity estimation are considered that can be applied at different operation modes of hot electron bolometers (HEB) with a given noise equivalent power (NEP). The equivalence of two methods of measurement of spectral noise density of superconducting bolometers operating under continuous and pulsed illumination is demonstrated.

ThR10-p10
Thursday, June 25, 2026; 10:00-13:30
Coexistence of decoy-state phase-time coding DV-QKD with classical channels over 80 km optical fiber *(Poster)*
A.V. Borisova[1], A.N. Klimov[2]; [1]JSC InfoTeCS, [2]Quantum Technology Centre, Lomonosov Moscow State University, Russia
This work presents an experimental investigation of the integration of O-band quantum key distribution based on decoy-state phase-time coding with classical C-band signals. Quantum-classical coexistence is demonstrated over an 80-km fiber-optic link, exceeding the previous result for a similar system by 20 km.

ThR10-p11
Thursday, June 25, 2026; 10:00-13:30
On Grover's algorithm in continuous variables *(Poster)*
S.G. Grigorev, E.A. Vashukevich; St.Petersburg State University, Russia
The work focuses on constructing Grover's algorithm for continuous variables, which reduces error accumulation and implementation complexity compared with the discrete version. However, the existing formulation involves a projection operator onto phase space, making its implementation highly non-trivial. The algorithm requires nonlinear operations, which are proposed to be realised using so-called non-Gaussian nodes.

ThR10-p12
Thursday, June 25, 2026; 10:00-13:30
Computational prediction of promising deep-UV nonlinear optical borate fluorides $SrBO_2F$ and $BaBO_2F$ *(Poster)*
D.D. Barma[1], A.S. Obrubov[1], A. Tudi[2, 3], Z. Yang[2, 3], A.A. Mikhailova[1], D.V. Rybkovskiy[1], A.R. Oganov[1]; [1]Skolkovo Institute of Science and Technology, Russia; [2]Xinjiang Technical Institute of Physics and Chemistry, China, [3]Center of Materials Science and Optoelectronics Engineering, University of CAS, China
This study introduces novel borate fluorides $SrBO_2F$ and $BaBO_2F$ predicted using the USPEX evolutionary algorithm as potential deep-ultraviolet nonlinear optical materials. DFPT calculations predict a large birefringence and a second-harmonic generation coefficient comparable to that of the benchmark KDP crystal. The origin of these enhanced optical properties is attributed to the presence of $[BO_2]_n$ chains within the crystal structure.

ThR10-p13
Thursday, June 25, 2026; 10:00-13:30
Analog circuit-QED simulator of quantum spin dynamics through the extended Bose-Hubbard model *(Poster)*
I.V. Dudinets[1,2], J. Kim[3], T. Ramos[4], A.K. Fedorov[1,5,6], V.I. Man'ko[6,2], J. Huh[7]; [1]Russian Quantum Center, [2]Moscow Inst. of Physics and Technology, Russia; [3]SKKU Advanced Inst. of Nanotechnology, Sungkyunkwan University, Republic of Korea; [4]Inst. of Fundamental Physics IFF-CSIC, Spain; [5]National Univ. of Science and Technology "MISIS", [6]Lebedev Physical Inst., Russia; [7]Yonsei Univ., Republic of Korea
We report an analog quantum simulator for the Heisenberg spin model using nonlinear microwave photonics in circuit-QED. By employing a regularized Dyson-Maleev transformation, we map spin dynamics onto the extended Bose-Hubbard Hamiltonian with engineered photon-photon nonlinearities. Numerical simulations confirm high-fidelity reproduction of complex spin dynamics, establishing a scalable photonic platform for exploring many-body phenomena through controlled quantum optical nonlinearities.

ThR10-p14
Thursday, June 25, 2026; 10:00-13:30
Incorporating measurement imperfections into Continious-Variable QKD *(Poster)*
A.S. Naumchik, R.K. Goncharov, A.D. Kiselev; ITMO Univ., Russia
We analyze measurement asymmetry effects – unbalanced beam splitters and mismatched detector efficiencies – in the Gaussian-modulated coherent-state continuous-variable quantum key distribution protocol under untrusted-noise scenario. These imperfections introduce excess noise accessible to Eve, negatively impacting secure key rate.

ThR10-p15
Thursday, June 25, 2026; 10:00-13:30
Statistical features of "elementary" response of superconducting hot-electron bolometer *(Poster)*
A.V. Osipenkov, T.I. Novikova, P.A. Prudkovskii, G.Kh. Kitaeva; Faculty of Physics, Lomonosov Moscow State University, Russia
We present an experimental study of the photoresponse of a superconducting hot-electron bolometer under low-power 1.5 THz radiation. Asymmetric response histograms are modeled by Poisson-weighted convolutions of Gaussian distribution functions, revealing power-dependent pulse amplitudes and saturation behavior. Results indicate fluctuating hot-spot configurations and can be used to study detection mechanisms in superconducting photodetectors.

ThR10-p16
Thursday, June 25, 2026; 10:00-13:30
Wavelength-tunable optical injection attacks on the QKD transmitter *(Poster)*
K.D. Bondar[1,2], I.S. Sushchev[1,2], D.S. Bulavkin[1], D.M. Melkonian[1], K.E. Bugai[1,3], A.S. Sidelnikova[1], V.M. Vakhrusheva[1,2], and D.A. Dvoretskiy[1,3]; [1]SFB Laboratory, LLC, [2]Quantum Technology Centre and Faculty of Physics, Lomonosov Moscow State University, [3]Bauman Moscow State Technical University, Russia
We experimentally investigate the effects of optical injection attacks on the transmitter side of QKD systems. Previous studies have primarily considered such attacks in the context of optical injection locking with slight frequency detuning between the master (Eve) and slave (Alice) lasers. Here, we demonstrate the impact of these attacks over a broad spectral range $\lambda = 1260 - 1650$ nm, showing a reduction in the relative key length under the decoy-state BB84 protocol.

ThR10-p17
Thursday, June 25, 2026; 10:00-13:30

Trigger-energy hysteresis in single-photon detectors under blinding attacks *(Poster)*

D.M Melkonian[1], D.S. Bulavkin[1], I.S. Sushchev[1,2], K.E. Bugai[1], R.Y. Lokhmatov[1], D.A. Dvoretskiy[1]; [1]SFB Laboratory, LLC, [2]Quantum Technology Centre and Faculty of Physics, M.V. Lomonosov Moscow State University, Russia

We observe hysteresis in the trigger-pulse energy of InGaAs/InP single-photon avalanche diodes under pulsed and continuous-wave detector blinding attacks at repetition rates of 2-10 MHz. The always-click, never-click thresholds, and the gap between them - key parameters in current statistics-based countermeasures - can be dynamically tuned over a much wider range than previously recognized, beyond detector heating, impacting the defenses' security.

ThR10-p18
Thursday, June 25, 2026; 10:00-13:30

Laser damage attacks on fusion-spliced attenuators: modeling attack scenarios in quantum key distribution systems *(Poster)*

K. E. Bugai[1,2], D. A. Gavrilovets[2], A. P. Zyzykin[1], D. S. Bulavkin[1], I. S. Sushchev[1], D. M. Melkonian[1], K. D. Bondar[1], A. S. Sidelnikova[1], V. M. Vakhrusheva[1], D. A. Dvoretskiy[1,2]; [1]SFB Laboratory, Ltd, [2]Bauman Moscow State Technical University, Russia

This work investigates laser damage attack targeting fusion-spliced attenuators within Quantum Key Distribution (QKD) systems, demonstrating that these passive components are vulnerable to thermal modification induced by high-power optical injection. Through modelling and experimental verification, we show that controlled heating produces permanent attenuation changes that remain undetected by standard QKD monitoring procedures. The results reveal a realistic hardware-based security loophole that threatens the practical implementation of quantum-secure communication networks.

Section R11. Lasers for Space Communication and Navigation

TuR11-01
Tuesday, June 23, 2026; 09:00-09:30
Nd:YAG lasers for new-generation satellite and lunar laser ranging *(Invited)*
V.V. Koval, A.F. Kornev, Y.V. Katsev, R.V. Balmashnov, A.M. Makarov; Lasers and Optical Systems, Russia

TuR11-02
Tuesday, June 23, 2026; 09:30-10:00
Compact highly coherent laser sources for sensing, navigation, and frequency standards *(Invited)*
V.N. Treshchikov[1,2], E.A. Fomiryakov[1], D.R. Kharasov[1], S.P. Nikitin[1], D.E. Artemov[1], G.Y. Ivanov[1], A.V. Reznikov[1], O.E. Nanii[1,3]; [1]T8 Company group, [2]Fryazino branch of the V.A. Kotelnikov Institute of Radio Engineering and Electronics, RAS, [3]Department of Physics, Lomonosov Moscow State University, Russia
A review of fiber coupled lasers developed by T8, LLC is given, including external cavity diode lasers (ECDL), distributed feedback Erbium-doped fiber lasers (DFB-FL) and InP-Si3N4 microring self-injection locked lasers. Relative intensity, phase noises and sensitivity to vibrations were measured. The application of these lasers for sensing, navigation, and frequency standards is discussed.

TuR11-03
Tuesday, June 23, 2026; 10:00-10:15
Space -based gravimetric complex with laser interferometric sensors and a ground -based data processing system
S.S. Donchenko, R.A. Davlatov; Federal State Unitary Enterprise “Russian Metrological Institute of Technical Physics and Radio Engineering”, Russia
A space-based gravimetric complex is proposed to improve gravitational mapping accuracy in high-latitude regions. The system integrates a central spacecraft, nanosatellites, laser interferometric sensors, and ground-based data processing to construct high-precision gravitational maps for navigation, geodetic, and hydrographic applications in the Arctic.

TuR11-04
Tuesday, June 23, 2026; 10:15-10:30
Ground terminal for high-speed space laser communication
R.K. Lozov, S.V. Petushkov, V.V. Murashkin, V.E. Nesterova, V.V. Netkachev, T.K. Govorov, E.K. Ugrevitskiy, M.V. Maslovets, R.A.Leksina; JSC RPC "PSI", Russia
This paper presents a multi-beam laser uplink terminal review, including operating principles and optical scheme

TuR11-05
Tuesday, June 23, 2026; 10:30-10:45
Background glare assessment for a ground station in space-to-earth laser link acquisition
S.D. Levashov[1,4], R.M. Bakhshaliev[1,4], A.V. Khmelev[1,2,3], A.V. Duplinsky[1,4]; [1]QSpace Technologies, [2]National University of Science and Technology MISIS, [3]Moscow Institute of Physics and Technology, [4]HSE University, Russia
For laser Space-to-Earth communication, precise guidance via a ground-based beacon is critical. Its beam must have high divergence to guarantee acquisition considering satellite coordinate accuracy, yet high brightness for detection against a variable solar background. Software has been developed to estimate the actual background glare using images from precision guidance cameras on the "Impulse-1" and "Vladivostok-2" satellites. The tool processes the images to evaluate background intensity, enabling the calculation of the minimum laser power required to reliably overcome it.

TuR11-06
Tuesday, June 23, 2026; 10:45-11:00
Polarization analysis of quantum-optical systems for space laser communications using a modified BB84 protocol
A.S. Akentev, A.L. Sokolov; JC "Research and Production Corporation "Precision Systems and Instruments", Russia
This paper examines the polarization characteristics of a pointing system for quantum-optical systems for space laser communications. The polarization state of the beam at the guidance system's output was experimentally determined, and polarization losses were studied. A polarization analysis of the quantum-optical laser beam guidance system, which can be used for a ground-based space laser communications system, revealed a significant change in the orientation of the polarization plane depending on the beam direction

TuR11-07
Tuesday, June 23, 2026; 11:30-12:00
Applications of satellite laser ranging in GNSS *(Invited)*
S.N. Karutin, V.D. Glotov, A.A. Pafnutev; Central Research Institute for Machine Building, Russia
Based on the international experiments results and the experience of JSC TsNIIMash specialists, the following directions for using of Satellite Laser Ranging in Global Navigation Satellite Systems (GNSS) are considered: Determination of spacecraft orbits and monitoring their accuracy; Calibration of radio equipment; Synchronization of ground-based and onboard frequency standards; Refinement of coordinate systems.

TuR11-08
Tuesday, June 23, 2026; 12:00-12:15
Optical system for satellite laser navigation in free-space optical communications
R.M. Bakhshaliev[1,2], A.V. Khmelev[1], K.A. Barbyshev[1,2], V.E. Merzlinkin[1,2], S.D. Levashov[1,2]; [1]QSpace Technologies, [2]HSE University, Russia
Classical optical communication facilitates high-speed data links between spacecraft and ground stations, or inter-satellite links, offering superior interference resistance, energy efficiency, low detectability, and higher data rates versus radio-frequency systems. However, these benefits necessitate precise laser pointing and tracking to minimize bit error rate (BER) and maintain link stability. This paper examines the subsystem design and assesses its impact, with preliminary results confirming reliable link performance.

TuR11-09
Tuesday, June 23, 2026; 12:15-12:30
Study of characteristics of erbium-doped NALM fiber lasers with different net cavity dispersion
A.A. Filonov[1], V.S. Pivtsov[1,2], N.A. Koliada[1,3]; [1]Institute of Laser Physics SB RAS, [2]Novosibirsk State Technical University, [3]Institute of Laser Physics SB RAS, Russia
In this paper, we investigated characteristics of erbium fiber lasers with a nonlinear amplifying loop mirror (NALM) at different values of the net cavity dispersion (NCD) of the laser. During the work, an average output power, pulse duration, optical spectrum width, signal-to-noise ratio (SNR) of the first harmonic of laser intermode beats (LIB) and mode locking self-starting conditions were investigated.

TuR11-10
Tuesday, June 23, 2026; 12:30-12:45
Adaptive control of laser beam parameters in radiation-hard ToF systems for space debris detection, autonomous docking and one-way optical synchronization
V.V. Davydov[1,2], A.V. Shavshin[3], R.A. Dmitriev[3], D.A. Boldarev[3]; [1]Peter the Great St.Petersburg Polytechnical University, [2]St.Petersburg Electrotechnical University "LETI", [3]St.Petersburg State University of Telecommunications, Russia
An adaptive laser beam pointing control method for spaceborne laser ranging and optical synchronization systems is presented. The system employs a photodiode array to measure the beam position and a closed-loop correction scheme based on a fast steering mirror. Simulation results demonstrate more than a fivefold reduction in angular drift, providing improved ranging accuracy and enhanced stability of the optical synchronization channel.

TuR11-11
Tuesday, June 23, 2026; 12:45-13:00
Multidither adaptive optical system for real-time correction of turbulent laser beam distortions
P.M. Kuzmitsky[1], A.V. Kudryashov[1], V.A. Tikhonov[2], A.N. Nikitin[1]; [1]Sadovsky Institute of Geosphere Dynamics RAS, [2]JSC "PLANETA-SID", Russia
Multidither adaptive optical system has been developed for real-time correction of turbulent laser beam distortions. The correction is performed through five control channels with frequency separation, each reproducing a specific Zernike mode.

TuR11-12
Tuesday, June 23, 2026; 13:15-13:30
Radiation hardness of InP DBR laser on photonic integrated circuit
K.M. Malakhov[1], A.A. Gorelov[1], I.Yu. Popova[1], T.A. Meleshko[1], R.K. Mozhaev[2], E.E. Kovalev, I.A. Kazakov[1], A.V. Shipulin[1]; [1]Skoltech, [2]National Research Nuclear University "MEPhI", Russia
A study of gamma-induced effects on InP-based DBR laser on photonic chip is presented. The laser was exposed to the total ionizing dose of 25 krad. The observed central wavelength red shift up to 0.38 nm might be explained as a result of competing processes: band filling and thermal effects. The radiation-hardening measures for long-term space missions are required.

TuR11-13
Tuesday, June 23, 2026; 13:30-13:45
Interference and diffraction techniques for investigating the propagation of vector vortex beams
D.D. Reshetnikov[1], E.V. Malyutina[1], T.K. Korol[1], A.A. Ryzhaya[2], M.E. Pavelina[1], V.Yu. Venediktov[1,2], A.L. Sokolov[3], V.M . Petrov[1]; [1]St.Petersburg State University, [2]St.Petersburg Electrotechnical University “LETI”, [3]National Research University “Moscow Power Engineering Institute”, Russia
Various experimental techniques for the rapid control of vectorial polarization field modes in Mach-Zehnder and Michelson interferometers will be explored. The propagation of vector vortex polarization fields in media with optical turbulence will also be considered. To simulate optical turbulence, employing both a model with normally distributed refractive index fluctuations and a Kolmogorov spectrum. The potential for holographic detection of vortex beams in ring interferometers and interferometric circuits based on collinear beams has been investigated.

TuR11-14
Tuesday, June 23, 2026; 13:45-14:00
Application of parallel-coupled resonators in optical resonant gyroscope with a broadband light source
Yu.V. Filatov, E.V. Shalymov, V.Yu. Venediktov; St.Petersburg Electrotechnical University "LETI", Russia
The subtypes of resonant optical gyroscopes with a broadband light source are briefly discussed and classified. Expressions are obtained that describe the operation of gyroscope subtypes with a broadband light source using multi-ring parallel-connected resonators. It has been demonstrated that the use of parallel-connected resonators allows for a significant increase in energy efficiency and sensitivity.

WeR11-p01
Wednesday, June 24, 2026; 15:00-18:30
Four-frequency Zeeman laser gyroscope with a static frequency bias *(Poster)*
Yu.Yu. Broslavets, A.A. Fomichev, E.A. Polukeev, V.G. Semenov, A.B. Mordvinova, E.S. Ivanina, A.I. Varenik; Moscow Institute of Physics and Technology (National Research University), Russia
This paper presents a four-frequency Zeeman laser gyroscope with an equifacial tetrahedral cavity and static frequency bias. Cavity stabilization and rotation sensing utilize combined signals without separating orthogonal polarization beats. Numerical modeling, accounting for dispersion and gain, determined optimal stabilization and beat parameters. As a result, complex bias subtraction is avoided and stable operation of the gyroscope is achieved.

WeR11-p02
Wednesday, June 24, 2026; 15:00-18:30
Comparison of laser and radio communication channels for the small spacecraft constellation *(Poster)*
S.Yu. Strakhov, D.M. Kadochnikov, N.V. Sotnikova; Baltic State Technical University "VOENMEH" named after D.F. Ustinov, Russia
The paper provides a comparative analysis of laser (optical) and radio-technical inter-satellite communication channels for grouping small spacecraft operating in low-Earth orbits. The requirements for bandwidth, energy potential of the line, resistance to interference and the possibility of scaling the grouping to hundreds of small spacecraft are considered.

WeR11-p03
Wednesday, June 24, 2026; 15:00-18:30
Aerosol concentration assessment model using the Beer-Lambert-Bouguer law *(Poster)*
I. Galaktionov[1,2], V. Tatyanin[3], V. Toporovsky[1], M. Koryachko[2,3]; [1]Moscow Technical University of Communications and Informatics, [2]Moscow Polytechnic University, [3]MIREA - Russian Technological University, Russia
This paper presents a software model for estimating aerosol concentration using the Beer-Lambert-Bouguer (BLB) law. The model numerically solves the radiative transfer equation to account for light-particle interactions and derives concentration from measured attenuation. Laboratory verification showed less than 2% error for wavelengths of 600–1200 nm and particle sizes of 0.5–5 μm.

WeR11-p04
Wednesday, June 24, 2026; 15:00-18:30
Optically inhomogeneous medium impact on BER and coupling efficiency for FSO communications *(Poster)*
I. Galaktionov[1,2], A. Kalimullina[3], V. Toporovsky[1], M. Koryachko[2,3]; [1]Moscow Technical University of Communications and Informatics, [2]Moscow Polytechnic University, [3]MIREA - Russian Technological University, Russia
This work analyzes the impact of wavefront distortions on Free Space Optical (FSO) links. We evaluate how the root mean square (RMS) wavefront error affects fiber coupling efficiency and the Bit Error Rate (BER). Results quantify the degradation of received power and system performance.

WeR11-p05
Wednesday, June 24, 2026; 15:00-18:30
Amplitude noise of 89Xnm single-mode VCSELs *(Poster)*

M.A. Bobrov[1], S.A. Blokhin[1], Ya.N. Kovach[1], A.A. Blokhin[1], N.A. Maleev[1], A.G. Kuzmenkov[1], M. N. Marchii[1], A.P. Vasil'ev[2]; [1]Ioffe Institute, [2]Submicron Heterostructures for Microelectronics, Research and Engineering Center, Russia

The study of the amplitude noise of the 89X nm single-mode polarization-stable VCSELs is presented. The increase in photon lifetime led to the relative intensity noise decrease of ~10 dB (at the same output power). The polarization-resolved relative intensity noise depends on polarization state and SMSR and was 10-20 dB higher than relative intensity noise depending on current and frequency.

WeR11-p06
Wednesday, June 24, 2026; 15:00-18:30
Correlations and frequency of variations of of laser beam parameters in a turbulent medium *(Poster)*

P.M. Kuzmitsky[1], F.Yu. Kanev[2], O. Del[2]; [1]Sadovsky Institute of Geosphere Dynamics RAS, [2]V.E. Zuev Institute of Atmospheric Optics SB RAS, Russia

In numerical experiments, the frequencies of variations, correlation and autocorrelation coefficients of laser radiation characteristics in a turbulent medium are obtained. A description of the computer applications used to conduct the studies is provided.

WeR11-p07
Wednesday, June 24, 2026; 15:00-18:30
Features of optical system design for daytime free-space quantum key distribution *(Poster)*

V.M. Vakhrusheva[1,2], A.N.Klimov[2], S.P.Kulik[2]; [1]SFB Laboratory, [2]Faculty of Physics, MSU, Russia

The work addresses the design of free-space quantum key distribution (QKD) systems operating over horizontal atmospheric links under daytime conditions. The paper describes the main sources of noise and provides an estimation of losses arising during the propagation of optical beams in the atmosphere, as well as during their transmission and reception by optical systems.

WeR11-p08
Wednesday, June 24, 2026; 15:00-18:30
Free-space optical communication based on quantum cascade lasers *(Poster)*

S.A. Chakhlov[1,2,3], A.A. Lastovkin[1], F.A. Starikov[1], N.G. Zakharov[1]; [1]Inst. of Laser Physics Research, RFNC-VNIIEF, [2]Moscow State Univ., [3]Branch of Moscow State Univ. in Sarov, Russia

The development of infrared communication systems is a pressing issue. Infrared radiation with wavelengths falling within transparency windows is subject to less scattering and absorption, allowing operation in almost any weather. Quantum cascade lasers are promising sources for this type of application due to their compactness and the ability to design a laser for virtually any wavelength.

WeR11-p09
Wednesday, June 24, 2026; 15:00-18:30
Countermeasure against detector blinding attak on the subcarrier wave quantum key distribution system *(Poster)*

M.E. Gellert, B.A. Nasedkin, V.V. Chistiakov; ITMO University, Russia

In this study, we proposed a countermeasure against a blinding attack. This countermeasure exploits the features of the subcarrier wave quantum key distribution system. Specifically, we suggest periodically increasing the modulating signal amplitude on the receiver side, allowing to detect the eavesdropper's actions. Simulation and experimental results confirm the effectiveness of the proposed approach without significant changes in the system.

WeR11-p10
Wednesday, June 24, 2026; 15:00-18:30
Comparison of methods for implementing optical communication channels based on single- and multi-element (matrix) emitters and receivers *(Poster)*

S.Yu. Strakhov, D.M. Kadochnikov, N.V. Sotnikova; Baltic State Technical University "VOENMEH" named after D.F. Ustinov, Russia

The paper considers the architectures of free-space optical communication channels implemented on the basis of single-element and multi-element (matrix) emitters and receivers. The analysis is carried out from the point of view of line energy, angular coverage, requirements for guidance and tracking systems, as well as noise immunity and fault tolerance of the channel. Special attention is paid to the use of such solutions in compact platforms with strict restrictions on weight, dimensions and energy consumption.

Section R12. Laser Additive Manufacturing: Processes, Materials and Application

TuR12-01
Tuesday, June 23, 2026; 11:30-11:45
Advanced additive manufacturing of lead-free piezoceramics: enabling textured, multi-material, and topologically engineered devices.
I.V. Shiskovsky; Lebedev Physical Institute of RAS, Russia.
We demonstrate photopolymerization--based additive manufacturing of lead-free $BaTiO_3$, KNN, and NBT piezoceramics, achieving polymerization depths up to >100 μm (vs. <20 μm in Refs.) and d_{33} = 148 pC/N for $BaTiO_3$. A custom multi-laser 3D printer, optimized pastes (≤50 vol.%), scalable digital workflow, and topological composites (0–3, 1–3, 3–3) were realized, enabling textured, high-efficiency piezodevices.

TuR12-02
Tuesday, June 23, 2026; 11:45-12:00
The features of laser shock processing of AMG6 alloy
S.I. Kuznetsov, S.I. Yaresko, A.S. Panin, E.Yu. Tarasova, I.A. Bakulin; Samara Branch of P.N. Lebedev Physical Institute of RAS, Russia
The effect of laser shock processing without coating (LSPwC) using low–energy pulses (0.3 - 0.4 J) on the structure and stress state of deformable aluminum alloy AMg6, with a different crystallographic texture and a thickness of 4 – 14 mm before and after heat treatment, is considered. The effectiveness of LSPwC to create residual compressive stresses in an alloy to a depth greater than 2 mm, with a maximum surface stress of –300 MPa, is shown.

TuR12-03
Tuesday, June 23, 2026; 12:00-12:15
Application of selective picosecond laser etching with circular polarization for precision 3D processing of quartz glass
S.S. Lyubin[1,2], M.A. Murzakov[1], I.I. Ryashko[1]; [1]LLC "VPG Laserone", [2]National Research Nuclear University MEPhI (Moscow Engineering Physics Institute), Russia
This study demonstrates the application of Selective Laser Etching (SLE) for high-precision machining of fused silica using a picosecond laser (15 ps pulse duration, 400 kHz). The use of circularly polarized radiation is emphasized to mitigate anisotropic scattering effects during internal modification. Optimal processing parameters were established, enabling the fabrication of complex 2D contours, such as micro-gears, with a cut taper angle less than 1°. The results confirm SLE as a potent tool for manufacturing micro-optical and microfluidic components.

TuR12-04
Tuesday, June 23, 2026; 12:15-12:30
Neural network fusion of Rayleigh and Raman reflectometry for enhanced distributed temperature sensing
N.V. Nikitin[1,2], Z. D. Evsiukhin[1,2], D.R. Kharasov[1], D.M. Bengalskii[1], V.N. Treshchikov[1]; [1]T8 Company Group, [2]MEPhI National Nuclear Research Univ., Russia
Enhanced accuracy and saving of spatial resolution for distributed temperature sensing are demonstrated by employing a reccurent neural network to combine the readings from Raman and Rayleigh phase-sensitive reflectometers. The proposed data fusion method effectively compensates for the inherent limitations of each individual sensing technique, as validated by experimental results.

TuR12-05
Tuesday, June 23, 2026; 12:30-12:45
Laser drilling of micro holes in transparent media under three different conditions
V.N. Ivanov[1,2], M. Salhab[2], S.A. Chemchem[2], A.V. Vasilieva[2]; [1]JSC RPC S.I. Vavilov State Optical Institute, [2]St.Petersburg Electrotechnical Univerity "LETI", Russia
This study compares nanosecond laser drilling of glass, focusing on the effect of an absorbing coolant on drilling quality under dry, top-surface, and bottom-surface cooling conditions. The results indicate that localized top-surface cooling provides superior thermal management, reducing heat-affected zones, cracking and debris while improving hole geometry. These findings demonstrate the effectiveness of controlled cooling strategies for enhancing precision and surface integrity in laser drilling of transparent materials.

TuR12-06
Tuesday, June 23, 2026; 12:45-13:00
Modern high-powerlaser sources and scanning systems for additive technologies
M. Lukyantsev; JSC "LLS", Russia
This work presents recent advancements in high-power blue (450 nm) and green (535 nm) fiber-coupled laser sources (BWT and analogs; Gongda Laser, VPG "Lazeruan") and Scanner Optics scanners for additive manufacturing. Advantages in processing metals and polymers, industrial 3D printing applications, and prospects for hybrid technologies integration are highlighted.

TuR12-07
Tuesday, June 23, 2026; 13:00-13:15
High power lasers in additive manufacturing
K.D. Babkin; Institute of Laser and Welding Technologies, State Marine Technical University, SMTU, Russia
This study describes improvement in laser metal deposition additive technology through usage of high power fiber lasers. It is shown, that productivity of manufacturing process can be raised up in 5-10 times in comparison to traditional 2-3 kW laser machines. Higher power brings bigger melt pool size, higher powder utilization rate and through this significant reduction of manufacturing cost.

TuR12-08
Tuesday, June 23, 2026; 13:15-13:30
Advanced materials for laser based - direct energy eeposition technology
O.G. Klimova-Korsmik; Institute of Laser and Welding Technologies, State Marine Technical University, SMTU, Russia
This The study explores Laser-based Direct Energy Deposition (LB-DED) for producing advanced materials like basic alloys, metal-matrix composites (MMC), functionally-graded materials (FGM), and high-entropy alloys (HEA). LB-DED allows precise control over composition and properties. MMCs gain strength and heat resistance from carbide phases. FGMs combine multiple properties (e.g., corrosion resistance, strength) via layer-by-layer composition changes.

TuR12-09
Tuesday, June 23, 2026; 13:30-13:45
Powder jet optimization in direct laser deposition: effect of carrier gas flow rate, lateral wire feed and nozzle position on a thin wall
M. Khomenko, D. Ronzhin, P. Rodin, M. Bannikov, I. Buzhin, A. Dubrov; NRC "Kurchatov Institute", Russia

Section SYP. Symposium on Biophotonics - Plenary

MoSYP-01
Monday, June 22, 2026; 14:15-15:00
Phototheranostics in the treatment of high-energy exposure wounds *(Plenary)*
I.V. Reshetov[1], T.N. Pisareva[1], M.P. Ivankov[2], N.A. Kalyagina[3,4], K.T. Efendiev[3,4], A.M. Udineev[4], D.V. Yakovlev[3,5], A.V. Meshkov[2], V.B. Loshenov[3,4], A.A Shiryaev[1]; [1]Sechenov First Moscow State Medical University, Department of Oncology, Radiotherapy and Reconstructive Surgery, University Clinical Hospital No.[1], [2]Federal State Budgetary Institution 'A.A. Vishnevsky National Medical Research Centre for Military Medicine', Ministry of Defence of Russia, [3]Prokhorov General Physics Institute of RAS, [4]National Research Nuclear University "MEPhI", [5]Shemyakin-Ovchinnikov Institute of Bioorganic Chemistry, RAS, Russia
We propose a method to address the problem of inactivating antibiotic-resistant microflora using a technology based on fluorescence diagnostics and photodynamic therapy (PDT). This study investigated the influence of irradiation parameters and the method of photosensitizer application on the photodynamic inactivation (PDI) of the microflora on the wound surface.

MoSYP-02
Monday, June 22, 2026; 15:00-15:45
Optical quantum sensors in biology and medicine *(Plenary)*
Alexander Sergeev[1], Andrey Naumov[2]; [1]National Center for Physics and Mathematics (NCPM), [2]Lebedev Physical Institute RAS, Russia

MoSYP-03
Monday, June 22, 2026; 15:45-16:30
Optical imaging in regenerative medicine *(Plenary)*
E.V. Zagaynova[1,2], A.V. Meleshina[2], D.S. Kuznetsova[2], S.A. Rodimova[2], A.S.Kashirina[2], P.S. Ermakova[2] , V.I. Shceslavskiy[2,4], G. Gelikonov[5]; [1]Lopukhin Federal Research and Clinical Center of Physical-Chemical Medicine, [2]Institute of Biomedical Technologies, Privolzhskiy Medical Research University, [3]Nizhny Novgorod Regional Clinical Oncological Dispanceyr, Russia; [4]Becker and Hickl GmbH, Germany; [5]A.V. Gaponov-Grekhov Institute of Applied Physics of RAS, Russia
Regenerative medicine includes the creation of tissue-engineered constructs, stimulation of organ regeneration, the production of cellular products from iPSCs, and CRISPR technologies. Using optical imaging, we sorted differentiated cells from MSCs, verified the structure of the transplanted tissue equivalent, identified Langerhans islets suitable for transplantation, and formulated optical criteria for effective liver regeneration for intraoperative assessment.

Section SYA. Section A. Advanced laser medical systems and technologies

TuSYA-01
Tuesday, June 23, 2026; 09:00-09:30
Optimization of methods for processing venous bed images obtained using visible and infrared radiation sources *(Invited)*
K.V. Prosvirin, P.A. Ryabochkina, M.V. Gerasimov; Department of Photonics, National Research Ogarev Mordovia State University, Russia
We propose a dual-spectral pipeline for venous bed visualization combining visible (VIS) and near-infrared (NIR) images captured by two cameras with a shared lens and dichroic beam splitter, providing pixel-level alignment. Processing has two stages: dual-spectral combination with local contrast enhancement, then vessel segmentation using multi-scale Frangi filtering. Experiments on manually annotated images show improved segmentation quality over a single-channel NIR baseline.

TuSYA-02
Tuesday, June 23, 2026; 09:30-10:00
Laser-activated irrigation of infected acute and chronic wounds *(Invited)*
I.A. Abushkin[1], V.M. Chudnovsky[2], M.A. Guzev[3], A.E. Anchugova[4], A.M. Plantus[5]; [1]Center for Medical Laser Technologies, [2]Pacific Oceanological Institute in V.I. Ilyichev, [3]Institute of Applied Mathematics, [4]Chelyabinsk State University, [5]North-West District Scientific Clinical Center in L.G. Sokolov, Russia
It is shown that during laser cavitation at the end of the optical fiber located in the tube, when the end of the fiber and the tube are near the bottom of the cuvette with water, a suction effect occurs. The use of the identified effect in medicine helps to effectively treat acute and chronic infected wounds.

TuSYA-03
Tuesday, June 23, 2026; 10:00-10:30
The effect of LED liver therapy on the clinical and biochemical characteristics of drug induced toxic hepatitis in tuberculosis patients *(Invited)*
S. D. Nikonov[1,2,4], A. P. Mayorov[3], L. G. Daudova[1], N. F. Davidovich [2], D. A. Bredikhin[1], T. S. Geleskul[2], N. V Miller[2]; [1]Novosibirsk State University, [2]Novosibirsk Regional Clinical Tuberculosis Hospital, [3]Institute of Laser Physics, SB RAS, [4]Novosibirsk TB Research Institute of the Ministry of Health of the Russian Federation, Russia
With a reported efficacy of only 54 % in TB chemotherapy (WHO, 2018), treatment outcomes are significantly limited by toxicityof anti-tuberculosis drugs. The development of toxic hepatitis (TH) as a consequence ofmedication necessitates chemotherapy (CT) cessation and transition to hepatotropic therapy, consequently increasing hospital length of stay and reducing overall treatment success. LED therapies for TH currently lack pathogenetic validation.

TuSYA-04
Tuesday, June 23, 2026; 10:30-10:45
Temperature control during laser lithotripsy: thermochromic fiber for thulium fiber laser
D.E. Lesnykh[1], O.I. Baytsaeva[1], V.V. Zefirov[2], M.G. Mukhin[1], E.A. Shirshin[2], V.A. Andreeva[1]; [1]VPG Laserone, [2]Lomonosov Moscow State University, Russia
High-power laser lithotripsy carries a risk of overheating the irrigation fluid and surrounding tissue. A thermochromic fiber has been developed for the thulium fiber laser (TFL) to provide real-time visual temperature feedback. This in vitro study characterized its response, demonstrating a distinct color transition at a specific irrigation fluid temperature.

TuSYA-05
Tuesday, June 23, 2026; 10:45-11:00
Comprehensive evaluation of a 3050-nm fiber laser for ablative fractional resurfacing in dermatology
V. Arkhipova[1], A. Mimov[2], V. Smolyannikova[3], I. Konstantinova[4], I. Larionov[1], V. Andreeva[1]; [1]VPG LaserONE, [2]TORI Clinic, [3]Sechenov University, [4]RUDN University, Russia
In presented study, we evaluated a novel laser emitting at a wavelength of 3050 nm. We analysed its effect on skin ablation and regeneration. Our data show that this system has a strong tissue regenerative effect and a great potential for use in dermatology.

TuSYA-06
Tuesday, June 23, 2026; 11:30-12:00
The automatic optical tissue recognition function in a super-pulsed thulium fiber laser: clinical application *(Invited)*
O.I. Baytsaeva[1], P.A. Ibragimova[1], D.E. Lesnykh[1], A.G. Martov[2,3], V.A. Andreeva[1]; [1]Department of Laser Technologies in Medicine, VPG LaserONE, [2]Urological Center, the Central Clinical Hospital of Civil Aviation, [3]Department of Urology and Andrology, IPPE of A.I. Burnazyan SSC FMBC, FMBA of Russia, Russia
This study evaluated the Tissue Sensor (TS), an automatic optical tissue recognition system in a super-pulsed thulium fiber laser (SP TFL), during lithotripsy in 60 patients. The TS actively prevented off-target radiation, significantly reducing thermal mucosal injuries without high-grade complications. Most procedures reported no significant impact on operative duration, demonstrating improved safety without compromising efficiency.

TuSYA-07
Tuesday, June 23, 2026; 12:00-12:30
Laser beam characteristics for optimization of stereotactic interstitial hyperthermia of cerebral gliomas *(Invited)*
O.V. Ostreiko; Pavlov University, Russia
The characteristics of laser radiation optimal for minimally invasive laser hyperthermia of cerebral gliomas (LITT) are presented. The results are based on scientific research conducted at Pavlov University. An original LITT technique based on zonal coagulation of intracerebral tumors has been developed. The technique has been clinically tested by the Ministry of Health. It is used at Pavlov University. The experience of more than 70 operations demonstrates the good effectiveness and safety of the developed LITT method.

TuSYA-08
Tuesday, June 23, 2026; 12:30-12:45
A fluorescent dye -based temperature sensor for intraoperative liquid temperature monitoring
H. Afraa[1], N.V. Korneva[1], I.R. Andrievskiy[1], S.O. Shiriaev[2], D.A. Davydov[1], G.S. Budylin[2], E.A. Shirshin[1]; [1]Department of Quantum Electronics, Faculty of Physics, Lomonosov Moscow State University, [2]Biomedical Science and Technology Park, Laboratory of Clinical Biophotonics, First Moscow State Medical University, Russia
Real-time temperature monitoring is crucial during endoscopic laser lithotripsy to prevent urothelial damage. We present an all-optical Methylene Blue-based thermal sensor enabling fiber-optic measurements in saline solution. Temperature-dependent dye optical properties allow simple, biocompatible, and real-time monitoring, providing a practical solution for intraoperative control in minimally invasive urinary tract procedures.

TuSYA-09
Tuesday, June 23, 2026; 12:45-13:00
ML -based prediction model of laser ablation morphology in biological tissues
G.A. Filokhin[1,2], N.V. Kovalenko[1,2]; [1]MIPT, [2]Fryazino branch of the Kotelnikov IRE of RAS, Russia
A predictive model for the morphology of laser ablation columns in biological tissues has been built using machine learning methods. A laboratory setup was developed to collect data in phantoms (40 g/l gelatin gel) using a thulium laser (wavelength 1942 nm) for various pulse powers (2.5--5.0 W) and durations (0.1--0.3 ms). The model demonstrated prediction errors of 14\% for depth and 8\% for diameter.

TuSYA-10
Tuesday, June 23, 2026; 13:00-13:15
Development of a spectral optical coherence tomography system enhanced with AI algorithms
A.M.Tarasov, E.A.Chudakov, L.V.Chernov, I.I.Gogin, M.P.Kalinin, L.U.Sheremeto, D.A.Tinyakov, A.S.Matveenko, M.A.Klychnikov, D.S.Ponomarenko. [1]Russian federal nuclear center all-russian research institute of experimental physics, Sarov, Russia
A model of a spectral OCT device for ophthalmology is presented. The model includes an optical layout and a digital processing unit with AI algorithms for real-time retinal analysis. The development aims at creating a compact device with improved diagnostic accuracy and automated data interpretation

TuSYA-11
Tuesday, June 23, 2026; 13:15-13:30
New approaches to optical temperature measurement in endovenous laser coagulation
O.V. Pykhtina[1], V.A. Arkhipova[1], N.R. Rovnyagina[2], G.S. Budylin[2], V.V. Zefirov[3], E.A. Shirshin[3], V.A. Andreeva[1]; [1]VPG LaserOne, [2]Sechenov First Moscow State Medical University, [3]Lomonosov Moscow State University, Russia
This study presents a fiber-optic instrument with a temperature-sensitive coating designed to monitor the temperature in the area of laser exposure during endovenous laser coagulation. We demonstrated localized heating measurement in the fiber area and temperature extrapolation to the vein wall, a capability which will enable adjustment of radiation parameters for controlled thermal exposure during clinical application.

TuSYA-12
Tuesday, June 23, 2026; 15:00-15:30
Laser photodestruction for the treatment of pyogenic granuloma in children *(Invited)*
E.N. Gasanova, A.V. Bryantsev, A. G. Dorofeev, O.O. Sarukhanyan; Clinical and Research Institute of Emergency Pediatric Surgery and Trauma - Dr. Roshal's Clinic (CRIEPST), Russia
Novel method of combined laser photodestruction using 0.97 μm wavelength radiation for the radical treatment of pyogenic granuloma in pediatric patients.

TuSYA-13
Tuesday, June 23, 2026; 15:30-16:00
All-optical detection of temperature and distance to fiber in laser surgery *(Invited)*
G. Budylin[1], S. Shiriaev[1], D. Fain[2], V. Andreeva[2], V. Panov[2], E. Shirshin[2]; [1]Laboratory of Clinical Biophotonics, Sechenov First Moscow State Medical University, [2]Faculty of Physics, M.V. Lomonosov Moscow State University, Russia
We report first experiments on a compact single-fiber near-infrared diffuse reflectance approach for intraoperative feedback in laser lithotripsy. Water absorption features in the irrigated field are leveraged to provide qualitative estimates of fiber-to-target proximity and local temperature trends using the same fiber for delivery and collection. Preliminary tests support feasibility for real-time guidance and safety monitoring.

TuSYA-14
Tuesday, June 23, 2026; 16:00-16:30
Real-time stone composition detection with an AI-based laser-integrated lithotripsy vision system *(Invited)*
P. Ibragimova[1], O. Baytsaeva[1], I. Golubev[1], D. Lesnykh[1], T. Khramov[1], A. Martov[2,3,4], V. Andreeva[1]; [1]VPG LaserONE, [2]Urological Center of the Central Clinical Hospital of Civil Aviation, [3]Department of Urology and Andrology, IPPE of A.I. Burnazyan SSC FMBC, FMBA of Russia, [4]Medical Research and Education Institute, M.V. Lomonosov Moscow State University, Russia
In this study we developed a deep-learning computer-vision model embedded in the Urolase Vision System to detect and classify urinary stones from intraoperative endoscopic video in real time, supporting thulium fiber laser (TFL) parameter selection. Trained and tested on clinically sourced videos with lab-confirmed fragments, the model achieved mAP50 ≈ 87.5% across urate, COM, COD, and phosphate stones.

TuSYA-15
Tuesday, June 23, 2026; 16:30-16:45
Are visible femtosecond laser pulses safe for trophectoderm biopsy of mammalian embryo?
D.S. Sitnikov[1], M.A. Filatov[2], V.S. Agentova[1], M.V. Kubekina[2], Y.Y. Silaeva[3]; [1]Joint Institute for High Temperatures of RAS, [2]Center for Precision Genome Editing and Genetic Technologies for Biomedicine, IGB RAS, [3]Core Facility Centre, IGB RAS, Russia
Femtosecond laser pulses (514 nm, 280 fs, 16 TW/cm2) are used for trophectoderm biopsy of mouse embryos at a blastocyst stage for the first time. Expression of heat shock proteins (HSPs) and reactive oxygen species (ROS) are used as markers for induced biological effects. Biopsy procedure did not increase ROS level. However, some increase in HSP caused by laser exposure is observed.

TuSYA-16
Tuesday, June 23, 2026; 16:45-17:00
Differentiation of biliary tract tissue and stones based on DRS spectroscopy in laser lithotripsy
E.S. Ermilova[1,2], O.I. Baytsaeva[2], M.V. Murashkina[3], N.R. Rovnyagina[4], E.A. Shirshin[5], V.A. Andreeva[2]; [1]National Research Nuclear University MEPhI, [2]Department of Laser Technologies in Medicine, VPG LaserONE, [3]City Clinical Hospital No.31 named after Academician G.M. Savelyeva, [4]Sechenov First Moscow State Medical University, [5]M.V. Lomonosov Moscow State University, Russia
Study adapted Tissue Sensor algorithm from urology TFL lithotripsy for safe bile duct procedures to prevent wall perforation. DRS spectra from 25 clinical cases analyzed: tissue shows hemoglobin absorption peaks, stones exhibit smooth monotonic decay. Achieved 100% differentiation accuracy via spectral ratio analysis. System automatically terminates laser emission upon soft tissue detection ahead of fiber.

TuSYA-17
Tuesday, June 23, 2026; 17:00-17:15
Exploring ring gas laser for biomedical research
I.A. Smetanin, A.O. Sinelnikov, E.A. Smetanin, A.A. Kuznetsova; RUDN University, Russia
Ring laser gyroscopes (RLG) with vibration suspension show promise for cardioseismic diagnostics. This study assessed their feasibility for detecting cardiac mechanical activity. An experimental setup evaluated RLG sensitivity to external disturbances with cardiographic spectra. Results confirm the RLG effectively registers cardiac signals, supporting its practicality for non-invasive cardiovascular monitoring.

WeSYA-18
Wednesday, June 24, 2026; 09:00-09:30
Improvement of advanced laser systems for monitoring diabetes mellitus complications using tissue optical clearing *(Invited)*
V.V. Tuchin[1,2,3], D. Li[4,5], Dan Zhu[4], E.A. Genina[1], P.A. Timoshina[1], D.K. Tuchina[1], I.Yu. Yanina[1], S. Liu[4], J. Huang[4], Yu.I. Surkov[1], I.A. Serebryakova[1], K.V. Berezin[1]; [1]Saratov State Univ., [2]Tomsk State Univ., [3]FRC "Saratov Scientific Centre of the RAS", Russia, [4]Huazhong Univ. of Science and Technology, China
The potential of using tissue optical clearing (TOC) technology for effective disease diagnostics by increasing the sensitivity and resolution of advanced laser medical systems is discussed for monitoring diabetes mellitus complications. A wide range of laser methods and devices successfully operating under TOC conditions, including optical coherence tomography (OCT), laser speckle-contrast imaging, multiphoton microscopy, Raman and fluorescence microscopies, are presented.

WeSYA-19
Wednesday, June 24, 2026; 09:30-10:00
Laser photodestruction for the treatment of ganglion cyst in children *(Invited)*
M.A. Dvornikova, A.V. Bryansev, E.N. Gasanova, R.T. Nalbandyan; Scientific and Research Institute of Emergency Pediatric Surgery and Trauma - Dr. Roshal's Clinic, Russia
A ganglion cyst is the most common benign soft tissue tumor of the hand in children, most frequently located on the dorsal aspect. These lesions can cause pain, paresthesia, and limited joint function, significantly reducing the quality of life. Current conservative and surgical treatments are associated with high recurrence rates (up to 80% and 50%, respectively). Therefore, the search for new, more effective surgical approaches remains a relevant clinical task in pediatric surgery.

WeSYA-20
Wednesday, June 24, 2026; 10:00-10:30
Solid-state nanosecond laser source for surgery with minimal collateral thermal damage *(Invited)*
M.K Tarabrin, D.A. Nazarov, E.A. Kozlova, D.T. Batov; Bauman Moscow State Technical University, Russia
A laser scalpel enables the bloodless and non-contact ability to create the incisions or to perform a debulking process. Unfortunately, many commercial systems create a large overheated zone around the ablation crater, which leads to the prolonged rehabilitation time. In this work the ablation of the biological tissue with minimal collateral damage by the nanosecond laser source was performed.

WeSYA-21
Wednesday, June 24, 2026; 10:30-10:45
Method and device for hyperspectral imaging in the diagnosis of vascular hyperplasia and mesenteric blood flow disorders
V.V. Shupletsov[1], I.A. Goryunov[1], N.A. Adamenkov[1,2], A.V. Mamoshin[1,3], E.V. Potapova[1], A.V. Dunaev[1], V.V. Dremin[1,4]; [1]Orel State University, Research and Development Center of Biomedical Photonics, [2]Orel Regional Clinical Hospital, [3]The National Medical Research Center of Surgery Named After A. Vishnevsky, Russia; [4]Aston University, College of Engineering and Physical Sciences, United Kingdom
A hyperspectral imaging system for assessment of vascular hyperplasia and mesenteric blood flow disorders is developed. Diffuse reflectance–derived oxygenation maps combined with unsupervised and gradient boosting classifiers enable staging of infantile hemangiomas and identification of irreversible intestinal ischemia, demonstrating high diagnostic accuracy and intraoperative applicability.

WeSYA-22
Wednesday, June 24, 2026; 10:45-11:00
Results of treatment of congenital melanocytic nevi in children with a wavelength of 0.45 microns and a CO_2 laser with a wavelength of 10.6 microns
S.A. Podurar[1], A.V. Bryantsev[1], G.P. Kuzmin[2], A.A. Sirotkin[2], Yu.L. Kalachev[2], G.A. Varev[3], M.A. Remennikova[4]; [1]Research Institute of Emergency Pediatric Surgery and Traumatology, [2]Prokhorov General Physics Institute of RAS, [3]Russian Engineering Club LLC, [4]Perm Scientific and Production Instrument Company (PNPPK PJSC), Russia
The optimal laser radiation parameters of 0.45 microns and 10.6 microns of pulsed periodic CO_2 laser for removal of congenital melanocytic nevi have been experimentally and clinically determined.

TuSYA-p01
Tuesday, June 23, 2026; 15:00-18:30
Speckle correlation analysis approach with acoustic probing for the diagnostic of the morphology of the multi-phase foam -like systems *(Poster)*
E.A. Isaeva, A.A. Isaeva, D.A. Zimnyakov; Yury Gagarin State Technical University of Saratov, Russia
The methods for the analyzing the structural and functional properties of foam-like media play an important role in the development of the methods for synthesizing tissue engineered structures or monitoring the degradation processes of 3D scaffolds. This paper presents the results of a study of a laser field scattered by the model gas-liquid foam under the lowfrequency acoustically probing using speckle correlometry technique.

TuSYA-p02
Tuesday, June 23, 2026; 15:00-18:30
The light transport modeling during the foam-like media aging *(Poster)*
E.A. Isaeva, A.A. Isaeva, D.A. Zimnyakov; Yuri Gagarin State Technical University of Saratov, Russia
This paper presents the results of radiation transfer modeling based on the Percus–Yevick hard-sphere model, which reproduces the morphology of gas-liquid foam during the initial stages of a foam-like medium aging and statistical modeling of radiation transfer in foam-like media simulated using a system of Kelvin cells at various stages of aging. Additionally, modeling of radiation transfer processes in a foam-like medium with a polydisperse structure was performed.

TuSYA-p03
Tuesday, June 23, 2026; 15:00-18:30
Improving human sperm motility using infrared low-level laser irradiation *(Poster)*
D.S. Sitnikov[1], I.M. Shorina[1], N.P. Makarova[2]; [1]Joint Institute for High Temperatures of RAS, [2]"National Medical Research Center for Obstetrics, Gynecology and Perinatology" MoH, Russia
Infrared (780 nm) low-level laser radiation was used for photobiostimulation as a means of therapy for male infertility. We studied the motility of human sperm after exposure to radiation with at an intensity of 140 MW/cm2 for two minutes. An increase in sperm kinetics was detected compared to control group.

TuSYA-p04
Tuesday, June 23, 2026; 15:00-18:30
Influence of UV laser treatment on the wettability of metallic materials for biomedical applications *(Poster)*
M.Yu. Kandaurova, T.Yu. Sablina, I.A. Zyatikov, Yu.N. Panchenko; Institute of High Current Electronics, SB RAS, Russia
The effect of UV laser treatment ($\lambda = 266$ nm) on the wettability, phase and chemical composition of TiNi alloy and AISI 316L stainless steel was studied.

TuSYA-p05
Tuesday, June 23, 2026; 15:00-18:30
Notched fibers as a sensing element of infrared fiber probes *(Poster)*
I.V. Yuzhakov, P.V. Pestereva, A.A. Yuzhakova, E.N. Malyshkina, A.E. Lvov, L.V. Zhukova; Ural Federal University, Russia
The notched fiber is made of ceramic with a composition of 42 mol. % AgBr0.7I0.3 in AgCl. It transmits radiation in the range of 3.5–15.0 μm with a loss of up to 1.8 dB/m. This fiber is a promising sensor element for fiber-optic probes.

TuSYA-p06
Tuesday, June 23, 2026; 15:00-18:30
Histophysiological study of the striated muscle tissue after exposure to 2 μm continuous-wave laser radiation *(Poster)*
V.V. Astashov[1], M.S. Kopyeva[1,2], S.A. Filatova[2], V.A. Kamynin[2], V.I. Kozlov[1], V.A. Duvanskiy[1]; [1]Peoples' Friendship University of Russia, RUDN University, [2]Prokhorov General Physics Institute of RAS, Russia
A histophysiological study of the striated muscle tissue of experimental animals was carried out on the 3rd day after exposure to continuous-wave laser radiation of a Holmium fiber laser with different exposure times. Using histological and functional research methods, morphological changes characteristic of aseptic inflammation were identified, depending on the radiation dose.

TuSYA-p07
Tuesday, June 23, 2026; 15:00-18:30
Surface modification of Ti-6Al-4V alloy by nanosecond ultraviolet laser irradiation *(Poster)*
T.Yu. Sablina, M.Yu. Kandaurova, I.A. Zyatikov, I.K. Lopatkin, Yu.N. Panchenko; Institute of High Current Electronics, SB RAS, Russia
The microstructure and surface functional characteristics of Ti-6Al-4V titanium alloy were investigated following treatment with nanosecond ultraviolet (UV) laser irradiation. UV laser treatment led to the formation of titanium oxide phases (TiO2, TiO). This resulted in enhanced nanohardness (by 25–30%), increased roughness, and a significant increase in hydrophilicity – the water contact angle decreased from 80° to 9–13°.

TuSYA-p08
Tuesday, June 23, 2026; 15:00-18:30
Laser formation of surface functional layers for use as neurointerfaces *(Poster)*
D.T. Murashko[1], M.S. Savelyev[1], A.Yu. Gerasimenko[1,2]; [1]Institute of Biomedical Systems, National Research University of Electronic Technology, [2]Institute for Bionic Technologies and Engineering, I.M. Sechenov First Moscow State Medical University, Russia
The formation of functional layers based on carbon nanomaterials contributes to an increase in the effective surface area of neurointerfaces. This study presents the results of the formation of functional layers by laser exposure to the surface of an AISI 316L steel substrate and the introduction of a layer of single-walled carbon nanotubes.

TuSYA-p09
Tuesday, June 23, 2026; 15:00-18:30
Comparative modeling of intramaterial inscription in hydrophilic and hydrophobic acrylics for intraocular lenses *(Poster)*
U.S. Averkieva[1], S.G. Sazonkin[1], I.O. Orekhov[1], K.B. Pershin[2], S.I. Kudryashov[2], N.A. Smirnov[2], P.P. Pakholchuk[2], A.V. Gorevoy[2], Yu.S. Gulina[2], E.N. Rimskaya[2], P.A. Danilov[2], A.Yu. Tsygankov[2]; [1]Bauman Moscow State Technical Univ., [2]P.N. Lebedev Physical Inst. of RAS, Russia
We investigated intramaterial inscription in hydrophilic and hydrophobic acrylics for intraocular lenses at 1.56 μm. Line and ring geometries were compared for femtosecond and picosecond pulses using fluence maps, normalized ratio, depth, and thermal buildup. Femtosecond pulses yielded narrower regions above threshold and thinner walls, whereas picosecond pulses increased depth per pass but raised thermal load, especially in hydrophilic acrylic.

TuSYA-p10
Tuesday, June 23, 2026; 15:00-18:30
The effect of fiber output end shape on the 1.54 μm laser ablation efficiency of biotisues phantoms *(Poster)*
R. Nasser , S.N. Smirnov, A.Yu. Perepelyakov, A.V. Belikov; Institute of Laser Technologies, ITMO University, Russia
This study investigates how shaping the output end of an optical fiber (flat, V, pyramid, ball) affects laser-induced cavitation bubbles and tissue ablation. Using a 1.54 μm Yb,Er:Glass laser, we show that specially shaped fibers significantly increase bubble size and ablation efficiency in gel phantoms, with the pyramid shape yielding a 5.3-fold improvement over a standard flat end.

Section SYB. Section B. Laser interaction with cells and tissues: clinical imaging and spectroscopy

TuSYB-01
Tuesday, June 23, 2026; 09:00-09:30
Autofluorescence of intrinsic chromophores in various environments: towards monitoring of redox reactions in living cells *(Invited)*
O.S. Vasyutinskii[1], A.V. Belashov[1], A.A. Zhikhoreva[1], F. Lin[2], Z. Huang[2], I.V. Semenova[1], J. Qu[2], E.A. Glazkova[1]; [1]Ioffe Institute, Russia; [2]Shenzhen University, China
The talk presents the analysis of FLIM images of intrinsic chromophores in living cells. As is known, in general, short and long decay times relate to unbound and bound chromophores, respectively. However, as shown in the talk the determination of relative concentrations of free and bound chromophores in cell compartments is not straightforward and needs additional experiments and significant theoretical analysis.

TuSYB-02
Tuesday, June 23, 2026; 09:30-10:00
Optical express-biopsy using macro-FLIM: a feasibility study in glioma and breast cancer surgery *(Invited)*
M.V. Shirmanova[1], D.A. Sachkova[1], A.A. Plekhanov[1], E.B. Kiseleva[1], D.V. Yuzhakova[1], I.D. Shchechkin[1], K.S. Yashin[1], A.Yu. Vorontsov[2], E.A. Shirshin[3], V.I. Shcheslavskiy[1]; [1]PRMU, [2]Nizhny Novgorod Region Oncology Hospital, Russia, [3]Moscow State University, Russia
Macro-FLIM (Macroscopic Fluorescence Lifetime Imaging) offers a unique opportunity to quickly obtain large field-of-view images of tissue samples based on autofluorescence. Macro-FLIM is sensitive to the biochemical differences between tumors and normal tissues, which makes it a potential tool for differentiating normal and pathological states. We demonstrate the feasibility of using macro-FLIM for the intraoperative assessment of glioma surgical margins and the identification of breast cancer metastases in sentinel lymph nodes (RSF, 25-14-00313).

TuSYB-03
Tuesday, June 23, 2026; 10:00-10:30
Fluorescent probes based on proton phototransfer for protein surface analysis *(Invited)*
E.A. Slyusareva, E. Nemtseva, D. Surzhikova; Siberian Federal University, Russia
Properties of the proteins surface differ from those of the solvent. Fluorescent probes based on intra- and intermolecular proton phototransfer exist as an equilibrium of ionic/tautomeric forms, disturbed in the near-surface regions. Difference in the spectral characteristics of these forms allows extracting useful ratiometric signals and associating them with the characteristics of the protein surface.

TuSYB-04
Tuesday, June 23, 2026; 10:30-10:45
Fluorescence-based tumor tracking and photosensitizer depth mapping for real-time dual-wavelength photodynamic therapy monitoring
A.S. Savelyev, M.Y. Kirillin, E.A. Sergeeva, A.B. Kostyuk, P.D. Agrba, I.V. Turchin; A.V. Gaponov-Grekhov Inst. of Applied Physics RAS, Russia
Noninvasive photosensitizer (PS) distribution assessment and tumor tracking improve photodynamic therapy (PDT). This study presents a software solution for real-time dual-wavelength fluorescence imaging that enables both tasks. Software validation, which included clinical post-processing and real-time phantom tests for the CSRT-based tracker and agar phantom tests for the depth estimation algorithm, demonstrated its capability for automated PS distribution and photobleaching assessment.

TuSYB-05
Tuesday, June 23, 2026; 10:45-11:00
Quantifying the sensitivity limit of ICG imaging in the presence of tissue autofluorescence
Y. Belozerov, I. Turchin; Inst. of Applied Physics RAS, Russia
This work investigates the fundamental sensitivity limit of indocyanine green fluorescence imaging in the NIR-I range. We demonstrate that tissue autofluorescence is the dominant factor constraining detection sensitivity, establishing a performance threshold for imaging systems. The study defines critical equipment requirements to optimizing contrast agent dosage and enabling autofluorescence registration in clinical applications.

TuSYB-06
Tuesday, June 23, 2026; 11:30-12:00
Multimodal optical diagnostics of microcirculatory-tissue systems: from stationary to wearable devices *(Invited)*
A.V. Dunaev[1], E.V. Zharkikh[1], Y.I. Loktionova[1], V.V. Sidorov[2], V.V. Dremin[1], E.V. Potapova[1]; [1]Research and Development Center of Biomedical Photonics, Orel State University, [2]SPE "LAZMA" Ltd, Russia
The work shows that a multimodal optical approach to the diagnosis of microcirculatory-tissue systems of the body makes it possible to identify pathological changes in the early stages of their development, classify neoplasms and predict the outcome of treatment. It is noted that such diagnostic technologies can be implemented in both stationary and wearable formats and are applicable in clinical and rehabilitation practice, as well as in space missions.

TuSYB-07
Tuesday, June 23, 2026; 12:00-12:30
Wearable laser Doppler flowmetry analyzers in monitoring microvascular responses to diverse physiological stimuli *(Invited)*
E.V. Zharkikh, Y.I. Loktionova, V.S. Yanushin, A.V. Dunaev; Research and Development Center of Biomedical Photonics, Orel State University, Russia
The paper presents the results of the study of the effect of individual physiological and environmental factors on the parameters recorded using wearable multimodal laser analyzers.

TuSYB-08
Tuesday, June 23, 2026; 12:30-13:00
Light interaction with blood vessels in biological tissue in vivo *(Invited)*
A.A. Kamshilin; Institute of Automation and Control Processes FEB RAS, Russia
This work examines the reasons why the intensity of light, after its interaction with a tissue, becomes modulated at heart rate. The question of how the observed modulation of light is related to the perfusion of biological tissue will be discussed.

TuSYB-09
Tuesday, June 23, 2026; 13:00-13:15
Imaging photoplethysmography reveals specific manifestations of systemic lupus erythematosus
N.P. Podolyan[1], M.A. Volynsky[2], O.V. Mamontov[3,4], R.V. Romashko[1], A.A. Kamshilin[1]; [1]Institute of Automation and Control Processes, FEB RAS, [2]ITMO University, [3]Almazov National Medical Research Centre, [4]Pavlov First St. Petersburg State Medical University, Russia
Imaging photoplethysmography synchronized with electrocardiography was used to diagnose systemic lupus erythematosus. It was found that patients had significant changes in the microcirculatory blood flow of the facial skin in the cheek area compared with the control. Therefore, the proposed technique can claim to be an objective instrumental criterion of the disease.

ThSYB-10
Thursday, June 25, 2026; 13:15-13:30
Systemic lupus erythematosus diagnostics based on surface-enhanced Raman scattering
L.A. Bratchenko[1,2], Y.A. Khristoforova[2], A.V. Ulyanova[3], P.A. Lebedev[3], I.A. Bratchenko[1,2]; [1]Immanuel Kant Baltic Federal Univ., [2]Samara Univ., [3]Samara State Medical Univ., Russia
An approach based on the integration of surface-enhanced Raman scattering of blood serum and multivariate analysis is presented for monitoring patients with systemic lupus erythematosus (SLE). Surface-enhanced spectra are implemented using a substrate of spherical silver particle agglomerates. The proposed approach enables spectral profiling of SLE and the identification of SLE patients with an accuracy exceeding 95%.

TuSYB-11
Tuesday, June 23, 2026; 15:00-15:30
Optical diagnostics in skin photoaging assessment and development of novel PDT protocols *(Invited)*
M. Kirillin[1], M. Shakhova[1,2], V. Fokeev[1,2], A. Saveliev[1,3], D. Kurakina[1], V. Prokopenko[1], D. Solovieva[3], K. Bylinskaya[1], V. Perekatova[1], A. Serebryakova[1,3], A. Mironycheva[1,2], I. Turchin[1], E. Sergeeva[1]; [1]A.V. Gaponov-Grekhov Institute of Applied Physics RAS, [2]Privolzhsky Research Medical University, [3]Lobachevsky State University of Nizhny Novgorod, Russia
Optical coherence tomography (OCT) and diffuse optical spectroscopy are used to detect structural features and chromophore content of skin with different photodamage level. OCT is used to evaluate clinical outcome of novel photodynamic therapy protocol for ENT diseases

TuSYB-12
Tuesday, June 23, 2026; 15:30-16:00
Optical and thermal modeling of benign retinal tumors laser treatment *(Invited)*
A.V. Belikov[1], A.A. Shamovaa[1], S.N. Smirnov[1], D.S. Polyakov[1], Yu.V. Fyodorova[1], G.D. Shandybina[1], T.G. Zakaraiya[2], E.V. Boiko[2]; [1]ITMO University, [2]S. Fyodorov Eye Microsurgery Federal State Institution, Russia
An optical-thermophysical model of the human eye with a benign retinal vascular tumor is proposed. The results of model verification and numerical optimization of laser transpupillary thermotherapy for human retinal capillary hemangioblastoma are presented and discussed.

TuSYB-13
Tuesday, June 23, 2026; 16:00-16:30
Sapphire fiber tips for laser interstitial therapy of soft tissues and natural canals *(Invited)*
I.N. Dolganova[1,2], I.A. Shikunova[1], P.V. Aleksandrova[2], A.A. Platonova[2], A.K. Zotov[2], V.N. Kurlov[1]; [1]Osipyan Institute of Solid State Physics of RAS, [2]Prokhorov General Physics Institute of RAS, Russia
In this talk, we describe and discuss various designs of sapphire fiber tips for laser medicine. Special attention is paid to thin capillary sapphire tips, manufactured by Stepanov (EFG) crystal growth concept, for interstitial laser coagulation of soft tissues and natural canals.

TuSYB-14
Tuesday, June 23, 2026; 16:30-16:45
Wearable devices in monitoring microcirculatory-tissue systems under the influence of G-loads and postural test
Y.I. Loktionova[1], E.V. Zharkikh[1], V.S. Yanushin[1], D.N. Lutsevich[2], N.V. Vlasova[2], V.V. Sidorov[3], K.S. Kireev[2], A.V. Dunaev[1]; [1]Research and Development Center of Biomedical Photonics, Orel State University, [2]State Organization "Gagarin Research and Test Cosmonaut Training Center", [3]SPE "LAZMA" Ltd, Russia
This study focuses on monitoring blood microcirculation and oxidative metabolism parameters of skin under the influence of simulated spaceflight factors on professional cosmonauts using a distributed system of portable multimodal analyzers.

TuSYB-15
Tuesday, June 23, 2026; 16:45-17:00
Breath-holding effect on cerebral blood supply and systemic arterial pressure in rats
P.M. Dolotovskaya[1], A.Y. Sokolov[2], I.A. Mizeva[3], A.A. Kamshilin[4]; [1]N.P. Bechtereva Institute of the Human Brain of the RAS, [2]Pavlov Institute of Physiology of RAS, [3]Institute of Continuous Media Mechanics, UB RAS, [4]Institute of Automation and Control Processes, FEB RAS, Russia
In the present study, we measured the dynamics of cerebral perfusion and systemic arterial pressure in rats during a breath-holding test using a contactless imaging photoplethysmography synchronized with an electrocardiogram. It was found that this technique allows us to qualitatively assess processes of cerebral blood supply regulation caused by temporary cessation of respiration.

WeSYB-16
Wednesday, June 24, 2026; 09:00-09:30
Homogeneous luminescent bionanosensors based on fractions of carbon dots *(Invited)*
K.A. Laptinskiy[1,2], A.A. Korepanova[1], A.M. Vervald[1,2], T.A. Dolenko[1,2]; [1]Physics Department, Moscow State University, [2]Skobeltsyn Institute of Nuclear Physics, Lomonosov Moscow State University, Russia
Carbon nanodots (CNDs) hold promise for biomedical diagnostics and therapeutics. However their application is hampered by the poorly understood photoluminescence mechanism. This leads to empirical particle selection, which is also heterogeneous after synthesis. In this study, CND fractions isolated by horizontal gel electrophoresis were used to visualize and analyze the intracellular environment.

WeSYB-17
Wednesday, June 24, 2026; 09:30-10:00
Oxidation-induced autofluorescence of proteins for drug storage monitoring *(Invited)*
A.A. Rubekina[1], B.P. Yakimov[1,2], E.A. Shirshin1; [1]M.V. Lomonosov Moscow State Univ., [2]Sechenov University, Russia
Deep blue autofluorescence (dbAF) emerges in proteins as a result of oxidative modifications and reflects their structural degradation. Here, we demonstrate that dbAF intensity increases under thermal and irradiation stress and correlates with non-optical indicators of protein instability. These results suggest that dbAF can serve as a rapid, non-invasive optical marker for monitoring the stability and quality of monoclonal antibodies during storage.

WeSYB-18
Wednesday, June 24, 2026; 10:00-10:30
NIR autofluorescence for prostate cancer diagnostics *(Invited)*
B.P. Yakimov[1,2], N.V.Danilova[3], V.S. Andreev[4], P.V. Morozov[4], V.I. Scheslavsky[5], P.G. Malkov[3], I.V. Turchin[6], L.S. Urusova[7], E.A. Shirshin[1,2,3]; [1]Physics Department, Lomonosov Moscow State University, [2]Laboratory of Clinical Biophotonics, Biomedical Science and Technology Park, Sechenov University, [3]Medical Research and Educational Institute, Lomonosov Moscow State University, [4]Physics Department, Moscow Pedagogical State University, [5]Privolzhky Research Medical University, [6]Department for Radiophysical Methods in Medicine, Institute of Applied Physics of RAS, [7]Endocrinology Research Center, Russia
Near-infrared autofluorescence (NIRAF), often considered background in Raman spectroscopy, encodes diagnostic information for prostate cancer. We show NIRAF intensity and lifetime distinguish benign from malignant tissue and correlate with glandular morphology, revealing its potential as an intrinsic optical contrast mechanism.

WeSYB-19
Wednesday, June 24, 2026; 10:30-10:45
Advanced monitoring of intracellular compartmets by label-free fluorescence lifetime imaging
I.A. Gorbunova[1], E.E. Nikonova[1], A. M. Mozerov[1], D. S. Kuznetsova1, V.I. Shcheslavskiy[3], M.V. Shirmanova[1], E.A.Shirshin[1,2], P.S.Timashev[1]; [1]Insitute for Regenerative Medicine, Sechenov First Moscow State Medical University, [2]Faculty of Physics, M.V. Lomonosov Moscow State University, [3]Institute of Experimental Oncology and Biomedical Technologies, Privolzhsky Research Medical University, Russia
In this work, we present advanced approaches for monitoring cellular metabolism in distinct intracellular compartments. We demonstrate that ultrafast FLIM detection significantly enhances molecular specificity by resolving multiple free NADH lifetimes and the short picosecond lifetime of FAD, enabling more accurate redox ratio determination. Analysis of endogenous nuclear fluorescence reveals distinct metabolic subpopulations in chemotherapy-treated cells, highlighting metabolic heterogeneity.

WeSYB-20
Wednesday, June 24, 2026; 10:45-11:00
Pituitary near-infrared autofliorescence as the basis of optical intraoperative navigation in neurosurgery
V.M. Alibaeva[1], G.S. Budylin[2], N.V. Korneva[1,3], A. Y. Grigoriev[4], G. Y. Starkov[4], A.M. Lapshina[3], L.S. Urusova[3], E.A. Shirshin[1,3]; [1]Faculty of physics, Lomonosov Moscow State University, [2]Laboratory of Clinical Biophotonics, Sechenov First Moscow State Medical University, [3]Laboratory of Endocrine Biophotonics, Endocrinology Research Center, [4]Neurosurgical department, Endocrinology Research Center, Russia
We evaluate label-free near-infrared autofluorescence for intraoperative differentiation in endoscopic endonasal pituitary surgery. In 27 operations, a fiber probe quantified autofluorescence near 805 nm. Pituitary tissue generally showed higher signal than PitNET and surrounding tissues, with step-like transitions during continuous probe movement. Ex vivo confocal spectral imaging links the contrast to secretory granule rich microdomains with extended long-wavelength emission.

WeSYB-21
Wednesday, June 24, 2026; 11:30-12:00
Fluorescence guidance in endocrine surgery: beyond parathyroid detection - a multimodal biophotonics approach *(Invited)*
E.A. Shirshin; M.V. Lomonosov Moscow State University, Russia
We assess the origin of unique optical properties of endocrine organs and suggest multimodal techniques for optical guidance in endocrine surgery

WeSYB-22
Wednesday, June 24, 2026; 12:00-12:30
The role of conformational dynamics of protein globules in the photophysical properties of colored fluorescent proteins *(Invited)*
M. Khrenova, A. Gavshina, N. Marynich, I. Soloviev, S. Kasatkina, G. Demina, M. Shleeva, A. Savitsky; FRC Biotechnology of RAS, Russia
Fluorescence as a phenomenon is characterized by a spectrum of temporal events ranging from femtoseconds to milliseconds. Similarly, thermal motions are possible in proteins in this same range. Colored fluorescent proteins are a striking example of visualizing this entire time range as changes in the physical parameters of fluorescence, as they are complex and highly informative chromophore-protein structures

WeSYB-23
Wednesday, June 24, 2026; 12:30-12:45
UV¯induced skin autofluorescence spectroscopy for in vivo diagnosis of metabolic and neurodegenerative diseases
S.V. Belenkaya[1,2], V.V. Salmin[2,3], N.P. Bainaev-Mangilev[4], E.O. Ivanova[1], M.V. Ershova[1], A.B. Salmina[1], S.N. Illarioshkin[1]; [1]Russian Center of Neurology and Neurosciences, [2]National Research Nuclear University MEPhI, [3]Bauman Moscow State Technical University, [4]National Research University MIPT, Russia
Characteristic patterns of skin autofluorescence were identified in persons with Parkinson's disease, diabetes mellitus, in the control and comorbid groups. The observed spectral profiles reflect alterations in endogenous fluorophores associated with affected metabolic pathways rather than isolated biochemical markers. Statistical analysis confirmed that these spectral features enable detection of pathology and provide a basis for noninvasive assessment of disease severity.

WeSYB-24
Wednesday, June 24, 2026; 12:45-13:00
Characterization of skin morphological layers by mapping the optical scattering coefficient and speckle-contrast parameter for optical coherence tomography scans *(Invited)*
A.A. Sovetsky[1], K.S. Petrova[2], M.A. Brueva[1,2], M.G. Ryabkov[3], A.L. Matveyev[1], L.A. Matveev[1], V.Y. Zaitsev[1]; [1]A.V. Gaponov-Grekhov Institute of Applied Physics of RAS, [2]N.I. Lobachevsky State University of Nizhny Novgorod, [3]N.A. Semashko Clinic of Nizhny Novgorod Region, Russia
In vivo segmentation of upper skin-tissue layers is of high biomedical importance. In this regard, OCT offers exceptionally promising prospects. We demonstrate that by analyzing optical scattering and speckle-contrast parameters for OCT data, the junctions of stratum corneum, living-cell epidermis and dermis beneath can clearly be found, even when experts may hardly discern these layers in initial structural OCT scans.

WeSYB-25
Wednesday, June 24, 2026; 13:00-13:15
Terahertz-wave scattering in absorption medium: spherical and cylindrical scatterers
A.S. Kucheryavenko[1], I.N. Dolganova[1], N.V. Chernomyrdin[2], K.I. Zaytsev[2]; [1]Institute of Solid State Physics of RAS, [2]Prokhorov General Physics Institute of RAS, Russia
Terahertz (THz) technology finds many applications in medical diagnostics, where the effective medium theory (EMT) is commonly used to describe wave-tissue interaction. To study the limits of EMT applicability, we developed two phantom types: spherical scatterers or ordered cylindrical structure, surrounded by absorption medium. Using THz time-domain spectroscopy and Lorenz-Mie theory analysis, we demonstrate that EMT remains applicable for a broad range of scatterers' dimentions and volume fractions.

WeSYB-26
Wednesday, June 24, 2026; 15:00-15:30
High-resolution terahertz microscopy and endoscopy of biological tissues *(Invited)*
V.A. Zhelnov[1], D.R. Il'enkova[1,2], D.D. Rybnikov[1,2], G.M. Katyba[1,3], V.N. Kurlov[3], K.I. Zaytsev[1], N.V. Chernomyrdin[1];[1] – Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia;[2] – Bauman Moscow State Technical University, Moscow, Russia;[3] – Osipyan Institute of Solid State Physics of the Russian Academy of Sciences, Chernogolovka, Russia
We present super-resolution terahertz (THz) solid immersion (SI) microscopy approaches including continuous-wave, pulsed and polarization-sensitive modalities. We also propose sapphire-based THz SI endoscopic system with a focal spot of 0.2λ, as well as a sapphire waveguide-assisted THz refractometry approach. Developed approaches pushing the wide application of THz technologies in biophotonics and medical diagnosis.

WeSYB-27
Wednesday, June 24, 2026; 15:30-16:00
Terahertz sensors for biomarker detection *(Invited)*
O.P. Cherkasova[1,2,3], N.A. Nikolaev[1,3]; [1]Laboratory of Terahertz Photonics, Institute of Automation and Electrometry SB RAS, [2]National Research Centre "Kurchatov Institute", [3]Laboratory of Laser Biophysics, Institute of Laser Physics SB RAS, Russia
Terahertz sensors based on metamaterials exhibit unique sensitivity for detecting small amounts of molecular biomarkers. This work presents the basic principles of biosensing with terahertz metamaterials and provides examples of the sensors' designs for stress hormone and glioma biomarker detection.

WeSYB-28
Wednesday, June 24, 2026; 16:00-16:30
Identification of pathological changes in the urethral and bladder tissues using multi-parameter analysis of cross-polarization OCT images *(Invited)*
E.B. Kiseleva[1], O.S. Streltsova[1,2], A.A. Sovetsky[3], M.R. Novgorodskaya[1,2], A.S. Kuyarov[1,2], A.L. Potapov[1], V.V. Vlasov[2], Y.V. Korzhimanova[1], A.L. Matveyev[3], L.A. Matveyev[3], V.Y. Zaitsev[3], G.V. Gelikonov[3], N.D. Gladkova[1]; [1]Privolzhsky Research Medical Univ., [2]Nizhny Novgorod Regional Clinical Hospital named after N.A. Semashko, [3]Institute of Applied Physics of RAS, [4]Lobachevsky State Univ. of Nizhny Novgorod, Russia
Healthcare professionals require rapid and accurate interpretation of medical images, especially when the diagnosis is unclear. Multiparametric analysis of cross-polarization optical coherence tomography images of the female urethra and bladder was developed. As a result, the proposed image quantification enables elucidating the pathogenetic pathway of tissue transformation in urethral and bladder pain syndromes.

WeSYB-29
Wednesday, June 24, 2026; 16:30-17:00
Prospects of multimodal optical coherence tomography in clinical application *(Invited)*
A.A. Plekhanov[1], E.B. Kiseleva[1], E.V. Gubarkova[1], A.A. Sovetsky[2], P.A. Shilyagin[2], D.A. Vorontsov[3], S.V. Panfilov[3], V.E. Zagainov[1,3], S.I. Gazhva[1], G.O. Grechkanev[1], E.V. Grigoriev[4], M.A. Sirotkina[1], S.V. Gamayunov[3], E.V. Zagaynova[1,5], G.V. Gelikonov[2], V.Y. Zaitsev[2], N.D. Gladkova[1]; [1]Privolzhsky Research Medical University, [2]A.V. Gaponov-Grekhov Institute of Applied Physics RAS, [3]Nizhny Novgorod Regional Oncological Hospital, [4]Research Institute for Complex Issues of Cardiovascular Diseases, [5]Lopukhin Federal Research and Clinical Center of Physical-Chemical Medicine, Russia
We demonstrate the successful application of multimodal OCT to address new clinical challenges. The analysis of tissue microstructural features revealed the high diagnostic potential of cross-polarization-OCT and OCT-elastography for detecting precancerous/cancerous lesions in oral mucosa, breast, colon and endometrium. Pioneering studies of sublingual microcirculation demonstrated the efficacy of OCT-angiography in monitoring patients during surgery and in postoperative intensive care phase.

WeSYB-30
Wednesday, June 24, 2026; 17:30-18:00
Cardiovascular risk stratification based on Raman spectroscopy of blood serum: an alternative to MSCT of coronary arteries *(Invited)*
I.A. Bratchenko[1,2], I.A. Pimenova[2], P.A. Lebedev[3], M.A. Skuratova[4], L.A. Bratchenko[1,2]; [1]Scientific and Educational Center "Fundamental and Applied Photonics. Nanophotonics", Immanuel Kant Baltic Federal University, [2]Laser and Biotech Dept. Samara National Research University, [3]Therapy Dept. Samara State Medical University, [4]Samara Regional Clinical Hospital named after V.D. Seredavin, Russia
The study compared SERS data from blood serum analysis with MSCT data from human vascular studies. Using MSCT data as a standard, predictive models for the development of cardiovascular diseases were constructed based on optical biopsy data. These models demonstrated high accuracy (90% and higher) in identifying non-communicable diseases based solely on serum analysis. The proposed method demonstrates significant potential as an alternative to expensive MSCT imaging.

WeSYB-31
Wednesday, June 24, 2026; 18:00-18:30
Discovery of a water skin layer using spontaneous Raman and stimulated Brillouin spectroscopies *(Invited)*
S.M. Pershin[1], D.G. Artemova[1], M.Ya. Grishin[1], P.S. Smerchansky[2], G.A. Boldin[1], I.A. Khodasevich[3]; [1]Prokhorov General Physics Institute of RAS, [2]National Research University Higher School of Economics, Russia; [3]B.I. Stepanov Institute of Physics of the NASB, Belarus
A near-surface water layer with distinct optical and interfacial properties is detected at room temperature using Raman spectroscopy, Rayleigh scattering, stimulated Brillouin scattering (SBS), and capillary meniscus measurements. Over 3–4 hours a 1–4 mm skin layer develops, accompanied by a characteristic deformation of the OH-stretch Raman band toward the ice-related component (~3200 cm-1) and by a noticeable decrease in elastic-scattering fluctuations.

WeSYB-32
Wednesday, June 24, 2026; 18:30-19:00
Pre-breakdown Raman spectroscopy of protein solutions *(Invited)*
I.R. Eremin, A.Yu. Chikishev, N.N. Brandt; Lomonosov Moscow State University, Russia
We compare Raman spectra of aqueous solutions of protein excited at a wavelength of 532 nm with different energy parameters. Continuous radiation with varying powers and pulsed radiation with varying repetition rates, durations, and energies are used.

WeSYB-33
Wednesday, June 24, 2026; 19:00-19:15
Heterogeneity and birefringence of soft tissues probed by the polarization-sensitive terahertz solid immersion microscopy
D.R. Il'enkova[1,2], D.D. Rybnikov[1,2], A.I. Alekseeva[3], A.S. Kucheryavenko[1,4], S.O. Yurchenko[2], K.I. Zaytsev[1], N.V. Chernomyrdin[1]; [1]Prokhorov General Physics Institute of RAS, [2]Bauman Moscow State Technical University, [3]Research Institute of Human Morphology, [4]Osipyan Institute of Solid State Physics of RAS, Russia
A polarization-sensitive terahertz (THz) solid immersion (SI) microscope applied to analyze freshly-excised rat tissues (muscles, tendons, aorta, brain). Refractive index was measured for orthogonal polarizations of the incident beam. Obtained THz birefringence attributed to fibrous morphology and confirmed by histology, was most pronounced in muscle tissue and Corpus callosum of the brain. These findings are crucial for developing THz biophotonics methods.

ThSYB-34
Thursday, June 25, 2026; 09:00-09:30
Erythrocyte-endothelium interplay investigated via optical tweezers *(Invited)*
M.K. Maksimov[1], P.B. Ermolinskiy[1], O.N. Scheglovitova[2], M.R. Kapkaeva[2], A.E. Lugovtsov[1], A.V. Priezzhev[1]; [1]Faculty of Physics, Lomonosov Moscow State University, [2]The Gamaleya National Center of Epidemiology and Microbiology, Russia
The interactions between pairs of erythrocytes, between single erythrocytes and endothelium monolayer are studied in vitro via optical tweezers. RBC-endothelium system is altered by the addition of nitric oxide precursor, L-Arginine. The results acquired demonstrate the dose-dependent decrease in erythrocyte aggregation and disaggregation forces, while the erythrocyte-endothelium adhesion forces seem to be not affected by nitric oxide.

ThSYB-35
Thursday, June 25, 2026; 09:30-10:00
Optical monitoring of intrafollicular drug delivery *(Invited)*
Yu.I. Svenskaya[1], Yu.I. Surkov[1,2], M.S. Saveleva[1], P.A. Demina[1], I.A. Serebryakova[2], M.E. Lobanov[1], R.A. Anisimov[1], G.S. Terentyuk[1], E.A. Genina[2], V.V. Tuchin[1,2]; [1]Science Medical Center, Saratov State University, [2]Institute of Physics, Saratov State University, Russia
We report on a novel approach towards the glucocorticosteroid encapsulation and delivery to hair follicles. Efficient intrafollicular accumulation of the GC-loaded carriers after their US-assisted topical application in vivo in rats provided the delivery of the drug molecules to targeted receptors. Gradual degradation of the vaterite matrices inside the HF granted in situ liberation of the payload. The resulting enhancement of a local drug concentration in skin provided the lowering of the dose and frequency of its application.

ThSYB-37
Thursday, June 25, 2026; 10:00-10:15
Convolutional neural networks for differential diagnosis of maxillary sinus pathologies
E.O. Bryanskaya[1], D.V. Gerasin[1], A.V. Bakotina[2], A.Yu. Ovchinnikov[2], Yu.O. Nikolaeva[2], V.V. Dremin[1], A.V. Dunaev[1]; [1]Research and Development Center of Biomedical Photonics, Orel State University, [2]Russian University of Medicine of the Ministry of Health of the Russian Federation, Russia
The work shows that application of convolutional neural networks in digital diaphanoscopy makes it possible to identify pathological changes in maxillary sinuses, classify the type of pathology (sinusitis, cystic change), indicating the side of the pathology. The proposed approach can be used for developing a clinical decision support system for early detection of maxillary sinus pathologies.

ThSYB-38
Thursday, June 25, 2026; 10:15-10:30
Hybrid nanomaterials for optical heating and temperature monitoring in biological objects
E.N. Gerasimova, L.V. Mikhailova, M.V.Zyuzin; ITMO University, Russia
Nanoscale temperature monitoring is vital in biomedicine, as thermal changes affect cellular functions.. This study introduces hybrid nanomaterials for real-time thermal sensing during laser heating. We demonstrate temperature monitoring via ODMR in nanodiamonds with nitrogen-vacancy center during photoinduced delivery of bioactive compounds and photothermal therapy. Additionally, we show plasmonic or all-dielectric nanostructures enable optical heating and monitoring through Raman scattering.

ThSYB-39
Thursday, June 25, 2026; 10:30-10:45
Intraoperative diagnostics of brain tumors using optical spectroscopy and machine learning algorithms
A. Ospanov[1], T.A. Savelieva[1,2], I.D. Romanishkin[2], S.V. Shugai[3], S.A. Goryajnov[3], G.V. Pavlova[3,4], I.N. Pronin[3], V.B. Loschenov[1,2]; [1]National Research Nuclear University MEPhI, [2]Prokhorov General Physics Institute of RAS, [3]N.N. Burdenko National Medical Research Center of Neurosurgery, [4]Institute of Higher Nervous Activity and Neurophysiology of RAS, Russia
The paper discusses classification algorithms for the analysis of fluorescence, diffuse reflectance, and Raman spectra obtained from biopsies of intracranial tumors.

ThSYB-40
Thursday, June 25, 2026; 11:30-12:00
Application of optical methods for noninvasive mapping of skin endogenous chromophores *(Invited)*
S.A. Perkov[1], V.A. Vorobev[1,2], T.N. Torokhov[1,3], B.V. Sheludko[4,1,5], D.U. Musaeva[1], M.M. Kuziuk[6], M.A. Kurochkin[1], S.Yu. Gorodkov[7], D.A. Gorin[1]; [1]Skolkovo Institute of Science and Technology, Russia; [2]Ecole Polytechnique Federale de Lausanne, Switzerland , [3]Prokhorov General Physics Institute of the Russian Academy of Sciences, Russia; [4]Institute for Information Transmission Problems of the Russian Academy of Sciences, Russia; [5]Moscow Institute of Physics and Technology, Russia, [6]Central University, Russia; [7]Saratov State Medical University, Russia
An overview of optical methods for assessing skin chromophore concentrations in newborns is presented, emphasizing their diagnostic potential. As specific examples, the application of hyperspectral imaging for noninvasive diagnosis of infantile hemangioma and the use of fluorescence spectroscopy to assess bilirubin photodegradation during neonatal jaundice treatment are investigated.

ThSYB-41
Thursday, June 25, 2026; 12:00-12:30
Laser beam scattering on a blood smear and the diffractometric parameter of erythrocytes *(Invited)*
S.Yu. Nikitin, E.G. Tsybrov, M.S. Lebedeva; M.V. Lomonosov Moscow State University, Russia
This paper examines the problem of measuring the geometric parameters of red blood cells in a blood smear using laser diffractometry. An algorithm is proposed for measuring the parameter characterizing the variation in red blood cell size and shape.

ThSYB-42
Thursday, June 25, 2026; 12:30-13:00
Optoacoustic characterization of vascular network in health and disease *(Invited)*
A.G. Orlova[1], A.M. Glyavina[1,2], A.A. Kurnikov[1], D.A. Khochenkov[3], Yu.A. Khochenkova[3], K.S. Kim[1,2], A.V. Maslennikova[1,2,4], S.V. Nemirova[1,4], I.V. Turchin[1], P.V. Subochev[1]; A.V. Gaponov-Grekhov Institute of Applied Physics of RAS, Russia
The structural and functional state of human and animal tissues was investigated using optoacoustic imaging. Normal tissues and experimental tumors with different transplantation sites were compared. Therapy-induced changes in tumor vascularity were demonstrated. In patients with post-thrombotic syndrome, increased blood volume, vessel diameter, and vascular tortuosity were revealed.

ThSYB-43
Thursday, June 25, 2026; 13:00-13:15
Metrology and data processing for photoacoustic imaging and cytometry
D.N. Bratashov[1,2], E.S. Prikhozhdenko[1]; [1]MIPT, [2]Saratov State University, Russia
This work examines capabilities of photoacoustic (PA) imaging and in vivo flow cytometry techniques for quantitative biomedical analysis. As the PA signal is nearly proportional to chromophore concentration, these methods enable precise in vivo spectroscopy and metrology. We focus on calibration approaches that allow real-time measurement of chromophores, nanoparticles, and metabolites, with applications in pharmacokinetics, pharmacodynamics, and targeted drug delivery.

ThSYB-44
Thursday, June 25, 2026; 13:15-13:30
Assessment of major skin chromophores in different body sites using diffuse reflectance spectroscopy
K.A. Bylinskaya, M.Y. Kirillin, E.A. Sergeeva, I.V. Turchin, A.B. Kostyuk, V.M. Perekatova; Biophotonics Laboratory, A.V. Gaponov-Grekhov Institute of Applied Physics of RAS, Russia
Diffuse reflectance spectroscopy (DRS) is a non-invasive technique for assessing chromophore concentrations in biological tissues. This study aims to quantify variations in the content of main chromophores (melanin, hemoglobin, water etc.) in skin across different anatomical sites and age groups, using a VIS-NIR self-calibrating DRS system. Measurements were performed on healthy volunteers at the wrist, palm, web space, and temple.

ThSYB-45
Thursday, June 25, 2026; 15:00-15:30
Multidistance self-calibrating diffuse optical spectroscopy of biotissue *(Invited)*
I.V. Turchin[1], V.V. Perekatova[1], K.A. Bylinskaya[1], A.S. Savelyev[1], E.A. Sergeeva[1], M.Yu. Kirillin[1], S.P. Dmitriev[2], S.V. Gamayunov[2]; [1]Federal Research Center A.V. Gaponov-Grekhov Institute of Applied Physics of RAS, [2]Research Institute of Clinical Oncology "Nizhny Novgorod Regional Clinical Oncological Dispensary", Russia
This study evaluates analytical models for diffuse optical spectroscopy (DOS), comparing them to Monte Carlo simulations. A refined model shows superior accuracy for source-detector distances over 2 mm, while a semi-analytical fit performs best at small source-detector separations. A self-calibrating probe design improves measurement precision, and the developed broadband DOS system has been applied in tumor and skin graft monitoring.

ThSYB-46
Thursday, June 25, 2026; 15:30-16:00
Tissue optical clearing in the diagnosis of a number of pathologies *(Invited)*
E.A. Genina[1], Yu.I. Surkov[1], I.A. Serebryakova[1], P.A. Timoshina[1], E.N. Lazareva[1], D.K. Tuchina[1], V.V. Tuchin[1,2,3]; [1]Saratov State Univ., [2]Tomsk State Univ., [3]IPMC RAS, Russia
Tissue optical clearing was used as an assistant technology in multimodal diagnostics of skin neoplasm and modeled alloxan diabetes.

ThSYB-47
Thursday, June 25, 2026; 16:00-16:30
Built-in multi-spectral imaging system for in vivo biomedical applications *(Invited)*
A.S. Machikhin, V.I. Batshev, A.V. Guryleva; Scientific and Technological Centre of Unique Instrumentation of RAS, Russia
We present a compact single-sensor multispectral imaging system based on a split-aperture design operating in the 0.4–1.7 μm range. Spatiospectral calibration and image processing enable accurate mapping of viable parameters. Experiments on phantoms, rats, and volunteers demonstrate the efficiency of the proposed device for non-invasive assessment of blood microcirculation and hemodynamic parameters.

ThSYB-48
Thursday, June 25, 2026; 16:30-16:45
Direct and inverse problem of the dependence between optical properties and diffuse reflected and transmitted signal for multilayer biological tissues
A.A. Krivetskaya[1,2], T.A. Savelieva[1,2], D.M. Kustov[1], V.V. Levkin[3], S.S. Kharnas[3], I.D. Romanishkin[1], V.B. Loschenov[1,2]; [1]Prokhorov General Physics Institute of RAS, [2]Institute of Engineering Physics for Biomedicine, National Research Nuclear University MEPhI, [3]Department of Faculty Surgery No.1, I.M. Sechenov First Moscow State Medical University, Russia
The knowledge of the biological tissues' optical properties is important for the personalization of the laser-induced therapy. The investigation of the direct and inverse problems is crucial for the understanding of the laser-tissue interaction.

ThSYB-49
Thursday, June 25, 2026; 16:45-17:00
Impact of laser spatial and temporal coherence in laser speckle contrast imaging
V.V. Perekatova, E.A. Sergeeva, M.Yu. Kirillin, D.A. Kurakina, Y.A. Belozerov, A.S. Savelyev, I.V. Turchin; A.V. Gaponov-Grekhov Institute of Applied Physics of RAS, Russia
Laser Speckle Contrast Imaging quantifies blood flow, but source coherence critically affects accuracy. However, the critical influence of the illumination source's coherence properties on measurement accuracy is often overlooked. This study systematically investigates how temporal and spatial coherence affect speckle contrast.

WeSYB-p01
Wednesday, June 24, 2026; 15:00-18:30
The effect of laser-generated ionizing secondary radiation on the pigment-protein complex C-phycocyanin *(Poster)*
V.V. Teplyakov[1], T.A. Semenov[1], Y.E. Sergeeva[1], P.M. Gotovtsev[2], M.M. Nazarov[1]; [1]National Research Centre "Kurchatov Institute", [2]Institute for Information Transmission Problems of RAS, Russia
We present results of experiments on the effect of two types of femtosecond pulsed radiation - an electron beam with an intensity of 3*10^18W/cm² and THz radiation with a pulse energy of 20 μJ - on a solution of the pigment-protein complex C-phycocyanin in deionized water as part of a study of the non-thermal effects of ionizing radiation on biological objects.

WeSYB-p02
Wednesday, June 24, 2026; 15:00-18:30
Optical imaging for characterization of tumor-associated fibroblasts *(Poster)*
A.I. Gavrina, V.D. Kapustina, N.I. Ignatova, V.V. Elagin, V.V. Dudenkova, I.N. Druzhkova; Privolzhskiy Research Medical Univ., Russia
Tumor-associated fibroblasts (CAFs) are a specific population of stromal cells in tumor tissue that differ from normal fibroblasts in their altered phenotype and functionality. They play a key role in the development and progression of cancer, making them potential targets for anticancer therapy. Targeting senescent CAFs may be a new approach to tumor treatment.

WeSYB-p03
Wednesday, June 24, 2026; 15:00-18:30
Fluorescence lifetime and optical spectrum dependence during photooxidation of lipofuscin granules *(Poster)*
P. Morozov[1,2], V. Andreev[2,3], M. Tokarev[1], M. Yakovleva[4,5], A. Kostyukov[4,5], T. Feldman[4,5], V. Kuzmin[4], M. Ostrovsky[4,5], G. Goltsman[1,3]; [1]Moscow State Pedagogical Univ., [2]LLC "Supercon Nanotech", [3]National Research University Higher School of Economics, [4]N.M. Emanuel Institute of Biochemical Physics RAS, [5]Lomonosov Moscow State University, Russia
In this paper we study the process of photooxidation in lipofuscin granules (LG) using fluorescence lifetime microscopy in combination with a superconducting single-photon detector (SSPD). The aim was to develop early diagnosis criteria for age-related macular degeneration (AMD). LG's, which accumulate in the retinal pigment epithelium (RPE), are the main source of fundus autofluorescence (FAF). Changes in their fluorescence properties during photooxidation serve as a model for studying AMD pathology.

WeSYB-p04
Wednesday, June 24, 2026; 15:00-18:30
Principal component analysis for virus classification *(Poster)*
E.E. Popov[1], A.T. Tabarov[1,2], V.V. Vitkin[1]; [1]Institute of Advanced Data Transfer Systems, ITMO University, [2]St. Petersburg State Pediatric Medical University, Russia
In this work we study the influence of changes in Raman spectrum of Solution of virus-containing particles on accuracy of classification using principal component analysis (PCA) as a machine learning tool for classification. Both experimental and modeling studies are presented.

WeSYB-p04
Wednesday, June 24, 2026; 15:00-18:30
The possibility of using histological data in assessing the skin thickness by OCT *(Poster)*
A.P. Tarasov[1,2], D.A. Rogatkin[1]; [1]Moscow Regional Research and Clinical Institute (MONIKI) named after M.F. Vladimirsky, [2]National Research Centre "Kurchatov Institute", Russia
The work presents the results of a preliminary study on the possibility of using histological data for calibrating the scale of OCT images of human skin. The study utilized thick cadaver skin, and the thickness of the stratum corneum was determined. It was established that, in general, the use of histology characterized by significant variability, which complicates the calibration of the optical tomograph's scale.

WeSYB-p05
Wednesday, June 24, 2026; 15:00-18:30
Method and device for detecting intracranial tumor tissue in situ using fiber-optic multimodal laser spectroscopy *(Poster)*
I.D. Romanishkin[1], A. Ospanov[2], T.A. Savelieva[1,2], K.G. Linkov[1], D.V. Yakovlev[1], A.V. Kosyrkova[3], G.V. Pavlova[3,4], I.N. Pronin[3], V.B. Loschenov[1,2]; [1]Prokhorov General Physics Institute of RAS, [2]National Research Nuclear University MEPhI, [3]N.N. Burdenko National Medical Research Center of Neurosurgery, [4]Institute of Higher Nervous Activity and Neurophysiology of RAS, Russia
This article discusses the approach to intraoperative multimodal laser spectroscopic analysis of intracranial tumors based on the simultaneous measurements of FAD and PpIX fluorescence, diffuse reflectance and Raman scattering. The data obtained this way automatically undergoes classification using a training set compiled from spectral signatures previously obtained by measuring samples of such tumors in the biobank conditions.

WeSYB-p06
Wednesday, June 24, 2026; 15:00-18:30
Real-time thermal mapping of biological tissue phantoms using two-dimensional FBG array *(Poster)*
V.A. Simonov[1,2], Z.E. Munkueva[1,2], A. Kokhanovskiy[1,4], A.V. Dostovalov[1,2], A.A. Evtushenko[1,3], L.V. Boldyreva[1,3]; [1]Novosibirsk State University, [2]Institute of Automation and Electrometry SB RAS, [3]Scientific Research Institute of Neurosciences and Medicine, [4]ITMO University, Russia
The real-time thermal mapping of the biological tissue phantom under the laser treatment is demonstrated using the two-dimensional fiber Bragg grating (FBG) array with 1 mm resolution. The method can be used to develop treatment protocols of tumors under the impact of laser radiation or cold atmospheric plasma.

WeSYB-p07
Wednesday, June 24, 2026; 15:00-18:30
Electromagnetic power transfer in strongly scattering layered media *(Poster)*
D.S. Malov, A.A. Shcherbakov; ITMO University, Russia
Prediction of laser light interaction with strongly scattering layered media is important for a range of applications including studies of biological tissues. In this work we propose a super-cell based simulation approach for rigorous diffraction simulation within arbitrary multilayer planar geometries, and use large-scale computations to extract averaged parameters and search for simple laws governing the electromangetic power transfer.

WeSYB-p08
Wednesday, June 24, 2026; 15:00-18:30
Simulation of infrared radiation backscattering by curved multilayer biological tissue *(Poster)*
R.R. Chegadaev[1], S.V. Ul'yanov[2], Yu.A. Zhavoronkov[1,2]; [1]Peter the Great St. Petersburg Polytechnic University, [2]St. Petersburg State University, Russia
We present results of Monte Carlo backscattering simulations for tissue models with different numbers of flat or curved layers, with particular emphasis on a human head model. We also studied possible causes of the loss of spatial coherence, leading to the broadening of the coherent backscattering peak. Backscattered intensity exhibited high sensitivity to blood penetration into the cerebrospinal fluid layer.

WeSYB-p09
Wednesday, June 24, 2026; 15:00-18:30
Ce^{3+} -lasers emission interaction with skin cells investigation in the presence of antioxidants *(Poster)*
A.S. Nizamutdinov, A.A. Varlamov, I.D. Sidorov, D.A. Makarova, N.I.Shamsutdinov, A.A. Shavelev, Y.M. Hamdan, T.A. Nevzorova, P.V. Zelenikhin, V.V. Semashko; Kazan Federal University, Russia
We report the cytotoxic effectof UVB laser radiation from LiCaAlF6:Ce3+ and LiLu0.7Y0.3F4:Ce3+-Yb3+ lasers on human skin fibroblasts. We show that only 6.2 ± 2.2% of cells reach the stage of late apoptosis, due to which they have the potential to restore the cytoplasmic membrane and subsequently divide. The effect of vitamins C and E on viability under UV irradiation is discussed.

WeSYB-p10
Wednesday, June 24, 2026; 15:00-18:30
Development of a software package for photoacoustic tomography data analysis based on open-source Python libraries *(Poster)*
S.A. Shevtsova[1], E.S. Prikhozhdenko[2], D.N. Bratashov[1,2]; [1]Saratov State Univ., [2]Moscow Institute of Physics and Technology, Russia
A software package for comprehensive photoacoustic tomography data processing has been introduced. It includes loading raw experimental data in HDF5 format and visualizing three-dimensional images. Based on reconstruction algorithms that convert ultrasonic sensor signals into spatial absorption maps, this tool enables both qualitative visual assessment and quantitative analysis of biological chromophore concentrations.

WeSYB-p11
Wednesday, June 24, 2026; 15:00-18:30
Synthesis bis-diimine rhenium(I) complexes and micelles based on it for photoacoustic research *(Poster)*
V.A. Suslova, K.S. Kisel; St.Petersburg State University, Russia
Re(I) complexes are promising candidates for synthesis contrast agents potentially applicable in photoacoustic imaging experiments. Usage of ligands with hydrophilic and hydrophobic functions allow us to obtain micelles based on this complexes. Photophysical properties of such micelles are consistent with their application as contrast agents.

Section SYC. Section C. Photonics and nanobiotechnology

TuSYC-01
Tuesday, June 23, 2026; 09:00-09:45
Functional nanoprobes for in vivo Imaging *(Keynote presentation)*
Mingyuan Gao; School of Life Sciences, Soochow University, China
The in vivo applications of functional nanoparticles for the diagnosis of major diseases will be reported. Moreover, the clinical translation of functional nanoparticles will also be discussed.

TuSYC-02
Tuesday, June 23, 2026; 09:45-10:15
Multifunctional and multimodal contrast agents: preparation, properties control, biomedical applications *(Invited)*
D.A. Gorin; Skolkovo Institute of Science and Technology, Russia
One of the trends in modern biophotonics is the use of multimodal diagnostic systems. This requires the development of multimodal contrast agents. A technology for synthesizing multimodal contrast agents has been developed. It has been established that the concentration of inorganic nanoparticles and/or organic dyes in composite particles allows for altering the contrast of OA, ultrasound, and MRI images.

TuSYC-03
Tuesday, June 23, 2026; 10:15-10:45
Functionalized gold nanobipyramids and luminescent Au¯atomic nanoclusters for biomedical applications *(Invited)*
N.G. Khlebtsov[1,2], A.M. Burov[1], D.S. Chumakov[1], S.S. Evstigneeva[1,2]; [1]Institute of Biochemistry and Physiology of Plants and Microorganisms, Saratov Scientific Centre of RAS, [2]Saratov State University, Saratov, Russia
Pentagonal gold bipyramids and nanorods with LPR from 640 to 940 nm were synthesized, functionalized with nitrobenzenethiol, and characterized by UV-vis spectroscopy, transmission electron microscopy (TEM), surface enhanced Raman scattering (SERS), and phtotothermal (PT) studies. We also show that fluorescent glutathione-stabilized gold nanoclusters are capable of selectively binding to bacterial biofilms, but do not stain planktonic bacteria.

TuSYC-04
Tuesday, June 23, 2026; 10:45-11:00
NIR photobiomodulation modulates differentiation of ADMSCs into neural embryoid bodies
A. Crous, P. Mulaudzi, H. Abrahamse; Laser Research Centre, Faculty of Health Science, University of Johannesburg, South Africa
This study compared the effects of 825 nm photobiomodulation on adipose-derived stem cells cultured in 2D monolayers and 3D spheroids. PBM at 5 J/cm² optimally enhanced viability and proliferation in 2D, while 10 J/cm² produced the most stable, physiologically relevant responses in 3D spheroids, underscoring the importance of 3D models for translational PBM optimisation.

TuSYC-05
Tuesday, June 23, 2026; 11:30-12:00
Magnetic particle imaging: from physics to biomedical applications *(Invited)*
Jing Zhong; Beihang University, China
Magnetic Particle Imaging (MPI) is new imaging modality that enables the direct and quantitative detection and imaging of magnetic nanoparticles (MNPs). MPI directly detects the dynamic magnetization of MNPs for radiation-free and tissue-background-free imaging. This study introduces the fundamental physics of MPI for in vitro biomolecule detection and in vivo imaging for cancer diagnostics.

TuSYC-06
Tuesday, June 23, 2026; 12:00-12:30
Optical characterization of advanced biosensing architectures for express sensitive detection of clinical biomarkers and food contaminants *(Invited)*
A.V. Orlov; Prokhorov General Physics Institute of RAS, Russia
Label-free optical biosensing platforms based on interferometry enable real-time characterization of biomolecular interactions with sub-nanometer axial resolution. This work presents advanced sensing architectures combining stimulus-responsive materials, reconfigurable molecular interfaces, and novel surface functionalization strategies. Systematic evaluation of interferometric and magnetometric detection reveals synergistic advantages for achieving sub-picogram sensitivity across extended dynamic ranges in clinical and food safety applications.

TuSYC-07
Tuesday, June 23, 2026; 12:30-12:45
Next generation optical biosensing with hybrid AI¯Photonics architecture
I. Saetchnikov, E. Tcherniavskaia, A. Saetchnikov; Belarusian State University, Belarus
We present a scalable optical biosensing platform combining thousands of high-Q whispering-gallery-mode microresonators with a hybrid deep-learning engine. By integrating CNNs, biLSTMs, transformer encoders, and cross-channel attention, the system enables real-time analysis of complex biochemical mixtures. In multiplexed immunosensing, it achieves >98% classification accuracy and parts-per-billion (ppb) concentration resolution, addressing scalability and data-heterogeneity challenges in photonic biosensing.

TuSYC-08
Tuesday, June 23, 2026; 12:45-13:00
Novel highly sensitive readout for an enzyme-linked immunosorbent assay based on surface-enhanced Raman scattering
E.G. Evtushenko[1,2], A.D. Vasilyeva[1], L.V. Yurina[1], E.S. Gavrilina[1], V.B. Krylov[3], N.E. Nifantiev[3], D.V. Basmanov[4], I.N. Kurochkin[1,2]; [1]N.M. Emanuel Inst. of Biochemical Physics RAS, [2]Lomonosov Moscow State Univ., Faculty of Chemistry, [3]N.D. Zelinsky Inst. of Organic Chemistry RAS, [4]Lopukhin Federal Research and Clinical Center of Physical-Chemical Medicine, Russia
An enzyme-linked immunosorbent assay (ELISA) is a widely used and universal method in laboratory diagnostics. We report on the development of a protocol for the measurement of horseradish peroxidase label in ELISA based on surface-enhanced Raman scattering (SERS) of 2,3-diaminophenazine using a silver nanoparticles colloid. We will demostrate its application for the analysis of galactomannan, a marker of invasive aspergillosis.

TuSYC-09
Tuesday, June 23, 2026; 13:00-13:15
Light-responsive multilayer carriers for controlled STING agonist release
L.V. Mikhailova[1], O.A. Gusliakova[2], N.A. Shushunova[3], M.V. Zyuzin[1,4], G.B. Sukhorukov[2,5]; [1]Bridge Center, Faculty of Physics, ITMO University, [2]Center for Bio- and Medical Technologies, Skoltech, [3]Core Facility Center, Saratov State Medical Univ., [4]Moscow Center for Advanced Studies, [5]Life Improvement by Future Technologies (LIFT) Center, Russia
Light-responsive polymer carriers encapsulating a STING agonist were engineered to reprogram tumor-associated macrophages from an M2- to an M1-like phenotype. Macroscopic and submicron carriers loaded with gold nanorods enabled NIR-triggered heating, controlled agonist release, and efficient uptake by macrophages. In vitro and in vivo experiments demonstrated enhanced CD86 expression and M1 polarization in melanoma, highlighting a spatiotemporally controlled immunotherapeutic strategy.

TuSYC-10
Tuesday, June 23, 2026; 13:15-13:30
Laser-induced release of neuroactive proteins from polymer capsules using one- and multiphoton excitation for directed neural cell differentiation in 2D and 3D models
I.V. Smirnov[1], V.S. Usatova[2], O.G Astakhova[2,3], A.A. Lanin[3,4], G.B. Sukhorukov[1,4]; [1]Skolkovo Inst., [2]FCBN FMBA, [3]MSU, [4]LIFT, Russia
Combining the processes of photoconversion and laser-induced release of neuroactive proteins from polyelectrolyte capsules allows for long-term tracking of the behavior of individual activated cells within a cellular population

TuSYC-11
Tuesday, June 23, 2026; 15:00-15:30
Nanostructured particles for remote neuron stimulation *(Invited)*
T. Pallaeva[1,2], A. Romaschenko[2], S. Lisitsyn[2], I. Smirnov[1], A. Abdurashitov[1,2], G. Sukhorukov[1,2]; [1]Skolkovo Institute of Science and Technology, [2]LIFT Center, Russia
The paper describes recent advances in fabrication of micro- and nanostructured systems enable to label, activate and track individual biological cells via alternated magnetic field and/or light.

TuSYC-12
Tuesday, June 23, 2026; 15:30-16:00
Plasmonic porous silicon-gold nanoparticles for optical diagnostics and multimodal therapy *(Invited)*
L.A. Osminkina[1,2]; [1]Faculty of Physics, Lomonosov Moscow State University, [2]Institute for Biological Instrumentation of RAS, Russia
Plasmonic hybrid porous silicon–gold nanoparticles are presented as a multifunctional platform for optical diagnostics and multimodal cancer therapy. The combination of biodegradable porous silicon and plasmonic gold enables photothermal effects, radiosensitization, and surface-enhanced Raman diagnostics. These results highlight the potential of the proposed nanoplatform for future development of integrated theranostic approaches in oncology.

TuSYC-13
Tuesday, June 23, 2026; 16:00-16:15
Microfluidic synthesis of $AgInS_2$/ZnS quantum dots with different stoichiometry for biomedicine
I.A. Reznik[1], A.A. Cherednikova[1], S. Bikmetova[1], D.V. Danilov[2], M.V. Zyuzin[1]; [1]Faculty of Physics, Bridge Center, ITMO University, [2]Interdisciplinary Research Center for Nanotechnology, St. Petersburg State University, Russia
We developed a microfluidic protocol to synthesize $AgInS_2$/ZnS quantum dots with tunable core stoichiometry (Ag:In = 0.05–0.30) and variable ZnS shell thickness. Optical properties and ROS generation were systematically linked to composition. Ag-rich QDs showed enhanced photodynamic activity against glioblastoma cells, indicating promise for biomedical imaging and photodynamic therapy applications.

TuSYC-14
Tuesday, June 23, 2026; 16:15-16:30
Partial enzymatic hydrolysis as a promising sample preparation method for the analysis of protein amino acid side chains oxidation using surface-enhanced Raman spectroscopy *(Poster)*
A.D. Vasilyeva[1], I.A. Boginskaya[2], R.O. Aliev[1], L.V. Yurina[1], E.G. Evtushenko[1,3], M.I. Indeykina[1], K.N. Afanas´ev[2], M.V. Sedova[2], I.A. Ryzhikov[2,4], M.A. Rosenfeld[1], I.N. Kurochkin[1,3]; [1]N.M. Emanuel Institute of Biochemical Physics, RAS, [2]Institute for Theoretical and Applied Electromagnetics, RAS, [3]Lomonosov Moscow State University, Faculty of Chemistry, [4]N.E. Bauman Moscow State Technical University, Russia
Surface-enhanced Raman spectroscopy (SERS) is a well-established basis for the development of cheap and rapid analytical protocols. For the case of hypochlorite-induced fibrinogen oxidative modification, SERS spectra of oxidized and native fibrinogen were shown to be very similar. Partial enzymatic hydrolysis of the protein significantly enhances the differences, enabling the SERS-based analysis of amino acid side chains oxidative modification.

TuSYC-15
Tuesday, June 23, 2026; 16:30-16:45
Single-exosome analysis in microfluidic flow by fluorescence correlation spectroscopy and burst detection
D.D. Kozhevnikova[1], A.V. Barulin[2], A.V. Petukhov[2], S.M. Novikov[2], A.M. Yashchenok[1]; [1]Skolkovo Institute of Science and Technology, [2]Moscow Institute of Physics and Technology, Russia
Accurate characterization of small extracellular vesicles is challenging due to their nanoscale size and heterogeneity. We present a microfluidics-assisted fluorescence spectroscopy approach combining fluorescence correlation and burst analysis for single-vesicle detection. This dual-modality method enables sensitive measurement of particle concentration and provides size-related information for exosome-enriched fractions.

TuSYC-16
Tuesday, June 23, 2026; 16:45-17:00
Multilayer sensing system with controllable density of antibody binding sites for hormone analysis
N.A. Belyakov[1,2], A.S. Rakitina[1,2], S.G. Trofimenko[1,3]; [1]Prokhorov General Physics Institute of RAS, [2]Moscow Center for Advanced Studies, [3]National Research Nuclear University MEPhI (Moscow Engineering Physics Institute), Russia
We developed a new universal approach in biosensorics which is based on an adaptive programmable biolayers that can form a multi-layer architecture on a surface of a glass sensor chip. Under a specific microenvironment the upper layers can be desorbed what allows to change the steric structure of the biosensor and change the calibration curve directly during the measurement.

WeSYC-17
Wednesday, June 24, 2026; 09:00-09:30
Analysis of small extracellular vesicles with magnetic particles and flow cytometry *(Invited)*
A.M. Yashchenok; Skoltech, Russia
Immunomagnetic isolation in combination with flow cytometry is of great interest for the development of sEV-based liquid biopsy methods. This combination makes it possible to enrich sEVs free of contaminating proteins and non-vesicular particles and to detect sEV membrane proteins in situ using fluorescently labeled antigens. This, in turn, opens up great opportunities for the detection of a wide range of tumor biomarkers.

WeSYC-18
Wednesday, June 24, 2026; 09:30-10:00
SERS probing of individual exosomes and their identification *(Invited)*
A.K. Sarychev[1], A. Ivanov[1], D. Korzhov[2,4], M. Shestopalova[2,4], K. Afanasev[1], I. Bykov[1], A. Smyk[5], A. Shurygin[5], K. Mochalov[2,3]; [1]Inst. for Theoretical and Applied Electromagnetics of RAS, [2]Shemyakin-Ovchinnikov Inst. of Bioorganic Chemistry, RAS, [3]RUDN Univ., [4]National Research Nuclear Univ., MEPHI, [5]James River Branch LLC, Russia
Individual exosomes are detected using surface-enhanced Raman scattering (SERS) by accumulating an electromagnetic field on a specially designed metasurface, which is a silver nanofilm deposited on a modulated plastic substrate. In the recesses of the metasurface, where the exosomes reside, the field reaches extremely high values under plasmon resonance conditions. Individual exosomes differ in their SERS spectra.

WeSYC-19
Wednesday, June 24, 2026; 10:00-10:30
Development of approaches to the determination of biologically active substances by the method of SERS spectroscopy *(Invited)*
I.A. Veselova, M.V. Samodelova, N.R. Yarenkov, E.Yu. Afonyushkina, Yu.S. Vershinina, O.O. Kapitanova; Analytical Chemistry Division, Chemistry Division, Lomonosov Moscow State Univ., Russia
The report will focus on the plasmonic nanostructured polymeric materials and the creation of photocatalytic materials for SERS sensors for the detection of biological active substances. Approaches to controlling the hydrophilicity/hydrophobicity of the sensor surface will also be discussed. This will not only expand the range of analytes but also control the orientation of analyte molecules (using specific functional groups) on the plasmonic surface.

WeSYC-20
Wednesday, June 24, 2026; 10:30-10:45
Using Raman scattering and fluorescence for non-invasive express -diagnosis of ENT-diseases (head and neck diseases)
A.B. Timurzieva[1,2], V.A. Duvansky[2], V.I. Popadyuk[2], V.I. Kukushkin[3], Yu.E. Abramov[2]; [1]N.A. Semashko National Research Institute of Public Health, [2]Peoples' Friendship University of Russia named after Patrice Lumumba, [3]Yu.A. Osipyan Institute of Solid State Physics, Russia
The aim of the study is to demonstrate the diagnostic possibility of Raman scattering and fluorescence for the early express-diagnosis of ENT-diseases. Raman scattering and fluorescence for ENT-diseases identification were useful for early, non-invasive, express-diagnostics of such pathology in clinical medicine in the future.

WeSYC-21
Wednesday, June 24, 2026; 10:45-11:00
A novel dual reporter gene system for lung metastasis multimodal imaging
I.E. Rozhkova[1], A.N. Gabashvili[1], A.O. Sosnovtseva[2], A.A. Dresviannikova[1], A.S. Petrova[1], D.V. Goliusova[3], P.I. Nikitin[1]; [1]Prokhorov General Physics Institute of RAS, [2]Engelhardt Institute of Molecular Biology RAS, [3]Lopukhin Federal Research and Clinical Center of Physical-Chemical Medicine of FMBA, Russia
Molecular imaging aids in studying malignant diseases in vivo. This study presents two novel genetic constructs combining genes for luminescent enzymes and bacterial nanocompartments. Stable cell lines of Lewis lung carcinoma (LLC1) were generated. These cells were successfully used for modeling and multimodal visualization of lung metastases in mice.

WeSYC-22
Wednesday, June 24, 2026; 11:30-12:00
Application of fuorescent polarization analysis (FPA) for determination of proteins, enzyme activity and immunodiagnosis of infectious and fungal diseases *(Invited)*
L.I. Mukhametova[1], S.A. Eremin[1], S.V. Tillib[2], V.B. Krylov[3], N.E. Nifantiev[3]; [1]Chemical Department, Lomonosov Moscow State University, [2]Institute of Gene Biology, RAS, [3]N.D. Zelinsky Institute of Organic Chemistry, RAS, Russia
The use of fluorescent single-domain-nanobodies enables detection of the number of human proteins and their conformation by FPIA. FPIA used to measure of lysozyme activity by synthetic flu-substrates. Flu-glycoconjugates are used for Brucella-specific antibodies detection in cattle serum. Methods for invasive mycoses detection using high-specific MAb developed. This work was supported by the Ministry of Science and Higher Education of the Russian Federation № 075-00422-24-02 (agreements № 075-03-2024-401/3 from 30.05.2024).

WeSYC-23
Wednesday, June 24, 2026; 12:00-12:30
Highly sensitive optical and magnetic biosensor methods for quantification of folic acid *(Invited)*
V.A. Bragina[1], D.O. Novichikhin[1], N.A. Belyakov[1,2], B.G. Gorshkov[1]; [1]Prokhorov General Physics Institute of RAS, [2]Moscow Center for Advanced Studies, Russia
Highly sensitive optical and magnetic biosensor methods based on protein-ligand interactions for folic acid (FA) quantification have been developed. The optical method, monitoring FA conjugate-antibody interactions on functionalized sensor chips, provides high analytical sensitivity with a wide dynamic range of six orders of magnitude. The point-of-care magnetic method enables rapid, simple and user-friendly FA detection in artificial saliva.

WeSYC-24
Wednesday, June 24, 2026; 12:30-12:45
Reproducibility of albumin nanoparticle synthesis by the desolvation method
Z.R. Galaeva, P.V. Khramtsov; Institute of Ecology and Genetics of Microorganisms (IEGM), RAS, Russia
The desolvation method is a simple approach for protein nanoparticle preparation based on reduced protein solubility upon addition of an organic solvent, leading to protein aggregation. However, synthesis reproducibility strongly depends on protein purity and physicochemical properties. In this study, reproducibility of albumin nanoparticles synthesized from bovine serum albumin of different manufacturers and purification grades was evaluated.

WeSYC-25
Wednesday, June 24, 2026; 12:45-13:00
Factors affecting the choice of IR radiation dose in nanoparticle-based photothermal therapy
A.A. Anikin, D.A. Petrukhin, V.D. Salnikov, V.K. Belyaev, V.V. Rodionova; Immanuel Kant Baltic Federal University, Russia
Anti-cancer photothermal therapy uses infrared laser heating of nanoparticles to induce cancer cell death. Compared to magnetic hyperthermia, it provides higher SAR at lower nanoparticle concentrations but involves strong temperature gradients and nanoparticle photothermal instability. These factors critically affect temperature control and optimal irradiation intensity in photothermal therapy and will be discussed in this report.

WeSYC-26
Wednesday, June 24, 2026; 13:00-13:15
Intrinsic protein luminescence as a tool for studying the structure, conformational dynamics and functioning of enzymes: case study of bacterial luciferase
EV Nemtseva[1,2]; [1]Siberian Federal University, [2]Institute of Biophysics of SB RAS, Russia
The application of various photonics techniques based on intrinsic fluorescence and phosphorescence of the protein to the analysis of conformational stability and dynamics, as well as ligand binding rates, of two bacterial luciferases is presented. The excellence and limitations of tryptophan as a universal intrinsic luminescent protein probe are discussed.

WeSYC-27
Wednesday, June 24, 2026; 13:15-13:30
Mimicking optoelectronic synapse in a hybrid fluorescent protein/carbon nanotube transistor
I. Bobrinetskiy[1], A. Kudriavtseva[1,2]; [1]Moscow Center for Advanced Studies, [2]Prokhorov General Physics Institute of RAS, Russia
This work demonstrates an electro photoactive synaptic transistor based on individual single-walled carbon nanotube modified with green fluorescent protein (FP/SWCNT) as a light tunable charge trapping layer. The device can be electrically switched between volatile and non volatile operating modes, enabling concurrent short term and long term neuroplasticity under specific light illumination. This work was supported by the Russian Science Foundation, grant no. 26-19-00062.

WeSYC-28
Wednesday, June 24, 2026; 15:00-15:30
Characterization of different optical labels and their surroundings for more sensitive biosensing *(Invited)*
A.V. Zherdev, B. B. Dzantiev; A.N. Bach Institute of Biochemistry, Research Centre of Biotechnology of RAS, Russia
The report presents the use of different labels in immuno- and aptasensors with colorimetric and fluorimetric detection. It discusses the factors determining detection limits of homogeneous and membrane biosensors for antibiotics and other analytes, the solutions for increasing sensitivity through new labels, techniques of their functionalization and integration into intermolecular complexes. The study was supported by the RSF grant 24-16-00273.

WeSYC-29
Wednesday, June 24, 2026; 15:30-16:00
The detection of pesticides and plasticizers by Fluorescence Polarization ImmunoAssay in different objects *(Invited)*
S.A. Eremin[1,2], M.A. Pashkova[1,2], Diao Zicheng[2], Xue Shixia[2], S. Filimonova[3]; [1]A.N. Bach Institute of Biochemistry, Research Centre of Biotechnology of RAS, [2]Faculty of Chemistry, Lomonosov Moscow State University, [3]Institute of Pharmacy, I.M. Sechenov First Medical University, Russia
Fluorescence Polarization Immunoassay (FPIA) is powerful tool for low-molecular-weight contaminants monitoring in a variety of matrices. This work highlights current developments of pesticides (acetochlor, butachlor) detection and plasticizers (phthalates and bisphenol A) by FPIA. Strategies for developing immunoreagents (antibodies and tracers), approaches to sample preparation for the analysis of complex matrices (water, soil, plant and animal products), and analytical characteristics are discussed. Acknowledgements: The study was supported by the Russian Science Foundation (RSF) grant # 24-43-00196 (https://rscf.ru/project/24-43-00196/).

WeSYC-30
Wednesday, June 24, 2026; 16:00-16:15
Substrate solution optimization as a method for signal enhancement in colorimetric analysis based on Prussian blue nanoparticles.
A.D. Novokshonova[1], P.V. Khramtsov[1,2]; [1]Perm Federal Research Center UB RAS, Russia, [2]Perm State Univ., Russia
Prussian blue nanoparticles are actively studied as a label in colorimetric analysis, such as in ELISA. However, the experimental conditions during the assay optimization phase are often not systematically studied. Our work is dedicated to optimizing the conditions of nanoparticle-based colorimetric assays. We demonstrate that the colorimetric signal can be significantly enhanced by optimizing the composition of the substrate solution.

WeSYC-31
Wednesday, June 24, 2026; 16:15-16:30
Visible light induced encapsulation of living cells into iron alginate hydrogel
A.S. Sokolov[1], S.G. Poroshin[1,2], G.B. Sukhorukov[1,2]; [1]Skolkovo Institute of Science and Technology, [2]Life Improvement by Future Technologies (LIFT) Center, Russia
The trump card of iron ions as alginate crosslinkers lies in the different behavior of iron ions with different charges. Fe^{3+} ions are strong and form a stiff, highly crosslinked hydrogel, whereas Fe^{2+} ions are weaker and crosslink alginate chains poorly. Using two visible-light-activated redox reactions, reversible hydrogel formation and dissolution were achieved. We present results on the cytocompatibility of this system.

WeSYC-32
Wednesday, June 24, 2026; 16:30-16:45
Anisotropic magnetic nanolabels for competitive lateral flow immunoassay
A.M. Skirda[1,2], A.V. Orlov[1], J.A. Malkerov[1,3], V.V. Volkov[1,3], U.D. Rezepova[1,3], P.I. Nikitin[1,3]; [1]Prokhorov General Physics Institute of RAS, [2]Moscow Center for Advanced Studies, [3]National Research Nuclear University MEPhI (Moscow Engineering Physics Institute), Russia
Due to unique properties of magnetic nanochains (MNCs), they are highly promising for diverse applications, including chemical synthesis, biosensing, and nanomedicine. Here, we present the MNCs application for the development of immunoassay for detection of chloramphenicol in milk. The proposed approach offers the detection limit of 5 pg/mL at the assay time of only 25 minutes.

WeSYC-33
Wednesday, June 24, 2026; 16:45-17:00
Modeling and numerical investigation of SPR biosensor for the detection of lung cancer cells
Jay Kumar Yadav, S.K. Tripathy; Department of Electronics and Communication Engineering, National Institute of Technology Silchar, India
We have demonstrated for the first time, a new class of light-based nanogeneration of plasmon using silver/Perovskite ($CsGeI3$)/ZnSe for the detection of lung cancer using the refractive index of the sample. The maximum possible nanogeneration of plasmons due to light-matter interaction occurs after optimizing various layers of the proposed surface plasmon resonance (SPR) biosensors, results in better sensor performance parameters.

ThSYC-34
Thursday, June 25, 2026; 09:00-09:30
Gold -based hybrid nanostructures with porphyrin derivatives for theranostics *(Invited)*
E.V. Solovyeva, A.A. Smirnov, V.O. Svinko, S.F. Aslanov, D.A. Lukyanov, A.V. Povolotskiy; St. Petersburg State University, Russia
The use of porphyrins in photomedicine is already in clinical practice. However, the search of more effective agents continues, including the development of organic-inorganic structures in which porphyrins combine with plasmonic nanoparticles. Here, we present hybrid structures based on gold nanoparticles and porphyrins, their photophysical properties, preliminary cellular tests and potential for bioimaging and photodynamic therapy.

ThSYC-35
Thursday, June 25, 2026; 09:30-10:00
Induction of non-apoptotic cell death in hepatocarcinoma cells via photothermal therapy using Au@Fe_3O_4 nanostars *(Invited)*
K. Levada[1], S. Pshenichnikov[1], A. Anikin[1], A. Motorzhina[1], M. Albino[2,3], V. Malashchenko[4], L. Litvinova[4], V. Rodionova[1], C. Sangregorio[2,3], L. Panina[1,5]; [1]REC Smart Materials and Biomedical Applications, Immanuel Kant Baltic Federal University, Russia; [2]Institute of Chemistry of Organometallic Compounds - C.N.R., Italy; [3]Department of Chemistry 'Ugo Schiff' and INSTM, University of Florence, Sesto Fiorentino (FI), Italy; [4]Center for Immunology and Cell Biotechnology, Immanuel Kant Baltic Federal University, [5]National University of Science and Technology MISiS, Russia
Hybrid Au@Fe_3O_4 nanostars, with a gold core and magnetite shell, are promising for photothermal cancer therapy. They efficiently convert near-infrared light to heat. In tests on liver cancer cells (Huh7), combining low-dose nanostars with NIR light reduced cell viability by 79% and triggered non-apoptotic cell death, confirming their potential for targeted, minimally invasive treatment.

ThSYC-36
Thursday, June 25, 2026; 10:00-10:30
Plasma membrane-bound heat shock proteins: mHsp70 as a target for theranostics in oncology *(Invited)*
M. Shevtsov[1,2]; [1]Department of Radiation Oncology, Klinikum rechts der Isar, Technical University of Munich, Germany; [2]Laboratory of Biomedical Nanotechnologies, Institute of Cytology (RAS), Russia
Heat shock protein 70 (Hsp70) is uniquely expressed on the plasma membrane of malignant cells (mHsp70) but not normal tissues, making it an attractive therapeutic target. Experimental, preclinical, and pilot clinical studies demonstrate that mHsp70 promotes tumor invasion and migration and can be selectively targeted by chaperone inhibitors, tumor-homing peptides, and antibody-functionalized nanoplatforms for theranostic applications in neuro-oncology.

ThSYC-37
Thursday, June 25, 2026; 10:30-10:45
Detection of Alzheimer's disease using potential SPR biosensor
Jay Kumar Yadav[1], Kedar Nath Das[2]; [1]Dept. of Electronics and Communication Engineering, National Institute of Technology Silchar, [2]Dept. of Mathematics, National Institute of Technology Silchar, India
In this paper, we have developed a perovskite (CsGeI3)-Ta2O5-based Kretschmann's configuration surface plasmon resonance (SPR) biosensor for assessing Alzheimer's disease, utilizing the refractive index (RI) of the sample to differentiate between healthy brain tissue and Alzheimer's disease. Furthermore, to enhance light-matter interaction, we have optimized the thickness of the silver and Ta2O5 material layers, along with the analyte sample.

ThSYC-38
Thursday, June 25, 2026; 10:45-11:00
Plasmonic Au-decorated magnetic Fe_3O_4 elongated clusters for dual-mode biosensing
V.V. Volkov[1,2], A.M. Skirda[1,3], A.V. Orlov[1], P.I. Nikitin[1,2]; [1]Prokhorov General Physics Inst. of RAS, [2]National Research Nuclear Univ. MEPhI (Moscow Engineering Physics Inst.), [3]Moscow Inst. of Physics and Technology, Russia
Plasmonic magnetic elongated clusters were developed for dual-mode biosensing. Magnetite nanoparticles, synthesized by co-precipitation, self-assembled into anisotropic clusters under magnetic field and coated with SiO_2 via Stöber process. Au satellites were deposited via borohydride reduction. The platform enables simultaneous magnetic manipulation/detection and optical readout with possibility of simple biomolecule functionalization on Au surface through thiol groups.

ThSYC-39
Thursday, June 25, 2026; 11:30-12:00
Programmable DNA nanostructures for on-chip photonic architectures *(Invited)*
I.V. Martynenko; Skoltech, Russia
Structural DNA nanotechnology, particularly the DNA origami technique, provides a powerful bottom-up approach for fabricating photonic architectures with nanometer precision. By using programmable DNA self-assembly, complex plasmonic and photonic elements can be precisely positioned and integrated on-chip with unprecedented spatial control. This talk presents recent advances in DNA-origami–templated nanophotonics, emphasizing scalable assembly strategies and their potential for next-generation biophotonic and quantum optical devices.

ThSYC-40
Thursday, June 25, 2026; 12:00-12:30
Limitations and solutions for nanozyme application in immunoassays *(Invited)*
P.V. Khramtsov; Perm Federal Research Center, Russsia
Nanozymes—artificial enzyme mimetics—are increasingly regarded in the current literature as promising alternatives to natural enzymes in colorimetric immunoassays. In this presentation, we aim to address several challenges associated with the practical implementation of nanozymes, as well as to discuss potential solutions and future research directions in this field.

ThSYC-41
Thursday, June 25, 2026; 12:30-12:45
Biosensor based on reduced graphene oxide for noninvasive detection of carcinoembryonic antigen
A.S. Kudriavtseva[1,2], B.G. Gorshkov[1], I.I. Bobrinetskiy[2], P.I. Nikitin[1]; [1]Prokhorov General Physics Institute of RAS, [2]Moscow Center for Advanced Studies, Russia
A biosensor based on reduced graphene oxide functionalized with a DNA aptamer was developed for non-invasive detection of carcinoembryonic antigen in saliva. The dual-mode platform, combining field-effect transistor and electrochemical principles, achieves a zeptomolar detection limit and a dynamic range spanning eight orders of magnitude. This approach enables rapid, reliable, and highly sensitive point-of-care cancer monitoring.

ThSYC-42
Thursday, June 25, 2026; 12:45-13:00
Machine learning in data analysis and data augmentation for Raman spectroscopy
E.S. Prikhozhdenko; MIPT, Russia
This study uses Principal Component Analysis (PCA) to generate synthetic Raman spectra and augment training data for classifying adipose tissue before and after lipase exposure. Optimized Random Forest and Gradient Boosting models achieved high accuracy (up to 96.4%), validating the data augmentation method and aligning with expected biochemical changes from hydrolysis.

ThSYC-43
Thursday, June 25, 2026; 13:00-13:15
Machine learning and evolutionary optimazation in modeling the optical response of organic pigments
V.A. Kurkov[1], D.D. Chesalin[2], N.N. Reutskii[3], A.N. Samarin[1], R.Y. Pishchalnikov[1]; [1]Prokhorov General Physics Institute of RAS, [2]Faculty of Biology, Lomonosov Moscow State University, [3]Faculty of Physics, Lomonosov Moscow State University, Russia
Considering the optically allowed electronic transition of carotenoids at 400-550 nm, we classified absorption spectra of these pigments by the set of Huang-Rhys factors. The modeling of the spectra in terms of semiclassical theory was optimized by differential evolution. As the result, the data base containing pigments, their spectra, and corresponding quantum parameters was made for the optical response identification.

ThSYC-44
Thursday, June 25, 2026; 13:15-13:30
Ultrafast force-clamp spectroscopy reveals force-dependent friction regulation of the microtubule-binding Ndc80 complex
V.M. Demidov, I.V. Gonchar, F.I. Ataullakhanov; Center for Theoretical Problems of Physicochemical Pharmacology, RAS, Russia
This work demonstrates the use of ultrafast force-clamp spectroscopy to investigate the properties and mechanism of force-induced motion of the kinetochore protein complex Ndc80 at the single-molecule level in vitro. We show that the Ndc80 complex can glide along microtubule wall under external force, and that this motion is highly asymmetric in a direction-dependent manner. This asymmetry arises from force-dependent modulation of the Nuf2 domain's interaction with the microtubule.

ThSYC-45
Thursday, June 25, 2026; 15:00-15:30
Multi-functionalization diamond particles for biological applications *(Invited)*
K.V. Bogdanov[1], T.E. Didukh[1], S.A. Grudinkin[2], A.V. Baranov; [1]ITMO University, [2]Ioffe Institute, Russia
This study presents CVD diamond nano/submicroparticles with core/shell structure for biomedical applications. The boron core heats via laser absorption, exciting SiV/GeV color centers in the shell for temperature-sensitive and visualisation luminescence at 738/602 nm

ThSYC-46
Thursday, June 25, 2026; 15:30-16:00
Optical properties of diatom algae: from nature to photonic structures *(Invited)*
J. Cvjetinovic, S. Dyakov, M. Reshetova, A. Ivleva, D. Tsiurko, D. Gorin; Skolkovo Inst. of Science and Technology, Russia
Diatom frustules are hierarchically structured silica shells enabling efficient light manipulation. Numerical modeling reveals Talbot interference and enhanced energy localization. Scaled-up biomimetic frustules fabricated by DLP 3D printing experimentally confirm Talbot focusing in the terahertz range. Modification via iron oxide nanoparticles is explored, linking optical and biological effects. The results demonstrate potential applications in bioinspired photonics, sensing, and light-harvesting technologies.

ThSYC-47
Thursday, June 25, 2026; 16:00-16:15
Application of lasers for amyloid fibril aggregation, disaggregation and detection
Y.A. Trutnev, T.A. Matveeva, E.A. Molkova, R.M. Sarimov; Prokhorov General Physics Institute of RAS, Russia
Amyloid fibrils, central to neurodegenerative diseases, resist conventional disaggregation and often yield toxic oligomers. We generated lysozyme-derived fibrils under varied conditions—temperature (22–65°C), denaturant concentration, and agitation—to produce structurally diverse aggregates. These were irradiated with ns/ps Nd:YAG laser pulses (1064/532 nm). This approach aims to achieve precise, non-invasive fibril disaggregation, advancing targeted therapy for protein-misfolding disorders.

ThSYC-48
Thursday, June 25, 2026; 16:15-16:30
Stabilization of the mesoporphyrin IX dihydrochloride with flavonoids (Tagetes patula L.) luminescent complex by ytterbium ions
E.S. Zemlyakova, A.V Tcibulnikova, V.A. Slezhkin, A.A. Kostrina, D.A. Artamonov, I.G. Samusev; Immanuel Kant Baltic Federal University, Russia
The study focuses on the photosensitizers found in plant extracts, their activation by molecular oxygen, and the formation of luminescent complexes with electromagnetic energy transfer.

ThSYC-49
Thursday, June 25, 2026; 16:30-16:45
Smart microchamber biomaterial scaffolds for bioactive compounds release and microenvironment modulation
A.V. Ermakov[1], E.V. Lengert[2], A.N. Ivanov[3], G.B. Sukhorukov[1, 4]; [1]Life Improvement by Future Technologies (LIFT) Center, [2]Institute of Molecular Theranostics, I.M. Sechenov First Moscow State Medical University, [3]Central Research Laboratory, Saratov State Medical University of V.I. Razumovsky, Ministry of Health of the Russian Federation, [4]Vladimir Zelman Center for Neurobiology and Brain Rehabilitation, Skolkovo Institute of Science and Technology, Russia
Addressing the rising costs of wound care, we present a novel microstructured wound dressing with integrated sensing and controlled release capabilities. Utilizing solid-powder encapsulation, this platform dynamically modulates the wound microenvironment via sustained delivery of antioxidants and hydrogen peroxide. This approach promotes angiogenesis, reduces inflammation, and facilitates scar-free healing by subtly shifting the chemical profile for optimized tissue regeneration.

ThSYC-50
Thursday, June 25, 2026; 16:45-17:00
Intravital cardiac dynamics imaging of zebrafish larva with a tunable two-photon light-sheet microscope
K.A. Kungurov[1,2], A.D. Sergeeva[3,4], L.L. Naumov[3], M.A. Solotenkov[1,2], A.B. Fedotov[1,2], V.V. Belousov[2,3,4], D.S. Bilan[3,4], A.A. Lanin[1,2]; [1]Physics Department, M.V. Lomonosov Moscow State University, [2]Life Improvement by Future Technologies (LIFT) Center, Skolkovo, [3]M.M. Shemyakin and Yu.A. Ovchinnikov Institute of Bioorganic Chemistry, RAS, [4]Federal Center of Brain Research and Neurotechnologies, Federal Medical Biological Agency, Russia
We have developed a femtosecond, three-stage, ytterbium-doped fiber chirped pulse amplifier for a solid-state laser. This source was used in a two-photon light-sheet microscopy scheme. As study subjects we used zebrafish larva with labeled cardiomyocytes. The developed system enabled non-invasive, high-speed, high-resolution visualization of cardiac temporal dynamics and morphology.

ThSYC-p01
Thursday, June 25, 2026; 15:00-18:30
New asymmetric porphyrin-based dyad as a fluorescent probe for cellular imaging *(Poster)*
A.A. Smirnov, D.A. Lukyanov, A.V. Povolotskiy, V.A. Pomogaev, E.V. Solovyeva; Institute of Chemistry, St. Petersburg State University, Russia
Porphyrin dyads are considered promising multimodal fluorescent probes due to their ratiometric spectral response and excellent biocompatibility. However, very few water-soluble compounds of this type are known. In this study, a new asymmetric dyad, ZnTPPS-TPP, was synthesized, containing both metallated and non-metallated fragments. Photophysical properties of the dyad were studied in biological environments and supported by DFT modeling.

ThSYC-p02
Thursday, June 25, 2026; 15:00-18:30
Wavelet analysis of cerebral versus systemic hemodynamics responses to breath-holding in rats *(Poster)*
I.A. Mizeva[1], A.Y. Sokolov[2], A.A. Kamshilin[3]; [1]Institute of Continuous Media Mechanics, UrB RAS, [2]I.P. Pavlov Institute of Physiology of RAS, [3]Institute of Automation and Control Processes FEB RAS, Russia
The study analyzes the response of low-frequency components of simultaneously measured cerebral blood supply and systemic arterial blood pressure to breath-holding in rats. The dynamics of cerebral blood supply was assessed by imaging photoplethysmography. The dynamics of the frequency components was quantified by the wavelet analysis. Results reveal distinct, frequency-specific regulatory mechanisms of cerebral blood supply.

ThSYC-p03
Thursday, June 25, 2026; 15:00-18:30
Separation of linear dichroism and birefringence in Polarization-Modulation Pump-Probe method as a tool for studying ultrafast dynamics in biomolecules. *(Poster)*
O.S. Vasyutinskii[1], D.A. Volkov[1], M.V. Belashov[1,2], A.V. Dmitrieva[1,3], M.A. Plotitsyna[1,3], M.E. Sasin[1]; [1]Ioffe Institute, [2]ITMO University, [3]Peter the Great St. Petersburg Polytechnic University, Russia
We experimentally separated linear dichroism (LD) and birefringence (BF) effects in NADH solution using polarization-modulation pump-probe spectroscopy. The BR detection gives significant increase in signal and can be used for studying long relaxation processes. The LD signal is more convenient for studying of fast relaxation processes. The approach enables the detailed study of ultrafast energy transfer processes in biomolecules in solutions and cells.

ThSYC-p04
Thursday, June 25, 2026; 15:00-18:30
Photoluminescence quenching of carbon dots by multi-metal ion systems in aqueous solutions *(Poster)*
A.A.Cherednikova[1], H.Barhum[2], L.V.Mikhailova[1], M.V.Timofeeva[1], E.N. Gerasimova[1], A.E. Zhilina[3], I.I. Vazhenin[1], I.A.Reznik[1], P. Ginzburg[2], M.V.Zyuzin[1]; [1]School of Physics and Engineering, ITMO University, Russia; [2]Department of Physical Electronics, Tel Aviv University, Israel; [3]Faculty of Biotechnologies, ITMO University, Russia
Fe3+ and Co2+ are essential for oxygen transport and vitamin B12 synthesis. Monitoring metal ion concentration changes enables early-stage diagnostics. Biological environment is a multicomponent system, containing various metals. This study explores CD's photoluminescence quenching behavior and sensitivity to Fe3+, Co2+, Fe3+/Co2+ combined system, where it's detected separately and as multi-metal ion system.

ThSYC-p05
Thursday, June 25, 2026; 15:00-18:30
Fluorescent copper nanoclusters stabilized with small L-proline and large vancomycin: ligand effect *(Poster)*
A.I. Demenshin, E.A. Kolobova, T.S. Sych, U.P. Zimarina, E.V. Solovyeva; St.Petersburg State University, Russia
Copper nanoclusters are promising for bioanalytics. Their intrinsic fluorescence can be combined with recognition properties of stabilizing organic ligands for improved biomolecule sensing. In this work, we present the developed procedures of the synthesis of L-proline and vancomycin-stabilized copper nanoclusters, their characterization and application in fluorescence sensing and electrophoretic separation of drugs from the family of selective serotonin reuptake inhibitors.

ThSYC-p06
Thursday, June 25, 2026; 15:00-18:30
Kinetic characterization of G-protein-coupled receptors using spectral-phase interferometry *(Poster)*
A.M. Skirda[1,2], A.V. Orlov[1], S.G. Trofimenko[1,3], E.S. Vyhodtseva[1,3], P.I. Nikitin[1,3]; [1]Prokhorov General Physics Institute of RAS, [2]Moscow Institute of Physics and Technology, [3]National Research Nuclear University MEPhI (Moscow Engineering Physics Institute), Russia
Despite their therapeutic importance, a substantial number of G-protein-coupled receptors (GPCRs) remain classified as "orphan receptors", meaning their ligands and cellular functions are unknown. Using a low-coherence interferometry-based biosensing platform, we characterize the binding kinetics between GPCR fragments and stabilizing antibodies. Developed approach provides a scalable method for the functional profiling of orphan GPCRs and the screening of potential ligands.

ThSYC-p07
Thursday, June 25, 2026; 15:00-18:30
Quantitative analysis of amino acid mixtures using drop-coating deposition Raman spectroscopy *(Poster)*
E.Y. Ponkratova[1], A.S. Shtumpf[1], M.P. Sandomirskii[1], K.A. Maleeva[2], D.A. Zuev[1]; [1]Faculty of Physics, ITMO University, [2]International Research and Education Center for Physics of Nanostructures, ITMO University, Russia
Proteinogenic amino acids are vital for peptides and proteins in the human body. Current analysis methods face challenges, prompting exploration of Raman spectroscopy with drop-coating deposition (DCDR) for unique molecular vibrations. This study evaluated the DCDR method using amino acid mixtures, determining optimal parameters. Results indicated varying accuracy based on hydrophobicity, highlighting DCDR's limitations and potential for analyzing complex mixtures.

ThSYC-p08
Thursday, June 25, 2026; 15:00-18:30
Integration of optical genome mapping with super-enhancer annotations: a conceptual framework for structural variant analysis in regulatory regions *(Poster)*
N.N. Orlova, G.A. Ashniev, Yu.V. Makus, A.V. Orlov; Prokhorov General Physics Institute of RAS, Russia
We propose a conceptual framework for integrating optical genome mapping (OGM) data with super-enhancer annotations to systematically identify structural variants affecting cancer-associated regulatory regions. OGM utilizes laser-induced fluorescence imaging of labeled DNA molecules, providing resolution suitable for analyzing extended regulatory elements. This approach may enable detection of enhancer hijacking events and facilitate discovery of novel mechanisms of oncogene dysregulation.

ThSYC-p09
Thursday, June 25, 2026; 15:00-18:30
Modeling of skin diffuse reflectance spectra *(Poster)*
Ya.A. Razumov[1], I.A. Serebryakova[1], Y.I. Surkov[1], E.A. Genina[1,2], V.V. Tuchin[1,2,3]; [1]Optics and Biophotonics Department, Saratov State University, [2]Laboratory of Biophotonics, Tomsk State University, [3]Laboratory of Laser Diagnostics of Technical and Living Systems, IPMC RAS, FRC "Saratov Scientific Centre of the RAS", Russia
This study presents a comprehensive investigation of the optical properties of human skin with varying melanin content (1–50%) and hematocrit levels (10–50%) using the CloudMonteCarloforLightTransport platform. Simulated diffuse reflectance spectra in the 400–1000 nm range were compared with experimental in vivo data acquired using a spectrometer and a dermatoscope. The work aims to establish a foundation for developing color-correction algorithms and quantitative methods for assessing skin biochemical parameters based on accessible optical measurements

ThSYC-p10
Thursday, June 25, 2026; 15:00-18:30
Optical biosensors for studying the kinetics of antibody binding and regeneration of sensor chips based on gelatin - folate conjugates *(Poster)*
D.O. Novichikhin[1], V.A. Bragina[1], G.M. Sorokin[2], A.I. Nikitin[3], N.A. Belyakov[1,4]; [1]Prokhorov General Physics Institute of RAS, [2]Chuvash State University, [3]Volga branch of MADI, [4]Moscow Center for Advanced Studies, Russia
A label-free optical biosensor based on low-coherence interferometry was developed for studying molecular binding kinetics by measuring surface biolayer thickness. Antibody binding to immobilized folic acid-gelatin conjugate (FA-gelatin) was investigated as a model system. Kinetic constants, competitive displacement, and surface regeneration were characterized for various chip modifications. Results demonstrate that FA-gelatin serves as a convenient model conjugate for assays with limited binding-site accessibility.

Section SYD. Section D. Photodynamic processes in biology and medicine

WeSYD-01
Wednesday, June 24, 2026; 09:00-09:30
Photoluminescence of molecular oxygen in systems of biological importance. Fifty years after the discovery. History, measurement technologies, application fields *(Keynote presentation)*
A.A. Krasnovsky Jr; Federal Research Center of Biotechnology RAS, Russia
Singlet oxygen molecules (SO) are known to promote photodynamic stress. In 1976, 50 years ago this author discovered that SO deactivation in natural systems is accompanied by IR phosphorescence at 1270 nm. Currently, this phosphorescence has been using worldwide as the best tool for SO investigation. This paper provides a survey of the progress for the half of century of phosphorescence research.

WeSYD-02
Wednesday, June 24, 2026; 09:30-10:00
Multimodal QPI^{-} and FLIM-based platform for analysis of localized photodynamic treatment of cells in vitro *(Invited)*
I.V. Semenova, A.V. Belashov, A.A. Zhikhoreva; Ioffe Institute, Russia
This report presents a multimodal approach combining the fluorescence lifetime imaging microscopy (FLIM) and spatial light interference microscopy (SLIM) into a single complex allowing for a concurrent analysis of fluorescence and morphological parameters of cells in vitro. The developed approach was validated on investigation of cell response to photodynamic treatment applied both onto the entire sample and on individual cells.

WeSYD-03
Wednesday, June 24, 2026; 10:00-10:30
Singlet oxygen generation in protein-containing solutions: towards understanding the mechanisms of photodynamic therapy *(Keynote presentation)*
O.S. Vasyutinskii[1], D.M. Beltukova[1], V.P. Belik[1], K.A. Chudakov[2], O.V. Smirnov[1], I.V. Semenova[1]; [1]Ioffe Institute, [2]Peter the Great St. Petersburg Polytechnic University, Russia
As demonstrated, the photosensitizer Ce6 bound with human serum albumin practically does not produce singlet oxygen. The result obtained challenges the established mechanisms of photodynamic therapy through singlet oxygen production. Moreover, the we suggest a novel method for characterization of photosensibilizer triplet states at room temperature that was not possible before.

WeSYD-04
Wednesday, June 24, 2026; 10:30-10:45
Sensitive singlet oxygen detection system based on a superconducting single photon detector
V.S. Andreev[1,2,3], P.V. Morozov[2,3], G.N. Goltsman[1,2,3]; [1]HSE University, [2]Moscow Pedagogical State University, [3]LLC "Scontel", Russia
In this paper we present sensitive system for detecting photons of singlet oxygen phosphorescence combined with the superconducting nanowire single photon detector. Detector coupled with multimode fiber and efficiency above 80 % with working area 50x50 um2 and DCR at working point of 1000, optimized for measurements around 1270 nm.

WeSYD-05
Wednesday, June 24, 2026; 10:45-11:00
Study of RPE lipofuscin photooxidation degree using VIS¯NIR spectroscopy and fluorescence lifetime imaging microscopy
P. Morozov[1,2], V. Andreev[1,2,3], M. Yakovleva[4,5], A. Kostyukov[4,5], M. Tokarev[1], T. Feldman[4,5], V. Kuzmin[4], G. Goltsman[1,3], M. Ostrovsky[4,5], M. Shirmanova[1]; [1]Physics dept., Moscow Pedagogical State University, [2]LLC “Superconductor Nanotech”, [3]Physics dept., National Research University Higher School of Economics, [4]N.M. Emanuel Institute of Biochemical Physics RAS, [5]Biology dept., Lomonosov Moscow State University, Russia
To study fluorescence lifetimes of lipofuscin from retinal pigment epithelium cells we used fluorescence excitation method with time correlated photon counting and fluorescence lifetimes imaging microscopy in combination with superconducting single-photon detector. An analysis of fluorescence lifetimes and VIS-NIR spectra before and after photooxidation of lipofuscin granules showed significant differences in the characteristic lifetimes, as well as a shift of the maximum of fluorescence spectrum to short-wavelength region. These methods become promising for development of early preclinical method.

WeSYD-06
Wednesday, June 24, 2026; 11:30-12:00
Photo- and sonocatalytic activity of Fotoditazin decorated microbubbles *(Invited)*
A. Orlova[1,2], A. Boltenko[1,2], T. Estifeeva[2,3], M. Rider[1], M. Yaroslavova[1], K. Parutina[2], A. Surkova[1], R. Barmin[2,3], P. Rudakovskaya[2,3]; [1]International Research and Education Centre for Physics of Nanostructures, ITMO University, [2]Center for Photonic Science and Engineering, Skolkovo Institute of Science and Technology, [3]Dmitry Mendeleev University of Chemical Technology of Russia, Russia
Mixtures of protein-shelled microbubbles with the photosensitizer Fotoditazin were studied for photo- and sonodynamic applications. Circular dichroism and optical spectroscopy revealed that Fotoditazin interacts with the microbubble shell, inducing shell-dependent changes in BSA structure and sensitizer aggregation. Stabilized shells and monomeric chlorin e6 result in enhanced photo- and sonocatalytic activity of Fotoditazin.

WeSYD-07
Wednesday, June 24, 2026; 12:00-12:30
Nano-phytoformulations of berberine and pheophorbide-a mediated photodynamic therapy on lung cancer spheroids model *(Invited)*
H. Abrahamse, M. Moloudi, B. George; Laser Research Centre, Faculty of Health Sciences University of Johannesburg, South Africa
Lung cancer is the second most common cancer, causing ~2 million cases and 1.76 million deaths annually due to late diagnosis. Smoking and environmental factors dominate risk. Conventional therapies face toxicity and resistance. Photodynamic therapy is a targeted, noninvasive alternative. Natural photosensitizers berberine and pheophorbide-a show promise, enhanced by nanocarriers and validated using 3D spheroid models.

WeSYD-08
Wednesday, June 24, 2026; 12:30-12:45
Evaluation of phototoxic potential of gold nanoparticles - liposome - pheophorbide-a against breast cancer cells
B.P. George, M. Zahra, H. Abrahamse; Univ. of Johannesburg, South Africa
Breast cancer treatment is limited by poor specificity and therapy resistance. This study evaluated green-synthesised Dicoma anomala-derived gold nanoparticles encapsulated in liposomes and loaded with pheophorbide-a for photodynamic therapy against MDA MB-231 triple-negative breast cancer cells. The nanoformulation showed dose-dependent cytotoxicity and induced intrinsic apoptosis, highlighting its potential as a promising breast cancer therapeutic platform.

WeSYD-09
Wednesday, June 24, 2026; 12:45-13:00
Synthesis of core-shell ternary quantum dots -porphyrin conjugates and itsphotodynamic therapy application
S.O. Oluwafemi; Univ. of Johannesburg, South Africa
In this presentation, a large-scale aqueous synthesis of ternary quantum dots (QDs) and their conjugation to porphyrin will be discussed as an efficient way to overcome photosensitizer shortcomings. The singlet oxygen generation of this highly aqueous-soluble novel conjugate and its cell viability against different cancer cell lines will be discussed, highlighting its potential for PDT applications.

WeSYD-10
Wednesday, June 24, 2026; 13:00-13:15
Plasmon-oxygen luminescence method for registration of quercetin and its derivates in extract solutions
A.V. Tsibulnikova[1], E.S. Zemlyakova[1,2], V.A. Slezhkin[1,2], A.A. Kostrina[1], D.A. Artamonov[1], I.G. Samusev[1]; [1]Immanuel Kant Baltic Federal University, Russia
This paper presents a luminescent method for the qualitative determination of flavonoids – quercetin and its main derivatives in the extract of viburnum berries (Viburnum Opulus L.) using oxygen saturation process and plasmon mechanism.

ThSYD-11
Thursday, June 25, 2026; 10:15-10:30
Tissue-mimicking phantoms with tunable optical properties for laser thermotherapy
S.A. Mirzaeva[1], P.V. Aleksandrova[1], I.N. Dolganova[1,2], Yu.A. Suchkov[1], V.B. Tsvetkov[1], K.I. Zaytsev[1], D.G. Kochiev[1], A.K. Zotov[1]; [1]Prokhorov General Physics Institute of RAS, [2]Osipyan Institute of Solid State Physics of RAS, Russia
Laser ablation demands precise thermal control. Existing phantoms cannot simultaneously replicate tissue's mechanical and optical properties and thermal response. We developed liver-mimicking alginate phantoms matching 1064 nm optical and thermal dynamics, bone-mimicking tunable opal structures replicating optical properties and thermal response, hybrid phantoms modeling thermal response on bone-soft tissue interfaces. Our results enable protocol optimization, device calibration, and surgical training for cancer therapy.

WeSYD-11
Wednesday, June 24, 2026; 15:00-15:30
A fiber photometry approach for the in vivo assessment of BBB integrity and brain tissue clearance *(Invited)*
A.K. Berdnikov[1], A.V. Stavrovskaya[1], I.V. Potapenko[1,2], V.I. Zhdankina[1], A.N. Lukyanchuk[1], Yu.K. Komleva[1], V.V. Salmin[2], A.B. Salmina[1,2]; [1]Russian Center of Neurology and Neuroscience, [2]Bauman Moscow State Technical University, Russia
Fiber photometry could be a potent method for assessing blood-brain barrier integrity in vivo. By monitoring sodium fluorescein decay in 5xFAD Alzheimer's mice versus wild-type controls, we observed significantly altered clearance dynamics. This approach enables longitudinal monitoring of BBB function, overcoming the limitations of standard post-mortem assessments.

WeSYD-12
Wednesday, June 24, 2026; 15:30-16:00
Non-invasive optical assessment of skin perfusion under lower limb ischemia *(Invited)*
V.I. Bukova[1], A.M. Kovalchuk[2], I.V. Makarova[1], A.V. Guryleva[1], A.S. Machikhin[1], V.P. Baklaushev[2]; [1]Scientific and Technological Centre of Unique Instrumentation of RAS, [2]Federal Center of Brain Research and Neurotechnologies of FMBA of Russia, Russia
Critical lower limb ischemia impacts microcirculation and requires early, non-invasive diagnosis. This study proposes the use of photoplethysmography and videocapillaroscopy for assessing skin microcirculation to address this issue. In a rat ischemia model, reduced perfusion and vessel density were observed after embolization. The method is rapid, safe, cost-effective, and suitable for continuous studies.

ThSYD-12
Thursday, June 25, 2026; 10:30-10:45
Low level laser therapy in dentistry
Y.S. Kozlova; Sechenov First Moscow State Medical Univ., Russia
Low Level Laser Therapy in Dentistry (LLLT) is very wide used in different parts of dentistry for example for treatment of dentin hypersensitivity, temporomandibular joint, for quicker healing process after any surgical procedure in the oral cavity, in orthodontic treatment for accelerating tooth movement, periodontal treatment.

WeSYD-13
Wednesday, June 24, 2026; 16:00-16:15
Controlling radiation parameters to expandthe functional capabilities of the optical method of recording human physiologicalsignals
V.V. Davydov[1,2], M.A. Yakusheva[3], D.S. Provodin[1], E.V. Porfir'eva[1], D.V. Davydova[1], E.A. Zhestkaya[2], Y.A. Guseva[1]; [1]Peter the Great St.Petersburg Polytechnic University, [2]St.Petersburg Electrotechnical University "LETI", [3]St.Petersburg State University of Telecommunications, Russia
A new method for recording human biological signals based on an optical sensor with a CCD array and radiation parameter adjustment has been proposed. The use of the new method has made it possible to increase the signal-to-noise ratio by more than an order of magnitude and to record minor changes in the cardiovascular system that were not previously reflected in the recorded signals.

ThSYD-13
Thursday, June 25, 2026; 11:30-12:00
Method of planning and monitoring the absorbed dose of laser light during photodynamic therapy of multilayered tissues of hollow organs *(Invited)*
T.A. Savelieva[1,2], A.A. Krivetskaya[1,2], D.M. Kustov[1], V.V. Levkin[3], S.S. Kharnas[3], V.B. Loschenov[1,2]; [1]Prokhorov General Physics Institute of RAS, [2]Institute of Engineering Physics for Biomedicine, National Research Nuclear University MEPhI, [3]Department of Faculty Surgery No.1, I.M. Sechenov First Moscow State Medical University, Russia
A PDT planning algorithm has been developed based on numerical modeling and utilizing optical-spectral measurement data of diffuse transmittance and diffuse reflectance of laser radiation by the walls of hollow gastrointestinal organs and the fluorescence of the photosensitizer contained within them, which allows to calculate the absorbed laser dose and to assess the biochemical effectiveness of PDT.

WeSYD-14
Wednesday, June 24, 2026; 16:15-16:30
Intraoperative fluorescent verification of intracerebral bone fragments in penetrating cranial injuries
G.G. Bulyshchenko[1], N.K. Vasileva[1], B.V. Martynov[1], G.V. Papayan[2], K.A. Chemodakova[1], K.N. Babichev[1], S.D. Mirzametov[1], B.G. Adleyba[1], S.A. Goryainov[3], A.I. Gaivoronsky[1], I.A. Menkov[1], I.V. Boykov[1], D.V. Svistov[1]; [1]Department of Neurosurgery, Military Medical Academy named after S.M. Kirov, [2]Center for Laser Medicine, Almazov National Medical Research Centre, [3]Department of Bone and Soft Tissue Tumors, A. Tsyb Medical Radiological Research Center, Russia
A novel intraoperative method using ultraviolet light (390 nm) visualizes bone fragments in penetrating brain injuries via green-blue autofluorescence. In a clinical case, it enabled complete removal of fragments <5 mm, undetectable under white light. The technique is simple, portable, and cost-effective, significantly improving surgical precision and infection prevention in field and emergency neurosurgery.

ThSYD-14
Thursday, June 25, 2026; 12:00-12:30
Raman spectroscopy: from solving fundamental problems to practical applications *(Invited)*
V.S. Novikov[1], L.Yu. Kozlova[1], S.O. Liubimovskii[1], S.M. Kuznetsov[1], D.D. Vasimov[1,2], A.M. Semin[1,3], V.I. Andreev[1,3], A.N. Bortcova[1,3], M.N. Moskovsky[4], S.V. Gudkov[1], V.V. Kuzmin[1], E.A. Sagitova[1], G.Yu. Nikolaeva[1]; [1]Prokhorov General Physics Institute of RAS, [2]Moscow Institute of Physics and Technology, [3]D.I. Mendeleev Russian University of Chemical Technology, [4]Federal Scientific Agronomic and Engineering Center VIM, Russia
Raman spectroscopy remains a powerful tool for molecular analysis, with expanding applications enabled by portable instruments and advanced data processing. We develop Raman methods (including Resonance Raman and SERS) to assess polymer crystallinity and composition, analyze oils and dietary supplements, identify carotenoids, and detect plant diseases at early stages, supporting medical, food, and agricultural applications.

ThSYD-15
Thursday, June 25, 2026; 12:30-12:45
Photodynamic therapy effect on the mouse mammary tumors with high levels of mechanical stress
A.V. Ryabova[1,2,3], I.D. Romanishkin[1], I.V. Markova[1,2], T.A. Savelieva[1,2], A.S. Moskalev[1,2], D.A. Vasilieva[2], D.V. Pominova[1,2]; [1]Prokhorov General Physics Institute of RAS, [2]Institute of Engineering Physics for Biomedicine, National Research Nuclear University MEPhI, [3]Peoples' Friendship University of Russia named after Patrice Lumumba, Russia
The effects of photodynamic therapy (PDT) on the tumor's extracellular matrix (ECM) were studied. The used tumors were differed in stiffness, scattering, blood permeability, water and collagen content. Ce6 accumulation was slower for stiffer tumors, which correlates with hypoperfusion and hypoxia. PDT reduced tumor stiffness due to cell death and ECM damage.

WeSYD-15
Wednesday, June 24, 2026; 16:30-16:45
LED compact illuminator -based photodynamic therapy efficacy assessment
A.Yu. Sain[1], A.S. Abdurashitov[1,2], P.I. Proshin[2], D.A. Terentyeva[1,3], G.B. Sukhorukov[1,2], O.A. Sindeeva[1]; [1]Center for Bio- and Medical Technologies, Skolkovo Institute of Science and Technology, [2]Life Improvement by Future Technologies (LIFT) Center, [3]Center for Photonic Science and Engineering, Skolkovo Institute of Science and Technology, Russia
The increasing demand for specialized equipment in photodynamic therapy necessitates innovative design approaches. This study presents the tunable LED illuminator operated at 660 nm engineered to scan-less provide uniform irradiation. The practical efficacy of the compact LED illuminator for photodynamic therapy parameters optimization was evaluated through experiments involving commonly used in vitro models for studying cancer treatments across various organs.

WeSYD-16
Wednesday, June 24, 2026; 16:45-17:00
Hardware design for reliable photosensitizers assessment
A.S. Abdurashitov[1,2], P.I. Proshin[1,2], A.U. Sain[1], D.A. Terentyeva[1,3], A.D. Kosov,[4], G.B. Sukhorukov[1,2], O.A.Sindeeva[1]; [1]Center for Bio- and Medical Technologies Skoltech, [2]Life Improvement by Future Technologies (LIFT) Center, [3]Center for Photonic Science and Engineering, Skoltech, [4]Department of Chemistry, Lomonosov Moscow State University, Russia
This work details a compact, scanless 660 nm LED illuminator engineered for PDT. The design ensures precise, uniform, and stable light delivery (1-20 mW/cm²) across standard 96-well plates. We validate performance through rigorous photodynamic efficacy studies on six cancer cell lines, establishing a robust platform for in vitro photosensitizer testing.

ThSYD-16
Thursday, June 25, 2026; 12:45-13:00
Methylene blue and chlorin e6 metabolic effects on macrophages: FLIM monitoring
D.V. Pominova[1,2], I.V. Markova[1,2], I.D. Romanishkin[1], A.S. Skobeltsin[1,2], V.I. Makarov[1,2], A.V. Ryabova[1,2]; [1]Prokhorov General Physics Institute of RAS, [2]Institute of Engineering Physics for Biomedicine, National Research Nuclear University MEPhI, Russia
We studied methylene blue (MB) and chlorin e6 (Ce6) metabolic effects on tumor-associated macrophages (TAMs). At first M1 and M2 macrophages polarized from THP-1 were treated with MB or Ce6, and then, photodynamic therapy was performed. Fluorescence-lifetime imaging microscopy (FLIM) of NAD(P)H/FAD revealed MB-induced OXPHOS restoration versus Ce6 OXPHOS blockade. Changes in NADH and FAD metabolic trajectories corresponding to the M2 to M1 shift in macrophage polarization were observed.

ThSYD-17
Thursday, June 25, 2026; 09:00-09:30
Aqueous dispersions of carbon nanoparticles: variability of basic structural elements and their role in the generation and accumulation of ROS *(Invited)*
N.N. Rozhkova[1], A.S. Stepanova[1,2], N.D. Sharpar[1].2, S.P. Rozhkov[3]; [1]Institute of Geology, Karelian Research Centre RAS, [2]Petrozavodsk State University, [3]Institute of Biology, Karelian Research Centre RAS, Russia
We analyzed the factors of structural heterogeneity of aqueous dispersions of shungite carbon nanoparticles (ShC). Water regulates intermolecular interactions and predetermines the existence of two types of ShC phases in water at physiological temperatures. ShC acts as a heterogeneous catalyst, enhancing the generation of ROS in the presence of iron ions, determining their antibacterial effect on the pathogenic microorganisms.

ThSYD-17
Thursday, June 25, 2026; 13:00-13:15
Optical properties of tumors with varying stroma stiffness in the visible and short-wave infrared ranges
I.V. Markova[1,2], D.V. Pominova[1,2], T.A. Savelieva[1,2], I.D. Romanishkin[1], A.S. Skobeltsin[1,2], A.V. Ryabova[1,2]; [1]Prokhorov General Physics Inst. of RAS, [2]National Research Nuclear Univ. MEPhI, Russia
In this work, the tumors with varying stiffness optical properties in transplanted mouse models during photodynamic therapy (PDT) in the visible and short-wave infrared ranges were studied. Using diffuse reflectance spectroscopy, a correlation between the tumor stiffness, absorption and scattering characteristics was established, as well as scattering decrease after PDT was observed.

ThSYD-18
Thursday, June 25, 2026; 15:00-15:30
Photodynamic therapy for cancer of external and visceral localizations in Russia *(Invited)*
E.Ph. Stranadko[1], T.I. Malova[2], M.V. Riabov[1]; [1]Skobelkin Centre for Laser Medicine - a branch of the Federal Clinical Center for High Medical Technologies, FMBA of Russia, [2]"VETA-GRAND" LLC, Russia
Photodynamic Therapy (PDT) for cancer at various stages and locations has been practiced in Russia for 32 years. PDT fundamentally changes the status of a significant group of inoperable patients with various cancer localizations.

ThSYD-18
Thursday, June 25, 2026; 09:30-10:00
Colloidal CaF_2:Eu^{2+} nanoparticles as nanoscintillators for X-ray-induced photodynamic therapy *(Invited)*
Yu.V. Orlovskii; Prokhorov General Physics Institute of RAS, National Research University Higher School of Economics, Russia

ThSYD-19
Thursday, June 25, 2026; 10:00-10:15
Macrophage-guided transport of photosensitizers for enhanced photodynamic tumor treatment
D.A. Terentyeva, Z.V. Kozyreva, D.A. Gorin, O.A. Sindeeva; Skolkovo Inst. of Science and Technology, Russia
Macrophages can function as "Trojan horses" delivering photosensitizer-loaded microcapsules into tumors to enhance photodynamic therapy. Layer-by-layer microcapsules were efficiently internalized and retained by peritoneal macrophages for up to 6 days without degradation, enabling transport into tumor spheroids and light-induced tumor regression in a CT-26 colon cancer model, addressing limited photosensitizer penetration in solid tumors.

ThSYD-19
Thursday, June 25, 2026; 15:30-15:45
Endoscopic photodynamic recanalization for inoperable obstructive esophageal cancer
E.Ph. Stranadko[1], T.I. Malova[2], M.V. Riabov[1]; [1]Skobelkin Centre for Laser Medicine - a branch of the Federal Clinical Center for High Medical Technologies, FMBA of Russia, [2]"VETA-GRAND" LLC, Russia
Esophageal cancer is one of the most aggressive and rapidly progressing malignant tumors. Photodynamic Therapy (PDT) expands the treatment options for inoperable esophageal cancer. PDT is effective in advanced obstructive esophageal cancer, improving the outcomes for this challenging group of patients and enhancing their quality and duration of life.

ThSYD-20
Thursday, June 25, 2026; 15:45-16:00
Ultraviolet irradiation of bacterial cellulose as an additional purification method *(Invited)*
P.M. Larionov[1], N.A. Maslov[2], I.A. Rozhin[2], T.M. Terekhova[1], I.A. Kirilova[1], A.A. Korytkin[1]; [1]Research department, Novosibirsk Research Institute of Traumatology and Orthopedics named after Ya.L. Tsivyan of the Ministry of Health of the Russian Federation, [2]Laser Technologies Laboratory, S.A. Khristianovich Institute of Theoretical and Applied Mechanics, SB RAS, Russia
The effectiveness of ultraviolet (UV) irradiation for the purification of bacterial cellulose was studied using laser-induced spectroscopy (LIFS) and laser scanning microscopy (LSM). A total UV dose of 12 J/cm2 resulted in the disappearance of the tryptophan peak and a marked reduction in the tyrosine peak, consistent with LSM results showing a significant reduction in the size and density of microbial inclusions.

ThSYD-21
Thursday, June 25, 2026; 16:00-16:15
Effective polycationic photosensitizer, their mechanisms of accumulation and effects on cancer cells in vitro
E.V. Akhlyustina[1,8], I.D. Romanishkin[2,8], I.G. Meerovich[3], S.Sh. Karshieva[4,5], A.S. Skobeltsin[1,2,8], D.A. Bunin[6,8], E.A. Makarova[7,8], V.B. Loschenov[1,2], E.A. Kogan[8], Zh.-L. Chen[9], G.A. Meerovich[2,8], Yu. G. Gorbunova[4,10], I.V. Reshetov[8]; [1]National Research Nuclear University MEPhI, [2]Prokhorov General Physics Institute of RAS, [3]A.N. Bach Institute of Biochemistry, Research Center of Biotechnology RAS, [4]National University of Science and Technology MISIS, Russia, [5]N.N. Blokhin National Medical Research Center of Oncology, [6]Frumkin Institute of Physical Chemistry and Electrochemistry, [7]Organic Intermediates and Dyes Institute, [8]I.M. Sechenov First Moscow State Medical University, Russia; [9]Huadong Hospital, Fudan University, China; [10]Kurnakov Institute of General and Inorganic Chemistry, Russia
The binding of photosensitizer molecules to cancer cells depends on the sign and charge value. A comparative in vitro study demonstrated that polycationic one exhibit higher phototoxicity. Photodynamic therapy with polycationic photosensitizer has a damaging effect on cancer cells through direct necrosis, increased apoptosis, a reduction in the number of all cancer stem cell subpopulations, and suppression of their proliferation.

ThSYD-22
Thursday, June 25, 2026; 16:15-16:30
Diagnosis of microbial contamination in bacterial cellulose using laser-induced fluorescence (LIF) spectroscopy
N.A. Maslov[1], P.M. Larionov[2], I.A. Rozhin[1], T.M. Terekhova[2], A.A. Korytkin[2]; [1]Khristianovich Inst. of Theoretical and Applied Mechanics SB RAS, [2]Novosibirsk Research Inst. of Traumatology and Orthopedics MH RF, Russia
This study explores the potential of laser-induced fluorescence (LIF) for real-time monitoring of bacterial cellulose (BC) purity. Our analysis reveals that current purification methods fail to completely remove residual proteins and microbial contaminants, limiting BC's applicability in medical settings. LIF spectroscopy proved highly effective in rapidly and accurately detecting amino acid residues, making it a promising tool for optimizing purification processes.

ThSYD-23
Thursday, June 25, 2026; 16:30-16:45
Investigation of the antibacterial effect of quartz nanoparticles of shungite rocks
N.D. Sharpar[1,2], A.S. Stepanova[1,2], N.N. Rozhkova[1]; [1]Institute of Geology of the Karelian Research Centre of RAS, [2]Petrozavodsk State University, Russia
The antibacterial activity of aqueous dispersions of quartz nanoparticles stabilized with carbon has been studied. Dispersions have been shown to have a bacteriostatic effect on pathogenic bacteria, inhibiting their growth. With respect to non-pathogenic bacteria, the effect was manifested only with prolonged exposure and the addition of ascorbic acid ions. The results confirm the potential of nanoparticles for biomedical applications.

ThSYD-p01
Thursday, June 25, 2026; 15:00-18:30
Hydrothermal microwave-assisted synthesis of colloidal solutions of CaF_2:Eu^{2+} nanoscintillators *(Poster)*
A.T. Shaidulin[1,2], E.O. Orlovskaya[1], O.V. Uvarov[1], S.Kh. Batygov[1], V.B. Loschenov[1], V.N. Makhov[3], Yu.V. Orlovskii[1]; [1]Prokhorov General Physics Institute of RAS, [2]National Research University Higher School of Economics, [3]P.N. Lebedev Physical Institute of RAS, Russia
This work examines the influence of the microwave-assisted hydrothermal synthesis conditions of colloidal CaF2:Eu3+ nanoparticles (NPs) on the brightness of the Eu2+ X-ray excited optical luminescence (XEOL) at the interconfigurational transition 4f65d1 → 4f7 (8S7/2) (luminescence in the range of 400-480 nm with a maximum at 425 nm, close to the Curcumin photosensitizer absorption maximum at 420-430 nm).

ThSYD-p02
Thursday, June 25, 2026; 15:00-18:30
Optical methods and devices for monitoring microcirculation during photodynamic therapy *(Poster)*
A.V. Guryleva[1], A.S. Machikhin[1], T.G. Grishacheva[2], S.G. Chefu[2], N.N. Petrishchev[2]; [1]Biomedical Instrumentation Lab. STC UI RAS, [2]Laser Medicine Center, Pavlov University, Russia
Direct assessment of skin microcirculation during photoactivation is crucial for understanding and optimizing photodynamic therapy. We propose a non-invasive imaging photoplethysmography method for continuous, spatially resolved monitoring of microcirculation in tumor and healthy tissue. Validated in an animal model, it reveals distinct tumor–tissue microvascular responses during and after photoactivation.

ThSYD-p03
Thursday, June 25, 2026; 15:00-18:30
Direct singlet oxygen generation by a bi-chromatic Raman fiber laser and its effect on glioblastoma cells *(Poster)*

M. Naumenko[1,2], V. Volosi[2], A. Leonteva[1,3], A. Nushtaeva[1,3], A. Ivanenko[2], S. Kulemzin[4], K. Baranov[4], A. Moskalensky[1,2]; [1]Sirius University of Science and Technology, [2]Novosibirsk State University, [3]Institute of Chemical Biology and Fundamental Medicine, [4]Institute of Molecular and Cellular Biology, Russia

Singlet oxygen (1O2) underpins photodynamic therapy but is limited in brain tumors by photosensitizer delivery across the blood–brain barrier. We investigate photosensitizer-free 1O2 generation in glioblastoma cells using a dual-wavelength NIR pulsed fiber laser (1066 and 1241 nm), revealing wavelength-dependent differences between chemical 1O2 yield and biological metabolic suppression.

ThSYD-p04
Thursday, June 25, 2026; 15:00-18:30
Photophysical properties of chlorin E6 at aPDT on experimental models *(Poster)*

A.F. Malikov[1], A.M. Udeneev[1], D.V. Yakovlev[2], N.A. Kalyagina[1,2]; [1]National Research Nuclear University MEPhI, [2]A.M. Prokhorov General Physics Institute of RAS, Russia

The aim of this study is to investigate various photophysical properties of chlorin e6 during antimicrobial photodynamic therapy (PDT) using wound surface models. The analysis of the accumulation and photobleaching of the photosensitizer in molecular and ethosomal forms on the wound surface of post mortem models was performed.

ThSYD-p05
Thursday, June 25, 2026; 15:00-18:30
FLIM-assisted monitoring of intracellular transportation and accumulation of Radachlorin photosensitizer *(Poster)*

E.A. Glazkova[1], A.A. Zhikhoreva[2], A.V. Belashov[2], T.N. Belyaeva[3], A.V. Salova[3], I.K. Litvinov[3], E.S. Kornilova[3], I.V. Semenova[2], O.S.Vasyutinskii[2]; [1]Herzen State Pedagogical University, [2]Ioffe Institute, [3]Institute of Cytology of RAS, Russia

Mechanisms and kinetics of Radachlorin uptake and accumulation in HeLa cells were studied by analysis of distributions of fluorescence intensity and lifetime at different incubation times. The observed decrease of Radachlorin fluorescence lifetime during its intracellular transportation was suggested to be due to its uptake via endocytosis and gradual acidification of endosomes on the way to lysosomes.

Section C01. Conference on Optics of Dielectric, Metal, and Semiconductor Nanostructures

WeC01-01
Wednesday, June 24, 2026; 09:00-09:30
Glasses with semiconductor nanocrystals for photonic applications *(Invited)*
A.A. Onushchenko; S.I. Vavilov State Optical Institute, Russia
Nanocrystals (NCs) of narrow-bandgap semiconductor compounds such, for example, as lead chalcogenides exhibit fundamental emission that can be easily tuned over the whole shortwave infrared range by varying the NC size. Emission efficiency is crucial for the practical application of such phosphors. My talk will provide a brief overview of research in this area.

WeC01-02
Wednesday, June 24, 2026; 09:30-10:00
Upconversion nanoparticles: size-dependent concentraton quenching *(Invited)*
Guanying Chen; Harbin Institute of Technology, China
Lanthanide concentration quenching remains a major barrier to achieving high luminescence efficiency under high dopant levels. Here, we propose a general strategy to suppress lanthanide luminescence quenching by confining the thickness of the active layer in a rationally designed core–multishell architecture with minimized surface quenching.

WeC01-03
Wednesday, June 24, 2026; 10:00-10:30
Photoluminescence and excited-state dynamics of nanomaterials for optoelectronic devices *(Invited)*
Amitava Patra; School of Materials Sciences, Indian Association for the Cultivation of Science, Jadavpur, India
Here, we investigate the carrier dynamics, energy transfer, and charge carrier dynamics of 2D CdSe nanoplatelets and perovskite nanocrystals

WeC01-04
Wednesday, June 24, 2026; 10:30-11:00
Interfacial and hydration strategies in perovskite nanocrystals *(Invited)*
H. Huang; School of Optoelectronic Science and Engineering, Soochow University, China
We facilitated interfacial ion transport using oleylamine molecules as shuttles at the polar-nonpolar interface. We successfully synthesized CsPbX3 nanorods using CsX nanocrystals as precursors and leveraging the directional diffusion of lead ions at the interface. We synthesized the Cs4ZnBi2Cl12 as a promising p-type transparent conductor (TC), which features a wide direct bandgap of 3.56 eV and intrinsic p-type conductivity.

WeC01-05
Wednesday, June 24, 2026; 11:30-12:00
Monodisperse $APbI_3$ perovskite nanoplatelets for light-emitting diodes and nonlinear optical applications *(Invited)*
A.P. Litvin[1,2], X. Zhang[1], W. Zheng[1], A.L. Rogach[3]; [1]Jilin Univ., China; [2]ITMO Univ., Russia; [3]CityU Univ., China
Metal halide perovskite nanoplatelets offer tunable and narrow emission for high-definition displays and nonlinear optics. We demonstrate synthesis of monodisperse CsPbI3 nanoplatelets through either halide-ratio control or Ostwald ripening, followed by anion exchange. Post-treatment enables efficient A-site cation exchange or surface passivation. Synthesized nanoplatelets were used to create orange and pure-red efficient LEDs with ultra-narrow emission, meeting Rec. 2020 standards.

WeC01-06
Wednesday, June 24, 2026; 12:00-12:30
Efficient and stable electroluminescence from thick perovskite emissive layers *(Invited)*
Yingtong Zhou, Wenxu Yin, Xiaoyu Zhang; Jilin University, China
Thick perovskite LEDs offer bright emission as well as peak external quantum efficiency of over 25%.

WeC01-07
Wednesday, June 24, 2026; 12:30-13:00
Peculiarities of the behavior of the exciton-polariton dispersion law taking into account multiphoton transitions *(Invited)*
O. Korovai; Shevchenko Prydnestrovian State University, Moldova
The features of the behavior of the exciton-polariton dispersion law are studied, taking into account the permitted single-photon and multiphoton transitions of excitations of excitons, biexcitons and triexcitons in semiconductors. The behavior of the exciton-polaritons dispersion law depends on quantum parameters, i.e., phase differences between the Rabi frequencies of the transitions under consideration.

WeC01-08
Wednesday, June 24, 2026; 13:00-13:15
Kinetics of nonequilibrium quasiparticles in CdSe nanoplatelets under optical Stark effect conditions
A.V. Ivanov[1], S.A. Khokhorin[1], D.P. Scherbinin[1], A.E. Romashova[1], A.A. Shimko[2], [1]ITMO University, [2]St. Petersburg State University, Russia
In this research, we consider the kinetics of nonequilibrium quasiparticles excited by an intense laser pulse in colloidal CdSe nanoplatelets. The modeling of kinetic processes is performed within the framework of the density matrix formalism and implements the conditions of the pump-probe experiment. The influence of trap states on the shift of exciton energy levels is investigated.

WeC01-09
Wednesday, June 24, 2026; 15:00-15:30
Photomodulating properties of structures based on diarylethenes and CdSe/ZnS quantum dots *(Invited)*
S.A. Maskevich[1], P.V. Karpach[2], G.T. Vasilyuk[2], O.V. Venidiktova[3], A.O. Ayt[3], V.A. Barachevsky[3]; [1]Belarussian State University, [2]Yanka Kupala State University of Grodno, Belarus; [3]Photochemistry Center, NRC Kurchatov Institute, Russia
The paper examines the spectral-kinetic, photochromic and photomodulating characteristics of nanostructures based on 4 diarylethenes and CdSe/ZnS quantum dots of various sizes in the spectral range of absorption and luminescence of 350-700 nm in solutions, polymer nanospheres and polymer films.

WeC01-10
Wednesday, June 24, 2026; 15:30-16:00
Chemiluminescent probes based on complexes of chemiluminophores with nanoparticles and nanostructures *(Invited)*
G.R. Simonenko, N.S. Petrov, A.V. Palekhova, I.Yu. Nikitin, D.R. Dadadzhanov, N.B. Leonov, T.A. Vartanyan; International Scientific and Educational Center for Physics of Nanostructures, ITMO University, Russia
Covalently bonded complexes of luminol molecules with metal nanoparticles and with quantum dots were created. In the first case, an increase in chemiluminescence intensity was achieved due to the acceleration of the radiative transition. In the second case, the shift of the emission spectrum to the long-wavelength region reduces radiation scattering in an inhomogeneous medium, allowing for emission from greater depths in biological tissue.

WeC01-11
Wednesday, June 24, 2026; 16:00-16:15
Metal chloride - luminol electrochemiluminescent system for metal ion detection
I.Yu. Nikitin, G.R. Simonenko, I.D. Buev, T.A. Vartanyan; ITMO University, Russia
In this work electrochemiluminescence of luminol was obtained via electrolysis of luminol – metal chloride solutions. It was found that some metal ions boost the process of electrochemiluminescence, while others tend to give background chemiluminescence and give lower signal intensities. The results of this work may be used in sensors for heavy metals

WeC01-12
Wednesday, June 24, 2026; 16:15-16:45
In situ observation of compressive forces experienced by DNA loci in the nucleus of living HeLa cell *(Invited)*
Maria Mukhina1, Vincent Tsai1, Yulia Gromova1, Nancy Kleckner2; [1]University of Maryland, [2]Harvard University, USA
In this talk, I will discuss two in situ force nanoprobes that my group is developing to elucidate mechanical information processing in the genome of living HeLa cells.

WeC01-13
Wednesday, June 24, 2026; 16:45-17:15
Application of CdSe/ZnS and AgInS/ZnS quantum dots in clinical morphology for differentiation of cancer cells *(Invited)*
N.D Strekal[1], I.G. Motevich[1], A.V. Shulga[2], S.A. Maskevich[1]; [1]Yanka Kupala State University of Grodno, [2]Grodno State Medical University, Belarus
The photoluminescence spectra of CdSe/ZnS and AgInS/ZnS quantum dots exhibit high sensitivity to the polar environment in aqueous solutions and in biopsy of ovarian, colon, and cervical tissues of different pathology degree.

ThC01-14
Thursday, June 25, 2026; 09:00-09:15
Photodynamic therapy of melanoma cells mediated by AIS QDs
X.L. Jiang[1,2], A.V. Boltenko[1], Z.B. Wang[2], A.O. Orlova[1]; [1]ITMO University, Russia, [2]Changchun University of Science and Technology, China
Photodynamic therapy using $AgInS_2$/ZnS@TGA quantum dots (AIS QDs) demonstrated potent efficacy against A375 melanoma cells. At 4 μM concentration under 540 nm irradiation (10 J/cm²), AIS QDs induced 50 % viability reduction with negligible dark toxicity (>80% viability). ROS generation and atomic force microscopy confirmed concentration-dependent apoptosis. AIS QDs represent promising heavy-metal-free photosensitizers for targeted melanoma PDT.

ThC01-15
Thursday, June 25, 2026; 09:15-09:30
Hybrid Nanostructure Engineering using Machine Learning: A Pathway to Highly Selective Volatile Organic Compounds Detection
A. Surkova[1], S. Domarev[1], A. Boltenko[1], M. Saveliev[2], E. Boichenko[2], D. Kirsanov[2], A.O. Orlova[1]; [1]International Laboratory "Hybrid Nanostructures for Biomedicine", PhysNano Department ITMO University, [2]Chemical Engineering Center, ITMO University, Russia
The development of gas sensors for non-invasive diagnostics via breath analysis requires efficient material design. We applied QSPR (Quantitative Structure-Property Relationship) modeling to a set of 20 nanocrystals. Using material descriptors and Partial Least Squares regression, we predicted their electrical conductivity response to VOCs. The results demonstrate that data-driven QSPR can accelerate the selection of optimal sensing materials, reducing reliance on extensive experimental screening.

ThC01-16
Thursday, June 25, 2026; 09:30-10:00
Chiral symmetry breaking in colloidal nanostructures *(Invited)*
M. Ghalawat, D. Feferman, D. Dadadzhanov, A. Idrees, G. Markovich; School of Chemistry, Tel Aviv University, Israel
We employ two approaches to symmetry breaking in inorganic nanocrystals. First, chiral molecular ligands induce intrinsically chiral nanocrystals with complete enantioselectivity. Second, circularly polarized light breaks the shape symmetry of plasmonic nanostructures, rendering them optically active, both for substrate-bound nanocrystals and freely rotating particles in solution.

ThC01-17
Thursday, June 25, 2026; 10:00-10:15
Comparing aggregation and layer-by-layer assembly for SERS-active polymer microspheres
K.A. Maleeva, A.P. Tkach, E. Smirnov, K.V. Bogdanov; ITMO University, Russia
A comparison of two methods for synthesizing SERS tags created by gold coated polymer microspheres revealed that adsorption of quasi-stable ascorbate-reduced nanoparticles yields a surface coverage of 32% vs. 14% for the LbL method, higher AEF due to aggregates, and better plasmonic coupling.

ThC01-18
Thursday, June 25, 2026; 10:15-10:45
Luminescent CDs: synthesis and applications *(Invited)*
Songnan Qu; University of Macau, China
Carbon nanodots (CDs) are the new type of carbon-based luminescent materials. Our group proposed a method of controlling the bandgap emissions of CDs through sp2C domains controlling and surface engineering to achieve full color and NIR emissive CDs.

ThC01-19
Thursday, June 25, 2026; 10:45-11:15
Chiral carbon dots and their bioconjugates *(Invited)*
E.V. Ushakova[1], M.S. Kim[1,2], A.A. Efimova[1], A.M. Mitroshin[1], A.A. Vedernikova, S.A. Cherevkov[1]; [1]PhysNano Department, ITMO University, [2]Branch of Petersburg Nuclear Physics Institute named by B.P. Konstantinov of National Research Centre "Kurchatov Institute", Institute of Macromolecular Compounds, Russia
We report red/green-emissive carbon dots functionalized via chiral isocyanate post-treatment and their integration into $CaCO_3$–magnetite composites. These multimodal microspheres with carbon dots exhibit tunable luminescence, magnetic responsiveness, low cytotoxicity, and enantioselective bio-interactions—enabling multiplexed bioimaging, flow cytometry, and targeted theranostics.

ThC01-20
Thursday, June 25, 2026; 11:30-12:00
Laser synthesis of carbyne-like structures for nanophotonics *(Invited)*
A. Kucherik[1], A. Osipov[1], V. Samyshkin[1], A. Abramov[1], A. Lelekova[1], A. Povolotskiy[2]; [1]Department of Physics and Applied Mathematics, Stoletov Vladimir State University, [2]Institute of Chemistry, St. Petersburg State University, Russia
The successful synthesis of carbyne, a linear acetylenic carbon chain characterized by alternating single and triple bonds, has been realized. This 1D material exhibits anisotropic optical properties and strong photoluminescence due to its direct band gap. We synthesized carbyne chains terminated by gold clusters and studied their optical behaviour, revealing strong polarization-dependent luminescence and a blue-shifted emission, which enables estimation of chain length and suggests applications in nanoscale optoelectronics.

ThC01-21
Thursday, June 25, 2026; 12:00-12:15
Optoelectric characteristics of TiO_2 microscrolls doped with stabilized carbyne chains
V. Samyshkin, D. Bukharov, A. Kucherik, A. Lelekova; Department of Physics and Applied Mathematics, Stoletov Vladimir State University, Russia
We study optoelectric properties of TiO_2 microscroll films doped with linear carbon chains and metal nanoparticles (Au, Cu, Fe). Under 532 nm light, they generate electric current. A Schottky photodiode model calculates the photocurrent. The integral quantum efficiency reaches 82 %, showing potential for solar cells.

ThC01-22
Thursday, June 25, 2026; 12:15-12:45
Chirality imprinting via plasmon-assisted radical polymerization *(Invited)*
D.R. Dadadzhanov[1,2], N.S. Petrov[2], I. A. Gladskikh[2], T.A. Vartanyan[2], G. Markovich[1]; [1]Raymond and Beverly Sackler Faculty of Exact Sciences, School of Chemistry, Tel Aviv University, Israel; [2]International Research and Education Center for Physics of Nanostructures, ITMO University, Russia
We demonstrate the induction of circular dichroism in plasmonic metasurfaces via asymmetric near-field-localized deposition of divinylbenzene polymer. Particularly, symmetry breaking in initially achiral nanoparticles on basis sparce and dense ensemble is achieved through near field “imprinting” of a polymer layer with a refractive index contrast relative to the surrounding medium, which produces an asymmetric dielectric environment and, consequently, a chiroptical response.

ThC01-23
Thursday, June 25, 2026; 12:45-13:00
Study of absorption nanostructure of pyroelectric detector based on tetraaminodifenil film from visible to terahertz range
V.V. Gerasimov[1,2], V.S. Vanda[1,2], A.G. Lemzyakov[1,2,3], V.P. Nuzmov[1,4], S.A. Kuznetsov[2,5], A.A. Ryback[2,6], V.A. Stepanov[7], D.V. Fromichev[7], A.K. Nikitin[8]; [1]Budker institute of nuclear physics SB RAS, [2]Novosibirsk state university, [3]Synchrotron Radiation Facility SKIF, [4]Institute of Solid State Chemistry and Mechanochemistry, SB RAS, [5]Rzhanov Institute of Semiconductor Physics SB RAS, [6]Institute of Automation and Electrometry, [7]Joint Stock Company " Novosibirsk factory of semiconductor device EAST, [8]Scientific and Technological Centre of Unique Instrum. of RAS, Russia
The talk will present the results of a study of the optimal parameters of an absorbing nanostructure for pyroelectric detectors based on organic tetraaminodiphenyl films manufactured by the Novosibirsk Semiconductor Devices Plant. The results demonstrate broadband absorption from the visible to THz frequency range, and the receiver's sensitivity, noise characteristics, and response time compare favorably with foreign commercial analogs.

ThC01-24
Thursday, June 25, 2026; 13:00-13:15
Femtosecond laser patterning of chalcogenide phase-change materials for development of tunable metasurfaces
V. Fedyaj[1,2], A. Kokhanovskiy[3], E. Menshikov[3], A. Revjakin[1,2], K. Bronnikov[3], V. Simonov[1], V. Terentiev[1], P. Lazarenko[4], A. Yakubov[4], S. Babin[1,2], A. Kuchmizhak[5,6], A. Dostovalov[1,2]; [1]Institute of Automation and Electrometry of the SB RAS, [2]Novosibirsk State University, [3]School of Physics and Engineering, ITMO University, [4]National Research University of Electronic Technology, [5]Institute of Automation and Control Processes of the FEB RAS, [6]Far Eastern Federal University, Russia
We demonstrate the femtosecond laser writing of reconfigurable metasurfaces on chalcogenide phase-change materials thin films (GST-225, GeTe, Sb2Se3). Various approaches including direct beam writing, spatial beam shaping via spatial light modulator, LIPSS formation were demonstrated. These single-step, lithography-free methods can find applications in rapid prototyping of tunable optical devices with tailored reflection and transmission spectra.

ThC01-25
Thursday, June 25, 2026; 13:15-13:30
Fluorescence recovery and fluorescence correlation microscopy studies of colloidal perovskite diffusivity
L. Borodina[1], D. Tatarinov[1], K. Annas[1], I. Kuznetsov[2], A. Barulin[2], V. Borisov[1], A. Veniaminov[1]; [1]PhysNano department, ITMO University, [2]Moscow Center for Advanced Studies, Russia
The diffusivity of colloid perovskite nanocrystals crucial for holographic recording using photoinduced diffusion was studied using two luminescence microscopy approaches based on photobleaching-recovery and fluctuation statistics. The results indicate the apparent hydrodynamic diameters of diffusing nanocrystals within the 10 to 25 nm range. The diversity of nanocrystals' size manifests itself via peculiar shapes of luminescence profiles and their broadening dynamics.

ThC01-26
Thursday, June 25, 2026; 13:30-13:45
Features of nanostructures of oxide multilayer interference reflecting coatings of laser mirrors
V.V. Azarova, A.S. Danilov, M.M. Rasev, M.S. Shvedov, I.V. Chertovich; POLYUS Research Institute of M.F. Stelmakh, Russia
Ion-beam sputtering (IBS) enables the production of laser mirrors with extremely high reflectivity, low scattering, and absorption, surpassing other PVD methods in density, purity, and film thickness control. Mirrors are critical for resonators and precision laser systems, where current performance is limited by coating technology. SEM/FIB studies show that even nanoscale substrate defects propagate through multilayer structures, requiring substrates to be virtually defect-free with sub-nanometer roughness. This research focuses on methods for producing high-quality mirrors using ion-beam sputtering.

ThC01-27
Thursday, June 25, 2026; 15:00-15:30
Developments of metalens platforms for miniaturized biophotonic tools *(Invited)*
A.V. Barulin; Moscow Center for Advanced Studies, Russia
This work discusses metalens miniaturization for portable biophotonic devices. We present a transmissive abd on-fiber metalenses for single-molecule fluorescence spectroscopy and nanoparticle sizing. A second application features a long-focus metalens enabling high-resolution photoacoustic microscopy, including 3D imaging in brain organoids for neurodegenerative disease research. These platforms enable compact tools for medical and environmental sensing.

ThC01-28
Thursday, June 25, 2026; 15:30-16:00
Principles of contactless movement of semimetal/semiconductor nanosheets by a laser beam *(Invited)*
I.M. Kislyakov, Yan Wang, Jun Wang; Shanghai Institute of Optics and Fine Mechanics Chinese Academy of Sciences, China
Laser drive is a promising method for the controllable movement of 2D materials and, therefore, a key factor for their integration into nano-electromechanical systems and nanorobotics. However, strong van-der-Waals interactions between nanosheets and substrates hinder this application. Here we describe the various forces generated in semimetal/semiconductor nanosheets under femtosecond irradiation and analyze conditions for achieving controlled motion.

ThC01-29
Thursday, June 25, 2026; 16:00-16:15
Dynamical phase transitions in quadrupole-trap-based nonlinear levitodynamic systems
V.V. Rybin, S.S. Rudyi, I.A. Huaman, A.A. Kropotov, D.P. Shcherbinin, ITMO University, Russia
This work considers the nonlinear effects arising in the charged microsphere dynamics in a quadrupole trap at atmospheric pressure. The particle motion possesses a phase transition manifesting as the formation of an extended orbit trajectory. We show that the phase transition is preceded by a transient dynamic state that is highly sensitive to the levitatiodynamic system parameters and external influences.

ThC01-30
Thursday, June 25, 2026; 16:15-16:30
Ising machine platform based on charged microparticle in a hybrid electrodynamic optical trap
E.V. Soboleva, S.S. Rudyi, A.V. Ivanov; International Research and Educational Center for Physics of Nanostructures, ITMO University, Russia
We present theoretical research of an Ising machine platform using a charged microparticle in a hybrid electrodynamic-optical trap. A controllable spatial bifurcation of the particle's stable equilibrium positions enables direct spin encoding via laser power and RF parameters. Our levitated optomechanical system offers a highly visualizable, room-temperature analog optimizer inspired by Ising machine for solving combinatorial optimization problems.

ThC01-31
Thursday, June 25, 2026; 16:30-16:45
Collective motion of Coulomb crystals in hybrid traps
A.V. Romanova, Yu.V. Rozhdestvensky; ITMO Univ., Russia
This work focuses on studying collective motion in Coulomb crystals trapped in a hybrid trap. We numerically solve equations of motion for a system of N=10 particles. We show that the additional optical potential changes phase transition conditions. Then we study the oscillation spectrum of the collective motion in the presence of the optical trap and without it.

ThC01-32
Thursday, June 25, 2026; 16:45-17:00
Optical dynamics of microparticles as a platform for gravity gradiometer
A.S. Leshchev, Yu.V. Rozhdesvenskii; International Research and Educational Center for Nanostructure Physics, ITMO University, Russia
In this work we present a new idea of a gradiometer based on an optical pendulum. We study the dynamics of a spherical dielectric microparticle in a Gaussian optical beam under vacuum. The local gravity acceleration can be derived from the amplitude and frequency of this motion. Theoretical analysis indicates a potential accuracy competitive with quantum gravimeters.

ThC01-p01
Thursday, June 25, 2026; 15:00-18:30
Study of magnetic properties of thin films using the magneto-optical Kerr effect *(Poster)*
D. Unurbileg[1], G. Batzul[1], R. Galbadrakh[1], L. Mend-Amar[1], V.V. Koledov[2], S.V. von Gratovsky[2], J. Davaasambuu[1]; [1]Institute of Physics and Technology, Mongolian Academy of Science, Mongolia; [2]Institute of Radio Engineering and Electronics named after V.A.Kotelnikov, RAS, Russia
In this study, a MOKE measurement system operating in the polar configuration where the incident light and the applied magnetic field are oriented normal to the sample surface was developed. Using this setup, the magnetic hysteresis loop along the (100) crystallographic direction was measured for a 133 nm thick bismuth-substituted yttrium iron garnet ($Bi_2Y_1Fe_5O_{12}$) thin film epitaxially grown on a $Gd_3Ga_5O_{12}$ substrate.

ThC01-p02
Thursday, June 25, 2026; 15:00-18:30
Fabrication of hybrid nanostructures based on carbon nanotubes and CdSe nanoplatelets for sensing applications *(Poster)*
M.A. Rider, A.V. Boltenko, S.N. Domarev, A.O. Orlova, V.V. Zakharov; ITMO Univ., Russia
Hybrid nanostructures based on carbon nanotubes and CdSe nanoplatelets were fabricated and investigated. Their optical, morphological, and electrical properties were studied, along with their response to volatile organic compounds. The results demonstrate analyte-dependent and reversible optical and electrical responses, confirming the potential of these hybrid nanostructures for selective sensing applications.

ThC01-p03
Thursday, June 25, 2026; 15:00-18:30
Formation of an optical rejection filter at the optical fiber end facet during the deposition of quasi-ordered C -Ag films *(Poster)*
A.O. Kucherik[1], A.V. Osipov[1], V.D. Samyshkin[1], A.S. Abramov[1], R. Ponomarev[2], A. Gordeeva[2]; [1]Vladimir State University, [2]Perm State University, Russia
A study presents a fast, semi-automated method for fabricating optical notch filters directly on fiber end facets using multilayer linear carbon and silver nanoparticle coatings. Droplet deposition of water-based colloids was used for 10, 20, and 30-layer structures, with results showing that additional layers narrow the transmission spectrum and shift the central wavelength toward 1100 nm.

ThC01-p04
Thursday, June 25, 2026; 15:00-18:30
Luminol chemiluminescence enhancement in the cavities of a thin aluminum film via acceleration of radiative transitions *(Poster)*
N.S. Petrov[1], G.R. Simonenko[1], D.R. Dadadzhanov[1,2], T.A. Vartanyan[1]; [1]ITMO Univ., Russia; [2]Tel Aviv Univ., Israel
A thin perforated aluminum film is proposed as an enhancer of luminol chemiluminescence. Numerical simulations show that the enhancement factor that is proportional to the radiative transition acceleration is distributed over the interior of the cylindrical cavities more homogenously as compared to the empty spaces between cylindrical aluminum posts studied previously. For the optimized geometry, the overall enhancement of chemiluminescence is found to be about 13, proving the potential of the proposed structure for application in biosensing.

ThC01-p05
Thursday, June 25, 2026; 15:00-18:30
Electrodynamic mechanisms of plasmon enhanced luminol chemiluminescence and systematic study of spectral characteristics *(Poster)*
G.R. Simonenko, T.A. Vartanyan, N.S. Petrov; ITMO University, Russia
This work presents a systematic spectral analysis of luminol chemiluminescence enhanced by silver nanoparticles. We demonstrate that the spectral enhancement factor correlates precisely with the Localized Surface Plasmon Resonance (LSPR) profile. These findings provide direct experimental evidence of the Purcell effect, confirming the electrodynamic nature of the enhancement and distinguishing it from purely catalytic enhancement.

ThC01-p06
Thursday, June 25, 2026; 15:00-18:30
Novel principle for ultra-relativistic particle detection using photonic crystals *(Poster)*
V. R. Gareyan[1], Zh. S. Gevorkian[1,2]; [1]Alikhanyan National Laboratory, [2]Institute of Radiophysics and Electronics, Armenia
Radiation from relativistic charged particles traversing alternating dielectric slabs is analyzed for disordered and periodic stacks. Exact solutions at Brewster angles reveal N^2-enhanced directional emission in disordered systems and E^4 energy dependence—saturating at high energies—in a 1D photonic crystal with graphene-like Dirac cones. These properties make the structure a promising detector for relativistic particles.

ThC01-p07
Thursday, June 25, 2026; 15:00-18:30
Upconversion luminescence in rare-earth -doped polystyrene microspheres: doping conditions, optical properties, and potential for whispering-gallery-mode sensing applications *(Poster)*
A.V. Kochakov[1], E.O. Soloveva[1], D.R. Dadadzhanov[1,2]; [1]International Research and Education Center for Physics of Nanostructures, ITMO University, Russia; [2]Raymond and Beverly Sackler Faculty of Exact Sciences, School of Chemistry, Tel Aviv University, Israel
We synthesized NaYF4:Er3+,Yb3+ upconversion nanocrystals (UCNC) by solvothermal synthesis. To make polystyrene microspheres (PMS) as potential active microresonators their surface was functionalized with synthesized UCNC by soaking for 24 hrs. Optical characterization was performed by luminescent microscopy and spectroscopy.

ThC01-p08
Thursday, June 25, 2026; 15:00-18:30
Ultra-fast recombination processes in thin films of $CsPbBr_3$ nanocrystals with varying defect densities *(Poster)*
I.M. Sevastianova, D.S.Gets; ITMO University, Russia
This study used ultrafast spectroscopy to examine recombination processesin $CsPbBr_3$ nanocrystals of various sizes and defect densities. Higher defect-density samples showed lasing and amplified spontaneous emission, alongside shorter PL decay times and lower quantum yields. Decay curves of PL and ASE on the picosecond scale by TAS mesurement revealed that in defect-rich samples, charge carriers redistributed between higher energy levels.

ThC01-p09
Thursday, June 25, 2026; 15:00-18:30
Temperature-dependent fluorescence properties of defective states in ternary quantum dots $AgInS_2/ZnS$ *(Poster)*
E.A. Lijina[1], E.O. Solovyova[1], A.A. Starovoytov[1], D.R. Dadadzhanov[1], N.A. Toropov[2]; [1]ITMO Univ., Russia, [2]Southampton Univ., United Kingdom
We investigated the effect of cryogenic temperatures on spectroscopically detectable defects in ternary semiconductor quantum dots, which can be attributed to vacancies or excess metals. In the absence of other external factors (e.g., changes in pH), the spectral component responsible for these defects exhibits properties different from those typically observed—it retains its position and exhibits no contour change.

ThC01-p10
Thursday, June 25, 2026; 15:00-18:30
Plasmon-enhanced emission from carbon dot -doped spherical polymer microresonators *(Poster)*
E.O. Soloveva[1], A.A. Starovoytov[1], K.V. Bogdanov[1], A.P. Tkach[1], N.N. Shevchenko[2], D.R. Dadadzhanov[1,3]; [1]International Research and Educational Center for Physics of Nanostructures, ITMO University,2- Branch of Petersburg Nuclear Physics Institute named by B.P. Konstantinov of National Research centre "Kurchatov Institute", Russia; [3]Raymond and Beverly Sackler Faculty of Exact Sciences, School of Chemistry, Tel Aviv University, Israel
Plasmonic nanoparticle functionalization enhances whispering-gallery mode emission in carbon dot-doped polystyrene microresonators. Gold nanoparticles provide strong (~2x) microresonator emission enhancement through local field amplification, while silver nanoparticles offer less enhancement and cause resonance broadening due to scattering losses.

ThC01-p11
Thursday, June 25, 2026; 15:00-18:30
Study of the terahertz surface plasmon polaritons on metals with different optical properties *(Poster)*
V.S. Vanda, V.V. Gerasimov, A.G. Lemzyakov, A.G. Kocheneva, V.P. Nazmov, A.I. Ivanov, I.A. Azarov, L.S. Kuznetsova, A.K. Nikitin; Russia
This paper examines the characteristics of SPPs on gold films deposited on a flat substrate under different magnetron sputtering conditions. Based on experiments performed on a Michelson plasmon interferometer in the wavelength range of 50–233 μm using radiation from the NovoFEL, an analysis of the radiation and ohmic losses of SPPs was performed depending on the gold film parameters.

ThC01-p12
Thursday, June 25, 2026; 15:00-18:30
Anisotropic plasmonic nanostructures created by near-field photopolimerization *(Poster)*
I.A. Gladskikh[1], D.R. Dadadzhanov[1,2], N.S. Petrov[1], G. Markovich[2]; [1]ITMO University, International Research and Educational Center for Physics of Nanostructures, Russia; [2]Raymond and Beverly Sackler Faculty of Exact Sciences, School of Chemistry, Tel Aviv University, Israel
The optical response of silver and gold nanostructures under local refractive-index modification was studied using near-field photoinduced radical polymerization under continuous-wave laser irradiation. Silver nanostructures exhibited a strong linear dichroism response (up to 30% of optical density), associated with hotspot-driven symmetry breaking, whereas gold showed a weaker response due to plasmon–laser spectral mismatch.

ThC01-p13
Thursday, June 25, 2026; 15:00-18:30
Sensor based on plasmonic chiral nanostructures *(Poster)*
N.S. Petrov[1], I.A. Gladskikh[1], , A.V. Kochakov[1], D.R. Dadadzhanov[1,2]; [1]ITMO Univ., Russia; [2]Tel Aviv Univ., Israel
This work reports a scalable method for fabricating chiral plasmonic structures via plasmon-enhanced polymerization. The structures exhibit strong circular dichroism (CD) (40 mDeg) with a refractive-index-dependent response, demonstrating their potential for biological and refractive index sensing applications.

ThC01-p14
Thursday, June 25, 2026; 15:00-18:30
Studies on the dielectric and thermal properties of ITO films with radiation ranging from visible to terahertz *(Poster)*
D.S. Gribanov[1,2,3], N.A. Nikolaev[1,3], N.D. Osintseva[2]; [1]Inst. of Automation and Electrometry, [2]Budker Inst. of Nuclear Physics, [3]Novosibirsk State Univ., Russia
We have studied the interaction of terahertz radiation of varying intensities with ITO films of the thicknesses of 41, 133, and 290 nm. Free-carrier plasma frequency, scattering frequency, and DC conductivity were determined. The complex refractive index of the films in the terahertz range was determined and lower limit of the optical damage threshold for terahertz waves has been estimated.

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Thin films of carbon nanotubes for advanced sensorics and optics *(Invited)*

N.I. Raginov[1], A.V. Radivon[2], A.S. Ezersky[3], A.V. Chernykh[3], A.V. Terentyev[2], K.V. Zhivetyev[2], I.I. Rakov[1], I.V. Novikov[1], E.G. Tsiplakova[3], M.I. Paukov[2], V.V. Starchenko[2], A.V. Arsenin[2], K.I. Zaitsev[4], N.V. Petrov[3], M.G. Burdanova[2,4], D.S. Kopylova[1], B.P. Gorshunov[2], V. Volkov[2], A.G. Nasibulin[1], D.V. Krasnikov[1]; [1]Skolkovo Institute of Science and Technology, [2]Moscow Institute of Physics and Technology, [3]ITMO University, [4]Prokhorov Institute of General Physics of RAS, Russia

Here we report our recent advances on tuning carbon nanotubes to create an element base in the THz range. By identifying five levels of material organization ("individual nanotubes", "nanotube agglomerates", "network of agglomerates", "structured assembly", "system of assemblies"), we transform the polyphony of properties of carbon nanotubes to THz field and sensorics create modulators, sensors, etc.

WeC02-01
Wednesday, June 24, 2026; 09:00-09:20

On the creation of an electromagnetic wave amplifier in a plasma medium with an inverse electron distribution function *(Invited)*

E.A. Bogdanov, A.A. Kudryavtsev, C.Yuan; Department of Physics, Harbin Institute of Technology, China

A criterion for the formation of an inverse EDF is obtained. Kinetic simulations and analysis have shown that one of the simplest to implement inverse EDFs is a glow discharge in a hollow cathode.

WeC02-02
Wednesday, June 24, 2026; 09:20-09:40

Tunable microwave photonic architectures enabled by plasma *(Invited)*

Jianfei Li, Jingfeng Yao; Harbin Institute of Technology, China

This review highlights gas-discharge plasma as a tunable medium for microwave photonics. Integrating plasma with periodic structures enables dynamic absorbers, robust waveguiding beyond cutoff, and manipulation of bound states in the continuum, opening avenues for adaptive and programmable systems.

WeC02-03
Wednesday, June 24, 2026; 09:40-10:00

Terahertz microscopy based on an air plasma dynamic aperture and its applications *(Invited)*

X. K. Wang, Y. Zhang; Key Laboratory of Terahertz Optoelectronics Ministry of Education, Beijing Key Laboratory of Metamaterials and Devices, Department of Physics, Department of Physics, Capital Normal University, China

In this work, a near-field technique was proposed based on an air-plasma dynamic aperture, where two mutually perpendicular air-plasmas overlapped to form a cross-filament above a sample surface that modulated an incident THz beam. Sub-wavelength THz imaging was realized without approaching a sample with any devices.

WeC02-04
Wednesday, June 24, 2026; 10:00-10:20

Optically addressed programmable metasurface for terahertz wavefront modulation *(Invited)*

Xinke Wang; Capital Normal University, China

We present optically addressed programmable metasurfaces for dynamic terahertz wavefront modulation. By employing structured optical pumping, multiple metasurface architectures are reconfigured to realize image storage, tunable focusing, and multi-bit phase modulation. Experimental results demonstrate flexible and efficient control of terahertz waves, offering versatile platforms for terahertz communication and imaging applications.

WeC02-05
Wednesday, June 24, 2026; 10:20-10:40

An overview of Terahertz phase imaging *(Invited)*

N. Petrov; ITMO University, Russia

WeC02-06
Wednesday, June 24, 2026; 10:40-11:00

Modulation of ferroelectric polarization and electro-optic properties based on the synergistic effect of optical field and electric field *(Invited)*

P. Tan, X. Jin, B. Xing, H. Tian; Harbin Institute of Technology, China

Precise laser control relies on electro-optic crystals, whose performance stems from ferroelectric polarization. This study modulated polarization and electro-optic properties via the synergistic effect of optical field and electric field in potassium tantalate-niobate crystals, drastically enhancing polarization stability and electro-optic effects, providing effective ferroelectric regulation strategies.

WeC02-07
Wednesday, June 24, 2026; 15:00-15:20

Metalens for control of complex light fields *(Invited)*

Li Li[1], Ruoxing Wang[2], Qianyun Zhang[3]; [1]Harbin Institute of Technology, [2]North China Electric Power University, [3]Tianjin University, China

The presentation introduces diverse metalenses to control complex light field. We proposed a reflective metalens with four focal points for polarization detection. A metalens for generating a customized vectorial focal curve was achieved. A compact metalens spectrometer was demonstrated with the wavelength and phase multiplexing. A metasurface approach to generate multispectral grafted perfect vector vortex beams was realized in experiment.

WeC02-08
Wednesday, June 24, 2026; 15:20-15:40

Terahertz multifunctional modulation device based on electrically controlled liquid crystal with structured electrodes and metasurfaces *(Invited)*

Y. Wang, C.X. Liu, Y.Y. Jia; School of Physics, Harbin Institute of Technology, China

To address the challenge of difficult dynamic switching of terahertz structured light beams, high-efficiency THz phase modulation is realized via electrically controlled liquid crystals , and the tunable THz wavefront control and multifunctional integration are achieved by combining structured THz-transparent electrodes with metasurfaces.

WeC02-09
Wednesday, June 24, 2026; 15:40-16:00
Fabrication of computer-generated holograms for high-precision optical testing *(Invited)*
Xiangji Bian[1], Roman Kuts[2], Kai Xu[1], Hongda Wei[1], Haixiang Hu[1], Zhiyu Zhang[1], V.P. Korolkov[2]; [1]Changchun Institute of Optics, Fine Mechanics and Physics, CAS, China; [2]Institute of Automation and Electrometry of SB RAS, Russia
A Computer-Generated Hologram (CGH) is a diffractive null lens used together with the laser interferometer for measuring surface figures of aspheres and freeform optics. It offers the advantages of interferometry, such as full resolution, snapshot measurement, and high accuracy. In this presentation, recent advancements in fabrication of CGHs is discussed. These developments enable the high-precision testing of large-aperture aspheric mirrors.

WeC02-10
Wednesday, June 24, 2026; 16:00-16:20
Unveiling ultra-high helical dichroism by twisted light with twisted nanostructure *(Invited)*
Xingguang Liu, Shuyuan Hu, Shengjie Gao, Junqing Li; School of Physics, Harbin Institute of Technology, China
The advent of twisted beam has introduced new forms of chirality through the helical wavefronts, which gives strong interaction with twisted structure. Here we present how to greatly enhanced this kind of dichroism by chiral nanostructures.

WeC02-11
Wednesday, June 24, 2026; 16:20-16:35
High-Q resonance Terahertz metasensors
Fei Yan, Li Li, Hao Tian; Harbin Institute of Technology, China
High-quality-factor (high-Q) resonances in the terahertz (THz) regime are pivotal for advancing ultrasensitive biochemical sensing. However, achieving high-Q factors has been a long-standing challenge due to the inherent ohmic and radiation losses in metamaterials, particularly for magnetic dipole resonances. In this presentation, I will introduce the recent experimental and theoretical works of high-Q THz metasensors, beginning with fundamental designs aimed at pushing the limits of Q-factor and figure-of-merit (FOM).

WeC02-12
Wednesday, June 24, 2026; 16:35-16:50
Generalized phase axicons for generating conical nonlinear wavefronts
P.A. Khorin[1], V.S. Shumigai[1,2]; [1]Samara National Research University, [2]ITMO University, Russia
This paper investigates generalized phase axicons, considering the three-dimensional structure of their elements. The study covers vortex axicons and axicons matched to wave aberrations. The proposed Bessel-like beam with a longitudinally dependent cone angle is proposed. These beams maintain a stable profile over significant distances and provide high sensitivity to phase distortions. This feature can be exploited to create precision diffraction sensors, including interferometric ones with complex reference beams.

WeC02-13
Wednesday, June 24, 2026; 17:30-17:50
Computational imaging lidar *(Invited)*
Chenfei Jin; School of Physics, Harbin Institute of Technology, China
We reviewed the significant role that "computation" has played in driving the innovation of imaging lidar systems. We also introduced the research work conducted by our group in different stages of the development of computational imaging lidar, and finally looked forward to the future development trends of imaging lidar.

WeC02-14
Wednesday, June 24, 2026; 17:50-18:10
Computational optical imaging methods with high-fidelity *(Invited)*
Zhengjun Liu, Yutong Li; School of Physics, Harbin Institute of Technology, China
In this talk, several high-fidelity computational optical imaging methods are introduced. The corresponding optical system, simulation and experimental results are given. The proposed methods effectively balance noise robustness, high throughput, and high-resolution imaging, offering valuable insights into high-fidelity quantitative computational imaging.

WeC02-15
Wednesday, June 24, 2026; 18:10-18:30
Light field manipulation and computing based on diffractive optical neural networks *(Invited)*
Weiqiang Ding, Qi Jia; Harbin Institute of Technology, China
We utilize diffractive optical neural networks to light field compensation and multispectral high-resolution polarization imaging. We also propose a novel optical computing architecture that integrates diffractive metasurfaces and deep neural networks, enabling snapshot real-time measurement of the polarization states of vector beam modes and hybrid-order Poincaré beams, and discussed the effect of spatial coherence on the performance of DONN.

WeC02-16
Wednesday, June 24, 2026; 18:30-18:50
High-throughput spatiotemporal microscopic imaging *(Invited)*
Yutong Li, Zhengjun Liu; School of Physics, Harbin Institute of Technology, China
High-throughput spatiotemporal microscopic imaging

WeC02-17
Wednesday, June 24, 2026; 18:50-19:10
SVETlANNa: an open-source framework for diffractive optical neural networks and its applications *(Invited)*
A. Kokhanovskiy[1], S. Chugunov[1], V. Igoshin[1], A. Sherbakov[1]; [1]School of Physics and Engineering, ITMO University, Russia
We present SVETlANNa, an open-source Python framework for the simulation, training and design of diffractive optical neural networks (D²NN). Built on top of PyTorch, the library represents every optical element as a differentiable module, so that complete free-space optical pipelines — phase masks, amplitude masks, lenses, apertures, polarizers, detectors and propagators - can be assembled and trained end-to-end with standard gradient-based optimizers.

ThC02-18
Thursday, June 25, 2026; 09:00-09:20
Digital holographic microscopy in laser processing and quantitative analysis of polarization-phase anisotropy of liquid crystals and sol-gel films *(Invited)*
A.V. Chernykh[1], T.V. Reztsov[1], A.S. Ezerskii[1,2], T. Han[2], V.R. Gresko[1], E.G. Tsiplakova[1,2], J. Li[3], M.M. Sergeev[1], B. Wang[2], T. Orlova[4], L. Li[3], S. Makarov[2,1] H. Tian[3], N.V. Petrov[1, 3]; [1]ITMO University, Russia; [2]Harbin Engineering University, China; [3]Harbin Institute of Technology, China; [4]Yerevan State University, Armenia
We discuss the application of digital holographic monitoring for quantitative phase analysis of polarization-sensitive materials treated with femtosecond pulses. A custom-built polarization holographic microscope reconstructs the full Jones matrix with high sensitivity, operating at three wavelengths (450, 532, 660 nm) to analyze spectral anisotropy. This enables direct visualization of laser-induced phase and polarization changes, advancing controlled laser microstructuring.

ThC02-19
Thursday, June 25, 2026; 09:20-09:40
Laser writing and microfabrication for diffractive optics and microoptics *(Invited)*
V.P. Korolkov, R.I. Kuts, D.A. Belousov, D.E. Kapustina; Inst. of Automation and Electrometry SB RAS, Russia
The results of the development of technologies for fabrication of diffractive optics and microoptics are presented. The technologies include laser writing on inorganic films and photoresists, and also reactive ion etching. Typical applications of the technologies are considered.

ThC02-20
Thursday, June 25, 2026; 09:40-10:00
Laser-induced amplified spontaneous emission and microresonator fabrication in perovskite nanocrystal films by femtosecond processing *(Invited)*
L.E. Zelenkov[1], S.V. Makarov[2,3], D.S. Gets[2]; [1]School of Physics, Harbin Institute of Technology, China; [2]School of Physics and Engineering, ITMO University, Russia; [3]Qingdao Innovation and Development Center, Harbin Engineering University, China
A femtosecond laser approach for inducing amplified spontaneous emission and fabricating resonant photonic structures in perovskite nanocrystal films is presented. Local laser modification enables spatially selective light amplification and direct writing of microresonators and photonic elements with controllable geometry.

ThC02-21
Thursday, June 25, 2026; 10:00-10:20
Carrier dynamics in perovskite micro-nano structures revealed by ultrafast laser spectroscopy *(Invited)*
Z. Lu, C.Y. Zhao; Anhui Key Laboratory for Control and Applications of Optoelectronic Information Materials, School of Physics and Electronic Information, Anhui Normal University, China
We applied the time-resolved photoluminescence-scanned imaging microscopy with both the sub-micron spacial resolution and ultrafast time-resolution to study the detailed carrier dynamics and transportation mechanism in both the three-dimensional and two-dimensional micro-nano structures of metal halide perovskites for future optoelectronic applications.

ThC02-22
Thursday, June 25, 2026; 10:20-10:40
High power 2 µm lasers from bulk to thin -disk geometry *(Invited)*
Weichao Yao; Shanghai Institute of Optics and Fine Mechanics, CAS, China
The 2 µm lasers hold significant potential for material processing and EUV generation. We have developed in-band pumped Ho lasers with <100 fs pulses in bulk and >200 W in thin-disk geometries, and are developing high-power amplifiers.

ThC02-23
Thursday, June 25, 2026; 10:40-11:00
Diamond Brillouin laser- featuring single-frequency output with high power and narrow linewidth *(Invited)*
Duo Jin[1], Zhenxu Bai[2], Yulei Wang[2], Zhiwei Lv[2], Richard Paul Mildren[3]; [1]Northeast Forestry Univ., [2]Hebei Univ. of Technology, China; [3]Macquarie Univ., Australia
High-power narrow-linewidth lasers are vital for advanced scientific applications. Traditional lasers face limitations like ASE and mode instability. In contrast, Brillouin lasers using SBS gain achieve quantum-noise-limited, ultra-narrow linewidths. This research demonstrates a spatial-structure Brillouin laser producing 22.5 W single-frequency output at 37.5% efficiency. To suppress cascaded Stokes waves, a method linking cascade order to cavity FSR and medium parameters is derived. Using diamond, with its high sound velocity, enables high-power single-frequency operation without cascading interference.

ThC02-24
Thursday, June 25, 2026; 11:30-11:50
Methods and technologies for creating high-quality fiber-optic filters for high-coherence lasers and QKD systems *(Invited)*
A.V. Kulikov, Ia.D. Moor, S.V. Varzhel, A.A. Dmitriev, V.A. Klishina, U.R. Korobkova, D.M. Kaliazina; ITMO University, Russia
This paper presents methods for fabricating high-quality fiber Bragg grating (FBG) filters. Narrowband, highly reflective FBGs were inscribed using phase mask and four-mirror interferometer techniques with KrF excimer lasers. An apodization method was optimized to achieve >23 dB side lobe suppression. The developed filters, including a cascaded configuration with a 47 pm bandwidth and >50 dB attenuation, demonstrate superior spectral selectivity compared to commercial counterparts, making them suitable for QKD systems and coherent lasers.

ThC02-25
Thursday, June 25, 2026; 11:50-12:10
Biochemical sensing based on surface structural modification of optical fibers *(Invited)*
X.H. Yang; Harbin Engineering University, China
Fiber-optic biochemical sensors enable highly sensitive trace detection through surface functionalization that enhances light–matter interactions. This work presents integrated microfluidic, SERS, and photoelectrochemical sensing architectures based on functionalized hollow and coreless fibers, demonstrating strong potential for trace analysis, multiphysics sensing, and in situ detection in confined environments.

ThC02-26
Thursday, June 25, 2026; 12:10-12:30
Dynamics of multitype mode-locking and pulse control in the ultrafast fiber lasers *(Invited)*
Lei Jin; Harbin Engineering University, China
This report focuses on the core bottlenecks and innovative breakthroughs in mode-locking technology for ultrafast fiber lasers, systematically sharing insights through a three-dimensional framework of "mechanism construction – dynamic analysis – intelligent control." It combines theoretical depth with engineering value, providing important references for research and applications in related fields.

ThC02-27
Thursday, June 25, 2026; 12:30-12:50
Integrated optics and optical devices in special functional fibres: focus on multi-core fibres and their sensing applications *(Invited)*
Xinghua Yang[1], Fengjun Tian[1], Li Li[2], Yuanyuan Xiang[1]; [1]Harbin Engineering University, [2]Harbin Institute of Technology, China
Multi-core fibres (MCFs), pivotal special functional fibres, enable multi-light-beam manipulation for high-performance sensing. This report highlights tailored MCF design/fabrication via advanced technologies, novel sensing platforms (SPR/LSPR sensors), and robust applications in structural health, biomedicine, and marine industries. It also addresses challenges and future AI-integrated, miniaturized development directions.

ThC02-28
Thursday, June 25, 2026; 12:50-13:10
Integrated frequency combs in Silicon Nitride and Lithium Niobrate *(Invited)*
Rui Niu; Harbin Institute of Technology, China
This paper reports on microcavity frequency combs using silicon nitride and lithium niobate. We demonstrate programmable wavemeters achieving sub-kHz accuracy via dispersion engineering and electro-optic effects. Furthermore, a low-noise integrated optoelectronic oscillator is realized using silicon oxynitride combs, advancing microwave photonics and precision measurement.

ThC02-29
Thursday, June 25, 2026; 13:10-13:30
Quasi-distributed fiber sensitization sensing technique based on FMCW interferometry *(Invited)*
Y. Yang; Guangdong Ocean University, China
A quasi-distributed fiber-optic sensitized sensing technique based on Fabry Perot (FP) microcavities is proposed by integrating frequency-modulated continuous-wave (FMCW) interferometry with the Vernier effect.

ThC02-30
Thursday, June 25, 2026; 15:00-15:20
Controlling femtosecond laser generation through tunable carbon nanotube saturable absorber *(Invited)*
Yu. Gladush; Skoltech, Russia
In our work, we investigate the saturable absorption of electrochemically gated carbon nanotubes and demonstrate that the gating effect exhibits nontrivial wavelength dependence. We then integrate a carbon nanotube electrochemical cell with a side-polished fiber and insert it into a fiber laser to achieve femtosecond pulse generation. By tuning the absorption saturation, we switch between various pulse generation regimes: Q-switching, mode locking, harmonic mode-locking of various orders. These findings open avenues toward efficient, high-repetition-rate lasers operating in harmonic mode-locking regimes.

ThC02-31
Thursday, June 25, 2026; 15:20-15:40
Kerr microcomb states in nontrivial dispersion profiles *(Invited)*
A.A. Gelash, A.Yu. Kolesnikova; Center of Engineering Physics, Skolkovo Institute of Science and Technology, Russia
We investigate the formation of coherent and partially coherent nonlinear optical states within the Lugiato–Lefever equation model of optical cavities with nontrivial dispersion profiles. Considering the current state of the art in dispersion engineering, we study new Kerr soliton states that may address the long-standing challenges of microcomb technology—self-referencing and high conversion efficiency.

ThC02-32
Thursday, June 25, 2026; 15:40-15:55
2.2 kW narrow-linewidth laser delivery over 1 km anti-resonant hollow-core fiber
J. Shi[1,2,3], Z. Chen[1,2,3], J. Jia[1,2,3], G. Sun[1,2,3], Z. Wang[1,2,3]; [1]College of Advanced Interdisciplinary Studies, National University of Defense Technology, [2]Nanhu Laser Laboratory, National University of Defense Technology, [3]Hunan Provincial Key Laboratory of High Energy Laser Technology, National University of Defense Technology, China
This work represents the first demonstration of all-fiber, kilometer-level delivery of narrow-linewidth lasers, marking a significant step toward practical applications such as coherent detection, LiDAR, and gravitational wave detection.

ThC02-33
Thursday, June 25, 2026; 15:55-16:10
New progress of high-power narrow-linewidth pulsed fiber lasers
Pengfei Ma[1,2,3], Heting Du[1,2], Xin Tian[1,2], Zilun Chen[1,2], Zefeng Wang[1,2]; [1]College of Advanced Interdisciplinary Studies, National University of Defense Technology, [2]Nanhu Laser Laboratory, National University of Defense Technology, China
In this report, two types of large-mode-area active fibers are designed and fabricated to balance these competing constraints, achieving record-level performance in both high-peak-power and high-average-power regimes. Based on the master oscillator power amplifier (MOPA) architectures, a record peak power of 200 kW at 270 W average power was achieved with a spectral linewidth of 2.53 GHz, pulse duration of 450 ps, and near-diffraction-limited beam quality.

ThC02-34
Thursday, June 25, 2026; 16:10-16:25
Spectral-control-assisted Kerr-lens mode-locking in a Tm:Y_2O_3 ceramic laser
Zeyu Gong[1], Jing Wang[1], Panqiang Kang[1], Weichao Yao[1], Yujie Peng[1], Jun Wang[2], Dingyuan Tang[3], Yuxin Leng[1]; [1]State Key Laboratory of Ultra-intense Laser Science and Technology, Shanghai Institute of Optics and Fine Mechanics, CAS, [2]Jiangsu Key Laboratory of Advanced Laser Materials and Devices, Jiangsu Normal University, [3]Future Technology School, Shenzhen Technology University, China
We report a Kerr-lens mode-locked Tm:Y_2O_3 ceramic laser stabilized by spectral control, that delivers an average output power of 0.5 W with a pulse duration of 113 fs at a repetition rate of 91 MHz. Further optimization for shorter pulses achieved a duration of 107 fs, at the reduced output power of 0.22 W.

ThC02-35
Thursday, June 25, 2026; 16:25-16:40
Non-destructive quality grading of milled rice via synergistic fusion of deep learning and explicit optical metrics using SS-OCT
Yuantong Liu[1,2,3], Xinxu Duan[1,2,3], Lei Jin[1,2,3]; [1]College of Physics and Optoelectronic Engineering, Harbin Engineering University, [2]Key Laboratory of Photonic Materials and Device Physics for Oceanic Applications, [3]Qingdao Innovation and Development Center of Harbin Engineering University, China
This paper presents a non-destructive framework for classifying milled rice quality grades using 1310 nm swept-source optical coherence tomography (SS-OCT). We propose a fusion strategy that combines deep learning-based texture features with explicit optical metrics. By integrating morphological patterns with physical density quantification, the proposed method effectively detects subsurface defects to ensure precise quality grading.

ThC02-36
Thursday, June 25, 2026; 16:40-17:00
Sleep improves the effectiveness of photobiomodulation of aging brain *(Invited)*
O. Semyachkina-Glushkovskaya[1], V. Adushkina[1], A. Terskov[1], A. Shirokov[1], N. Navolokin[1,2], I. Blokhina[1], D. Zlatogorskaya[1], A. Evsyukova[1], O. Semiachkina-Glushkovskaia[1], K. Sonina[1], E. Ilyukov[3], S. Popov[3], D. Myagkov[3], D. Tuktarov[3], I. Fedosov[3]; [1]Department of Biology, Saratov State University, [2]Department of Pathological Anatomy, Saratov State Medical University, [3]Institute of Physics, Saratov State University, [4]Department of computer science and information technology, Saratov State University, Russia
Age is a limiting factor in photobiomodulation (PBM) of the aging brain and treatment of age-related brain diseases. In this study, we tested and confirmed the hypothesis that sleep improves therapeutic efficacy of PBM in aged mice in terms of beta-amyloid clearance and cognitive function.

ThC02-37
Thursday, June 25, 2026; 17:30-17:50
New types of ferroelectric crystals and photoelectric functional devices *(Invited)*
Hao Tian; School of Physics, Harbin Institute of Technology, China
Taking ferroelectric crystals as the research subject, this work achieved efficient modulation of their optical and piezoelectric properties via methods including chemical doping and external field modulation, which demonstrates the high tunability of the material properties of ferroelectric crystals as well as their application potential in photoelectric functional devices.

ThC02-38
Thursday, June 25, 2026; 17:50-18:10
Engineering of charged domain walls in lead-free KNN single crystals *(Invited)*
C. Hu; School of Physics, Harbin Institute of Technology, China
We report a current-controlled poling protocol to induce and modulate stable CDWs density in bulk lead-free (K, Na)NbO_3 (KNN) single crystals by engineering leakage current and oxygen vacancy. The as-formed CDWs exhibit a high current-carrying capacity (exceeding 0.1 mA at 30 V) and ultra-long-term stability (over 2 years), overcoming the key limitations of previously reported counterparts.

ThC02-39
Thursday, June 25, 2026; 18:10-18:30
Domain evolution induced by multi-field and its properties in KN-based single crystals *(Invited)*
Xiangda Meng, Yifeng Suo, Yining Dong; School of Physics, Harbin Institute of Technology, China
With the purpose of studying the potential of KN-based materials in piezoelectric field, we grew a few of KN-based single crystals with large size and high quality via top-seed solution growth (TSSG) method and carried out investigations of their performance. The as-grown crystal displayed outstanding properties, which is caused by the engineered domain structure induced by muti-field. In addition, the domain evolution is also investigated.

ThC02-40
Thursday, June 25, 2026; 18:30-18:50
Plasmonic nanocavities for memristive light emitting devices and ultrahigh efficiency electro-optic modulators *(Invited)*
Shunping Zhang[1,2]; School of Physics and Technology, Wuhan University, [2]Wuhan Institute of Quantum Technology, China
We developed a menristive plasmonic tunneling junction for memristive light emitting device and a hybrid plasmonic cavity for record low VπL electro-optic modulators operating at > 60 GHz.

ThC02-41
Thursday, June 25, 2026; 18:50-19:10
Radiation dosimetric properties via radiophotoluminescence in metal oxide-doped lithium fluoride. *(Invited)*
Guanghui Ge[1], V.I. Korepanov[2], E.F. Policadova[2]; [1]Department of Physics, College of Science, Northeast Forestry University, China; [2]Department of Materials Science, National Research Tomsk Polytechnic University, Russia
This work develops metal oxide -doped lithium fluoride nanocomposites for radiation dosimetry. The materials show dramatically enhanced radiophotoluminescence (RPL) sensitivity, a wide linear dose response, and allow for non-destructive, repeated readout. This makes them promising for next-generation personal dosimeters and high-resolution dose mapping in medical radiotherapy.

ThC02-42
Thursday, June 25, 2026; 19:10-19:30
Study on hot-electron photoelectric conversion *(Invited)*
W. Shao; Guangxi Normal University, China
We have desigend several hot-electron extraction junctions to explore the path to reliable and feasible photoelectric conversion.

FrC02-43
Friday, June 26, 2026; 09:00-09:20
Development challenges of augmented reality waveguides: focus on critical trade-offs *(Invited)*
A.B. Solomashenko, M.V. Shishova, O.L. Afanaseva; Holography and waveguide optics laboratory, BMSTU, Russia
The report analyzes the key challenges of waveguide technologies for AR devices: diffraction – optimizing grating profiles for high efficiency and suppressing chromatic aberration; refractive – parallelism tolerances for reflective surfaces to reduce ghosting; holographic – efficiency/selectivity tradeoffs and new recording methods

FrC02-44
Friday, June 26, 2026; 09:20-09:40
AR displays based on slanted waveguide diffractive periscopes *(Invited)*
A.N. Putilin[1,2], S.S. Kopenkin[1,2], N.A. Putilin[1,2], S.E. Dubynin[1], Yu.P. Borodin[1,2]; [1]Lebedev Physical Institute RAS, [2]Moscow State University of Geodesy and Cartography, Russia
Waveguide diffractive periscopes (WDP) in AR display design provide both optical axis shift and exit pupil multiplication. In addition to the classic configurations, the variations of the diffractive element parameters makes it possible the slanted variant of design. We investigated the dependence of the maximum angular field of view for various WDP design modifications, including several original designs.

FrC02-45
Friday, June 26, 2026; 09:40-10:00
Development of an immersive virtual reality simulator for training and retraining of water transport specialists *(Invited)*
A.N. Popov[1], D.V. Zakharkin[2], A.S. Nekrasov[1]; [1]AUMSU, [2]VR Concept, Russia
Training of maritime specialists is currently implemented in a digital environment. The STCW Convention will soon mandate such training on virtual reality simulators. VR Concept, utilizing a Russian 3D engine, makes it possible this idea to be realized today. 3D modelling and initial texturing of key units and the engine room scene have been performed based on authentic layout drawings.

FrC02-46
Friday, June 26, 2026; 10:00-10:20
Photo-thermo-refractive glass - advanced polyfunctional material for photonics: properties, technologies and applications *(Invited)*
N.V. Nikonorov, V.A. Aseev; ITMO University, Russia
Photo-thermo-refractive glasses are a medium for recording ultra-deep volume holographic optical elements. Examples of creating the photonic elements and devices based on such glasses are presented: ultra-narrow-band spectral filters, chirped Bragg gratings for light pulse compression, spectral multiplexers with high spectral resolution, laser light beam combiners, holographic prisms for testing of rocking platforms, holographic waveguides for AR glasses.

FrC02-47
Friday, June 26, 2026; 10:20-10:40
Bound states in the continuum for applied photonics *(Invited)*
M.V. Rybin[1,2]; [1]School of Physics and Engineering, ITMO University, [2]Ioffe Institute, Russia
Here I trace the advancement of bound states in the continuum (BICs) from fundamental principles to functional metasurface applications. It highlights key demonstrations in silicon-based platforms for chiral dichroism and polarization-independent electromagnetically induced transparency, progresses to active switching with phase-change materials, and examines critical studies on Q-factor scaling and structural robustness.

FrC02-48
Friday, June 26, 2026; 10:40-11:00
Two-dimensional single-crystal gold for extreme nanophotonics *(Invited)*
Pan Wang; Zhejiang Univ., China
In this work, by downscaling the thickness of plasmonic nanostructures to the nanometer limit, we show that atomic scale light-matter interactions can be significantly enhanced, enabling the realization of ultrathin photonic devices with high performance.

FrC02-49
Friday, June 26, 2026; 11:30-11:50
Low-power optical generation and polymer stabilization of topological structures in liquid-crystalline materials *(Invited)*
D.D. Darmoroz, S.A. Shvetsov, M.S. Rafayelyan, T. Orlova; Yerevan State University, Armenia
Liquid crystals (LC) are versatile photonic materials with emerging applications beyond classic optoelectronics. Chiral LCs can host localized topological structures applicable in modern optics and photonics, but their implementation requires mechanical stability. A photopolymerizable, azo-dye-doped chiral LC enables the optoelectronic approach for generation and transformation of topological structures. Their configuration can be stabilized at any moment during the structural evolution.

FrC02-50
Friday, June 26, 2026; 11:50-12:10
Pd-coated Au core-shell nanorod metamaterial for optical hydrogen sensing *(Invited)*
Yajie Wang, Haibin Ni; Nanjing University of Information Science and Technology, China
We report a compact optical hydrogen sensor based on Au@Pd nanorod arrays embedded in anodic aluminum oxide (AAO). Near-field coupling between localized surface plasmon resonance and a vertical Fabry–Pérot cavity yields a hybrid mode with enhanced refractive-index sensitivity. The device shows 11.33 nm/% sensitivity from 0–2 vol% H2, with <20 s response, <50 s recovery, and stable cycling over time.

FrC02-51
Friday, June 26, 2026; 12:10-12:25
Neural network analysis of bound states in the continuum in disordered dielectric metasurfaces
K.V. Semushev, N.A. Vlasov, A.I. Solomonov, Z.F. Kondratenko, E.E. Maslova; ITMO University, Russia
This study explores how imperfections affect the Q factor of symmetry-protected bound states in the continuum in dielectric structures. Using neural networks, we analyze position disorder and shape defects. The approach enables rapid assessment of imperfection impacts, drastically reducing required computational resources.

FrC02-52
Friday, June 26, 2026; 12:25-12:40
Pushing plasmonic nanogaps to sub-5 nm limit in ultrathin single-crystal gold
Chenming Wu; Zhejiang University, China
Here we report the realization of sub-5-nm gaps in single-crystal gold films with thicknesses down to 4 nm, achieved by using focused helium ion beam milling. This capability establishes ultrastrong optical confinement in both in-plane and out-of-plane directions and opens new opportunities for extreme nanophotonics.

FrC02-53
Friday, June 26, 2026; 12:40-12:55
Measurement of dielectric function of single crystal gold
Yi Luo; Zhejiang University, China
Here we determine the complex dielectric function of chemically synthesized single-crystal gold flakes (bulk-like thickness, >150 nm) using imaging micro-area spectroscopic ellipsometry over 360–1000 nm. Relative to widely used datasets for single-crystal and polycrystalline gold, our measurements show a markedly smaller value of the imaginary part of the permittivity (lower ε_2) in the spectral range from ~600-1000 nm, consistent with reduced dissipation.

FrC02-54
Friday, June 26, 2026; 12:55-13:15
From porphyrins to spin quantum matter: hollow nanoclusters, low-dimensional magnetism, and emerging quantum architectures *(Invited)*
P.V. Avramov; [1]School oof Physics, Harbin Institute of Technology, China
This keynote explores design principles of low-dimensional spin quantum materials based on porphyrinoid architectures and carbon nanostructures. By combining controlled coordination, curvature, and symmetry, these systems stabilize localized spin states, high-spin nanoclusters, and superatomic orbitals. Recent experimental realizations demonstrate how chemically programmable nanostructures bridge molecular chemistry and quantum materials, enabling applications in spintronics and quantum technologies.

WeC02-p01
Wednesday, June 24, 2026; 10:00-13:30
Fabrication of kilowatt-level chirped tilted fiber Bragg gratings using femtosecond laser direct writing method *(Poster)*
Cong Chen[1,2], Hao Li[1,2], Shancheng Liao[1,2], Meng Wang[1,2], Rong Zhao[1,2], Xin Tian[1,2], Zilun Chen[1,2], Pengfei Ma[1,2], Zefeng Wang[1,2]; [1]College of Advanced Interdisciplinary Studies, National University of Defense Technology, [2]Nanhu Laser Laboratory, National University of Defense Technology, China
Our works verifies the feasibility of fabricating high-power chirped tilted fiber Bragg gratings using the femtosecond laser direct writing system, which provides new insights into the development of CTFBG for high-power fiber lasers.

WeC02-p02
Wednesday, June 24, 2026; 10:00-13:30
Scanning off-axis beam wavefront detection method based on metasurface *(Poster)*
Xingdong Liu, Li Li; Harbin Institute of Technology, China
By using metasurfaces and through the principle of PB phase control and the derivation of the generalized Snell's law, researchers have successfully achieved the detection of the isophase surfaces of unknown beams under off-axis conditions.

WeC02-p03
Wednesday, June 24, 2026; 10:00-13:30
Study of optical transmission in GaP nanowire-based directional 2×2 couplers *(Poster)*
M.A. Anikina[1], A. Kuznetsov[1], D.V. Grudinin[1], A.N. Abramov[3], V.A. Sharov[2], V.M. Kondratev[1], A.D. Bolshakov[1]; [1]Moscow Center for Advanced Studies, [2]Alferov Univ., [3]School of Physics and Engineering, ITMO Univ.
We investigate the optical properties of a GaP nanowire-based 2×2 coupler with the aim of developing a fully functional nanophotonic device and optimizing its performance. Optical transmittance is shown to depend on the coupling length, nanowire (NW) diameters, and gap between NWs. Mechanical assembly and the intrinsic elasticity of GaP NWs enable in-situ tuning, demonstrating reconfigurable nanophotonic couplers.

WeC02-p04
Wednesday, June 24, 2026; 10:00-13:30
Bias-voltage control of terahertz waves by thin-film bismuth strips *(Poster)*
P.S. Demchenko[1], N.S. Kablukova[1,2], V.V. Nikolaev[3], Yu.V. Kistenev[3], M.K. Khodzitsky; [1]Terahertz Photonics LLC, [2]Herzen State Pedagogical University, [3]National Research Tomsk State University, Russia
We study bias-voltage dependent of the structure of bismuth thin-film strips on a mica substrate on effective optical properties and transmittance. It was shown that the modulation depth has a value up to 47.7% at 1.2 THz at 0-28.6V bias-voltage. There were different amplitude modulation modes in different spectral ranges. The strips structure had decreased sample`s plasma frequency.

WeC02-p05
Wednesday, June 24, 2026; 10:00-13:30
High-power all-fiber laser exceeding 3 kW based on a pair of YDF-FBGs fabricated by femtosecond laser direct writing *(Poster)*
Xinda Lu[1,2], Rong Zhao[1,2], Shancheng Liao[1,2], Hao Li[1,2], Xin Tian[1,2], Zilun Chen[1,2], Pengfei Ma[1,2], Zefeng Wang[1,2,4]; [1]College of Advanced Interdisciplinary Studies, National University of Defense Technology, [2]Nanhu Laser Laboratory, National University of Defense Technology, China
This work demonstrates that femtosecond laser direct writing through the coating is a viable and promising technique for fabricating high-power-rated fiber Bragg gratings in active fibers, paving the way for further power scaling of monolithic all-fiber lasers.

WeC02-p06
Wednesday, June 24, 2026; 10:00-13:30
Parametric study and spectral control of plasma photonic crystal slabs *(Poster)*
Nie Chen[1], Ying Wang[1,2,3], Chengxun Yuan[1,2,3], Zhongxiang Zhou[1,2,3]; [1]School of Physics, Harbin Institute of Technology, [2]Heilongjiang Provincial Key Laboratory of Plasma Physics and Application Technology, [3]Heilongjiang Provincial Innovation Research Center for Plasma Physics and Application Technology, China
This paper presents a unified modeling framework for plasma photonic crystal slabs (PCS) in the GHz band. We investigate the tunable spectral response controlled by geometric parameters and plasma parameters. Numerical results reveal the influence of plasma dispersion on guided mode resonance, proposing a strategy for realizing reconfigurable electromagnetic device with tunable bandwidth and lineshape.

WeC02-p07
Wednesday, June 24, 2026; 10:00-13:30
Crystal growth and Terahertz time-domain spectroscopy in Sm−xRxFeO$_3$ orthoferrite *(Poster)*
Anhua Wu[1], Zhen Zhang[1], Liangbi Su[1], A.M. Kalashnikova[2], R.V. Pisarev[2]; [1]Shanghai Institute of Ceramics, CAS, China; [2]Ioffe Institute of RAS, Russia
The dynamics of spin reorientation phase transition is studied in SmxR1-xFeO3 single crystal. Our results demonstrate that Terahertz time-domain spectroscopy is an effective method to study iron ions spin reorientation phase transition.

WeC02-p08
Wednesday, June 24, 2026; 10:00-13:30
Experimental investigation of frequency-modulated single-pixel imaging Lidar *(Poster)*
A.K. Lappo-Danilevskaia[1], A.O. Sazhin[2,3], A.O. Ismagilov[1], A.S. Sinko[2,3], V.S. Shumigai[1]; [1]ITMO University, [2]Lomonosov Moscow State University, [3]NRC Kurchatov Institute, Russia
The use of single-pixel imaging (SPI) as an alternative to conventional detector-array based imaging systems in Lidar technologies represents a promising approach and is especially relevant for frequency-modulated continuous-wave (FMCW) Lidar. In this work, we experimentally demonstrate that a FMCW LiDAR system based on the SPI concept is capable of simultaneously measuring distances and visualizing multiple objects.

WeC02-p09
Wednesday, June 24, 2026; 10:00-13:30
Improving the accuracy of an optical-electronic triangulation system with active laser markers through the use of redundant measurement information *(Poster)*
A.A. Luzanov, I.A. Konyakhin; ITMO Univ., Russia
The paper presents a multichannel optical-electronic triangulation system with active emitting markers for monitoring large-scale structures. It is shown that the use of redundant measurement information and appropriate processing methods increases the accuracy of spatial coordinate determination without additional hardware complexity.

WeC02-p10
Wednesday, June 24, 2026; 10:00-13:30
Enhancing SHG around exceptional point by coupling a quasi-BIC and toroidal dipole modes *(Poster)*
Jiashuo Huo[1], Qiaohua Wu[1], Wei Wang[1], Jie Lin[1], Peng Jin[2,3], Shutian Liu[1], Keya Zhou[1]; [1]School of Physics, Harbin Institute of Technology, [2]Key Laboratory of Micro-systems and Micro-Structures Manufacturing, Harbin Institute of Technology, [3]School of Instrumentation Science and Engineering, Harbin Institute of Technology, China
We demonstrate an exceptional point (EP) formed by coupling a bound state in the continuum with a toroidal dipole mode in a bilayer metasurface. The EP exhibits enhanced field localization and boosts second harmonic generation efficiency by 5.6 times, further improved to 0.35 through structural perturbation, enabling high-efficiency nonlinear photonics.

WeC02-p11
Wednesday, June 24, 2026; 10:00-13:30
Performance limits of pattern dithering for compressive sensing imaging *(Poster)*
V.S. Shumigai, V.S. Tuchin, A.O. Ismagilov, A.N. Tcypkin; ITMO Univ., Russia
This work analyzes image reconstruction accuracy in compressive sensing with grayscale patterns. Such patterns require dithering for projection on binary modulators, introducing signal distortion. We quantify how this distortion grows with scaling factor of dithered pattern.

WeC02-p12
Wednesday, June 24, 2026; 10:00-13:30
High-speed structured fields generation via spinning disk and multichannel diffraction optics *(Poster)*
V.S. Shumigai[1,2], P.A. Khorin[1]; [1]Samara National Research University, [2]ITMO University, Russia
This work presents the design of a high-speed spatiotemporal light modulator based on a spinning disk with diffractive masks. The modulator's core topology employs multi-order diffractive optical elements (DOEs) featuring 25 diffraction orders and a resolution of 256 × 256 pixels. This architecture enables the integration of over 300 distinct DOEs on a 135-mm diameter disk.

WeC02-p13
Wednesday, June 24, 2026; 10:00-13:30
High brightness radiation sources and isotopes production generated by high power laser beams *(Poster)*
Mingzhe Yang[1], Ziyao Wang[1], Jieru Ren[1], Wenqing Wei[1], Benzheng Chen[1], Bubo Ma[1], Shizheng Zhang[1], Lirong Liu[1], Fangfang Li[1], Jie Xiong[1], Hongwei Yue[1], Zeyu Lai[1], Wenxuan Li[1], Dieter Hoffmann[1], Olga Rosmej[2], Parysatis Tawana[2], N.E. Andreev[3], I.R. Umarov[3], Zhigang Deng[4], Wei Qi[4], Shaoyi Wang[4], Quanping Fan[4], Zongqiang Yuan[4], Weiwu Wang[4], Bo Cui[4], Xiaohui Zhang[4], Yuchi Wu[4], Weimin Zhou[4], Jingqin Su[4], Rui Cheng[5], Yongtao Zhao[1]; [1]School of Physics, Xi'an Jiaotong University, China; [2]Heavy Ion Research Center, Germany; [3]Joint Institute for High Temperatures, RAS, Russia; [4]Laser Fusion Research Center of China Academy of Engineering Physics, China; [5]Institute of Modern Physics, CAS, China
We explored the generation of high intensity electron beams to generate high brightness radiation sources using the interaction of high-power laser-radiation with near-critical density plasma. The laser generated electron beam was directed onto a tantalum converter, and resulted in a photon production of 1010 photons/(MeV·sr). We investigated the spatial angular distribution and energy spectral information of these radiation sources. Our findings also demonstrate the efficient feasibility of producing isotopes based on direct laser acceleration.

WeC02-p14
Wednesday, June 24, 2026; 10:00-13:30
Trace triazole enables kinetic-controlled Zn deposition via adsorptive interface regulation for highly reversible zinc metal anodes *(Poster)*
Jingwen Shao[1], Ping Lei[2], Lan Jin[1], Jiehui Liu[1], Shuyuan Zhuge[1], Zhe Lü1; [1]Harbin Institute of Technology, [2]Harbin University of Science and Technology, China
Trace 1H-1,2,3-Triazole (Trl) additive reconfigures the Zn interface to enhance aqueous zinc-ion battery stability. Trl preferentially adsorbs on Zn anodes, forming a water-depleted layer that suppresses side reactions. By accelerating interfacial de-solvation while preserving bulk solvation, Trl enables kinetic-controlled uniform deposition. This achieves ultra-stable cycling (5000 h) and 99.75% Coulombic efficiency, and significantly enhances practical applications.

WeC02-p15
Wednesday, June 24, 2026; 10:00-13:30
Tri-additive PEGDA-based quasi-solid electrolyte for enhanced ion transport and interface stability in Li-O_2 batteries *(Poster)*
Jiaqi Wang[1], Xiqiang Huang[1], Xingbao Zhu[2], Yuanguo Wu[1], Zining Man[1], Xiangyu Wen[1], Weiting Qi[2], Xing Tang[2], Zhe Liu[1]; [1]Center for Condensed Matter Science and Technology, Harbin Institute of Technology, [2]School of Physics, Beijing Institute of Technology, China
Solid polymer electrolytes for Li-O2 batteries often suffer from low ionic conductivity and high interfacial resistance. We report a PEGDA-based quasi-solid electrolyte formed by in situ polymerization with cellulose acetate, N-methyl-2-pyrrolidone and fluoroethylene carbonate. Synergistic Li+ coordination and interphase stabilization deliver 8.54×10^-4 S cm^-1 conductivity, tLi+ = 0.78, and markedly improved Li-O2 cycling performance.

WeC02-p16
Wednesday, June 24, 2026; 10:00-13:30
Improving noise robustness in single-pixel imaging via adaptive frequency-hopping modulation *(Poster)*
E.N. Oparin, A.N. Tcypkin; ITMO Univ., Russia
We present an adaptive frequency-hopping spread-spectrum (FHSS) method for improving the noise robustness of single-pixel imaging (SPI). By distributing the modulation across multiple frequencies and dynamically excluding corrupted ones, the system maintains high reconstruction quality under low-frequency drifts and narrowband interference. Numerical simulations and experiments confirm substantial improvements over conventional SPI.

WeC02-p17
Wednesday, June 24, 2026; 10:00-13:30
Beam profiling of a terahertz quantum cascade laser using phase retrieval *(Poster)*
I.G. Stepanov[1], E.G. Tsiplakova[1,2], A.V. Chernykh[1], I.E. Rykov[3], M.V. Maytama[3], I.A. Glinskiy[3], D.A. Belov[3,4], A.V. Ikonnikov[3,4], R.A. Khabibullin[3], N.V. Petrov[1,5]; [1]Digital and Display Holography Laboratory, ITMO University, Russia; [2]Qingdao Innovation and Development Center, Harbin Engineering University, China; [3]Moscow Institute of Physics and Technology, Russia; [4]Physics Department M.V. Lomonosov Moscow State University, Russia; [5]School of Physics, Harbin Institute of Technology, China
Beam emitted by quantum cascade laser operating at 3.75 THz is characterized. Raster-scanning with a Golay cell provided intensity measurments at different propagation planes. Phase fronts are obtained by means of single beam multiple intensity reconstruction method. The performed analysis allows for comprehensive understanding of the beam profile, enabling precise alignment of the optical scheme.

WeC02-p18
Wednesday, June 24, 2026; 10:00-13:30
Modeling of a distributed feedback laser based on a fiber Bragg grating in erbium-doped fiber *(Poster)*
Ia.D. Moor, A.V. Kulikov, G.P. Miroshnichenko, I.A. Pakhomov; ITMO University, Russia
This work investigates the stability of DFB fiber lasers via modeling and experiment. A sufficient active medium gain is proven essential for stable single-frequency operation, confirmed using FiberCore Er-doped fibers. A 70 mm FBG caused observed spectral splitting, explained by a noise-inclusive coupled-mode model. Simulations show a small distributed chirp (ξ=4.3×10^{-3} nm/cm) stabilizes the ASE peak, analogous to a π-phase shift. The results are vital for designing stable lasers for sensing and communications.

WeC02-p19
Wednesday, June 24, 2026; 10:00-13:30
High-brightness multimode fiber laser based on wavefront shaping *(Poster)*
Zhen Huang[1,2], Chenxin Gao[1,2], Xiaofei Ma[1,2], Xiangfei Zhu[1,2], Xin Tian[1,2], Chenzi Lun[1,2], Pengfei Ma[1,2], Zefeng Wang[1,2]; [1]College of Advanced Interdisciplinary Studies, National University of Defense Technology, [2]Nanhu Laser Laboratory, National University of Defense Technology, China
In this work, we first theoretically demonstrate that a diffraction-limited Gaussian beam (M^2≈1) can be achieved through coherent superpositions of fiber modes. We experimentally implement intensity-guided wavefront shaping in a high-power multimode fiber amplifier. Using a genetic algorithm with the optimized TR size, we achieve a focused output beam at 168 W average power, representing an eightfold brightness enhancement compared to the uncontrolled multimode output.

WeC02-p20
Wednesday, June 24, 2026; 10:00-13:30
Normalized cutoff frequency as a universal robustness metric for optical diffractive neural networks *(Poster)*
Ning Wang[1], Siyuan Wang[1], Zonglin Guo[1], Yu Zhao[2], Qi Jia[1], Jingbo Zhang[1], Jian Wang[1]; [1]Harbin Institute of Technology, [2]Beijing Institute of Spacecraft System Engineering, China
We address the underexplored robustness of optical diffractive neural networks (ODNNs) for real-world deployment. We introduce a normalized cutoff frequency (NCF) criterion and show robustness is governed by the light field's spatial-frequency bandwidth. Across architectures, equal NCF yields comparable robustness in classification and regression, for both linear and nonlinear ODNNs, enabling efficient robustness prediction for large-scale models.

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