



V International Conference on Ultrafast Optical Science  
"UltrafastLight-2021"

# Conference program

October 4 – 8, 2021  
Lebedev Physical Institute, Moscow

V International Conference on Ultrafast Optical Science "UltrafastLight-2021", is the broad-scope, annual international symposium dedicated to the most important aspects of ultrafast phenomena in different fields of natural sciences and engineering.



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**Chair** Nikolay Kolachevsky (Lebedev Physical Institute)

**Vice-chair** Andrey Ionin (Lebedev Physical Institute),

**Vice-chair** Sergey Kudryashov (Lebedev Physical Institute)

## Monday, October 4

9:00	Registration (Main entrance)		
9:45	Conference opening and technical information (Conference hall)		
Plenary session (Conference hall)			
10:00	M. Frolov "High harmonic generation of an atomic system subjected in an intense IR field and XUV pulse: application to the spectroscopy and metrology of an attosecond pulses"		
10:45	K. Sugioka "3D microfluidic SERS chips fabricated by hybrid femtosecond laser processing for attomolar sensing"		
11:25	Coffee break		
12:15	Section 1 "Extreme Light"  <div style="text-align: right;">(Small hall) <b>page 8</b></div>	Section 3 "Ultrafast phenomena in condensed matter"  <div style="text-align: right;">(Conference hall) <b>page 10</b></div>	Section 7 "Ultrafast laser technologies and structured light in micro-optics and nanophotonics"  <div style="text-align: right;">(Conference hall of QRPD) <b>page 12</b></div>
14:30	Lunch		
16:00	Section 1 "Extreme Light"  <div style="text-align: right;">(Small hall) <b>page 9</b></div>	Section 3 "Ultrafast phenomena in condensed matter"  <div style="text-align: right;">( Conference hall) <b>page 11</b></div>	Section 7 "Ultrafast laser technologies and structured light in micro-optics and nanophotonics"  <div style="text-align: right;">(Conference hall of QRPD) <b>page 13</b></div>

## Tuesday, October 5

9:30	Registration (Main entrance)			
<i>Plenary session</i> (Conference hall)				
10:00	Y. Cheng "Lithium Niobate Nanophotonics"			
10:45	S. Maier "Ultrafast optical modulation in dielectric nanoantennas and Weyl semimetal thin films"			
11:25	<i>Coffee break</i>			
12:15	Section 2 "Ultra-fast phenomena in condensed matter and ionized gases"  <i>(Small hall)</i> <b>page 14</b>	Section 3 "Ultrafast phenomena in condensed matter"  <i>(Conference hall)</i> <b>page 16</b>	Section 7 "Ultrafast laser technologies and structured light in micro-optics and nanophotonics"  <i>(Conference hall of QRPD)</i> <b>page 18</b>	
14:30	<i>Lunch</i>			
16:00	Section 2 "Ultra-fast phenomena in condensed matter and ionized gases"  <i>(Small hall)</i> <b>page 15</b>	Section 3 "Ultrafast phenomena in condensed matter"  <i>(Conference hall)</i> <b>page 17</b>	Section 7 "Ultrafast laser technologies and structured light in micro-optics and nanophotonics"  <i>(Conference hall of QRPD)</i> <b>pages 19-20</b>	Section 4 "Femtosecond nonlinear optics. Filamentation. High field THz generation"  <i>(Online only)</i> <b>page 21</b>

## Wednesday, October 6

9:30	Registration <i>(Main entrance)</i>		
10:00	Section 1 "Extreme light"      (Small Hall) <b>page 22</b>	Section 3 "Ultrafast phenomena in condensed matter"      (Conference hall) <b>page 25</b>	Section 4 "Femto-second nonlinear optics. Filamentation. High field THz generation"      (Conference hall of QRPD) <b>page 27</b>
12:00	<i>Coffee-break</i>		
12:45	Section 1 "Extreme light"      (Small Hall) <b>pages 23-24</b>	Section 3 "Ultrafast phenomena in condensed matter"      (Conference hall) <b>page 26</b>	Section 4 "Femto-second nonlinear optics. Filamentation. High field THz generation"      (Conference hall of QRPD) <b>page 28</b>
15:00	<i>Lunch</i>		
<i>Plenary session (Conference hall)</i>			
16:30	X.-C. Zhang "From THz air photonics to THz liquid photonics"		
17:15	A. Belyanin "Optical frequency combs from quantum cascade lasers"		
18:00	A. Arefiev "Laser-driven magnetic filaments as a platform for high-field science"		

## Thursday, October 7

9:30	Registration (Main entrance)		
<i>Plenary session</i> (Conference hall)			
10:00	V. R. Soma "Novel Applications of Ultrafast Laser Ablation in Liquids"		
10:45	A. Houard "Long range kilohertz laser filamentation and the Laser Lightning Rod project"		
11:25	<i>Coffee break</i>		
12:15	Section 6 "Physics and technology of ultrafast lasers and ultrashort laser pulses"  <div style="text-align: right;">(Small Hall) <b>page 29</b></div>	Section 3 "Ultrafast phenomena in condensed matter"  <div style="text-align: right;">(Conference hall) <b>page 31</b></div>	Section 4 "Femto-second nonlinear optics. Filamentation. High field THz generation"  <div style="text-align: right;">(Conference hall of QRPD) <b>page 33</b></div>
14:45	<i>Lunch</i>		
16:00	Section 6 "Physics and technology of ultrafast lasers and ultrashort laser pulses"  <div style="text-align: right;">(Small Hall) <b>page 30</b></div>	Section 3 "Ultrafast phenomena in condensed matter"  <div style="text-align: right;">(Conference hall) <b>page 32</b></div>	Section 4 "Femto-second nonlinear optics. Filamentation. High field THz generation"  <div style="text-align: right;">(Conference hall of QRPD) <b>page 34</b></div>
17:15 — 18:45	Poster session + coffee break  <div style="text-align: right;">(2<sup>nd</sup> floor) <b>pages 35-37</b></div>		

## Friday, October 8

9:30	Registration (Main entrance)		
<i>Plenary session</i> (Conference hall)			
10:00	A. Zheltikov "Fiber-optic diamond-based biothermometry"		
10:45	E. Stratakis "Ultrafast laser biomimetic fabrication and related applications"		
11:25	<i>Coffee break</i>		
12:15	Section 6 "Physics and technology of ultrafast lasers and ultrashort laser pulses"  <i>(Small Hall)</i> <b>page 38</b>	Section 5 "Frequency combs in spectroscopy and optical clocks"  <i>(Physical hall)</i> <b>page 40</b>	Section 8 "Ultrafast laser technologies in biomedicine"  <i>(Conference hall of QRPD)</i> <b>page 41</b>
14:45	<i>Lunch</i>		
16:00	Section 6 "Physics and technology of ultrafast lasers and ultrashort laser pulses"  <i>(Small Hall)</i> <b>page 39</b>		Section 8 "Ultrafast laser technologies in biomedicine"  <i>(Conference hall of QRPD)</i> <b>page 42</b>

## Section 1 "Extreme Light"

Monday, October 4 / (Small Hall)

Session 12:15 – 14:35, Chair: Prof. Valery Bychenkov

12:15-12:40

(invited) A. Andreev "Magnetization and X-ray emission of cluster gas irradiated by polarized intense laser pulse"

12:40-12:55

(invited) A. Savel'ev "X-ray, gamma and relativistic electron sources with tabletop femtosecond laser"

12:55-13:20

(invited) A. Soloviev "Laser pulse focusing optimization in the case of nonlinear self-phase modulation"

13:25-13:50

(invited) A. Brantov "Photonuclear applications with gamma rays from laser-accelerated electrons in a self-trapping regime"

13:50-14:05

A. Martynenko "Optimization of a laser plasma based X-ray source according to warm dense matter absorption spectroscopy requirements"

14:05-14:20

V. Krainov "The Markoff approximation for high harmonic generation at the laser-atom interaction"

14.20-14:35

I. Khairulin "Boosting the efficiency of high harmonic amplification by modulating a plasma-based X-ray laser with the second harmonic of the fundamental frequency laser field"



**Session 16:00 – 18:25, Chair: Prof. Alexander Andreev**

16.00-16:25

(invited) *S. Ter-Avetisyan* "Perspectives of Ion Acceleration with PW-ultrashort laser pulse"

16.25-16:40

*Ph. Korneev* "Transient processes in micro-coils induced by a short laser pulse"

16.40-16:55

*K. Ivanov* "High-Z structured target for efficient laser-driven X-ray source and phase-contrast imaging applications"

16.55-17:10

*V. Kulagin* "Efficiency for terahertz pulse generation using a complex nanostructured target"

17.10-17:25

*O. Kostenko* "Simulation of generation of characteristic X-ray radiation under vacuum heating of electrons of nanocylinders"

17.25-17:40

*D. Gorlova* "THz radiation generation in the interaction of TW laser pulse with dense tens of micron-scale preplasma layer"

17.40-17:55

*A. Zavorotnyi* "The analysis of the bremsstrahlung spectrum of the laser-plasma electron source in presence of pileup effect"

17.55-18.10

*O. Vais* "Angular-spectral characteristics of synchrotron radiation generated in a regime of relativistic self-trapping laser propagation"

18.10-18.25

*O. Shoutova* "Harmonics generation by atomic medium in optical vortex fields"

18.25-18.40

*I. Metelskii* "Nonlinear absorption of laser radiation due to relativistic plasma resonance in an inhomogeneous plasma"

## Section 3 "Ultrafast phenomena in condensed matter"

Monday, October 4 / (Conference Hall)

Session 12:15 – 14:40, Chair: Prof. Nail' Inogamov

12:15-12:40

(invited) T. Derrien "Ultrafast excitation of electrons in crystals: insights from non-equilibrium band structure calculations"

12:40-13:05

(invited) M. Garcia "Theory for the laser induced transition from nonthermal to incoherent thermal lattice dynamics in condensed matter"

13:05-13:30

(invited) I. Milov "Thermal and non-thermal phase transitions in laser-irradiated metals"

13:30-13:55

(invited) N. Bulgakova "Effects of laser-induced stresses in material modification"

13:55-14:20

(invited) F. Akhmetov "Dynamics of ultrafast melting in laser-irradiated ruthenium thin films"

14:20-14:35

I. Mogunov "Ultrafast laser-induced phase transition in VO<sub>2</sub> for picosecond acoustics"

14:35-14:40 *Flash talk*

S. Murzov "Ultrashort laser shock in iron: extreme strain rates for elastoplastic and polymorphic transformation"

**Session 16:00 – 18:30, Chair: Prof. Sergey Kudryashov**

*16.00-16:25*

*(invited) E. Mareev* "Interaction of tightly focused mid-IR femtosecond laser pulses with Si"

*16.25-16:50*

*(invited) A. Wang* "Internal laser writing inside semiconductors by ultrafast pulses"

*16.50-17:05*

*K. Lvov* "Numerical investigation of chirped laser pulse focusing in bulk of Si"

*17.05-17:30*

*(invited) T. Apostolova* "Femtosecond optical breakdown of silicon"

*17.30-17:55*

*(invited) A. Bulgakov* "Dual wavelength ultrashort laser ablation and surface modification of silicon"

*17.55-18:20*

*(invited) L. Zhigilei* "Atomistic simulations of the generation of alloy nanoparticles by short pulse laser ablation in liquid"

*18.20-18:30 Flash talks*

*N. Smirnov* "Investigation of ambipolar diffusion of electron-hole plasma under the action of ultra-short laser pulses on a silicon"

*B. Rumiantsev* "Effect of the laser pulse polarization ellipticity on laser-induced acoustic wave under plasma-mediated laser excitation of the condensed medium bulk"

## Section 7 "Ultrafast laser technologies and structured light in micro-optics and nanophotonics"

Monday, October 4 / (Conference hall of QRPD)

Session 12:15 – 14:45, Chair: Dr. Michael Kovalev

12:15-12:40

(invited) V. Zhukov "Monitoring Laser Radiation Scattered by Laser- Produced Free electron Plasma inside Transparent Dielectrics"

12:40-13:05

(invited) G. Duchateau "Role of electronic interband transitions for the femtosecond laser energy deposition into dielectric materials"

13:05-13:30

(invited) F. Courvoisier "Resonance absorption in the bulk of dielectrics"

13:30-13:55

(invited) R. Stoian "Nanostructuring of materials for photonics with designer ultrafast laser pulses"

13:55-14:20

(invited) E. Martynovich "New nonlinear photographic materials with fluorescent imaging"

14:20-14:45

(invited) N. Sanner "Processing of arrays of microchannels in fused silica by picosecond laser ablation"

**Session 16:00 – 18:25, Chair: Dr. Yulia Gulina**

16.00-16:25

(invited) V. Kononenko "Optical properties of laser-induced plasma in water"

16.25-16:40

I. Slovinskii "Microstructure and droplet formation via extreme energy deposition of 3- $\mu\text{m}$  laser radiation in water"

16.40-16:55

R. Zakoldaev "Femtosecond structuring of nanoporous silicate matrices"

16.55-17:10

A. Rupasov "Direct femtosecond laser recording in the volume of transparent dielectrics"

17.10-17:25

M. Kovalev "Ultrashort registration of the object field: algorithm, possibilities and limitations"

17.25-17:40

M. Vetchinnikov "Micro-modification of optical properties in cadmium sulfide-doped silicate glass by a femtosecond laser beam"

17.40-17:55

G. Shahgildyan "Laser micromodification of phosphate glass impregnated with silver"

17.55-18:25 *Flash talks*

V. Zhukov "A finite-difference scheme realizing the model of the interaction of a femtosecond laser pulse with a transparent solid"

Y. Yandybaeva "Barriers building inside nanoporous silicate matrix by femtosecond laser pulses"

A. Shishkina "Femtosecond laser writing of hollow channels in nanoporous silicate matrix"

V. Yakimuk "Femtosecond laser writing of waveguides inside nanoporous silicate matrix"

E. Oleynichuk "Formation of nanogratings on the surface of nanoporous glass under the action of femtosecond laser pulses in the visible range"

A. Pomigueva "Nanograting formation in sodium germanate glasses by femtosecond-laser pulses"

## Section 2 "Ultrafast phenomena in ionized gases"

Tuesday, October 5 / (Small Hall)

Session 12:15 – 14:45, Chair: Dr. Vasily Kostin

12:15-12:40

(invited) M. Kozák "Optical strong-field phenomena in crystalline solids driven by few-cycle mid-infrared laser pulses"

12:40-13:05

(invited) Y. Liu "Coherent control of the air molecule ionization and its Terahertz radiation pumped by a 3-color femtosecond laser field"

13:05-13:30

(invited) T. Sarantseva "Retrieving of an attosecond pulse waveform based on high harmonic generation"

13:30-13:45

V. Kostin "Analytical approach to ionization-induced multiwave mixing in multicolor fields"

13:45-14:00

A. Konovko "Surface plasmon resonance enhanced second and third harmonic generation of intense near-IR femtosecond laser with periodic microtip metal structure"

14:00-14:15

A. Romanov "Generation of secondary radiation during interaction of intense laser field with fullerenes"

14:15-14:30

V. Grishkov "Generation of THz radiation under the action of a focused femtosecond laser pulse on a semiconductor layer deposited on a metal surface"

14:30-14:45

E. Danilov "Competition of low-frequency fields arising at the effect of the focused laser pulse on a conductor"

**Session 16:00 – 18:30, Chair: Prof. Alexander Popov**

16:00-16:25

(invited) A. Silaev "Multielectron effects in high-harmonic generation by atoms in intense laser field"

16:25-16:50

(invited) A. Bogatskaya "High intense unipolar THz pulses generation in nonequilibrium xenon plasma"

16:50-17:05

A. Popov "3D modeling of short THz pulse propagation and amplification pulses in strongly nonequilibrium plasma channels formed in xenon by femtosecond UV laser pulses"

17:05-17:20

K. Vagin "Potential instability of collision plasma formed by multiphoton ionization of inert gas"

17:20-17:35

I. Osovitskaya "Electromagnetic wave transformation in an abruptly created plasma layer"

17:35-17:50

T. Mamontova "On the applicability limits of the sharp boundary assumption in the interaction of laser pulses with photoionized plasma"

17:50-18:05

K. Ovchinnikov "Effect of electron-ion collisions on the generation of terahertz radiation at the interaction of femtosecond pulse with plasma in magnetic field"

18:05-18.20

A. Frolov "Terahertz wave emission under action of a p-polarized laser pulse on plasma"

18:20- 18:30 *Flash talks*

**Chair: Tatiana Mamontova**

S. Kuznetsov "Mechanism of electron bunching by a relativistically intense laser pulse when crossing a nonuniform-plasma boundary"

P. Nikiforova "Bolometric detection of broadband terahertz radiation by resonant heterostructures"

## Section 3 "Ultrafast phenomena in condensed matter"

Tuesday, October 5 / (Conference Hall)

Session 12:15 – 14:45, Chair: Dr. Pavel Danilov

12:15-12:40

(invited) U. Bovensiepen "Dynamics of propagating and localized excitations across interfaces analyzed by femtosecond solid state spectroscopy"

12:40-13:05

(invited) N. Khokhlov "Tuning the spectrum of magnetostatic waves optically excited in ferromagnetic anisotropic films"

13:05-13:30

(invited) I. Oladyshkin "Anisotropy of electron distribution function in metals, semimetals and graphene at subpicosecond timescales"

13:30-13:55

(invited) S. Houver "2D-THz spectroscopy investigation of electron dynamics in InSb and perspectives in Weyl semimetals"

13:55-14:20

(invited) L. Mazov "Hot electron ultrafast thermalization in high-Tc cuprates"

14:20-14:45

(invited) A. Hayat "Two-Photon Excitation of an Exciton-Polariton Condensate"



**Session 16:00 – 18:30, Chair: Dr. Ivan Oladyskhin**

16:00-16:25

(invited) *H. Huber* "Dynamics and efficiency of ultrafast laser ablation of metals and implications for MHz- and GHz-burst processing"

16:25-16:40

*A. Melnikov* "Phonon driven ultrafast nonlinear dynamics in a  $\text{Bi}_2\text{Se}_3$  crystal"

16:40-16:55

*A. Kuzikova* "Laser-induced heating and precession of magnetization in  $\text{Fe}_3\text{O}_4$  near phase transitions temperature"

16:55-17:10

*D. Poydashev* "Ultrafast dissociation dynamics induced in  $[\text{Fe}(\text{CO})_5]_n\text{Xe}_m$  mixed nanoclusters by resonant femtosecond IR laser radiation"

17:10-17:25

*E. Mareev* "Time-resolved diagnostics of laser-induced extreme state of condensed matter and supercritical fluids"

17:25-17:40

*S. Kudryashov* "Ultrashort-pulse laser probing of non-equilibrium high-temperature 2T-electron heat conduction"

17:40-17:55

*O. Vitrik* "Simple analytic approach to the problem of calculations of scattering amplitude of surface plasmon polaritons excited by a spherical nanoantenna"

17:55-18:10

*I. Tumkin* "Cu and Cu-Au electrodes for enzyme-free sensing fabricated by laser-induced selective electroless plating"

18:10-18:25

*D. Iabbaden* "Molecular dynamics simulation of structural evolution in crystal and amorphous alloys under ultrafast laser irradiation"

18:25-18:30 *Flash talk*

*A. Fedianin* "Ultrafast excitation and detection of laser-driven two-magnon dynamics in a Heisenberg antiferromagnet with anisotropy"

## Section 7 "Ultrafast laser technologies and structured light in micro-optics and nanophotonics"

Tuesday, October 5 / (Conference hall of QRPD)

*Mini-symposium "Diamond photonics"*

**Session 12:15 – 14:45, Chair: Prof. Sergey Kudryashov**

12:15-12:40

*(invited) V. Vins* "Engineering of atomic defects in the crystal structure of diamond"

12:40-13:05

*(invited) T. Apostolova* "Femtosecond optical breakdown in diamond"

13:05-13:30

*(invited) V. Bharadwaj* "Ultrafast laser writing for integrated quantum diamond technology"

13:30-13:55

*(invited) A. Gorbachev* "Formation of localized color centers NV and SiV in CVD diamond"

13:55-14:20

*(invited) E. Martynovich* "Linear and nonlinear excitation of the A-band of luminescence in diamond"

14:20-14:45

*(invited) Y. Shimotsuma* "Efficient NV center formation inside diamond by femtosecond laser pulses"

**Session 16:00 – 18:55, Chair: Dr. Alexey Levchenko**

*16:00-16:25*

*(invited) V. Kononenko* "Photolytic formation of NV complexes in diamond exposed to UV femtosecond pulses"

*16:25-16:50*

*(invited) M. Kempkes* "Ultrafast nonthermal formation of NV centers in diamond"

*16:50-17:15*

*(invited) S. Kudryashov* "Overview of basic processes underlying ultrafast intra-center and interband photoexcitations in bulk diamond for micromarking and tracing applications"

*17:15-17:40*

*(invited) A. Akimov* "Color center in diamond for quantum computation and sensing applications"

*17:40-17:55*

*G. Krasin* "Ultrafast polarization resolved surface and bulk ionization effects in natural diamond"

*17:55-18:10*

*Y. Gulina* "Effect of convergent beam aberrations on laser focusing in dielectrics"

*18:10-18:55 Flash talks*

*N. Stsepuro* "Photoluminescent mapping of optical centers in natural diamond excited by femtosecond laser pulses"

*N. Smirnov* "Formation of luminescent defects in artificial diamonds by femtosecond laser pulses"

*M. Savinov* "Craters morphology on a diamond surface after 0.3 ps and 10 ps laser ablation"

*P. Danilov* "Laser-induced luminescent centers in diamond: influence of exposure and duration of short laser pulses"

*E. Oleynichuk* "Laser-induced luminescence of boron-doped synthetic diamond at various laser pulse durations"

*A. Rupasov* "Chalcogenide immersion media for diamond research"

*S. Shelygina* "Spectral transformation of visible and IR ultrashort laser pulses in polycrystalline ZnSe"

*A. Nastulyavichus* "Liquid immersion for imaging defects in diamonds"

*M. Lobaev* "Formation of localized color centers NV and SiV in CVD diamonds"

## Section 4 "Femtosecond non-linear optics. Filamentation. High field THz generation"

Tuesday, October 5 / (Online only)

Session 16:00 – 18:25, Chair: Prof. Olga Kosareva

16:00-16:25

(invited) A. Couairon TBA

16:25-16:50

(invited) S. Tzortzakis TBA

16:50-17:05

V. Fedorov TBA

17:05-17:30

(invited) Yu. Geints "Femtosecond filamentation of structured light: Perspectives for long-range pulse propagation"

17:30-17:45

A. Kuznetsov "Model of micromodification induced by multi-pulse filamentation in LiF"

17:45-18:00

L. Vamos "Ultra-broad, high-brightness coherent light source"

18:00-18:25

(invited) J.-C. Diels "Thriving for highest signal to noise in active sensors: free space versus fibers"

## Section 1 "Extreme Light"

Wednesday, October 6 / (Small Hall)

Session 10:00 – 12:15, Chair: Prof. Andrey Savel'ev

10:00-10:25

(invited) *E. Khazanov, V. Ginzburg, I. Yakovlev, A. Kochetkov, A. Kuzmin, S. Mironov, I. Shaikin and A. Shaykin* "11 fs, 1.5 PW laser with compression after compressor approach"

10:25-10:50

(invited) *D. Batani* "Generation of transient strong shocks by fs-lasers"

10:50-11:15

(invited) *N. Andreev* "Laser-driven relativistic electrons for high energy density research"

11:15-11:30

*E. Gelfer* "Locally constant crossed field approximation for the radiation in a time-dependent electric field"

11:30-11:45

*A. Samsonov* "Effect of  $e+e^-$  pair production on generation of magnetic field driven by radiation reaction"

11:45-12:00

*A. Bashinov* "QED effects and pair plasma dynamics in laser beam configurations maximizing the magnetic field"

12:00–12:15

*I. Aleksandrov* "Pair production in a gas target as a method for the laser intensity diagnostics"

**Session 12:45 – 14:30, Chair: Prof. Nikolay Andreev**

12.45-13:00

V. Kovalev "Self-trapping of extreme radiation"

13:00-13:15

A. Golovanov "Analytic model for excitation of a plasma wakefield in the bubble regime"

13:15-13:30

I. Tsymbalov "High-charge electron beams generation due to direct laser acceleration in subcritical plasma"

13:30-13:45

D. Gozhev "Laser triggered stochastic electron acceleration in dusty plasma irradiated by a powerful pulse of record short duration"

13:45-14:00

R. Feshchenko "On generation of ultrashort pulses X-ray pulses by the inverse Compton scattering"

14:00-14:15

E. Ivanova "Optically self-photopumped X-ray laser at  $\sim 13.4$  nm in  $\text{Sn}^{22+}$  in plasma produced by intense pump laser interacting with nanostructured Sn target, as promising radiation source for nanolithography"

14:15-14:30

I. Mordvintsev "Comparative study of efficiency of ion acceleration from nanoscale structured targets at relativistic laser-plasma interaction"

14:30- 15:10 *Flash talks* **Chair: Dr. Sergey Bochkarev**

E. Dmitriev "Orbital angular momentum absorption by an electron in a laser wave"

E. Starodubtseva "Phase space investigation of electron acceleration in DLA"

A. Muraviev "Particle dynamics governed by radiation losses in extreme-field current sheets"

M. Sedov "Simulation of the angular distribution of a laser-plasma X-ray source in picosecond region"

*E. Filippov* "X-ray radiography measurements of short-lived hydrodynamic phenomena in astrophysically relevant plasma flows"

*S. Shulyapov* "Indirect excitation of the  $^{83}\text{Kr}$  low isomeric nuclear states using femtosecond laser plasma"

*E. Parkevich* "Optical registration of fine-structured electrical sparks"

*A. Khirianova* "The first Rytov approximation and its limits in describing the wave diffraction behind a micrometer-sized phase object"



## Section 3 "Ultrafast phenomena in condensed matter"

Wednesday, October 6 / (Conference Hall)

Session 10:00 – 12:15, Chair: Dr. Michael Kovalev

10:00-10:25

(invited) N. Inogamov "Laser action on complicated targets: laminates and surface with a bubble"

10:25-10:50

(invited) B. Gaković "Ultrafast laser micro- and nano-modification of metallic bilayer thin films"

10:50-11:15

(invited) D. Milovanović "Surface structuring of Ti-based implant alloy by fs laser light – low and high fluence mode"

11:15-11:30

D. Pavlov "Multifunctional IR sensor platform fabricated by direct laser printing"

11:30-11:45

P. Sopeña "Energy stability limits of precision in ultrafast laser material processing"

11:45-12:00

Y. Ryabchikov "Nanofabrication of Composite Nanostructures by Femtosecond Laser Ablation"

12:00-12:15

A. Bushunov "Broadband antireflection of GaSe crystals for optical parametric oscillators"

**Session 12:45 – 14:45, Chair: Dr. Pavel Danilov**

12:45-13:10

(invited) *N. Goodfriend* "Two-dimensional material printing via blister-based laser induced forward transfer"

13:10-13:25

*M. Zukerstein* "Single-shot formation of hollow microneedles in silicon by doughnut-shaped laser pulses"

13:25-13:50

(invited) *C. Doñate Buendia* "Laser generated nanoparticle decoration of polymer micro powders for laser powder bed fusion"

13:50-14:05

*D. Shuleiko* "Electrophysical anisotropy of femtosecond laser-irradiated phosphorous- and boron-doped amorphous silicon films"

14:05-14:20

*A. Kolchin* "Morphological and phase modifications in amorphous  $\text{Ge}_2\text{Sb}_2\text{Te}_5$  thin films on dielectric substrates driven under femtosecond laser illumination"

14:20-14:35

*M. Sergeev* "Laser modification of semiconductor films with Ag NPs"

14:35-14:45 *Flash talk*

*K. Khamidullin* "Infrared and terahertz photoconductivity of sulfur-hyperdoped Si structure"

*P. Lazarenko* "Structural modifications in  $\text{Ge}_2\text{Sb}_2\text{Te}_5$  thin films under thermal crystallization"

## Section 4 "Femtosecond non-linear optics. Filamentation. High field THz generation"

Wednesday, October 6 / (Conference hall of QRPD)

Session 10:00 – 12:05, Chair: Prof. Leonid Seleznev

10:00-10:25

(invited) O. Kosareva "Directional diagram of THz radiation from DC-biased and dual-color femtosecond filaments"

10:25-10:50

(invited) I. Babushkin "High order Brunel harmonics and supercontinuum formed by a weak optical pump in presence of a strong terahertz field"

10:50-11:05

M. Nazarov "Strong field THz generation in a non-phasematched, large area LiNbO<sub>3</sub>"

11:05-11:20

G. Rizaev "Angular distribution of THz emission in different wavelengths single-color filament plasma"

11:20-11:35

I. Nikolaeva "Transition from quadrupole to dipole THz radiation source in a DC-biased single color filament"

11:35-11:50

P. Chizhov "THz plasma source angular distribution modification by use of pump beam regularization"

11:50-12:05

A. Ismagilov "Liquid jet based broadband terahertz radiation source"

**Session 12:45 – 15:05, Chair: Prof. Pavel Polynkin**

12:45-13:10

(invited) A. Shkurinov "Nonlinear optics of Liquid-like media"

13:10-13:35

(invited) A. Mysyrowicz "Cavity-free Lasing in  $N_2^+$ "

13:35-14:00

(invited) E. Oliva "1D and 3D Maxwell-Bloch modelling of  $N_2$  and  $N_2^+$  lasing in plasma filaments"

14:00-14:15

N. Panov "100-m long postfilament for spectroscopy and high-voltage discharge triggering applications"

14:15-14:40

(invited) L. Arantchouk "Evolution of a long lived laser guided discharge"

14:40-15:05

(invited) V. Losev "Lasing of molecular nitrogen ions in laser plasma"

## Section 6 "Physics and technology of ultrafast lasers and ultrashort laser pulses"

Thursday, October 7 / (Small Hall)

Session 12:15 – 14:35, Chair: Dr. Igor Kinyaevskiy

12:15-12:40

(invited) S. Smetanin "Laser pulse shortening via cascade stimulated Raman scattering in crystals on combined vibrational modes under picosecond synchronous pumping"

12:40-13:05

(invited) I. Kinyaevskiy "Stimulated Raman scattering of chirped Ti:Sapphire laser pulses in BaWO<sub>4</sub> crystal"

13:05-13:20

A. Koribut "Raman modes excitation of BaWO<sub>4</sub> crystal under traveling high-intensity 515-nm 300-fs laser pulse"

13:20-13:35

E. Anashkina "Raman and laser generation in silica, chalcogenide, and tellurite glass microresonators in the telecommunication C-, L-, and U-bands"

13:35-13:50

M. Wu "Intracavity Stimulated low-frequency Raman scattering – a spectroscopy method in the gigahertz frequency range"

13:50-14:05

A. Skrabatun "Multifrequency stimulated Raman scattering in ethanol and glycerol under picosecond excitation"

14:05-14:20

K. Yushkov "Time-domain acousto-optic modulation and direct characterization of chirped laser pulses"

14:20-14:35

S. Sazonkin "Features of a scalable dissipative solitons in an ultrafast erbium-doped fiber ring laser"

**Session 16:00 – 17:30, Chair: Dr. Igor Kinyaevskiy**

16.00-16:25

(invited) V. Petukhov "Low coherence lasing in dense mixtures of solid-state microparticles and liquids"

16.25-16:40

S. Pershin "Unique dual-pulse diode laser with controllable (3-20 ns) interval & duration for the eye-safe lidar"

16.40-16:55

E. Rakhmanov "Efficiency of excitation of a quantum two-level system by free space ultrashort laser pulse"

16.55-17:10

N. Kalinin "Coherent combining of radiation transferred through a multicore fiber with 25 coupled cores"

17.10-17.30 *Flash talks*

N. Popov "Free space strange and unipolar waves in electrodynamics and acoustics"

M. Marisova "Four-wave mixing in silica microresonators with germanosilicate coating"

A. Sytchenko "Optically transparent coatings based on refractory compounds for protection of laser-induced damage"

D. Lubenko "THz wave generation in Al and O doped GaSe"

## Section 3 "Ultrafast phenomena in condensed matter"

Thursday, October 7 / (Conference Hall)

Session 12:15 – 14:35, Chair: Dr. Yulia Gulina

12:15-12:40

(invited) J. P. Colombier "Nanoscale topographical, structural and chemical patterning of surfaces by ultrafast laser irradiation"

12:40-13:05

(invited) P. Terekhin "Ablative versus non-ablative laser-induced periodic surface structures"

13:05-13:30

(invited) J. Solis "Anisotropic resistivity ITO surfaces produced by laser-induced self-organization mediated by fluence selective compositional modification"

13:30-13:55

(invited) A. Dostovalov "Thermochemical LIPSS formation on Ti, Hf films at various ambient atmospheres"

13:55-14:20

(invited) G. Tsididis "Modelling Sub-micrometer Periodic Surface Structures formation through Ultrashort Pulsed Direct Laser Interference Patterning"

14:20-14:35

J. Sladek "LIPSS Regularity on Silicon: From Spot Size Effect to the Emergence of Periodic Columns of Structures"

**Session 16:00 – 17:20, Chair: Dr. Pavel Danilov**

16:00-16:25

(invited) M. Malinauskas "Ultrafast laser additive manufacturing: plant based organic and crystalline inorganic 3D nanostructures"

16:25-16:50

(invited) A. Kuchmizhak "2D Perovskite Micro-optics and Advanced Microlasers Enabled by Direct Femtosecond-Laser Printing"

16:50-17:05

I. Mirza "Laser-induced crystallization of titanium dioxide (TiO<sub>2</sub>) nanotubular layer for photocatalytic applications"

17:05-17:20

S. Bibicheva "Design and manufacturing of planar optical waveguide by femtosecond laser recording technique"



## Section 4 "Femtosecond non-linear optics. Filamentation. High field THz generation"

Thursday, October 7 / (Conference hall of QRPD)

Session 12:15 – 14:50, Chair: Dr. Nikolay Panov

12:15-12:40

(invited) V. Kandidov "Light bullets. Spatio-temporal and energetic characteristics."

12:40-13:05

(invited) P. Polynkin "Carrier-Envelope Phase effects in short-wave and mid-wave infrared laser filamentation in gases"

13:05-13:20

D. Shipilo "Continuous transition from X- to O-shaped angle-wavelength spectra of femtosecond filament in a gas mixture"

13:20-13:35

T. Semenov "Controlled resonant third harmonic generation in clusters with intense femtosecond laser"

13:35-13:50

Yu. Gerasimova "Conversion of Ti:Sa laser radiation due to spectral broadening in post-filament channel and intrapulse difference frequency generation"

13:50-14:05

E. Mitina "Multiple filaments and superfilaments of femtosecond terawatt laser pulses over an extended atmospheric path"

14:05-14:20

A. Garmatina "Optimized femtosecond laser-driven  $K_{\alpha}$  hard x-ray generation from Cu target placed in gas under overcoming the impact of clamping intensity regime: towards diffraction experiments and backlight imaging."

14:20-14:35

D. Pushkarev "Frequency-angular structure evolution of postfilament channel on 100 m atmospheric trace"

**Session 16:00 – 17:20, Chair: Prof. Olga Kosareva**

*16:00-16:25*

*(invited) N. Litchinitser* "Optics on the nanoscale: from materials to applications"

*16:25-16:40*

*V. Zvorykin* "Spectral broadening and phase randomization of TW-power KrF laser beam along 100-m propagation in atmosphere related to the shock ignition ICF"

*16:40-16:55*

*K. Mamaeva* "Femtosecond Laser Induced Photoelectron Emission from Nano Graphite Flakes Photocathodes"

*16:55-17:20 Flash talks*

*D. Banerjee* "Ultrafast Nonlinear Optical Studies of Central Cavity Varied Novel Phthalocyanines"

*O. Chefonov* "The second optical harmonic generation at a wavelength of 620 nm in an antiferromagnetic NiO, induced by broadband and narrowband THz pulses"

*P. Ilyushin* "Spectral transformation of ultraviolet radiation in single-mode fibers"

*A. Ovchinnikov* "Broadband and narrowband laser-based terahertz source and its application for excitation of ferroelectric"

*N. Vrublevskaya* "Nonlinear response of 1D multi-level system calculated from nonstationary Schrodinger equation"

## Poster session

Thursday, October 7 / (2nd floor)

### Section 1

*E. Dmitriev* "Orbital angular momentum absorption by an electron in a laser wave"

*E. Starodubtseva* "Phase space investigation of electron acceleration in DLA"

*A. Muraviev* "Particle dynamics governed by radiation losses in extreme-field current sheets"

*M. Sedov* "Simulation of the angular distribution of a laser-plasma X-ray source in picosecond region"

*E. Filippov* "X-ray radiography measurements of short-lived hydrodynamic phenomena in astrophysically relevant plasma flows"

*S. Shulyapov* "Indirect excitation of the  $^{83}\text{Kr}$  low isomeric nuclear states using femtosecond laser plasma"

*E. Parkevich* "Optical registration of fine-structured electrical sparks"

*A. Khirianova* "The first Rytov approximation and its limits in describing the wave diffraction behind a micrometer-sized phase object"

### Section 2

*S. Kuznetsov* "Mechanism of electron bunching by a relativistically intense laser pulse when crossing a nonuniform-plasma boundary"

*P. Nikiforova* "Bolometric detection of broadband terahertz radiation by resonant heterostructures"

### Section 3

*N. Smirnov* "Investigation of ambipolar diffusion of electron-hole plasma under the action of ultra-short laser pulses on a silicon"

*B. Rumiantsev* "Effect of the laser pulse polarization ellipticity on laser-induced acoustic wave under plasma-mediated laser excitation of the condensed medium bulk"

*K. Khamidullin* "Infrared and terahertz photoconductivity of sulfur-hyperdoped Si structure"

*P. Lazarenko* "Structural modifications in  $\text{Ge}_2\text{Sb}_2\text{Te}_5$  thin films under thermal crystallization"

#### **Section 4**

*D. Banerjee* "Ultrafast Nonlinear Optical Studies of Central Cavity Varied Novel Phthalocyanines"

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#### **Section 6**

*N. Popov* "Free space strange and unipolar waves in electrodynamics and acoustic"

*M. Marisova* "Four-wave mixing in silica microresonators with germanosilicate coating"

*A. Sytchenko* "Optically transparent coatings based on refractory compounds for protection of laser-induced damage"

*D. Lubenko* "THz wave generation in Al and O doped GaSe"

#### **Section 7**

*V. Zhukov* "A finite-difference scheme realizing the model of the interaction of a femtosecond laser pulse with a transparent solid"

*Y. Yandybaeva* "Barriers building inside nanoporous silicate matrix by femtosecond laser pulses"

*A. Shishkina* "Femtosecond laser writing of hollow channels in nanoporous silicate matrix"

*V. Yakimuk* "Femtosecond laser writing of waveguides inside nanoporous silicate matrix"

*E. Oleynichuk* "Formation of nanogratings on the surface of nanoporous glass under the action of femtosecond laser pulses in the visible range"

*A. Pomigueva* "Nanograting formation in sodium germanate glasses by femtosecond-laser pulses"

*N. Stsepuro* "Photoluminescent mapping of optical centers in natural diamond excited by femtosecond laser pulses"

*N. Smirnov* "Formation of luminescent defects in artificial diamonds by femtosecond laser pulses"

*M. Savinov* "Craters morphology on a diamond surface after 0.3 ps and 10 ps laser ablation"

*P. Danilov* "Laser-induced luminescent centers in diamond: influence of exposure and duration of short laser pulses"

*E. Oleynichuk* "Laser-induced luminescence of boron-doped synthetic diamond at various laser pulse durations"

*A. Rupasov* "Chalcogenide immersion media for diamond research"

*S. Shelygina* "Spectral transformation of visible and IR ultrashort laser pulses in polycrystalline ZnSe"

*A. Nastulyavichus* "Liquid immersion for imaging defects in diamonds"

*M. Lobaev* "Formation of localized color centers NV and SiV in CVD diamonds"

## **Section 8**

*I. Sozaev* "Comparative FT-IR spectroscopy of Gram-positive and Gram-negative bacteria after laser-induced forward transfer of Cu and Ag nanoparticles"

*A. Fronya* "Optical properties of Ge nanoparticles deposited in films by PLD method"

*S. Shelygina* "Laser-based inactivation method of pathogenic microorganisms"

*A. Nastulyavichus* "Metal nanoparticles for antibacterial treatment"

*A. Kharin* "Molecular dynamic simulation for estimation of porosity effect on laser ablation threshold in silicon"

## Section 6 "Physics and technology of ultrafast lasers and ultrashort laser pulses"

Friday, October 8 / (Small Hall)

Session 12:15 – 14:15, Chair: Dr. Fedor Potemkin

12:15-12:40

(invited) V. Chvykov "Ultra-high peak and average laser systems (problems and solutions)"

12:40-13:05

(invited) I. Sorokina "Ultrashort pulsed mid-IR lasers for science and technology"

13:05-13:30

(invited) S. Tokita "Mid-infrared fiber laser pumped Fe:ZnSe lasers"

13:30-13:45

D. Suleimanova "Towards efficient mid-IR optical parametric amplifier pumped by Ti:sapphire laser"

13:45-14:00

A. Andrianov "Spectral-temporal patterned supercontinuum generation at a multi-gigahertz repetition rate"

14:00-14:15

A. Sagitova "Applicability of second order nonlinear crystals for broadband ultrashort mid-IR pulse generation"

**Session 16:00 – 17:35, Chair: Dr. Fedor Potemkin**

16.00-16:25

(invited) *E. Suraud* "Towards the analysis of attosecond dynamics in complex systems"

16.25-16:50

(invited) *M. H. Pham* "Tunable dual wavelength and narrow linewidth laser using a single solid-state gain medium in a double Littman resonator"

16.50-17:05

(invited) *A. Pushkin* "Powerful diode side-pumped Er:YLF laser operation regimes"

17.05-17:20

*O. Gatsa* "Spot size dependence of blister formation in picosecond-laser irradiation regime for blister-based LIFT"

17.20-17:35

*K. Glushkov* "Generation of femtosecond pulses from the radiation of a sub-ps ytterbium pump laser"

## Section 5 "Frequency combs in spectroscopy and optical clocks"

Friday, October 8 / (Physical Hall)

Session 12:15 – 14:45, Chair: Dr. Dmitry Tregubov

12:15-12:40

(invited) *D. Skryabin* "Frequency combs in CHI-2 microresonators"

12:40-12:55

*A. Sorokin* "Analysis of optimal soliton pulse duration for quantum noise squeezing in optical fiber"

12:55-13:20

(invited) *A. Alodjants* "Quantum metrology with weakly coupled atomic condensate solitons"

13:20-13:45

(invited) *G. Vishnyakova* "Atmospheric Short Link for the Ultra-Stable Optical Frequency Signal Transfer"

13:45-14:00

*E. Chiglintsev* "Progress of silicon cavities with crystalline mirrors for infrared laser stabilization"

14:00-14:15

*S. Leonov* "Repetition frequency stability of mode-locked Cr:ZnSe laser"

14:15-14:30

*A. Kireev* "Methane Photonic Microwave Oscillator - Experience of Testing at Long-Term Operation"

14:30-14:45

*D. Provorchenko* "Second-order Zeeman shift suppression in thulium optical clock using synthetic frequency"



## Section 8 "Ultrafast laser technologies in biomedicine"

Friday, October 8 / (Conference hall of QRPD)

Session 12:15 – 14:25, Chair: Dr. Eteri Tolordava

12:15-12:40

(invited) *T. Itina* "How surface relief affects wettability and cell behavior on ultra-short laser-textured surfaces"

12:40-13:05

(invited) *M. Darwin* "In vivo staining-free visualization of mast cells in human skin using two-photon femtosecond-pulsed tomography with fluorescence lifetime imaging"

13:05-13:30

(invited) *V. Nikolaev* "Structure images analysis of collagen using two-photon microscopy and machine learning approaches"

13:30-13:55

(invited) *S. Zobotnov* "Fabricating nanoparticles for biophotonics by laser ablation and fragmentation of nano- and microstructured silicon in liquids"

13:55-14:10

*M. Kröger* "In vivo visualization of fibroblasts in tattooed human skin using two-photon femtosecond-pulsed tomography with fluorescence lifetime imaging"

14:10-14:25

*L. Khaertdinova* "Laser-induced forward transfer for antibacterial application"

**Session 16:00 – 18:25, Chair: Prof. Sergey Gonchukov**

16.00-16:25

(invited) *E. Tolordava* "Search for alternative methods of controlling biofilms of pathogenic microorganisms"

16.25-16:50

(invited) *Yu. Yushina* "Microbiome of food production and innovative methods of microbiological risk management"

16.50-17:05

*M. Grudistova* "Physical methods against microbial communities in food production"

17.05-17:25

*I. Romanishkin* "Investigating monocyte metabolic state using fluorescence lifetime unmixing"

17.25-17:40

*Yu. Maklygina* "Neuroport with fibre-optic internal structure for therapy and prevention of brain tumours"

17.40-17:55

*S. Umanskaya* "Stimulated low-frequency Raman scattering in biological nanoparticles"

17.55-18:10

*O. Sokolovskaya* "Numerical simulation of photothermal effect in presence of silicon nanoparticles in skin tumors"

18.10-18:25

*B. P. Yakimov* "Ultrafast energy transfer determines the formation of fluorescence in natural organic matter"