# PROGRAM of ALT`22 The 29th International Conference on Advanced Laser Technologies



September 11-16, 2022 MOSCOW, RUSSIA



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ALT'22



# **ALT`22**

# The 29th International Conference on Advanced Laser Technologies

September 11-16, 2022 / Moscow, Russia



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# **Plenary Speakers**



**Prof. Andrey Naumov** 

Lebedev Physical Institute, Moscow, Russia

**Title:** Single-molecule spectroscopy and nanoscopy: advantages and new horizons

#### Abstract

The lecture discusses the experimental technique of fluorescence spectromicroscopy of single molecules, and quantum emitters in general, the history of the development of this field, as well as applications for studying the photophysical properties of colloidal semiconductor quantum dots (QDs), organic single molecules (SMs), color centers in diamonds, incl. at cryogenic temperatures. The microscopic nature of the blinking photoluminescence effect of single QDs, the results of studies of local field effects, as well as the processes of spectral diffusion and electron-phonon coupling in impurity polymer media with quantum dots and organic molecules are considered. The results of a comparative analysis with data obtained by other methods (photon echo, Raman scattering, electron microscopy) are presented. The capabilities of the three-dimensional (3D-) fluorescence nanoscopy technique implemented according to the scheme of the double-helix point spread function (DHPSF) with the use of adaptive optics tools are demonstrated.

The lecture presents the results obtained by the team of authors of the Leading Scientific School of Russia headed by RAS Corr. Memb. A.V. Naumov (NSh-776.2022.1.2, <u>www.single-molecule.ru</u>). Researches were supported by State Contract of MPGU (AAAA-20-120061890084-9).

A.V. Naumov et al. Physics Uspekhi 56, 605 (2013); Nano Letters 18, 6129 (2018)
I.Y. Eremchev et al. Physics Uspekhi 62, 294 (2019); 65 (2022)
E.P. Kozhina et al. Bull. RAS: Physics 84, 1465 (2020)
I.Y. Eremchev et al. J. Phys. Chem. C 125, 17774 (2021)
A.I. Arzhanov et al. Photonics Russia 15, 622 (2021); 16, 96 (2022)





Prof. Vladimir Makarov

Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia

Title: Nonlinear singular polarization optics of wave beams and pulses

#### Abstract

In the middle of 70's the first experimental evidence of the nonlinear optical activity came to light, giving the impulse to the development of nonlinear polarization optics. The subsequent theoretical and experimental investigations assure that the polarization self-action and interaction of waves are fine and widespread phenomena in nonlinear optics. Despite the popularity and wide range of the considered problems, investigations of the origin and dynamics of the polarization singularities in nonlinear optical processes are virtually absent. The present report focuses on the study of formation of *L*-type *C*-type polarization singularities in the signal beam cross section generated in various nonlinear optical processes.

The conditions of appearance and the behavior of polarization singularities in the cross-section of light beam arising due to nonlinear interaction of elliptically polarized laser beams with a medium with nonlocality of quadratic and cubic optical responses are discussed. The formation dynamics and propagation features of *C*-points, including pairwise creation and annihilation, for sum-frequency and second harmonic generation, beams self-action and interaction and other nonlinear optical processes are presented. The ranges of the parameters of an elliptically polarized Gaussian beam and a medium with local and nonlocal nonlinearity are determined, at which the lines of circular polarization singularity appear in cross sections of propagated beam. The specific features of nonlinear optics with laser beams containing polarization singularities are also discussed.

Analytically found expressions, which relate the values of two parameters characterizing the topological type of linear and circular polarization singularities in nonparaxial light fields to the values of the complex amplitude components of the electric field and their first spatial derivatives are also discussed.

The numerically investigate the interaction of a plane elliptically polarized monochromatic wave on a spherical nanoparticle. In the resulting light field near the particle, the topology of strips, formed by the axes of the polarization ellipses and the normal vectors to their planes, is studied. The strips may have one half-twist only if they enclose a circular polarization singularity line, while almost all other strips, even enclosing the linear polarization singularity lines, are trivial. The correlation between the twisting indices of different strips is found, and their relation to the topological features of points of the singular lines is analyzed.

The found laws of transformation of the total topological indices allow one to get an idea of the fine details of these nonlinear optical processes and may be of interest for creating light beams and pulses with an inhomogeneous distribution of the electric field containing polarisation singularities of a given type by methods of nonlinear optics. The latter are promising for use in quantum information optical systems and can be used in problems of nonlinear bulk and surface spectroscopy of nonlinear media.

I take this opportunity to acknowledge many key contributions to this report by former students and postgraduate students of M.V. Lomonosov Moscow State University. I am indeed grateful to Prof. Dr. A.A. Golubkov, Dr. K.S. Grigoriev, Dr. I.A. Perezhogin, Dr. N.N. Potravkin, and M.P.S. N.Yu. Kuznetsov, G.M. Shishkov, P.S. Ryzhikov, and G.A. Gryaznov.

- ALT'22



**Prof. Vladimir Yu. Zaitsev** Institute of Applied Physics, RAS, Nizhniy Novgorod, Russia

Title: Optical Coherence Elastography: Past, Present, and Future

#### Abstract

Over two decades passed after the seminal work by J. Schmitt in which, by analogy with medical ultrasound, he proposed Optical Coherence Elastography (OCE) for evaluation of microscopic strains and characterization of elastic properties of biological tissues. However, only during ~5-7 recent years there appeared practically workable realizations OCT-based imaging of strains, as well as quantitative OCT-based techniques for assessment of elastic properties of biological tissues based on the compression principle and measurements of shear-wave velocities.

These techniques have demonstrated previously unavailable prospects for various applications, where imaging of strains is required (from fairly rapidly varying thermo-mechanical strains, osmotically-induced strains to slow strains due to drying, relaxation, etc.)

Furthermore, quantitative assessment of tissue elasticity beyond conventional linear paradigm has become possible. For oncologic applications, novel possibilities have been demonstrated, in particular feasible in vivo morphological segmentation of tumors with an accuracy very close to results of morphological segmentation of conventional histological images, the obtaining of which requires laborious and invasive procedures. In application to freshly excised samples of breast-cancer tissues, OCT-based elastography opened previously unavailable possibilities of accurate assessment of clean resection boundary. Furthermore, intraoperatively feasible OCE-based differentiation of molecular/morphological subtypes of tumors has been demonstrated. The report gives an overview of these topics.



Date and Time	September 12 (Monday) /
Place	10:00-10:40 Room 2
Session Title	[P-1] Plenary session 1
Session Chair	Vitaly Konov <i>(Russia)</i>

#### P-1

10:00-10:40

# [Plenary] Single-molecule spectroscopy and nanoscopy: advantages and new horizons

### Andrey Naumov

Lebedev Physical Institute, Moscow, Russia

Date and Time	September 12 (Monday) / 11:00-13:00
Place	Room 1
Session Title	[LM-1.1] Laser-Matter Interaction 1.1
Session Chairs	Alexey Kucherik, Boris Lukiyanchuk (Russia)

#### LM-I-1

#### [Invited] From Color Laser Marking to Laser Painting

V. Veiko, G. Odintsova, V. Luong, D. Lutoshina

ITMO University, Saint-Petersburg, Russia

#### LM-I-2

# [Invited] Ultrafast excitation of silicon by mid-IR tightly focused laser radiation

F.V. Potemkin

Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia

#### LM-I-3

# [Invited] Laser synthesis of linear carbon: new route of molecular optics

A. Kucherik, S. Kutrovskaya, A. Osipov, V. Samyshkin, A. Abramov, A. Povolotskiy

Department of Physics and Applied Mathematics, Stoletov Vladimir State University, Vladimir, Russia

#### LM-I-4

### [Invited] Laser-Induced Forward Transfer of CVD Graphene for Electronic Applications

M. Komlenok, N. Kurochitsky, P. Pivovarov, M. Rybin, E. Obraztsova, V. Konov

Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

#### LM-I-5

#### [Invited] Magnetic fields generated by light in dielectric particles

#### B.S. Lukiyanchuk

Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia

LM-I-6

12:40-13:00

11:40-12:00

12:00-12:20

11:00-11:20

11:20-11:40

12:20-12:40

#### [Invited] 3D inflection and 1D-3D attenuation of initially planar shock wave generated by femtosecond laser pulse

N. Inogamov, V. Shepelev, Y. Petrov, V. Zhakhovsky, E. Perov, S. Fortova Landau Institute for Theoretical Physics of the Russian Academy of Sciences, Chernogolovka, Moscow region, Russia Dukhov All-Russian Research Institute of Automation, Moscow, Russia

September 12 (Monday) / 14:20-16:00
Room 1
[LM-1.2] Laser-Matter Interaction 1.2
Sergey Klimentov (Russia)

#### LM-I-7

[Invited] Mechanisms of femtosecond ablation of optical crystals depending on free electron lifetime

#### S. Klimentov

National Research Nuclear University MEPHI, Moscow, Russia

#### LM-I-8

[Invited] Ultrafast laser processing of photosensitive planar junctions in graphene and carbon nanotube field-effect transistors

I.I. Bobrinetskiy, A.V. Emelianov, N.P. Nekrasov,

National Research University of Electronic Technology, Moscow, Zelenograd, Russia BioSense Institute, University of Novi Sad, Novi Sad, Serbia

#### LM-I-9

[Invited] Specific mechanisms of nonlinear absorption of intense ultrashort mid-infrared laser pulses in transparent semiconductors

#### V. Gruzdev

Department of Physics and Astronomy, University of New Mexico, Albuquerque, USA

#### LM-O-1

#### LIPSS Fabrication on Large Areas of Amorphous Silicon Under Multi-Pulse Femtosecond Laser Action

S. Zabotnov, D. Shuleiko, D. Presnov, M. Martyshov, E. Kuzmin, P. Danilov, A. Serdobintsev, P. Kashkarov

Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia

#### LM-O-2

#### Anisotropic femtosecond laser-induced modification of doped amorphous silicon films

D. Shuleiko, S. Zabotnov, D. Presnov, M. Martyshov, P. Kashkarov

Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia

#### 14:40-15:00

14:20-14:40

15:20-15:40



15:00-15:20

15:40-15:55

The 29<sup>th</sup> International Conference on Advanced Laser Technologies

Date and Time	September 12 (Monday) / 16:20-18:00
Place	Room 1
Session Title	[LM-1.3] Laser-Matter Interaction 1.3
Session Chairs	Irina Zavestovskaya, Anton Popov ( <i>Russia)</i>

#### LM-I-10

**ALT'22** 

#### [Invited] Role of the leaf epidermis in the interaction of low-intensity laser radiation with the plant regulatory system

Yu.N. Kulchin, E.P. Subbotin, A.S. Kholin, D.O. Gol'tsova, S.O. Kozhanov, E.I. Markovetc Institute of Automation and Control Processes Far Eastern Branch of the Russian Academy of Sciences (IACP FEB RAS), Far Eastern Branch of the Russian Academy of Sciences, Vladivostok, Russia

#### LM-I-11

### [Invited] Laser-ablative synthesis of multimodal nanoparticles for nuclear nanoteranostics

I.N. Zavestovskaya

P.N. Lebedev Physical Institute, MEPHI, Moscow, Russia

#### LM-I-12

#### [Invited] Laser functionalization of titanium surface for medical applications

G. Odintsova, V. Veiko, Yu. Karlagina

ITMO University, Kronverksky Pr. 49, bldg. A, St. Petersburg, Russia

#### LM-I-13

#### [Invited] Laser synthesis of colloidal nanomaterials for biomedicine

#### A. Popov

Institute of Engineering Physics for Biomedicine (Phys-Bio), Moscow Engineering Physics Institute, Moscow, Russia

#### LM-O-3

#### Investigation of a composite of laser reduced graphene oxide and polymers for implant applications

E.G. Abyzova, E.M. Dogadina, E.N. Bolbasov, R.D. Rodriguez, E.S. Sheremet

Federal State Autonomous Educational Institution for Higher Education National Research Tomsk Polytechnic University, Tomsk, Russia

#### LM-0-4

#### Thermo-mechanical effect of eye-tissue laser modification

#### O.I. Baum

Institute of Photon Technologies, Federal Scientific Research Centre 'Crystallography and Photonics' of Russian Academy of Sciences, Troitsk, Moscow, Russia

17:20-17:40

16:40-17:00

17:55-18:10

17:00-17:20

16:20-16:40

17:40-17:55

(Monday) / 11:00-13:00
lical Photonics 1.1
ko, Nikita V. Chernomyrdin ( <i>Russia</i> )

#### **B-I-1**

#### [Invited] In vivo tissue optical clearing as a tool for laser diagnostics and therapeutics

#### V.V. Tuchin

Science Medical Center, Saratov State University, Saratov, Tomsk State University, Tomsk, Institute of Precision Mechanics and Control, FRC Saratov Research Centre of Russian Academy of Sciences. Russia

#### **B-I-2**

#### [Invited] THz solid immersion microscopy: Review and perspectives

N.V. Chernomyrdin, V.A. Zhelnov, M. Skorobogatiy, K.I. Zaytsev Prokhorov General Physics Institute of the Russian Academy of Sciences, Bauman Moscow State Technical University, Moscow, Russia

#### **B-I-3**

#### [Invited] Terahertz and Infrared Spectroscopy of blood plasma for glioblastoma diagnosis

O. Cherkasova, M. Konnikova, A. Mankova, D. Vrazhnov, Yu. Kistenev, Y.Peng, A. Shkurinov Institute of Laser Physics of SB RAS, Novosibirsk, Russia

Institute on Laser and Information Technologies - Branch of the Federal Scientific Research Centre "Crystallography and Photonics" of RAS, Shatura, Moscow Region, Russia

#### **B-I-4**

#### [Invited] Study the life activity of regenerative worm Aeolosoma Viride using Raman spectroscopy and Two-Photon Fluorescence Lifetime Imaging Microscopy

Cheng Chia-Liang, P.M. Badgujar, Jia-Hua Wu, Pei-Yang Huang, Wrenit Gem Pearl, Artashes V. Karmenyan, E.V. Perevedentseva, Jiun-Hong Chen

Department of Physics, National Dong Hwa University, Hualien, Taiwan

#### **B-I-5**

#### [Invited] Raman-based liquid biopsy of chronic heart failure patients

I. Bratchenko, L. Bartchenko, S. Al-Sammarrae, P. Lebedev, M. Skuratova Samara National Research University, Samara, Russia

#### **B-I-6**

#### [Invited] Laser drug delivery by radiation of Vis and IR lasers: efficacy and spectral study

Belikov A., Fedorova Y., Smirnov S., Kozlova A. ITMO University, Saint Petersburg, Russia

#### **B-I-7**

[Invited] The study of laser-assisted skin optical clearing in vivo

11:00-11:20

11:20-11:40

12:20-12:40

12:40-13:00

13:00-13:20

12:00-12:20

11:40-12:00

#### The 29th International Conference on Advanced Laser Technologies

E.A. Genina, V.D. Genin, A.B. Bucharskaya, N.A. Navolokin, G.S. Terentyuk, N.G. Khlebtsov, V.V. Tuchin

Saratov State University, Saratov, Russia Tomsk State University, Tomsk, Russia Saratov State Medical University, Saratov, Russia FRC "Saratov Research Centre of the Russian Academy of Sciences," Saratov, Russia

Date and Time	September 12 (Monday) / 14:30-16:00
Place	Room 2
Session Title	[B-1.2] Biomedical Photonics 1.2
Session Chairs	Andrei Lugovtsov, Elina Genina (Russia)

#### B-I-8

**ALT'22** 

#### [Invited] Laser Speckle Auto-inverse Covariance for Blood Flow Imaging

Pengcheng Li, Jiachi Hong, Jinling Lu,

Huazhong University of Science and Technology, Wuhan, Hainan University, Haikou, China

#### B-I-9

#### [Invited] Laser assisted methods in haemorheologic research

<u>A. Priezzhev</u>, A. Lugovtsov, P. Ermolinskiy, A. Semenov, S. Nikitin, Y. Gurfinkel, Kisung Lee *Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia* 

#### B-I-10

[Invited] Correlation of red blood cell and platelet aggregation measured in vitro by optical techniques in blood of patients suffering from arterial hypertension

<u>P. Ermolinskiy</u>, A. Lugovtsov, D. Umerenkov, L. Dyachuk, A. Priezzhev Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia

#### B-O-1

#### Viscoelasticity measurement using laser speckle contrast imaging

<u>Jiachi Hong</u>, Xiao Chen, Jinling Lu, A. Priezzhev, A.E. Lugovtsov, Pengcheng Li *University of Science and Technology, Wuhan, China* 

#### B-O-2

#### Analytical capabilities of the intrinsic fluorescence of blood plasma proteins for biomedical diagnostics

E. Shirshin, A. Gayer, B. Yakimov,

Faculty of Physics, Lomonosov Moscow State University, World-Class Research Center "Digital Biodesign and Personalized Healthcare", Sechenov First Moscow State Medical University, Moscow, Russia

Date and Time	September 12 (Monday) / 16:20-18:00
Place	Room 2
Session Title	[B-1.3] Biomedical Photonics 1.3
Session Chairs	Vlad Shcheslavskiy (Germany), Yulia Alexandrovskaya (Russia)

14:30-14:50

14:50-15:10

15:10-15:30

15:30-15:45

15:45-16:00

#### B-I-11

#### [Invited] OCE-assisted monitoring and quantification of osmotically-induced strain in biological tissues

Yu.M. Alexandrovskaya, O.I. Baum, A.A. Sovetsvky, A.L. Matveyev, L.A. Matveev, V.Y. Zaitsev,

Institute of Photon Technologies, Federal Scientific Research Centre 'Crystallography and Photonics' of Russian Academy of Sciences, Troitsk, Moscow, Russia

#### B-I-12

#### [Invited] Imaging of Molecular Oxygen Using Time-resolved Phosphorescence

V. Shcheslavskiy, P. Morozov, M. Shirmanova, G. Goltzman and W. Becker Becker&Hickl GmbH, Berlin, Germany, Privolzhsky Research Medical University, Nizhny Novgorod, Russia

#### B-O-3

#### Resolving Ultrafast Fluorescence Decays with Hybrid Detectors

V. Shcheslavskiy, V. Elagin, E. Shirshin, M. Shirmanova, and W. Becker Becker&Hickl GmbH, Berlin, Germany, Privolzhsky Research Medical University, Nizhny Novgorod, Russia

#### B-O-4

# Protein-mediated carotenoid delivery into liposomes affects local microviscosity of the membranes as revealed by fluorescence anisotropy

<u>A.N. Semenov</u>, D.A. Gvozdev, A.R. Hashimova, Eu.Yu. Parshina, D.V. Zlenko, A.A. Bayzhumanov, N.Y. Lotosh, A.A. Selishcheva, N.N. Sluchanko, Eu.G. Maksimov

Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia

#### B-O-5

### Contrast-free FLIM diagnostics of the quality of pancreas islet of Langerhans

<u>P. Ermakova</u>, A. Kashina, I. Kornilova, A. Bogomolova, A. Kashirina, N. Naraliev, D. Kuchin, E. Zagaynova, V. Zagainov,

Privolzhsky Research Medical University, Nizhny Novgorod, Russia

### B-O-6

### FLIM imaging of pathological liver during regeneration

<u>I.D. Shchechkin</u>, S.A. Rodimova, N.V. Bobrov, , D.P. Krylov, D.S. Kozlov, V.V. Elagin, M.M. Karabut, A.M. Mozherov, V.E. Zagainov, E.V. Zagaynova, D.S. Kuznetsova,

Privolzhsky Research Medical University, Lobachevsky Nizhny Novgorod National Research State University, Nizhny Novgorod, Russia

Date and Time	September 12 (Monday) / 11:00-13:00
Place	Room 3
Session Title	[LS-1.1] Laser Systems and Materials 1.1
Session Chair	Boris Denker <i>(Russia)</i>



16:20-16:40

16:40-17:00

17:15-17:30

17:00-17:15

17:45-18:00

17:30-17:45

11:00-11:20

#### The 29th International Conference on Advanced Laser Technologies

# [Invited] Multimode and multicore fiber lasers with a cavity based on 3D fs-inscribed refractive-index structures

S.A. Babin, A.A. Wolf, A.G. Kuznetsov, A.V. Dostovalov

Institute of Automation and Electrometry SB RAS, Novosibirsk, Russia

#### LS-I-2

**ALT'22** 

[Invited] The pulse origin in heavily erbium-doped fiber lasers: experimental evidence and modified theory

O.V. Butov, A.M. Smirnov, A.V. Dorofeenko

Kotelnikov Institute of Radioengineering and Electronics of RAS, Moscow Moscow Institute of Physics and Technology, Dolgoprudny, Russia

#### LS-I-3

LS-I-4

#### [Invited] Ultrafast composite fiber-based lasers and amplifiers for the 1.53-1.59 um spectral region

V.A. Kamynin, A.D. Zverev, B.I. Denker, S.E. Sverchkov, V.V. Vel'miskin, I.S. Panyaev, P.A. Itrin, D.A. Korobko, I.O. Zolotovskii, V.B. Tsvetkov

Prokhorov General Physics Institute of Russian Academy of Sciences, Moscow, Russia

# [Invited] Recent Progress in Cladding-Pumped Bismuth-Doped Fiber Lasers and Amplifiers

S.V. Firstov

Prokhorov General Physics Institute of the Russian Academy of Sciences, Dianov Fiber Optics Research Center, Moscow, Russia

#### LS-0-1

#### Pulses features of the self-Q-switched erbium fiber lasers

<u>A.M.Smirnov</u>, A.V.Dorofeenko, A.A. Rybaltovsky, O.V.Butov<sup>,</sup> Kotelnikov Institute of Radioengineering and Electronics of RAS, Faculty of Physics of Lomonosov Moscow State University, Moscow Institute of Physics and Technology, Moscow, Russia

#### LS-0-2

#### Optical pulse compressor using Bayfol based holographic gratings

<u>R. Okun</u>, I. Zhluktova, V. Kamynin, V. Tsvetkov Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

Date and Time	September 12 (Monday) / 14:30-16:10
Place	Room 3
Session Title	[LS-1.2] Laser Systems and Materials 1.2
Session Chair	Sergey Babin ( <i>Russia</i> )

#### LS-I-5

### [Invited] Mid-Infrared Ultrashort Pulse Raman Lasers based on Gas-Filled Revolver Silica Fibers

A.V. Gladyshev, A.F. Kosolapov, I.A. Bufetov

Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

12:00-12:20

11:40-12:00

11:20-11:40

12:35-12:50

12:20-12:35

14:30-14:50

LS-I-6

#### [Invited] High-Power Mid-Infrared Quantum-Cascade Lasers

#### G.S. Sokolovskii

loffe Institute, St.Petersburg, Russia

#### LS-I-7

#### [Invited] Lasing properties of chalcogenide glasses in the 5+6 $\mu m$ spectral range

<u>S.E. Sverchkov</u>, B.I. Denker, B.I. Galagan, M.P. Frolov, V.V. Koltashev, V.G. Plotnichenko, G.E. Snopatin, M.V. Sukhanov, A.P. Velmuzhov

Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

#### LS-I-8

### [Invited] Development of mid-IR lasers based on transition metal doped chalcogenide crystals in Lebedev Physical Institute

V.I. Kozlovsky, M. P. Frolov, Yu. V. Korostelin, S. O. Leonov, Ya. K. Skasyrsky

P.N. Lebedev Physical Institute of the Russian Academy of Sciences, Moscow, Russia

LS-I-9

# [Invited] New anti-stokes phosphors and laser mediums based on II-III2-VI4 typed wide-gap chalcogenide semiconductors doped with rare earth elements

O. B. Taghiyev, M. S. Leonenya, E.V. Lutsenko, G.P. Yablonsky

Institute of Physics NAS Azerbaijan, Baku, Russia

September 12 (Monday) / 16:20-18:00
Room 3
[LS-1.3] Laser Systems and Materials 1.3
Grigorii Sokolovskii (Russia)

#### LS-O-3

#### Physical properties' temperature dynamics of GeTe, Ge2Sb2Te5, and Ge2Sb2Se4Te1 materials

A.A. Burtsev, V.V. Ionin, A.V. Kiselev, N.N. Eliseev, V.A. Mikhalevsky, V.V. Grebenev, D.N. Karimov and A.A. Lotin

ILIT RAS — Branch of FSRC "Crystallography and Photonics" RAS, Shatura, Moscow Region, Russia

#### LS-0-4

16:35-16:50

Thin Film Chalcogenide Materials for Photonic Applications

<u>A.V. Kiselev</u>, A.A. Burtsev, V.V. Ionin, N.N. Eliseev, A.A. Nevxorov, V.A. Mikhalevsky, A.A. Lotin *ILIT RAS — Branch of FSRC "Crystallography and Photonics" RAS, Shatura, Moscow Region, Russia* 

14:50-15:10

16:20-16:35

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15:30-15:50

15:50-16:10

15:10-15:30

#### The 29th International Conference on Advanced Laser Technologies

# LS-I-11

ALT'22 -

#### [Invited] Influence of Ca<sub>3</sub>(VO<sub>4</sub>)<sub>2</sub> crystal structural transformations on spectroscopic properties of transition metal ions

16:50-17:10

17:10-17:25

17:25-17:40

L.I.Ivleva, G.M.Kuzmicheva, M.E.Doroshenko Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

#### LS-0-5

#### Spin-coating of deep eutectic solvent for film formation for fabrication of copper patterns using picosecond laser irradiation

L. Logunov, D. Shestakov ITMO University, Saint-Petersburg, Russia

#### LS-O-6

#### Formation of Microporous Diamond Films by Microwave Plasma CVD from a Diamond-Germanium Composite

V. Sedov, A. Martyanov, I. Tiazhelov

Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

Place	10:00-10:40 Room 2
Session Title	[P-2] Plenary session 2
Session Chair	Alexander Priezzhev (Russia)

# P-2

# [Plenary] Optical Coherence Elastography: Past, Present, and Future

September 13 (Tuesday) /

# Vladimir Yu. Zaitsev

Date and Time

Institute of Applied Physics, RAS, Nizhniy Novgorod, Russia

September 13 (Tuesday) / 11:00-13:05
Room 1
LM-2.1] Laser-Matter Interaction 2.1
lya Tumkin (Russia)
5

#### LM-I-14

[Invited] Direct laser writing of copper micropatterns from deep eutectic solvents: chemical and physical aspects

<u>I.I. Tumkin,</u> L. Logunov, E.A. Avilova, E.M. Khairullina, A.Yu. Shishov, A.Levshakova, D.A. Sinev, *ITMO University, Institute of Chemistry, Saint Petersburg University, St. Petersburg, Russia* 

#### LM-O-5

#### Direct Laser Writing of Helical Bragg Grating in Vortex Fiber

A.G. Okhrimchuk, V.V. Likhov, S.L. Semjonov, S.A. Vasiliev, G.K. Alagashev

Prokhorov General Physics Institute of the Russian Academy of Sciences, Mendeleev University of Chemical Technology of Russia, Moscow, Russia

#### LM-O-6

### Direct writing of conductive patterns with pulsed near-IR laser irradiation of deep eutectic solvents

D.A. Sinev, E.A. Avilova, E.A. Eltysheva, M.A.Zaikina, E.M. Khairullina, A.Yu.Shishov, I.I.Tumkin *ITMO University, 197101 St. Petersburg, Russia* 

#### LM-0-7

Capillary instability of a keyhole and pore formation mechanism during laser additive manufacturing

R. D. Seidgazov, F. Kh. Mirzade

ILIT RAS - Branch of the FSRC "Crystallography and Photonics" RAS, Shatura, Moscow Region, Russia

#### LM-O-8

### Laser-assisted design of graphene-glass conductive surfaces for electronics and sensing

<u>A. Lipovka</u>, R. D. Rodriguez, A. Garcia, M. Fatkullin, S. Shchadenko, I. Petrov, L. Lu, A. Averkiev, R. Wang, J. Sun, Q. Li, X. Jia, C. Cheng, O. Kanoun, E. Sheremet *Tomsk Polytechnic University, Tomsk, Russia, Russia* 

10:00-10:40

11:20-11:35

11:35-11:50

11:50-12:05

12:05-12:20

11:00-11:20



#### LM-O-9

#### Laser processing mechanisms of graphene oxide

<u>E. Sheremet</u>, G. Murastov, M. Fatkullin, A. Averkiev, D. Cheshev, L. Kim, R.D. Rodriguez *Tomsk Polytechnic University, Tomsk, Russia* 

#### LM-O-10

#### Drilling of micro-hole grids in quartz crystals with ultraviolet picosecond laser

<u>E.M. Ibragimova</u>, A.A. Sapaeva, N.E. Iskandarov, F.M. Tojinazarov, B.R. Sobirov, K.T. Nazarov and Z.T. Azamatov

Center for Advanced Technologies, Tashkent, Uzbekistan; Institute of Nuclear Physics Academy of Sciences, Tashkent, Uzbekistan

#### LM-O-11

Laser processing as an approach for an inexpensive, green, and scalable dual-channel pesticide sensor fabrication

<u>M. Fatkullin</u>, A. Lipovka, A. Averkiev, A. Ivanov, J. Kolesnikova, R. Rodriguez, E. Sheremet *Tomsk Polytechnic University, Tomsk, Russia* 

Date and Time	September 13 (Tuesday) / 14:20-16:00
Place	Room 1
Session Title	[LM-2.2] Laser-Matter Interaction 2.2
Session Chairs	Sergei Arakelian, Dmitry Ivanov (Russia)

#### LM-I-15

[Invited] An insight into property-process parameters correlation of laser additive manufactured TiC precipitates in Ti-Al composite

M.D. Khomenko, F.Kh. Mirzade, J. D. Majumdar

Institute on laser and information technologies RAS - branch of FSRC "Crystallography and photonics" RAS, Shatura, Russia

#### LM-I-16

[Invited] Laser-induced topological quantum states in thin films on solid surface: the functional characteristics controlling for cluster systems

S. Arakelian, D. Bukharov, T. Khudaiberganov, A. Putilov, A. Antipov

Vladimir State University named after Nikolay and Alexander Stoletovs, Vladimir, Russia

#### LM-I-17

[Invited] Porosity reduction and structural features of 316L stainless steel fabricated using combined laser metal deposition with laser remelting

A.V. Dubrov, Y.N. Zavalov, P.S. Rodin, E.S. Makarova and V.D. Dubrov

ILIT RAS – Branch of the FSRC «Crystallography and Photonics» RAS, Shatura, Moscow Region, Russia

#### LM-I-18

[Invited] Modeling of Laser-Induced Surface Structures Generation due to Surface Plasmon-Polariton Excitation

12:20-12:35

14:40-15:00

15:00-15:20

15:20-15:40

14:20-14:40

12:35-12:50

12:50-13:05

D. S. Ivanov, P.N. Tetekhin, M.E. Garcia, B. Rethfeld, I.N. Zavestovskaya, A. Kabashin, and S. Klimentov

Lebedev Physical Institute, Moscow Engineering Physics Institute, Moscow, Russia

#### LM-0-12

#### Coulomb explosion in metals under the influence of fs-laser pulses V.I. Mazhukin, M.M. Demin, A.V. Shapranov, A.V. Mazhukin

Keldysh Institute of Applied Mathematics of RAS, Moscow, Russia

Date and Time	September 13 (Tuesday) / 16:20-18:00		
Place	Room 1		
Session Title	[LM-2.3] Laser-Matter Interaction 2.3		
Session Chair	Alexandr Antipov, Vitalii Kononenko (Russia)		

#### LM-I-19

### [Invited] Synthesis of copper nanoparticles by high-energy laser pulses in liquid

A.A. Antipov, A.G. Putilov, A.E Shepelev

ILIT RAS — Branch of FSRC "Crystallography and Photonics" RAS, Shatura, Russia Vladimir State University named after Alexander Grigorievich and Nikolai Grigorievich Stoletovs, Vladimir, Russia

#### LM-I-20

#### [Invited] Femtosecond laser plasma driven nanoparticle formation in Au aqueous solution

V.V. Kononenko, K.H. Ashikkalieva, N.R. Arutyunyan and V.I. Konov

Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

### LM-O-13

#### Anisotropic structuring of Ge2Sb2Te5 thin films by femtosecond laser pulses

A.V. Kolchin, S. V. Zabotnov, D. V. Shuleiko, L. A. Golovan, M. N. Martyshov, A. I. Efimova, V. B. Glukhenkaya, P. I. Lazarenko, T. S. Kunkel, S. A. Kozyukhin, E. V. Kuzmin, P. K. Kashkarov

Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia

#### LM-O-14

#### Modification of Ge2Sb2Te5 Thin Film by Femtosecond Laser Pulses under Different Irradiation Modes

S. Kozyukhin, M. Smayev, P. Lazarenko, Yu. Vorobyov, T. Kunkel Lebedev Physical Institute of the Russian Academy of Sciences, Moscow, Russia

#### LM-O-15

#### Laser assisted synthesis of boron nanoparticles

K.O. Aiyyzhy, E.V. Barmina, G.A. Shafeev

Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

#### LM-O-16

Nanostructuring of polymer surfaces mediated by colloidal microparticle lens array by pair of femtosecond laser pulses of different colors

15:40-15:55

16:40-17:00

17:00-17:15

16:20-16:40

17:15-17:30

17:45-18:00

17:30-17:45

#### The 29th International Conference on Advanced Laser Technologies

<u>A. Afanasiev</u>, I. Ilyakov, B. Shishkin, A. Pikulin, N. Bityurin Institute of Applied Physics of Russian Academy of Sciences, Nizhny Novgorod, Russia

Date and Time	September 13 (Tuesday) / 11:00-13:00			
Place	Room 2			
Session Title	[B-2.1] Biomedical Photonics 2.1			
Session Chairs	Mikhail Kirillin ( <i>Russia</i> ), Stanislav Zabotnov ( <i>Russia</i> )			

#### B-I-13

**ALT'22** 

[Invited] Gold concentration in colloids from extinction at 400 nm: universality for nanoparticles of various shape, morphology, and nanoparticle clusters

N. Khlebtsov, B. Khlebtsov, S. Zarkov

Institute of Biochemistry and Physiology of Plants and Microorganisms, Saratov Scientific Centre of the Russian Academy of Sciences (IBPPM RAS, Saratov State University, Saratov, Russia

#### B-I-14

#### [Invited] Microrheologic effects of magnetic nanodiamonds assessed by laser methods

A.E. Lugovtsov, P.B. Ermolinskiy, E.V. Perevedentseva, C.-L. Cheng, A.V. Priezzhev

Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia

#### B-I-15

[Invited] Silicon Nanoparticles Fabricated by Laser Ablation and Fragmentation: Perspectives in Optical Bioimaging and Photohyperthermia

<u>S. Zabotnov</u>, V. Nesterov, O. Sokolovskaya, D. Shuleiko, L. Golovan, P. Kashkarov, A. Khilov, D. Kurakina, P. Agrba, E. Sergeeva, M. Kirillin

Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia

#### B-I-16

#### [Invited] Effect of various NP on in vitro development of preimplantation mouse embryos

<u>A. Karmenyan</u>, A. Krivokharchenko, M. Kormacheva, M. Sarmiento, E. Barus, E. Perevedentseva, C.-L. Cheng

Department of Physics, National Dong Hwa University, Hualien, Taiwan

#### **B-I-17**

# [Invited] Quantum nano-plasmonics for biosensing and bioimaging on the level of single molecules and virions

<u>P. Melentiev</u>, D. Kudryavtsev, V. Mozhaeva, A. Kalmykov, A. Gritchenko, B. Khlebtsov, R. Kirtaev, D. Negrov, I. Ivanov, A. Siniavin, V. Tsetlin, V. Balykin

Institute of Spectroscopy RAS, Moscow, Russia

#### B-I-18

#### [Invited] Unified Monte Carlo platform for light transport in complex geometries

<u>M. Kirillin</u>, D. Kurakina, I. Fiks, A. Getmanskaya, A. Gorshkov, A. Khilov, V. Perekatova, V. Shishkova, I. Turchin, and E. Sergeeva

Institute of Applied Physics RAS, Nizhny Novgorod, Russia

11:40-12:00

11:20-11:40

12:20-12:40

11:00-11:20

12:00-12:20

12:40-13:00

### **B-I-19**

[Invited] Ultrawideband 100 kHz-100MHz ultrasonic detectors for multiscale optoacoustic angiography

#### P. Subochev

Institute of Applied Physics, Russian Academy of Sciences, Nizhny Novgorod, Russia

Date and Time	September 13 (Tuesday) / 14:20-16:00
Place	Room 2
Session Title	[B-2.2] Biomedical Photonics 2.2
Session Chairs	Artashes Karmenyan ( <i>Taiwan</i> ), Arsenii Gavdush ( <i>Russi</i> a)

#### **B-I-20**

[Invited] Broadband dielectric spectroscopy of astrophysical ice analogues; from the most common molecules toward complex organic compounds

#### A.A. Gavdush

Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

#### [Invited] Complex of NaYF4:Yb,Er -HSA-MB for cancerous tumour destruction

I. Yu. Yanina, E. N. Lazareva, A. A. Doronkina, D. K. Tuchina, A. M. Mylnikov, N. A. Navolokin, V. I. Kochubey

Saratov State University (National Research University), Institute of Physics, Saratov, Tomsk State University (National Research University), Tomsk, Russia

#### **B-O-7**

Berberine mediated gold nanoclusters for optical diagnostics and improved photodynamic effect in 2D and 3D cell model

W.G. Pearl, R. Selvam, A.V. Karmenyan, Y.C. Ko, E.V. Perevedentseva, C.L. Cheng Department of Physics, National Dong Hwa University, Hualien, Taiwan

#### **B-O-8**

Meet new photo-pharmacological agents – functionalised phosphonates with cholinesterase activity

A. Manshina, I. Kolesnikov, D. Mamonova, D. Pankin, A. Pilip, A. Egorova

Institute of Chemistry, St. Petersburg State University, St. Petersburg, Russia

#### **B-O-9**

#### NIR responsive Fe doped nanodiamond for Fenton enhanced chemotherapy

R. Selvam, W.G. Pearl, E. Prevedentseva, A. Karmenyan, C.L Cheng Department of Physics, National Dong Hwa University, Hualien, Taiwan

#### **B-O-10**

Non-invasive diagnosis of histopathological patterns in vulvar dermatoses by multimodal optical coherence tomography

13:00-13:20

15:00-15:15

15:30-15:45

15:15-15:30

15:45-16:00

14:20-14:40

A. Potapov, M. Sirotkina, M. Karabut, I. Kuznetsova, S. Radenska-Lopovok and N. Gladkova

Privolzhsky Research Medical University, Nizhny Novgorod, Russia

Date and Time	September 13 (Tuesday) / 16:20-18:05		
Place	Room 2		
Session Title	[B-2.3] Biomedical Photonics 2.3		
Session Chairs	Valery Tuchin ( <i>Russia</i> ), Vitalii Plavskii ( <i>Belarus</i> )		

#### B-I-22

**ALT'22** 

#### [Invited] Photoacoustic sensor for the diagnosis of Asthma.

<u>Santhosh Chidangil</u>, Nidheesh V. R, Aswini Kumar Mohapatra, Unnikrishnan V. K, Vasudevan Baskaran Kartha

Centre of Excellence for Biophotonics, Department of Atomic and Molecular Physics, Manipal Academy of Higher Education, Manipal, Karnataka, India

#### B-I-23

#### [Invited] Refractive index measurement of the mouse skin in the visible wavelength range

M.A. Ansari, M. Samani, S. Ziaee, E.A. Lazareva, Yu.I. Surkov, I.A. Serebryakova, E.A. Genina, V.V. Tuchin

Laser and plasma research institute, Shahid Beheshti University, Tehran, Iran

#### B-O-11

Assessment of the forces of paired erythrocytes aggregation by the optical tweezers in Type 1 and Type 2 diabetes mellitus

<u>Fabrichnova A.A.</u>, Koshelev V.B., Misnikova I.V., Kovaleva Y.A., Semenov A.N., Lugovtsov A.E., Kadanova I.M., Neznanov A.I., Priezzhev A.V.

Faculty of Fundamental Medicine, Lomonosov Moscow State University, Moscow, Russia

#### B-O-12

Imaging of plasma membrane microviscosity in cancer cells during chemotherapy using molecular rotor and FLIM

L. Shimolina, A. Hlynova, I. Druzhkova, N. Ignatova, M. Kuimova, E. Zagaynova, M. Shirmanova

Privolzhsky Research Medical University, Nizhny Novgorod, Russia

#### B-I-24

# [Invited] Photoacceptors and photochemical processes determining the regulatory effect of visible laser radiation on various cell types

V. Plavskii, T. Ananich, O. Dudinova, J. Kruchenok, I. Leusenko, A. Mikulich, R. Nahorny, L. Plavskaya, A. Tretyakova, A. Sobchuk, S. Yakimchuk

B.I.Stepanov Institute of Physics of the National Academy of Sciences of Belarus, Minsk, Belarus

#### B-O-13

#### Decrease Stiffness of Patients' Breast Cancer Tissue during Neoadjuvant Therapy

<u>A.A. Plekhanov</u>, E.V. Gubarkova, M.A. Sirotkina, V.V. Elagin, A.A. Sovetsky, D.A. Vorontsov, A.Y. Bogomolova, A.Y. Vorontsov, S.V. Gamayunov, V.Y. Zaitsev, and N.D. Gladkova *Privolzhsky Research Medical University, Nizhny Novgorod, Russia* 

17:15-17:30

16:20-16:40

16:40-17:00

17:00-17:15

17:30-17:50

17:50-18:05

Date and Time	September 13 (Tuesday) / 11:00-12:15		
Place	Room 3		
Session Title	[LS-2.1] Laser Systems and Materials 2.1		
Session Chair	Oleg Butov (Russia)		

#### LS-I-12

#### [Invited] Disk lasers with off-axis beam paths in degenerated type cavities

V.B. Tsvetkov, D.A. Nikolaev

Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

#### LS-I-13

#### [Invited] Radiation resistance of laser crystals: yesterday, today, tomorrow

B.L. Oksengendler, M.Kh. Ashurov, I.A. Shcherbakov

Arifov Institute of Ion-Plasma and Laser Technologies of Uzbekistan Academy of Sciences, Tashkent, Uzbekistan

#### LS-I-14

#### [Invited] Light Frequency Converters and Tunable Diffractive Elements Based on Periodically Poled Ferroelectric Crystals and Thin Films

V. Shur, A. Akhmatkhanov, A. Esin, M. Chuvakova, B. Slautin, V. Pavelyev, D. Kolker, A. Boyko Institute of Natural Sciences and Mathematics, Ural Federal University, Ekaterinburg, Russia

#### LS-0-7

#### Two-mode lasing in disk laser with degenerated configuration cavity

D. Guryev, D. Nikolaev, V. Tsvetkov

Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

Date and Time	September 13 (Tuesday) / 12:15-13:00
Place	Room 3
Session Title	[LD-2.1] Laser Diagnostics and Spectroscopy 2.1
Session Chair	Alexei Kalachev (Russia)

#### LD-I-1

# [Invited] Time-Resolved Electron Diffraction Studies of Laser-Induced Processes in Thin Films

<u>S.A. Aseyev</u>, A.A. Ischenko, I.V. Kochikov, B.N. Mironov, E.A. Ryabov Institute of Spectroscopy, Russian Academy of Sciences, Moscow, Troitsk, Russia

#### LD-I-2

#### [Invited] Nonlinear Polarization Rotation of Laser Radiation in Isotropic Media

S.Bakhramov, A. Kokhkharov, U. Makhmanov

Institute of Ion-Plasma and Laser Technologies named after U.A. Arifov, Uzbekistan Academy Sciences, Tashkent, Uzbekistan

12:00-12:15

12:20-12:40

12:40-13:00



11:00-11:20

11:20-11:40

11:40-12:00

23

# LD-I-3

# [Invited] Promising schemes of heralded single-photon qubit sources

# A. A. Kalachev

Kazan Scientific Center of Russian Academy of Sciences, Kazan, Russia

#### LD-I-4

#### [Invited] Near-field Optical and IR Spectroscopies of Semiconductor Nanostructures

<u>A.G. Milekhin</u>, I.A. Milekhin, N.N. Kurus, L.S. Basalaeva, R.B.Vasiliev, K.V. Anikin, V.G. Mansurov, K.S. Zhuravlev, A.V. Latyshev, D.R.T. Zahn

A.V. Rzhanov Institute of Semiconductor Physics, Novosibirsk, Russia

#### LD-I-5

# [Invited] Atomically thin nanosheets of zinc and cadmium chalcogenides: colloidal growth, ligand exchange, and control of exciton properties

<u>R.B. Vasiliev</u>, D.A. Kurtina, V.P. Grafova, A.V. Knot'ko, A.V. Garshev Lomonosov Moscow State University, Moscow, Russia

#### LD-0-1

Electron-phonon coupling in the ensemble of colloidal quantum dots: combined study by spectral and time-resolved methods

A. I. Arzhanov, K. R. Karimullin, I. Yu. Eremchev, N. V. Surovtsev, A. V. Naumov

Moscow Pedagogical State Universi;

Lebedev Physical Institute, Russian Academy of Sciences, Branch in Troitsk; Institute for Spectroscopy, Russian Academy of Science, Moscow, Russia

#### LD-0-2

Testing different models of fluorescence blinking in submicron perovskite crystals by studying photon statisticsy

<u>A. Tarasevich</u>, J. Li, A. Naumov, I. Eremchev, I. Sheblykin Institute of spectroscopy RAS, Troitsk, Moscow pedagogical state university, Higher school of economics, Pokrovsky bulvar, Moscow, Russia

#### LD-I-6

[Invited] Photomodification of Silver Nanocubes for Patch Plasmonic Nanoantennas by Visible Laser Light

S.G. Lukishova, Rochester, NY, USA



14:10-14:30

14:30-14:50

15:10-15:25

14:50-15:10

15:25-15:40

15:40-16:00

Date and Time	September 13 (Tuesday) / 16:20-18:10		
Place	Room 3		
Session Title	[LD-2.3] Laser Diagnostics and Spectroscopy 2.3		
Session Chair	Sergei Aseev		

#### LD-I-7

### [Invited] Novel physical method for 2-D chiral metasurfaces formation

<u>D.R. Dadadzhanov</u>, I.A. Gladskikh, R.A. Zakoldaev, N.A. Toropov, A.A. Starovoytov and T.A. Vartanyan School of Physics and Engineering, ITMO University, St. Petersburg, Russia

#### LD-I-8

#### [Invited] Optically tunable nanophotonic structures with Mie-type resonances

A.S. Shorokhov

Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia

#### LD-I-9

#### [Invited] Single-layer atom chip for quantum metrology

<u>A. Afanasiev</u>, P. Skakunenko, D. Bykova, A. Kalmykov, R. Kirtaev, D. Negrov, V. Balykin Institute of Spectroscopy Russian Academy of Sciences, Moscow, Troitsk, Russia

#### LD-I-10

# [Invited] Nonlinear optical dynamics of gigawatt single-cycle phase-stable pulses generated in hollow-core photonic-crystal fiber

<u>A.B. Fedotov</u>, I.V. Savitsky, E.A. Stepanov, A.A. Voronin A.A. Lanin, A.M. Zheltikov Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia

#### LD-O-3

#### SERS-spectroscopy on microcrakes of metal coating of track-etched membranes

S. Bedin, N. Kovalets, E. Kozhina, I. Razumovskaya, A. Naumov

Moscow State Pedagogical University, Lebedev Physical Institute RAS, Center of Crystallography and Photonics of RAS, Moscow, Russia

#### LD-0-4

#### Ultrasensitive SERS active sensors based on leaning silver NWs bundles

E. Kozhina, S. Bedin, S. Andreev, A. Naumov

Lebedev Physical Institute RAS, Moscow Pedagogical State University (MPGU), Moscow, Russia

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16:20-16:40

16:40-17:00

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17:20-17:40

17:00-17:20

17:40-17:55

17:55-18:10

#### The 29<sup>th</sup> International Conference on Advanced Laser Technologies

Date and Time	September 14 (Wednesday) /	
Place	10:00-10:40 Room 2	
Session Title	[P-3] Plenary session 3	
Session Chair	Alexander Shkurinov <i>(Russia)</i>	

#### **P-3**

**ALT'22** 

#### [Plenary] Nonlinear singular polarization optics of wave beams and pulses

# Vladimir Makarov

Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia

Date and Time	September 14 (Wednesday) / 11:00-13:00
Place	Room 1
Session Title	[THz-3.1] Nonlinear and THz Photonics 3.1
Session Chair	Vladimir Makarov (Russia)

#### THz-I-1

#### [Invited] Towards standardless calibration of the quantum efficiency of analog terahertz detectors

G.Kh. Kitaeva, P.A.Prukovskii, D.A. Safronenkov

Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia

#### THz-I-2

# [Invited] Transmission features of nonlinear Fabry-Perot interferometer with giant Kerr nonlinearity in THz frequency range

S.A.Kozlov, A.A. Gendrina, M.D.Shipov, M.V.Melnik, A.N.Tsypkin ITMO University, Saint Petersburg, Russia

#### THz-I-3

#### [Invited] Directional diagram of THz radiation from femtosecond filament in DC-biased and transition regimes

O.G. Kosareva, N.A. Panov, D.E. Shipilo, I.A. Nikolaeva, D.V. Pushkarev, G.E. Rizaev, D.V.Mokrousova, A.V. Koribut, Y.V. Grudtsyn, L.V. Seleznev, A.A. Ionin Faculty of Physics, Lomonosov Moscow State University, P.N. Lebedev Physical Institute of the RAS, Moscow, Russia

#### THz-I-13

#### [Invited] THz generation in multi-terawatt laser plasma

M. M. Nazarov, P. A. Shcheglov, M. V. Chaschin, A.A.Tausenev, A.A. Garmatina, A.V.Mitrofanov, D. A. Sidorov-Biryukov.

Kurchatov Institute National Research Center, Moscow 123182, Russia

#### THz-I-4

#### [Invited] THz emission from single metallic microdroplet targets irradiated with femtosecond laser pulses

A.V. Balakin, P.M. Solyankin, M.S. Krivokorytov, A.P. Shkurinov Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia 11:20-11:40

11:00-11:20

10:00-10:40

11:40-12:00

12:20-12:40

12:00 - 12:20

### THz-I-5

# [Invited] Anisotropic Photoconductivity and Terahertz Emission from Semiconductors V. Malevich, P. Ziaziulia

Institute of Physics, National Academy of Sciences of Belarus, Belarusian State University of Informatics and Radioelectronics, Minsk, Belarus

#### THz-I-6

#### [Invited] Photogalvanic currents in a-Sn/Ge QW

V.N. Trukhin, I. A. Mustafin, F. V. Kusmartsev, A. Kusmartseva, Y. Liu, B. Zhang, Y. Luo *Ioffe Institute, 19021, St Petersburg, Russia* 

Date and Time	September 14 (Wednesday) / 14:20-16:00
Place	Room 1
Session Title	[THz-3.2] Nonlinear and THz Photonics 3.2
Session Chair	Alexander Shkurinov (Russia)

#### THz-I-7

# [Invited] Development of High-Power Frequency Tunable THz Band Gyrotrons for Spectroscopy Applications

<u>M. Glyavin</u>, A. Fokin, A. Tsvetkov, M. Morozkin, M. Proyavin, A. Fedotov, I. Zotova Institute of Applied Physics RAS (IAP RAS), Nizhny Novgorod, Russia

#### THz-I-8

# [Invited] Terahertz-field-induced optical second harmonic generation and luminescence for material nonlinear diagnostic and terahertz beam visualization

#### S. B. Bodrov

Institute of Applied Physics of the Russia Academy of Sciences, Nizhny Novgorod, Russia

#### THz-I-9

# [Invited] Analysis of the metabolites composition for the ENT organs tissues with high resolution THz spectroscopy

V.L.Vaks, V.A.Anfertev, E.G.Domracheva, M.B.Chernyaeva, T.G, Shcherbatyuk, E.S.Zhukova Institute for Physics of Microstructures RAS, Lobachevsky University, Nizhny Novgorod, Russia

#### THz-I-10

### [Invited] Technologies of Diffractive Optics for IR and THz Ranges

<u>V. Pavelyev</u>, B. Knyazev, M. Komlenok, K. Tukmakov, T. Kononenko, A. Reshetnikov, A. Agafonov, Yu. Choporova, N. Osintseva, V. Konov, V. Soifer, G. Kulipanov, N. Vinokurov

Samara National Research University, IPSI RAS – Branch of the FSRC "Crystallography and Photonics" RAS, Samara, Russia

#### THz-O-1

# Ultrafast pump-probe spectroscopy of 1D van der Waals heterostructures

M. Burdanova, James Lloyd-Hughes

Institute of Solid State Physics of the Russian Academy of Sciences, Chernogolovka, Russia Center for Photonics and 2D Materials, Moscow Institute of Physics and Technology, Dolgoprudny, Russia

12:40-13:00

15:00-15:20

13:00-13:20

14:40-15:00

14:20-14:40

15:20-15:40

15:40-15:55

ALT'22

The 29<sup>th</sup> International Conference on Advanced Laser Technologies

Date and Time	September 14 (Wednesday) / 11:00-13:00
Place	Room 2
Session Title	[B-3.1] Biomedical Photonics 3.1
Session Chairs	Valery Tuchin (Russia), Yury Kistenev (Russia)

#### **B-I-25**

#### [Invited] Breathomics using laser spectroscopy and machine learning

Y.V. Kistenev, A.V. Borisov, V.E.Skiba, I.K. Lednev, Han Jin Tomsk State University, Tomsk, Russia

#### **B-I-26**

#### [Invited] Lasers in the evolving world of biomedical sensing and diagnosis

Z. Zalevsky

Faculty of Engineering, Bar-Ilan University, Israel

#### **B-I-27**

#### [Invited] Non-obvious features of low-coherence interferometry

G.V. Gelikonov

Institute of Applied Physics Russian Academy of Sciences, Nizhny Novgorod, Russia

#### **B-O-14**

Vacuum atraumatic tissue fixation enables multimodal OCT monitoring of the enterostomy condition

E. Kiseleva, M. Ryabkov, M. Sizov, P. Peretyagin, E. Bederina, P. Shilyagin, N. Gladkova

FSBEI HE PRMU MOH, Nizhny Novgorod, Russia

#### **B-O-15**

### Optical coherence angiography of the ischemic bowel in open and laparoscopic surgery

M. Ryabkov, E. Kiseleva, P. Zarubenko, M. Sizov, M. Bagryantsev, N. Gladkova

FSBEI HE PRMU MOH, Nizhny Novgorod, Russia

#### **B-O-16**

Comparison of the antitumor activity of the photosensitizer based on indotricarbocyanine dye and Photolon

D.S. Tarasov, M.P. Samtsov, A.P. Lugovski

A.N Sevchenko Institute for Applied Physical Problems of BSU, Minsk, Belarus

#### **B-O-17**

#### Bactericidal and Bacteriostatic Effect of Blue Light: Basic Patterns and Methods for the Efficiency Enhancement

V. Plavskii, A. Tretyakova, A. Mikulich, N. Dudchik, O. Emelyanova, L. Plavskaya, T. Ananich, O. Dudinova, A. Sobchuk, R. Nahorny, I. Leusenko, S. Yakimchuk

Institute of Physics of the NAS of Belarus, Minsk, Belarus

11:20-11:40

11:40-12:00

12:15-12:30

12:30-12:45

12:45-13:00

**ALT'22** 

11:00-11:20

12:00-12:15

Date and Time	September 14 (Wednesday) / 12:20-16:00
Place	Room 2
Session Title	[LM-3.2] Laser-Matter Interaction 3.2
Session Chair	Sergey Klimentov (Russia)

#### LM-I-21

#### [Invited] Laser synthesis of thin-film memristor structures based on tantalum and niobium oxides

O. Novodvorsky, D. Gusev, O. Khramova, L. Parshina, A. Polyakov, V. Mikhalevsky, E. Cherebilo Institute on Laser and Information Technologies of RAS — Branch of Federal Scientific Research Center "Crystallography and Photonics" of RAS, Shatura, Moscow Region, Russia

#### LM-I-22

# [Invited] Laser-Induced Phase Transitions Dynamics of GeTe and Ge2Sb2Te5 Thin Films

# A. Lotin

Institute on Laser and Information Technologies of the RAS, Moscow, Russia

#### LM-0-17

#### Excitation of Rare-Earth lons Luminescence in Glasses by Satellites of Raman Scattering

G. Malashkevich, V. Kouhar, A. Sukhodola, T. Khottchenkova, N. Golubev, M. Ziyatdinova, V. Sigaev

B.I. Stepanov Institute of Physics of the National Academy of Sciences of Belarus, Minsk, Belarus

#### LM-O-18

Numerical Simulation and Experimental Validation of Solidification Phenomena in Functionally Graded Inconel625/WC Composite Coatings Fabricated with Laser Metal Deposition

Eyitayo Olatunde Olakanmi, M. Khomenko, E. Lindsay, I. Akintunde, B. Masina, S. Skhosane, N. Arthur, M. Tlotleng, S. Pityana

Department of Mechanical, Energy & Industrial Engineering, Botswana international University of Science & Technology, Palapye, Botswana

#### LM-O-19

Pressure pulse in nanosecond laser ablation of mercury due to metal-nonmetal transition: analysis of resent experimental results

A.A. Samokhin, P.A. Pivovarov

Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

Date and Time	September 14 (Wednesday) / 11:00-13:00
Place	Room 3
Session Title	[LD-3.1] Laser Diagnostics and Spectroscopy 3.1
Session Chair	Leonid Golovan (Russia)

15:00-15:15

14:20-14:40

**ALT'22** 

14:40-15:00

15:15-15:30

15:30-15:45

# LD-I-11

**ALT'22** 

# [Invited] Low energy nuclear photonics

# Andrei Savel'ev

Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia

# LD-I-12

[Invited] Control of Femtosecond Filamentation by NIR- and SWIR-Laser-induced Rotational Quantum Wakes in Nitrogen

S.V. Chekalin, V.O. Kompanets, A.A. Melniko

Institute of Spectroscopy of the Russian Academy of Sciences, Troitsk, Moscow, Russia

# LD-I-13

# [Invited] Laser spectroscopy of interactions at the carbon nanoparticle-medium interface

T. Dolenko, S. Burikov, A. Vervald, K. Laptinskiy

Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia

# LD-I-14

[Invited] Broadband two-dimensional spectrochronography with ultrashort pulses in the midinfrared

<u>E.A. Stepanov</u>, A.N. Zhdanov, I.V. Savitskii, G.D. Ivanov, A.A. Lanin, A.B. Fedotov, A.M. Zheltikov Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia

# LD-I-15

# [Invited] High-resolution modulation spectroscopy: opportunities and prospects Kirill Boldyrev

Institute of Spectroscopy of the Russian Academy of Sciences, Troitsk, Moscow, Russia

# LD-0-5

# Quantum physics of nano-confined water

<u>V.Uskov</u>, M. A. Belyanchikov, M. Savinov, V. A. Abalmasov, E. S. Zhukova, V. G. Thomas , B.Gorshunov

Moscow Institute of Physics and Technology (National Research University), Moscow, Russia

Date and Time	September 14 (Wednesday) / 14:20-16:00
Place	Room 3
Session Title	[LD-3.2] Laser Diagnostics and Spectroscopy 3.2
Session Chair	Kirill Boldyrev (Russia)

# LD-I-16

[Invited] Quasi-equilibrium saturated states of fluorescence emission by laser-pumped fluorescent random media: the fundamental role of characteristic scales of radiative transfer D.A. Zimnyakov, S.S. Volchkov, L.A. Kochkurov, A.F. Dorogov

Yury Gagarin State Technical University of Saratov, Institute for Precision Mechanics and Control Problems of the Russian Academy of Sciences, Saratov, Russia

11:00-11:20

11:20-11:40

12:00-12:20

11:40-12:00

12:20-12:40

12:40-12:55

14:20-14:40

30

#### LD-I-17

#### [Invited] Elastic scattering controls Raman scattering efficiency in suspension

L.A. Golovan, O.I. Sokolovskaya, V.V. Yakovlev

Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia

#### LD-I-18

[Invited] Synthesis of monolithic ultraporous 3D nanostructures and nanocomposites with desired optical properties

A. Khodan, A. Konovko

Frumkin Institute of Physical Chemistry and Electrochemistry RAS, Semenov Federal Research Center for Chemical Physics, RAS, Moscow, Russia

#### LD-O-6

#### Raman scattering spectra in zinc oxide microstructures placed in photon traps

I.A. Rakhmatullaev, N.V. Tcherniega, M.Kh. Davronov, O.M. Tursunkulov Center for Advanced Technologies under the Ministry of Innovative Development of the Republic of Uzbekistan. Tashkent. Uzbekistan

P.N. Lebedev Physical Institute of the Russian Academy of Sciences, Moscow, Russia

#### LD-0-7

#### Laser-induced deposition of topologically controlled nanometal surfaces for sensing and electrochemistry

A. Manshina, A. Vasileva, G. Bikbaeva, D. Mamonova, I. Kolesnikov, D. Pankin Institute of Chemistry, St. Petersburg State University, St. Petersburg, Russia

#### LD-0-8

Spectral variables selection in multivariate calibration of concentrations of C, Mn, Si, Cr, Ni, AND Cu IN LOW-ALLOY STEELS BY LIBS METHOD

M. Khodasevich, M. Belkov, D. Borisevich, K. Catsalap,

B.I.Stepanov Institute of Physics, National Academy of Sciences of Belarus, Minsk, Belarus

Date and Time	September 14 (Wednesday) / 16:20-18:20
Place	Room 1
Session Title	Poster session
Session Chair	

14:40-15:00

15:50-16:05

15:35-15:50

15:20-15:35

15:00-15:20

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•	The 29 <sup>th</sup> International Conference on Advanced	Laser Technologies
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Date and Time	September 15 (Thursday) / 10:00-11:20
Place	Room 1
Session Title	[THz-4.1] Nonlinear and THz Photonics 4.1
Session Chair	Olga Kosareva (Russia)

#### THz-O-2

# Analysis of rodent's urine vapors with using THz high resolution spectrometer for revealing the markers of dysbacteriosis

V.Vaks, V.A.Anfertev, E.G.Domracheva, S.I.Pripolzin, M.B.Chernyaeva, A.Baranov

Institute for Physics of Microstructures of the Russian Academy of Sciences (IPM RAS), Nizhny Novgorod, Russia

#### THz-I-11

# [Invited] THz quantum cascade lasers with two-photon emission in the gain module grown by MBE and MOCVD

<u>R.A. Khabibullin</u>, S.S. Pushkarev, R.R. Galiev, D.S. Ponomarev, I.S. Vasil'evskii, A.N. Vinichenko, A.N. Klochkov, T.A. Bagaev, M.A. Ladugin, A.A. Marmalyuk, K.V. Maremyanin, V.I. Gavrilenko,

D.V. Ushakov, A.A. Afonenko

V.G. Mokerov Institute of ultra-high frequency semiconductor electronics of RAS, Moscow, Russia

#### THz-O-3

# Morphological and photoelectric studies of the (GaAs)<sub>1-x-y</sub>(Ge<sub>2</sub>)<sub>x</sub>(ZnSe)<sub>y</sub> solid solution

A. Boboev, S.Z. Zainabidinov

Andijan State University, Andijan, Uzbekistan

#### THz-O-4

# Five-Fold Frequency Multiplication in MW-Level Gyrotrons as a Way to High-Power THz Radiation Sources

<u>I. Zotova</u>, G. Denisov, A. Malkin, A. Sergeev, I. Zheleznov, M. Glyavin Institute of Applied Physics RAS (IAP RAS), Nizhny Novgorod, Russia

Date and Time	September 15 (Thursday) / 11:40-13:00
Place	Room 1
Session Title	[THz-4.2] Nonlinear and THz Photonics 4.2
Session Chair	Vladimir Vaks <i>(Russia)</i>

#### THz-I-13

### [Invited] Classification of chocolates by multivariate methods in THz spectroscopy

M. Khodasevich, A. Lyakhnovich, H. Eriklioğlu

B.I.Stepanov Institute of Physics, National Academy of Sciences of Belarus, Minsk, Belarus

# THz-O-5

### <u>A. Sinko</u>

ILIT RAS — Branch of FSRC "Crystallography and Photonics" RAS, Shatura, Moscow reg., Russia



10:00-10:15

10:15-10:35

10:50-11:05

11:40-12:00

12:00-12:15

10:35-10:50

### THz-O-6

# Microsphere Sensors Based on Thermo-Optical Effect in Different Glasses: Modelling and Experiment

<u>M.P. Marisova</u>, A.V. Andrianov, E.A. Anashkina Institute of Applied Physics RAS, Nizhny Novgorod, Russia

#### THz-O-7

# Fundamental and practical properties of stretchable carbon nanotubes under ultrafast pump-probe spectroscopy

<u>M. Paukov</u>, A. Goldt, A. Nasibulin, James Lloyd-Hughes, A. Arsenin, V. Volkov, M. Burdanova *Center for Photonics and 2D Materials, Moscow Institute of Physics and Technology, Dolgoprudny, Russia* 

#### THz-O-8

#### Angular structure of the optical-terahertz biphoton field

P.A. Prudkovskii

Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia

Date and Time	September 15 (Wednesday) / 10:00-11:25
Place	Room 3
Session Title	[LD-4.1] Laser Diagnostics and Spectroscopy 4.1
Session Chair	Sergey Pershin <i>(Russia )</i>

#### LD-I-19

[Invited] Fluorescence lifetime imaging of porous silicon nanoparticles in heart muscle cells <u>M.B. Gongalsky</u>, D. Akimov, E. Tolstik, V. Sivakov, L.A. Osminkina

Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia

#### LD-I-20

# [Invited] Study of the molecular composition of cancer cells immobilized on SERS-active composite plasmonic nanostructures

L.A. Osminkina

Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia

#### LD-O-9

# Dielectric, infrared and Raman spectroscopy of BiScO3

V. Kozlov, A. Bush, V. Trotsenko, E. Zhukova, A. Serovaiskii, V. Kutcherov

MIREA – Russian Technological University (RTU MIREA), Moscow, Russia

# LD-O-10

# Determination of particle concentrations from absorption spectra with fast frequency tuning

V. Lagunov, V.Ochkin, A.Volkova

Lebedev Physics Institute, Russian Academy of Sciences, Moscow, Russian

12:30-12:45

12:45-13:00

10:00-10:20

10:20-10:40

10:40-10:55

10:55-11:10

10:00-10:20

12:15-12:30

# LD-0-11

# High-Speed GalnAsSb/GaAlAsSb Photodetectors for Precision Diode Laser Spectroscopy

E.V. Kunitsyna, I.A. Andreev, G.G. Konovalov, A.A. Pivovarova, N.D. II`inskaya, Yu.P. Yakovlev, Ya.Ya. Ponurovskii, A.I. Nadezhdinskii, <u>A.S. Kuz'michev</u>, D.B. Stavrovskii, M.V. Spiridonov *Ioffe Institute, St. Petersburg, Russia* 

Date and Time	September 15 (Wednesday) / 11:40-13:00	
Place	Room 3	
Session Title	[LD-4.2] Laser Diagnostics and Spectroscopy 4.2	
Session Chair	Alexander Kuz`michev, Liubov Osminkina (Russia)	

#### LD-0-12

Developing Compact LIDAR Systems: Size and Eye-Safety Matters

V.N. Lednev, M.Ya. Grishin, P.A. Sdvizhenskii, V.A. Zavozin, S.M. Pershin, A.F. Bunkin *Prokhorov General Physics Institute, Russian Academy of Science, Moscow, Russia* 

#### LD-I-21

[Invited] Hybrid metal-semiconductor nanoparticles produced by laser ablation in liquid for optical nanosensing, anti-counterfeiting and photothermal conversion

#### A. Kuchmizhak, S. Gurbatov, V. Puzikov

Institute of Automation and Control Processes, FEB RAS, Vladivostok, Russia

#### LD-0-13

Elbrus activity sensing by eye-safe lidar based on diode laser proposed by Basov-Krokhin-Popov in 1960: to the 100th anniversary of Nikolai Basov

<u>S.M. Pershin</u>, V.A. Zavozin, M.Ya. Grishin, V.N. Lednev, V.S. Makarov, A.V. Myasnikov, S.P. Yakimenko, Ya.Ya. Ponurovsky, and D.G. Artemova, and A. A. Ushakov *Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia* 

### LD-0-14

### Fiber-optical Faraday current sensor with enhanced SNR

Y. Przhiyalkovskiy, N. Starostin, S. Morshnev, A. Sazonov

SPC Profotech, Skolkovo innovation center area, Moscow; Kotelnikov Institute of Radio Engineering and Electronics (Fryazino Branch) of RAS, Fryazino, Moscow region, Russia

### LD-0-15

# Interference method for the selection of homogeneous lines in the spectrum of a superluminescent source

<u>S. Morshnev</u>, N. Starostin, Y. Przhiyalkovskiy, A. Sazonov Kotelnikov Institute of Radio Engineering and Electronics of RAS, Fryazino, SPC Profotech, Skolkovo innovation center area, Moscow, Russia 12:15-11:30

12:30-12:45

12:45-13:00

11:55-12:15

11:40-11:55

11:10-11:25



Date and Time	September 14 (Wednesday) / 16:20-18:20
Place	Room
Session Title	Poster session
Session Chair	

#### Section LASER-MATTER INTERACTION

#### LM-P-1

Optical detection of the glass transition temperature of nanoconfined polymers using plasmon nanostructures

#### E. Chernykh, S. Kharintsev

Kazan Federal University, Institute of Physics, Department of Optics and Nanophotonics, Kazan, Russia

#### LM-P-2

# Designing Two-Dimensional Temperature Profiles with Arrays of Tunable TiON:Si Nanostructures

A. V. Kharitonov, S. S. Kharintsev

Department of Optics and Nanophotonics, Institute of Physics, Kazan Federal University, Kazan, Russia

#### LM-P-3

# Influence of Multi-Photon Laser Excitation on Excitons and Free Charge Carriers Dynamics in Lead-Halide Perovskites

D.I. Markina, P.A. Tonkaev, M.A. Masharin, A.P.Pushkarev, S.V. Makarov ITMO University, St. Petersburg, *Russia* 

#### LM-P-4

# Simulation of microscopic defect formation in layered high-temperature superconducting composites by exposure to ultrashort laser pulses

I. Martirosian, S. Pokrovskii, I. Rudnev National Research Nuclear University MEPHI, Moscow, Russia

#### LM-P-5

Atomistic modeling of mobility of solid/liquid interfaces of melting/crystallization of metals AI, Cu, Fe under deep overheating/undercooling conditions

V.I. Mazhukin, A.V. Mazhukin, A.V. Shapranov, O.N. Koroleva, Keldysh Institute of Applied Mathematics of RAS, Moscow, Russia

#### LM-P-6

#### Delayed effects in laser ablation

<u>A.A. Samokhin</u>, N.N. Il'ichev, A.V. Sidorin, P.A. Pivovarov Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

#### LM-P-7

# Enhanced Raman scattering in amorphous carbon films under cw laser irradiation <u>S. Saparina</u>, A. Gazizov, S. Kharintsev

Kazan Federal University, Department Optics and Nanophotonics, Kazan, Russia

#### LM-P-8

#### Laser creation of samples to reveal hidden defects in steel products

<u>E. Surmenko</u>, T. Sokolova, D. Bessonov, Yu. Chebotarevskiy, A. Klushev, N. Kulikov Saratov State Technical University, Saratov, Russia



#### LM-P-9

#### Hybrid silicon-based nanoparticles prepared by laser-induced annular plasma

N. Tarasenka, V. Kornev, S. Gurbatov, A. Kuchmizhak, N. Tarasenko

B. I. Stepanov Institute of Physics, National Academy of Sciences of Belarus, Minsk, Belarus

#### LM-P-10

#### Picosecond laser-induced micro- and nano-structures on Ti surface

<u>F. Tojinazarov</u>, E. Ibragimova, Kh. Nazarov, N. Iskandarov Center for Advanced Technologies, Ajou University in Tashkent, Tashkent, Uzbekistan

#### Section LASER SYSTEMS AND MATERIALS

#### LS-P-1

#### Radiation characteristics of crystals and nanoceramics based on CaF2:SrF2:YbF3

S.T. Boyboboeva, M.Kh. Ashurov, I. Nuritdinov, P.P. Fedorov

Institute of Nuclear Physics of the Academy of Sciences of the Republic of Uzbekistan TRChSPI, Chirchik, Uzbekistan

#### LS-P-2

# All-glass single-mode microstructured optical fibers with a large mode area and low bending losses

<u>A. Denisov</u>, S. Semjonov, M. Likhachev, V. Velmiskin, A. Kosolapov, O. Egorova, S. Zhuravlev Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

#### LS-P-3

# Comparison of pulsed generation parameters in dumbbell-shaped and ring cavities of the Holmium-doped fiber laser

<u>S.A. Filatova</u>, V.A. Kamynin, Y.G. Gladush, E.M. Khabushev, D.V. Krasnikov, A.G. Nasibulin, V.B. Tsvetkov

Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

#### LS-P-4

#### New Ca<sub>3</sub>(VO<sub>4</sub>)<sub>2</sub> :Cr crystal: synthesis, doping technique, optical properties

I.S.Voronina, E.E.Dunaeva, M.E.Doroshenko, L.I. Ivleva

Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

#### LS-P-5

# Effect of isomorphic substitution in the cationic sublattice of langasite family crystals on their optical and electrophysical properties

<u>N. Kozlova</u>, E. Zabelina, O. Buzanov National University of Science and Technology MISiS, Moscow, Russia

#### LS-P-6

#### Sensitivity limit of a chemical sensor based on porous silicon microresonator

V.I. Krasovskii, L.A. Apresyan, T.V. Vlasova, S.I. Rasmagin Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia



# LS-P-7

# $Er:Y_2O_3$ optical ceramics as a gain medium for in-band pumped 1.6 $\mu m$ lasers: synthesis and spectroscopic properties

<u>N.V. Kuleshov</u>, K.N. Gorbachenya, A.S. Yasukevich, V.E. Kisel, A.I. Lazarchuk, A.A. Tarachenko, K.V. Lopuhin, V.V. Balashov, A.V. Fedin, M.N. Gerke, E.A. Volkova, V.O. Yapaskurt, N.N. Kuzmin, D.A. Ksenofontov, D.V. Korost

Center for optical materials and technologies, Belarusian National Technical University, Minsk, Belarus

# LS-P-8

#### Magneto-optical and structural properties of ultrafine-grained Tb2O3 transparent ceramics R.N. Maksimov, V.V. Osipov, G.R. Karagedov, V.V. Platonov, A.N. Orlov, A.V. Spirina, A.S. Yurovskikh,

V.A. Shitov

Institute of Electrophysics UrB RAS, Ekaterinburg, Russia Ural Federal University named after the first President of Russia B.N. Yeltsin, Ekaterinburg, Russia

### LS-P-9

# Promising materials for optoelectronics - CdGa2Se4: Theoretical calculations and experimental studies of electronic properties

T.G. Mammadov, I.A. Mamedova, Z.A. Jahangirli, E.H. Alizade, T.G. Kerimova, N.A. Abdullayev Institute of Physics of NAS of Azerbaijan, ave.H.Javid, 131, AZ1143, Baku, Azerbaijan

# LS-P-10

# Growth of nanocrystalline CVD diamond films doped with germanium

<u>A. Martyanov</u>, V. Sedov, I. Tiazhelov Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

# LS-P-11

### Photoluminescence of SrF2:Eu powders after annealing in CH4/H2 microwave plasma

I. Tiazhelov, A. Martyanov, V. Sedov, K. Boldyrev, A. Drobysheva, Yu. Ermakova, A. Alexandrov, V. Voronov, S. Kuznetsov

Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

### LS-P-12

### Influence of Sc on luminescence properties of GAGG:Ce scintillator

<u>E. Zabelina</u>, D. Spassky, O. Buzanov, N. Kozlova, V. Kasimova National University of Science and Technology MISiS, Moscow, Russia

### LS-P-13

### Chalcogenide film electrical and optical properties modification by 1064 nm laser irradiation

I.G. Zaytsev, A.A. Olhova, A.A. Patrikeeva, M.M. Sergeev ITMO University, St. Petersburg, Russian

### LS-P-14

### Quasi-CW lasing performance of Yb:YSAG ceramics

<u>I V. Zhmykhov</u>, D. Guryev, V.S. Tsvetkov, E. Dobretsova, S. Kuznetsov, M. Nikova, I. Chikulina, D. Vakalov, V. Tarala and V.B. Tsvetkov

Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia



#### Section **BIOPHOTONICS**

#### B-P-1

#### Nanocomposites of graphene-porphyrins for solar cells

<u>G. Gyulkhandanyan</u>, V. Tuchin, G. Shmavonyan Institute of Biochemistry, NAS of Armenia, Yerevan, Armenia

#### B-P-2

Manifestation of hydrophobicity of water molecules on the rheological properties of the excluded band of nafion

Juraev Yulchi, N.F. Bunkin, L.M. Sabirov, V.A. Kozlov, M.T. Makhamadiev, M.A. Khasanov Samarkand State University, Samarkand, Uzbekistan

#### B-P-3

#### **Bimodal Fluorescence Imaging of Bladder Cancer**

<u>N. Kalyagina</u>, D. Kustov, E. Kozlikina, A. Borodkin, M. Loshchenov, D. Yagudaev Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

#### B-P-4

# Blood plasma protein constitution and erythrocytes aggregation relationships: study with laser tweezers

K.N. Korneev, P.B. Ermolinsky, A.E. Lugovtsov, A.V. Priezzhev Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia

#### B-P-5

#### Effect of CaCO3 on Optical Parameters of Biological Tissues in Normal and Cancer

<u>E. N. Lazareva</u>, D. K. Tuchina, A. A. Doronkina, R. A. Anisimov, M. V. Lomova, A. M. Mylnikov, N. A. Navolokin, V. I. Kochubey, I. Yu. Yanina Saratov State University (National Research University), Institute of Physics, Saratov, Russia

#### B-P-6

# The effect of dextrans as optical clearing agents on microrheologic properties of blood in vitro studied by laser techniques

<u>A.V. Priezzhev</u>, A.E. Lugovtsov, P.B. Ermolinskiy, Jiachi Hong, Pengcheng Li Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia

#### B-P-7

#### Antimicrobial Photoinactivation Using Medicinal Plant Extracts

A. Mikulich and ets.

State Scientific Institution "B. I. Stepanov Institute of Physics of the National Academy of Sciences of Belarus", Minsk, Belarus

#### B-P-8

### Photobleaching of cationic porphyrins and their complexes with folic acid in presence of Lhistidine and D-mannitol as quenchers

L. Mkrtchyan, <u>A. Zakoyan</u>, T. Seferyan, G. Gyulkhandanyan, V. Tuchin *Institute of Biochemistry, NAS of Armenia, Yerevan, Armenia* 

#### B-P-9

#### Enhancing diffuse optical tomography using deep learning

M.A. Ansari, A. Meisamy

Optical Bio-imaging Lab, Laser and Plasma Research Institute, Shahid Beheshti University, Tehran, Iran

-ALT'22

#### B-P-10

# Raman study of the cyanobacterium Synechocystis sp. PCC 6803 mutants deficient in phycobiliproteins

<u>E. Perevedentseva</u>, E. Muronets, N. Melnik, A. Karmenyan, I. Elanskaya *P.N. Lebedev Physical Institute of Rus. Acad. Sci., Moscow, Russia* 

#### B-P-11

# Consolidated model for propagation of optical and terahertz radiation through different media in relation to the remote sensing of biological objects

<u>G.S. Rogozhnikov</u>, V.V. Kostromykina, A.A. Skrybykina FSUE "Russian Federal Nuclear Center - VNIIEF", Sarov, Russia

#### B-P-12

#### Development of a multimodal approach to the diagnosis of human skin cancer in vivo

I. A. Serebryakova, Yu. I. Surkov, E. N. Lazareva, Y. K. Kuzinova, O. M. Konopatskova, V.V. Tuchin, E. A. Genina

Saratov State University, Saratov, Tomsk State University, Tomsk, Russia

#### B-P-13

#### Monitoring of the volume fraction of water and optical clearing agents in skin ex vivo

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#### B-P-14

#### Nanocomplexes for nanomaterial-based and enzyme-assisted photodynamic therapy

<u>A. Zakoyan</u>, L. Mkrtchyan, N. Sarkisyan, R. Grigoryan, V. Tuchin, G. Gyulkhandanyan *Institute of Biochemistry, NAS of Armenia, Yerevan, Armenia* 

#### B-P-15

Monitoring of the ice ball formation during tissue cryosurgery using sapphire shaped crystals <u>A.K. Zotov</u>, I.N. Dolganova, K.I. Zaytsev, I.A. Shikunova, L.P. Safonova and V.N. Kurlov *Institute of Solid State Physics of the Russian Academy of Sciences, Chernogolovka, Russia* 

#### Section LASER DIAGNOSTICS AND SPECTROSCOPY

#### LD-P-1

### Dye's fluorescence amplification by nanostructures on various semiconductor thin films

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#### LD-P-2

Luminescent kinetics of the Quantum Dots inside Polymer with Different Refractive Indexes

K. Magaryan, I. Kalaev, A. Tarasevich, A. Arzhanov, A. Alentiev, S. Chirkov

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#### LD-P-3

Resonant hyper-Raman scattering of light by 2LO phonons in a CdS crystal

#### L. Semenova

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# Raman and hyper-Raman scatterings of light by TO phonons in a CdS crystal L. Semenova

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