ALT`21

INTERNATIONAL CONFERENCE

Advanced Laser Technologies

PROGRAM

September 06-10, 2021

MOSCOW, RUSSIA

PROGRAM BOOK

ALT`21

The 28th International Conference on Advanced Laser Technologies

September 06-10, 2021 / Moscow, Russia

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Plenary Speakers

Prof. Bruno Bousquet

University of Bordeaux, Bordeaux, France

Title: SuperCam: a unique instrument for remote laser-based analyses on Mars

Abstract

In the frame of the NASA mission Mars 2020, the rover Perseverance landed on Mars on Feb, 18, 2021. Among the instruments onboard the rover, SuperCam [1,2] enables the remote analysis of rock and soil samples with three types of laser-based spectroscopy : laser-induced breakdown spectroscopy (LIBS), time-resolved Raman (TRR) and time-resolved luminescence (TRL).

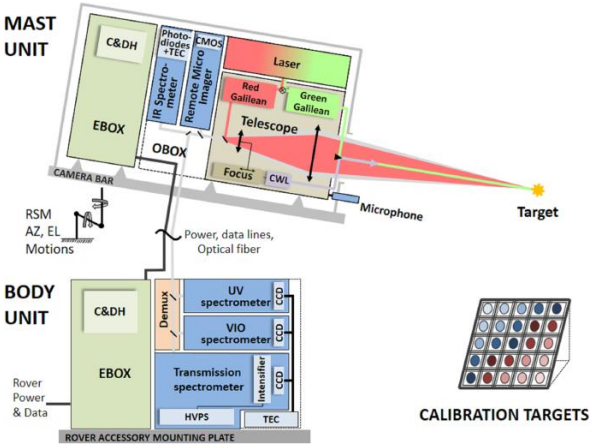


Fig.1. schematic diagram showing the major units and subcomponents of the SuperCam instrument suite is given in Figure 1.

The aim of this presentation is to give an overview of the Mars2020 mission and more precisely the SuperCam instrument schematically described in Figure 1. SuperCam is equipped with a diode pumped Q-switched Nd:YAG laser delivering nanosecond millijoule pulses at 1064 nm for LIBS and 532 nm for TRR and TRL, up to seven meter. It also records passive spectra in the visible and infrared, and high-resolution images and sounds.

After a brief update of the operations performed by Perseverance on Mars, we will present a selection of results including spectra, images and sounds to illustrate the role of the SuperCam instrument. We will also discuss the necessity of applying advanced data processing strategies to interpret the data.

Finally, we will present laboratory experiments of plasma-induced luminescence (PIL) [3] developed to support the SuperCam instrument and assess the potential of this type of spectroscopy as a complement to the techniques mentioned previously.

1. Wiens, R.C., Maurice, S., Robinson, S.H. et al. The SuperCam Instrument Suite on the NASA Mars 2020 Rover: Body Unit and Combined System Tests. Space Sci Rev 217, 4 (2021). https://doi.org/10.1007/s11214-020-00777-5
2. Maurice, S., Wiens, R.C., Bernardi, P. et al. The SuperCam Instrument Suite on the Mars 2020 Rover: Science Objectives and Mast-Unit Description. Space Sci Rev 217, 47 (2021). https://doi.org/10.1007/s11214-021-00807-w
3. Clavé, E.,Gaft, M., Motto-Ros, V. et al. Extending the potential of plasma-induced luminescence spectroscopy. Spectrochim. Acta B At. Spectrosc., 177 (2021) 106111.

Biography

Bruno Bousquet, Professor of Physics at University of Bordeaux, France.

His main research activity is laser-based spectroscopy. He obtained a PhD in Physics in 1997 at university of Bordeaux, and started his career as assistant professor at university of Brest in 1999 before moving back to Bordeaux in 2001. Since 2003, he is working on LIBS and multivariate data processing referred as chemometrics. Laureate of the Fulbright program in 2011 he worked one year at University of Central Florida, Orlando, USA. He is teaching Optics at the institute of technology, at university of Bordeaux. He is today member of the SuperCam team, in the frame of the Mars 2020 NASA program.

Prof. Igor K. Lednev

Department of Chemistry,
Department of Biological Sciences,
University at Albany, State University of New York (SUNY), USA

Title: Raman spectroscopy and machine learning for medical diagnostics and forensic purposes

Abstract

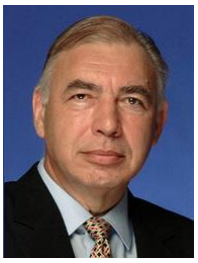
Raman spectroscopy combined with advanced statistics is uniquely suitable for characterizing microheterogeneous samples. Understanding the structure and (bio)chemical composition of samples at the microscopic level is important for many practical applications including material science, pharmaceutical industry, etc. We have recently demonstrated a great potential of Raman hyperspectroscopy for disease diagnostics and forensic purposes. In this presentation, we will discuss the development of a new, noninvasive method for Alzheimer's disease (AD) diagnostics based on Raman spectroscopy of blood. Near infrared (NIR) Raman hyperspectroscopy coupled with advanced multivariate statistics was utilized for differentiating patients diagnosed with Alzheimer's disease, other types of dementia and healthy control subjects with more than 95% sensitivity and specificity. When fully developed, this fast, inexpensive noninvasive method could be used for screening at risk patient populations for AD development and progression.

Raman spectroscopy has already found numerous applications in forensic chemistry providing confirmatory identification of analytes. The technique is non-destructive, rapid and requires little or no sample preparation. Furthermore, portable Raman instruments are readily available allowing for crime scene accessibility. We have recently demonstrated that Raman microspectroscopy can be used for the identification of biological stains at a crime scene indicating the type of body fluid. In addition, peripheral and menstrual blood as well as human and animal blood can be differentiated. The time since deposition of bloodstain can be estimated up to two years. Most recently, we demonstrated the proof-of-concept for phenotype profiling based on Raman spectroscopy of dry traces of body fluids including the determination of sex, race and age group of the donor.

Biography

Igor K. Lednev graduated from the Moscow Institute of Physics and Technology, Russian Federation. He is currently a Professor in the Department of Chemistry, Department of Biological Sciences and RNA Institute at the University at Albany, State University of New York. In 2021, he was appointed as a

Leading Scientist of the Laboratory of Laser Molecular Imaging and Machine Learning (LM&ML) at the Tomsk State University supported from Megagrant-2021. His research is focused on the development of novel laser spectroscopy for forensic purposes and medical diagnostics. He coauthored over 250 publications in peer-reviewed journals reaching h-index of 60. He is a cofounder and CTO of startup company SupeMEtric LLC targeting the commercialization of his patented technology for forensic applications. Lednev is on editorial boards of Journal Raman Spectroscopy, Forensic Chemistry, High Energy Chemistry journals and Spectroscopy magazine. He served as an advisory member on the White House Subcommittee for Forensic Science. He is a Fellow of the Society for Applied Spectroscopy and the Royal Society of Chemistry. Dr. Lednev received several prestigious awards including Gold Medal Award from the Society for Applied Spectroscopy, Guest Prof. Fellowship from the Friedrich-Schiller-University, Jena, Germany and Research Innovation Award from Research Corporation.



Prof. Boris Lukiyanchuk

Physical Faculty, Lomonosov Moscow State University, Moscow, Russia

Title: Optical phenomena in micrometer dielectric spheres

Abstract

In the Mie theory, representing the exact solution of Maxwell's equations for scattering plane wave on a homogeneous sphere, electromagnetic fields depend on the refractive index of the sphere, n, and the so-called size parameter, $q = 2\pi R / \lambda$, where R is the radius sphere, and λ is the radiation wavelength. The history of classical optics is associated with lenses, with a size of about one centimeter (Galileo's telescope, microscope, etc.). The corresponding size parameter in such optical systems is quite large, $q > 10^5$. The geometrical optics approximation is in good agreement with the Mie theory for $q > 10^2$. Research on the optics of nanostructures in plasmonics and nanophotonics refer to the systems where the size parameter is of the order of unity, $q \sim 1$. In this area, progress has been made in the study of optically resonant dielectric nanostructures with a high refractive index [1]. At the same time, structures with the size parameter of the ten, $q \sim 10$, are in the region between the wave and geometric optics turned out to be a "blank spot" on the map of optics due to the reason that lenses of the size of a few micrometers had no particular interest.

However, the studies on the optics of dielectric spheres micrometer sizes over the past twenty years, discover a number of unusual phenomena, including photonic nanojets [2], optical nanovortices [3], Fano resonances [4], magnetic light [5], the effects of overcoming the diffraction limit in the virtual image [6], effects associated with the excitation of anapole modes [7-9] and the excitation of giant magnetic fields [10]. The report gives an overview of these phenomena and discusses the physical mechanisms underlying these phenomena. The presence of a number of interesting applications indicates a new promising direction in optics.

This work was supported by the Ministry of Science and Higher Education Russian Federation (grant # 14.W03.31.0008) and also partially supported by the Russian Science Foundation (project # 20-12-00389) and by the Basic Russian Foundation (project # 20-02-00715).

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3. B. S. Luk`yanchuk et al.// *Journal of Optics* **15**, 073001 (2013).
4. B. Luk`yanchuk et al.// *Nature Materials* **9**, 707 (2010).
5. A.I. Kuznetsov et al.// *Scientific Reports* **2**, 492 (2012).
6. Z.B. Wang et al.// *Nature Communications* **2**, 218 (2011).
7. A.E. Miroshnichenko et al.// *Nature Communications* **6**, 8069 (2015).
8. B. Luk`yanchuk et al.// *Phil. Trans. Roy. Soc*. A **375**, 20160069 (2017).
9. B. Luk`yanchuk et al.// *Phys. Rev*. A **95**, 063820 (2017).
10. Z.B. Wang et al.// *Scientific Reports* **9**, 20293 (2019).

Biography

Boris Lukiyanchuk graduated from M. V. Lomonosov Moscow State University, Russia. He got PhD, Doctor of Sciences (Habilitation) and State Professor's Degree. Till 1999 he was working as a Head of the Laboratory at General Physics Institute, Russian Academy of Sciences, Moscow. Since 1999 to 2019 was working at Data Storage Institute, Agency for Science, Technology and Research, Singapore and Professor of School of Physical & Mathematical Sciences, Division of Physics and Applied Physics, Nanyang Technological University, Singapore. During 1989 – 2000 Lukiyanchuk was working as Visiting Professor at the Universities of Austria, Italy, France, Sweden, Japan and Australia. He is a Honorary Professor at Johannes Kepler University, Linz, Austria and a Fellow of the Optical Society of America. He got IES Prestigious Engineering Achievement Awards 2004, Singapore, President's Science Award, Singapore 2013 and World Scientific Physics Research Award and Gold Medal, Singapore 2016. At present Lukiyanchuk is working as Professor, Head of the Nonlinear and Extreme Nanophotonics Laboratory, Lomonosov Moscow State University, Faculty of Physics, Moscow, Russia. He is a Guest Editor of Appl. Phys. A and J. Appl. Phys., Topical Editor of Optics Letters and Journal of Optics.

Prof. Galiya Kitaeva

Physical Faculty, Lomonosov Moscow State University, Moscow, Russia

Title: Generation and detection of quantum-correlated pairs of optical and terahertz photons

Abstract

Generation of terahertz frequency (THz) fields with quantum properties and study of statistical parameters of THz radiation at the photonic level can provide a new understanding of the interaction of THz fields with matter and be useful for expanding optical quantum technologies, such as quantum field sensing [1], imaging [2], spectroscopy [3], photometry [4], for the THz range. Quantum-correlated pairs of photons of optical and terahertz ranges ("optical - terahertz biphotons"), generated under spontaneous parametric down-conversion (SPDC) in a strongly frequency non-degenerate regime [5,6], are first exciting examples of non-classical radiation matching the terahertz gap.

The prospects and challenges of generation and detection of optical-terahertz biphotons are analyzed theoretically, using the generalized Klyshko-Kirchhoff approach [6], and experimentally, by studying the SPDC fields generated under pulsed laser pumping of nonlinear Mg:$LiNbO_3$ crystal. Analysis of frequency-angular distributions of optical photons generated at the Stokes idler frequency

shifts 0.2–5 THz at different crystal temperatures in the range from 300 K to 4.2 K enabled to predict the temperature behavior of the total number of THz idler photons, the temperature variation of the optical-terahertz biphoton function, and to study the contributions of classical thermal and pure quantum field fluctuations to parameters of biphotons [7]. It was shown that detecting only optical part of SPDC can provide information on THz properties of matter without direct detection of THz waves [8,9]. However, for a vast majority of attracting quantum applications such as ghost imaging without THz cameras, absolute calibration of quantum efficiency of THz detectors, and other tasks, the direct measurement of optical-terahertz correlation function $g^{(2)}$ is important. An experimental scheme for direct measuring of $g^{(2)}$ for the optical–THz biphotons has been designed and implemented recently. Terahertz radiation of type-0 SPDC in cooled down to 4.8 K Mg:$LiNbO_3$ was detected with a superconducting NbN bolometer operating in an analog detection mode [10-12]. A special procedure was proposed for evaluating $g^{(2)}$ in the absence of single-photon THz detectors and impossibility of using coincidence circuits. A quantum excess over the classical level of correlations between optical and terahertz fields was detected experimentally for the first time.

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[8] K.A. Kuznetsov, E.I. Malkova, R.V. Zakharov, O.V. Tikhonova, G.Kh. Kitaeva, Nonlinear interference in strongly non-degenerate regime and Schmidt mode analysis, Physical Review A, vol. 101, p. 053843, (2020).
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[12] P. Prudkovskii, A. Leontyev, K. Kuznetsov, G. Kitaeva, Towards Measuring Terahertz Photon Statistics by a Superconducting Bolometer, Sensors, vol. 21, p. 4964 (2021)

Biography

Galiya Kitaeva is a Professor in Lomonosov Moscow State University, was a visiting Professor at National University of Singapore, National Tsing Hua University of Taiwan, Paderborn University and Friedrich-Alexander-Universität Erlangen-Nürnberg in Germany. Working at MSU since graduation, she studied applications of spontaneous parametric down-conversion effect in quantum photometry and spectroscopy of phonon polaritons, also taking advantage of the nonlinear-optical processes in periodically poled crystals and other spatially inhomogeneous solid structures. In 1982 she received PhD and in 2002 received her Doctor of Science Degree, both in MSU. Since 2006 develops the laser-based methods for the terahertz wave generation, detection and spectroscopy. Starting from 2016 Galiya Kitaeva is a leader of Quantum Optical-Terahertz Photonics Lab at the MSU Chair of Quantum Electronics. Her current research interests include generation of quantum-correlated optical-terahertz photons, applications of quantum technologies in the THz range, as well as terahertz photonics in semiconductor structures and topological insulators.

Date and Time	September 06 (Monday) / 10:00-10:40
Place	Room 1
Session Title	[P-1] Plenary session 1
Session Chair	Guillaume Duchateau *(France)*

P-1 09:00-09:45

[Plenary] SuperCam: a unique instrument for remote laser-based analyses on Mars

Bruno Bousquet

University of Bordeaux, Bordeaux, France

Date and Time	September 06 (Monday) / 11:00-12:20
Place	Room 1
Session Title	[LM-1.1] Laser-Matter Interaction 1.1
Session Chairs	Sergey Klimentov *(Russia)*, Nadejda Bulgakova (*Czech Republic*)

LM-I-1 11:00-11:20

[Invited] Ultrashort-pulse-laser excited dielectric materials: Unexpected transient optical properties

P. S. Sneftrup, S. H. Møller, T. Winkler, P. Balling

Dept. of Physics and Astronomy, Aarhus University, Aarhus C, Denmark

LM-I-2 11:20-11:40

[Invited] Ultrafast oscillatory dynamics of free carriers in semiconductors driven by intense ultrashort laser pulses: a basis of novel technologies

V. Gruzdev

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

LM-I-3 11:40-12:00

[Invited] Effects of Laser Energy Delocalization in the Regimes of Bulk Modification of Transparent Dielectrics

M. Zukerstein, V.P. Zhukov, N.M Bulgakova

HiLASE Centre, Institute of Physics ASCR, Czech Republic

LM-I-4 12:00-12:20

[Invited] Solving Bloch equations to evaluate the energy deposition in silica induced by two-color femtosecond laser pulses

P. González de Alaiza Martínez, E. Smetanina, I. Thiele, B. Chimier, G. Duchateau

University of Bordeaux-CNRS-CEA, Centre Lasers Intenses et Applications, France

Date and Time	September 06 (Monday) / 12:40-14:00
Place	Room 1
Session Title	[LM-1.2] Laser-Matter Interaction 1.2
Session Chairs	Olivier Uteza *(France)*, Sergey Klimentov *(Russia)*

LM-I-5 12:40-13:00

[Invited] Ultrashort laser heating of Al and W metals: learning from self-reflectivity and ablation threshold measurements

T.Genieys, G. Tsibidis, M. Sentis, O. Utéza

Aix-Marseille University, CNRS, LP3, Marseille, France

LM-I-6 13:00-13:20

[Invited] Reverse deposition of oxides under nanosecond laser ablation of metals: physical mechanisms and applications

V.P. Veiko, J.J. Karlagina, A.A. Samokhvalov, D.S. Polyakov, I.B. Gornushkin

ITMO University, Saint-Petersburg, Russia

LM-I-7 13:20-13:40

[Invited] Influence of pulse duration and pulse separation on dynamics and efficiency of ultrafast laser ablation of metals

J. Winter, M. Spellauge, D. Redka, H.P. Huber

Munich University of Applied Sciences, Munich, Germany

LM-I-8 13:40-14:00

[Invited] Assessment of the time-dependent density functional theory for investigating femtosecond laser energy absorption by metals

T. J.-Y. Derrien, Y. Levy, N.M. Bulgakova

Institute of Physics AS CR, HiLASE Centre, Czech Republic

Date and Time	September 06 (Monday) / 11:00-12:20
Place	Room 2
Session Title	[B-1.1] Biophotonics 1.1
Session Chair	Alexander Priezzhev *(Russia)*, Andrei Lugovtsov *(Russia)*

B-I-1 11:00-11:20

[Invited] Surface-enhanced Raman scattering from Au nanorods as a function of their aspect ratio and morphology: the fourth-power law revisited

N. G. Khlebtsov

Institute of Biochemistry and Physiology of Plants and Microorganisms, Russian Academy of Sciences, Saratov, Russia

B-I-2 11:20-11:40

[Invited] Nanoparticles fabricated by laser ablation and fragmentation of nano- and microstructured silicon: perspectives in biophotonics applications

S.V. Zabotnov, L.A. Golovan, D.A. Kurakina, A.V. Khilov, E.A. Sergeeva, D.V. Shuleiko, O.I. Sokolovskaya, V.Yu. Nesterov, D. E. Presnov, P.K. Kashkarov, P.D. Agrba, M.Yu. Kirillin

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

B-I-3 11:40-12:00

[Invited] Laser-based techniques for verification of nanomaterials safety from microrheologic viewpoint

A.E. Lugovtsov, A.I. Neznanov, A.A. Kapkov, I.M. Kadanova, E.V. Perevedentseva, C.-L. Cheng, A.V. Priezzhev

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

B-O-1 12:00-12:15

Photothermal effect in skin tumor with embedded silicon nanoparticles: numerical simulation

O.I. Sokolovskaya, S.V. Zabotnov, L.A. Golovan, P.K. Kashkarov, A.V. Khilov, D.A. Kurakina, E.A. Sergeeva, M.Yu. Kirillin

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

Date and Time	September 06 (Monday) / 12:40-14:05
Place	Room 2
Session Title	[B-1.2] Biophotonics 1.2
Session Chair	Andrei Zvyagin *(Australia)*

B-I-4 12:40-13:00

[Invited] Tunable self-assembly in colloidal materials: Designing structures and properties with external fields

P.A. Libet, I.V. Simkin, S.A. Korsakova, K.A. Komarov, E.V. Yakovlev, N.P. Kryuchkov, and S.O. Yurchenko

Bauman Moscow State Technical University, Moscow, Russia

B-I-5 13:00-13:20

[Invited] Direct in situ observation of nanoparticles in turbid colloidal solutions

P.A. Demina, A. Kostyuk, Y. Lu, E.A. Sergeeva, E.V. Khaydukov, A.V. Ivanov, A.V. Zvyagin

Macquarie University, Sydney, Australia

B-O-2 13:20-13:35

Increasing the thermal effect efficiency of NIR laser radiation on biological tissue using Yb-containing dielectric nanoparticles

S.A. Khrushchalina, A.N. Belyaev, O.S. Bushukina, P.A. Ryabochkina, I.A. Yurlov

National Research Ogarev Mordovia State University, Saransk, Russia

B-O-3 13:35-13:50

Plasmon resonances of the dielectric-metal core-shell nanostructure in the near infrared range

I.A. Pavlichenko

University of Nizhny Novgorod, Nizhny Novgorod, Russia

B-O-4 13:50-14:05

Time-resolved analysis of upconversion nanoparticles and photosensitizers fluorescence to determine the type of cell metabolism

D.V. Pominova, I.D. Romanishkin, V.Y. Proydakova, E.Z. Sadykova, A.V. Ryabova
Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

Date and Time	September 06 (Monday) / 11:00-12:20
Place	Room 3
Session Title	[LS-1.1] Laser Systems and Materials 1.1
Session Chairs	Valentin Petrov *(Germany),* Denis Penninckx *(France)*

LS-I-1 11:00-11:20

[Invited] Upconversion pumping of continuous-wave tunable Tm3+-doped KY3F10 lasers near 2 and 2.3 μm

A. Sennaroglu, Y. Morova, E.N. Kamun, M. Tonelli, and V. Petrov
Departments of Physics and Electrical-Electronics Engineering, Koç University, Istanbul, Turkey

LS-I-2 11:20-11:40

[Invited] Rare earth doped selenide glasses as 5-6 μm laser materials

S.E.Sverchkov, B.I.Denker, B.I.Galagan, V.V.Koltashev, V.G.Plotnichenko, G.E.Snopatin, M.V.Sukhanov, A.P.Velmushov, M.P.Frolov, P.Fjodorow, S.O.Leonov
Prokhorov General Physics Institute, Russian Academy of Sciences, Moscow, Russia

LS-I-3 11:40-12:00

[Invited] Waveguide Lasers Based on Fluoride Films Grown by Liquid Phase Epitaxy

P. Loiko, G. Brasse, A. Braud, J.-L. Doualan, and P. Camy
CIMAP, Université de Caen Normandie, France

LS-I-4 12:00-12:20

[Invited] Investigations on high power oscillators and amplifiers based on birefringent Yb:LiLuF4 Single Crystal Fibers grown by the micro pulling down

S. Pizzurro, M. Tonelli, A. Agnesi, F. Pirzio
Dip. di Ingegneria Industriale e dell'Informazione, University of Pavia, Pavia, Italy

Date and Time	September 06 (Monday) / 12:40-14:00
Place	Room 3
Session Title	[LS-1.2] Laser Systems and Materials 1.2
Session Chair	Boris Denker (*Russia*), Li Wang *(China)*

LS-I-5 12:40-13:00

[Invited] High Efficiency In-Band Fiber-Laser Pumped 2-um Lasers Based on Tm-doped Ceramics and

Crystals and Mid-IR Conversion of Their Radiation

O.L. Antipov

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

LS-O-1 13:00-13:15

Crystalline and electronic structure, spectroscopy and laser operation of Tm:KY(MoO4)2 crystal

S. Slimi, P. Loiko, A. Volokitina, A. Pavlyuk, R.M. Solé, J.M. Serres, U. Griebner, V. Petrov, M. Aguiló, F. Díaz, and X. Mateos,

Rovira i Virgili University (URV), Tarragona, Spain

LS-O-2 13:15-13:30

Mid-Infrared Laser Operation of Er:KY3F10 Crystal at 2.80 µm

L. Basyrova, P. Loiko, J.-L. Doualan, A. Benayad, A. Braud, C. Labbé, and P. Camy

Université de Caen Normandie, France

LS-O-3 13:30-13:45

Laser spectroscopy of a new CaSrBaF6: Tm3+ crystal

Alimov O.K., Doroshenko M.E., Konyushkin V.A., Kuznetsov S.V., Nakladov A.N., Nekhoroshikh A.V, Pierpoint K.A.

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

LS-O-4 13:45-14:00

Structural and spectroscopic features of the rare-earth-doped bixbyite-type yttrium scandate

E. Dobretsova, O. Alimov, D. Guryev, S. Rusanov, V. Kashin, S. Kutovoi, V. Vlasov, V. Voronov, G. Kiriukhina, S. Simonov, Olga Yakubovich, V. Tsvetkov

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

Date and Time	September 06 (Monday) / 15:00-16:20
Place	Room 1
Session Title	[LM-1.3] Laser-Matter Interaction 1.3
Session Chairs	Wolfgang Kautek (*Austria*), Vitali Kononenko (*Russia)*

LM-I-9 15:00-15:20

[Invited] Femtosecond Laser Induced Physicochemical Reactions

W. Kautek

University of Vienna, Department of Physical Chemistry, Vienna, Austria

LM-I-10 15:20-15:40

[Invited] Laser-induced plasma in water as an origin of chemical reactions

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

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

LM-I-11 15:40-16:00

[Invited] Femtosecond Laser Induced Surface Crystalline-Amorphous Alternating Structure on a GST225 Thin Film for Optical Applications

S. Kozyukhin, T. Kunkel, M. Smayev, Yu. Vorobyov, P. Lazarenko

Kurnakov Institute of General and Inorganic Chemistry of RAS, Moscow, Russia

LM-I-12 16:00-16:20

[Invited] Synthesis by laser ablation in liquid of alloy nanoparticles: controlling the structure and the composition for specific applications

V. Amendola

University of Padova, Department of Chemical Sciences 1, Italy

Date and Time	September 06 (Monday) / 16:40-18:00
Place	Room 1
Session Title	[LM-1.4] Laser-Matter Interaction 1.4
Session Chairs	John Lopez (*France*), Frank Wagner (*France)*

LM-O-1 16:40-16:55

Multiscale surface texturing of zirconium based thin film metallic glasses by femtosecond laser pulses

M. Prudent, F. Bourquard, A. Borroto, J.F. Pierson, F. Garrelie, J.P. Colombier

Univ Lyon, UJM-Saint-Etienne, CNRS, Institute of Optics Graduate School, Laboratoire Hubert Curien UMR, France

LM-I-13 16:55-17:15

[Invited] UV-laser induced contamination on space optics

F. R. Wagner, G. Gebrayel El Reaidy, D. Faye and J.-Y. Natoli

Aix Marseille Univ, CNRS, Centrale Marseille, Institut Fresnel, Marseille, France

LM-O-2 17:15-17:30

Direct laser printing of continuous graphene patterns from a growth substrate

N. Kurochitsky, M. Komlenok, P. Pivovarov, M. Dezhkina, M. Rybin, S. Savin, A. Popovich, E. Obraztsova, V. Konov

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

LM-O-3 17:30-17:45

Effect of alumina content on femtosecond laser processing of zirconia/alumina composites

Jide Han, Olivier Malek, Jozef Vleugels, Annabel Braem, Sylvie Castagne

KU Leuven, Leuven, Belgium

LM-O-4 17:45-18:00

Laser micro-processing of graphite with pulsed ytterbium laser

T. Doualle, M. Reymond, Y. Pontillon, L. Gallais

CEA, DES, IRESNE, DEC, Cadarache F-13108 Saint-Paul-Lez-Durance, France

Date and Time	September 06 (Monday) / 15:00-16:20
Place	Room 2
Session Title	[B-1.3] Biophotonics 1.3
Session Chair	Ilya Turchin *(Russia)*

B-I-6 15:00-15:20

[Invited] Macroscopic Time- and Spectrally Resolved Fluorescence Imaging

V. Shcheslavskiy, M. Shirmanova, J. Lagarto, D. Yuzhakova, A. Mozherov, F.S. Pavone, R. Cicchi and W. Becker

Becker&Hickl GmbH, Berlin, Germany

B-I-7 15:20-15:40

[Invited] Endogenous NIR fluorophores for biomedical diagnostics

E.A. Shirshin

Lomonosov Moscow State University, Moscow, Russia

B-I-8 15:40-16:00

[Invited] Multiparametric FLIM for cancer study using endogenous fluorescence and genetically encoded sensors

M. Shirmanova, A. Gavrina, A. Polozova, L. Shimolina, I. Druzhkova, N. Ignatova, V. Dudenkova, M. Lukina, V. Shcheslavskiy, K. Lukyanov, V. Belousov, E. Zagaynova

Privolzhsky Research Medical University, Nizhny Novgorod, Russia

B-I-9 16:00-16:20

[Invited] Complementary fluorescence and optoacoustic monitoring of treatment with novel photoactivatable agents for combined photodynamic and chemotherapy

I. Turchin, M. Kirillin, A. Orlova, V. Perekatova, V. Plekhanov, E. Sergeeva, D. Kurakina, A. Khilov, A. Kurnikov, P. Subochev, M. Shirmanova, A. Komarova, D. Yuzhakova, A. Gavrina, S. Bano, S. Mallidi, T. Hasan

Institute of Applied Physics RAS, Nizhny Novgorod, Russia

Date and Time	September 06 (Monday) / 16:40-18:00
Place	Room 2
Session Title	[B-1.4] Biophotonics 1.4
Session Chair	Tatiana Novikova *(France)*

B-I-10 16:40-17:00

[Invited] Label-free optical diagnosis of malignant and benign neoplasms with different nosologies and localizations

I.V Reshetov, K.I. Zaytsev, I.N. Dolganova, E.N. Rimskaya, K.G. Kudrin, P.A. Karalkin, V.N. Kurlov, and V.V. Tuchin

Institute for Cluster Oncology, Sechenov University, Moscow, Russia;

B-I-11 17:00-17:20

[Invited] Applications of FLIM in regenerative medicine

A. Kashina, D. Kuznetsova, V. Elagin, V. Dudenkova, S. Rodimova, M. Karabut, A. Kashirina, E. Dashinimaev, E. Vorotelyak, N. Bobrov, V. Zagainov, V. Shcheslavskiy, E. Zagaynova

Privolzhsky Research Medical University, Nizhny Novgorod, Russia

B-O-5 17:20-17:35

Multiphoton microscopy and FLIM metabolic imaging of the hepatocytes during liver regeneration

S.A. Rodimova, D.S. Kuznetsova, N.V. Bobrov, A.A. Gulin, V.V. Elagin, M.M. Karabut, V.I. Shcheslavskiy, V.E. Zagainov, E.V. Zagaynova

Privolzhsky research medical university, Institute of Experimental Oncology and Biomedical Technologies, N.I. Lobachevsky Nizhny Novgorod National Research State University, Nizhny Novgorod, Russia

B-O-6 17:35-17:50

Visualization of viscous changes of membranes of tumor cell during chemotherapy

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

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

B-I-12 17:50-18:10

[Invited] Advances in Mueller polarimetry for tissue diagnosis

T. Novikova, O. Rodriguez-Nunez, H.R. Lee, P. Schucht, A. Raabe, E. Hewer, E. Kovari, A. Pierangelo

LPICM, CNRS, Ecole polytechnique, IP Paris, Palaiseau 91128 France

Date and Time	September 06 (Monday) / 15:00-16:20
Place	Room 3
Session Title	[LS-1.3] Laser Systems And Materials 1.3
Session Chair	Jerome Lhermite *(France),* Igor Bufetov *(Russia)*

LS-I-6 15:00-15:20

[Invited] NIR Fluorescence Concentration Self-Quenching and Quenching by OH- Acceptors in Aqueous Colloids of Nd3+ Doped Fluoride Nanocrystals

Yu.V. Orlovskii, A.V. Popov, E.O. Orlovskaya, A.S. Vanetsev

Prokhorov General Physics Institute RAS, Moscow, Russia

LS-I-7 15:20-15:40

[Invited] Yb:LuAP Laser Crystal for Mode-Locked Lasers and Chirped Pulse Regenerative Amplifiers

V.E. Kisel, A.S. Rudenkov, A.S. Yasukevich, K.L. Hovhannesyan, A.G. Petrosyan, and N.V. Kuleshov

Center for Optical Materials and Technologies, Belarusian National Technical University, Minsk, Belarus

LS-I-8 15:40-16:00

[Invited] Non-resonant PPLN optical parametric oscillator in the narrow-band regime

Li Wang, W. Chen, and V. Petrov

Max Born Institute for Nonlinear Optics and Ultrafast Spectroscopy, Berlin, Germany,
Hefei Institutes of Physical Science, Chinese Academy of Sciences, Anhui, China

LS-I-9 16:00-16:20

[Invited] Dual-comb mode-locked lasers based on intrinsic polarization-multiplexing

M. Kowalczyk, L. Sterczewski, X. Zhang, V. Petrov, Z. Wang, J. Sotor
Laser & Fiber Electronics Group, Faculty of Electronics, Wroclaw University of Science and Technology, Poland

Date and Time	September 06 (Monday) / 16:20-18:00
Place	Room 3
Session Title	[LS-1.4] Laser Systems And Materials 1.4
Session Chair	Yurii Orlovskii *(Russia),* Nikolay Kuleshov *(Belarus)*

LS-I-10 16:20-17:00

[Invited] Third Order Nonlinearity for Contrast Enhancement of High Power Femtosecond Lasers

E. Khazanov
Institute of Applied Physics of the Russian Academy of Sciences, Nizhny Novgorod, Russia

LS-I-11 17:00-17:20

[Invited] Advanced technologies for energetic lasers

D. Penninckx
CEA DAM CESTA, Arpajon, France

LS-I-12 17:20-17:40

[Invited] HORIZON Laser: a new generation of kW-class ps amplifier

J. Lhermite, C.Féral, D. Marion, A. Rohm, Ph. Balcou, D. Descamps, S. Petit, M.C. Nadeau, E. Mével
Université de Bordeaux-C.N.R.S.-C.E.A., Centre Lasers Intenses et Applications (CELIA), Talence, France

LS-I-13 17:40-18:00

[Invited] Periodically Poled Ferroelectric Crystals and Thin Films for Nonlinear Optical Conversions and Controlling of Coherent Light

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

Date and Time	September 07 (Tuesday) / 10:00-10:40
Place	Room 1
Session Title	[P-2] Plenary session 2
Session Chair	Valery Tuchin *(Russia)*

P-2 10:00-10:40

[Plenary] Raman spectroscopy and machine learning for medical diagnostics and forensic purposes

Igor Lednev

Department of Chemistry, Department of Biological Sciences, University at Albany, State University of New York (SUNY), USA

Date and Time	September 07 (Tuesday) / 11:00-12:20
Place	Room 1
Session Title	[LM-2.1] Laser-Matter Interaction 2.1
Session Chair	Joern Bonse (*Germany*)

LM-I-14 11:00-11:20

[Invited] Laser-induced periodic surface structures: when electromagnetics drives hydrodynamics

J. Bonse, M. Mezera, C. Florian, J. Krüger, S. Gräf

Bundesanstalt für Materialforschung und -prüfung (BAM), Unter den Eichen 87, D-12205 Berlin, Germany

LM-I-15 11:20-11:40

[Invited] Tailoring Sub-micrometer Periodic Surface Structures via Ultrashort Pulsed Direct Laser Interference Patterning

F. Fraggelakis, G. D. Tsibidis and E. Stratakis

Institute of Electronic Structure and Laser (IESL), Foundation for Research and Technology (FORTH), Crete, Greece

LM-I-16 11:40-12:00

[Invited] Laser-induced micro- and nano-structures for biomedical applications

J. Heitz

Institutes of Applied Physics, Johannes Kepler University Linz, Austria

LM-I-17 12:00-12:20

[Invited] Improvement of fabrication resolution in two-photon polymerization by using GHz burst mode

K. Sugioka, K. Obata, and F. Caballero-Lucas

RIKEN Center for Advanced Photonics, RIKEN, Wako, Japan

Date and Time	September 07 (Tuesday) / 12:40-14:00
Place	Room 1
Session Title	[LM-2.2] Laser-Matter Interaction 2.2
Session Chair	Razvan Stoyan (*France)*

LM-I-18 12:40-13:00

[Invited] Non-diffractive ultrafast beams, new opportunities for material processing

R. Stoian

Laboratoire Hubert Curien, CNRS UMR 5516, Université Jean Monnet, 42000 St Etienne, France

LM-I-19 13:00-13:20

[Invited] Electron and Phonon Dynamics in Nonlinear Optics by Multiscale First-Principles Simulation

A. Yamada

University of Tsukuba, Center for Computational Sciences, Japan

LM-I-20 13:20-13:40

[Invited] Scattering and self-healing of terahertz high-order Bessel beams transmitting through randomly inhomogeneous media and obstacles

B.A. Knyazev, V.S. Pavelyev, K.N. Tukmakov, A.S. Reshetnikov, V.V. Gerasimov, N.D. Osintseva

Samara National Research University, Samara, Budker Institute of Nuclear Physics of SB RAS, Novosibirsk, Russia

LM-I-21 13:40-14:00

[Invited] Optical Non-Linearity and Light Diffusion in Laser-Pumped Fluorescent Nanocomposites: From a Spontaneous Fluorescence Emission to a Random Lasing

D.A. Zimnyakov, S.S. Volchkov, L.A. Kochkurov, A.F. Dorogov

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

Date and Time	September 07 (Tuesday) / 11:00-12:20
Place	Room 2
Session Title	[B-2.1] Biophotonics 2.1
Session Chair	Petr Timashev *(Russia)*

B-I-13 11:00-11:20

[Invited] Probing Small Distances in Live Cell Microscopy

H. Schneckenburger, V. Richter

Institute of Applied Research, Aalen University, Germany

B-I-14 11:20-11:40

[Invited] The Fastest High-Resolution 3D Imaging of Sperm Cells during Free Swim

N.T. Shaked

Department of Biomedical Engineering, Tel Aviv University, Israel.

B-I-15 11:40-12:00

[Invited] Biological Atomic-Force Microscopy: Is It worth It?

P.S. Timashev

Institute for Regenerative Medicine, Sechenov University, Moscow, N.N. Semenov Institute of Chemical Physics of RAS, Research Center "Crystallography and Photonics" of RAS, Russia

B-I-16 12:00-12:20

[Invited] Highly sensitive optical methods for differential diagnosis of autoimmune diseases and identification of DNA molecules

P.I. Nikitin, A.V. Orlov, V.A. Bragina, A.V. Pushkarev, E.N. Mochalova, M.P. Nikitin, B.G. Gorshkov

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

Date and Time	September 07 (Tuesday) / 12:40-14:00
Place	Room 2
Session Title	[B-2.2] Biophotonics 2.2
Session Chair	Yuri Kistenev *(Russia)*

B-I-17 12:40-13:00

[Invited] The development of technologies for biomedical imaging of skin cancer

E.A. Genina, E.N. Lazareva, V.D. Genin, I.A. Serebryakova, Y.I. Surkov, A.N. Bashkatov, M.A. Ansari, Y.K. Kuzinova, O.M. Konopatskova, V.V. Tuchin

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

B-I-18 13:00-13:20

[Invited] Cancer tissue detection with molecular IR and THz imaging and machine learning

Y.V. Kistenev, A.V.Borisov, V.V.Nikolaev, D.A.Vrazhnov, A.I. Knyazkova

Tomsk State University, Siberian State Medical University, Tomsk, Russia

B-I-19 13:20-13:40

[Invited] Machine learning on diffuse reflectance spectra towards colorectal cancer diagnosis

H.P. Oliveira, L. Fernandes, S. Carvalho, I. Carneiro, R. Henrique, V.V. Tuchin, L.M. Oliveira

Institute for Systems and Computer Engineering, Technology and Science, University of Porto, Porto, Portugal

B-I-20 13:40-14:00

[Invited] Observation of osmotically induced strain in biological tissues with optical coherence elastography

Yu.M. Alexandrovskaya, O.I. Baum, A.A. Sovetsky, V.Yu. Zaitsev

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

Date and Time	September 07 (Tuesday) / 11:00-12:20
Place	Room 3
Session Title	[LS-2.1] Laser Systems and Materials 2.1
Session Chair	Pavel Loiko *(France),* Efim Khazanov *(Russia)*

LS-I-14 11:00-11:20

[Invited] Destruction of Optical Fibers of Various Types under the Action of High-Power Laser Radiation

I. A. Bufetov

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

LS-I-15 11:20-11:40

[Invited] Ultrashort pulses dynamics in 2 um spectral range lasers and amplifiers

V.A. Kamynin, A.D. Zverev, S.A. Filatova, I.V. Zhluktova, N.R. Arutyunyan, E.D. Obraztsova, and V.B. Tsvetkov

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

LS-I-16 11:40-12:00

[Invited] Multiband Supercontinuum Generation in the Mid-infrared Gas Fiber Raman Laser

A.V. Gladyshev, I.G. Pritulenko, Yu.P. Yatsenko, A.N. Kolyadin, I.A. Bufetov

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

LS-O-5 12:00-12:15

Silica Porous Glass Doped with Arsenic Trisulfide

J.A. Burunkova, G. Alkhalil, A.V. Veniaminov, I. Csarnovics, S. Kokenyesi

ITMO University, Saint Petersburg, Russia

Date and Time	September 07 (Tuesday) / 12:40-14:00
Place	Room 3
Session Title	[LD-2.2] Laser Diagnostics and Spectroscopy 2.2
Session Chair	Ilya Sychugov *(Sweden)*

LD-I-1 12:40-13:00

[Invited] Time-dependent density functional theory for extremely nonlinear optics

K. Yabana

Center for Computational Sciences, University of Tsukuba, Tsukuba, Japan

LD-I-2 13:00-13:20

[Invited] Surface enhanced spectroscopy and sensing enabled by femtosecond-laser-printed plasmonic metasurfaces

A. Kuchmizhak

Institute of Automation and Control Processes FEB RAS, Far Eastern Federal University, Vladivostok, Russia

LD-O-1 13:20-13:35

Optical Detection of Defects during Laser Metal Deposition: Simulations and Experiment

I.B. Gornushkin, G. Pignatelli, A. Straße

AM Federal Institute for Materials Research and Testing, Berlin, Germany

LD-I-3 13:35-13:55

[Invited] Physical and chemical characterization of the nanoparticles formed during laser cladding with metal powder

A. Nagy, Sz. Kugler, J. Osán, L. Péter, V. Groma, A. Czitrovszky

Wigner Research Centre for Physics, POB 49, H-1525 Budapest, Hungary

Date and Time	September 07 (Tuesday) / 15:00-16:20
Place	Room 1
Session Title	[LM-2.3] Laser-Matter Interaction 2.3
Session Chairs	Stephane Guizard (*France*), John Lopez (*France*)

LM-I-22 15:00-15:20

[Invited] Laser dielectric interactions: new insight from double pulse experiments

S. Guizard, A. Bildé, S. Klimentov, A. Mouskeftaras

Laboratoire Interactions, Dynamiques Lasers, UMR CEA, CNRS, Université Paris-Saclay, France

LM-I-23 15:20-15:40

[Invited] Fundamentals of ultrafast intra-center and interband photoexcitations in bulk diamond for micromarking and tracing applications

S. Kudryashov, P. Danilov, N. Smirnov, N. Stsepuro, G. Krasin, O. Kovalchuk, E. Oleynichuk, A. Levchenko, M. Kovalev, A. Ionin, N. Melnik and R. Khmelnitskiy

Lebedev Physical Institute, Moscow, Russia

LM-I-24 15:40-16:00

[Invited] Confinement of laser-matter interaction with shaped femtosecond pulses in dielectrics

F. Courvoisier, M. Hassan, K Ardaneh, B. Morel, J. Hoyo, R. Meyer, L. Furfaro, C. Billet, L. Froehly, R. Giust, C. Xie

FEMTO-ST Institute, Univ. Bourgogne Franche-Comté, CNRS, Besançon Cedex, France

LM-I-25 16:00-16:20

[Invited] Dual wavelength double fs-pulse laser irradiation for fused silica processing

J. Lopez, K. Gaudfrin(, K. Mishchik, M. Delaigue, C. Hoenninger, E. Audouard, L. Gemini, R. Kling, G. Duchateau

UNIV BORDEAUX, CNRS, CEA, CELIA UMR 5107, 33405 Talence, France

LM-I-26 16:20-16:40

[Invited] Development of logic system elements based on new physical principles using quantum nanophotonics approaches for low-dimensional laser-induced surface topological structures

S. Arakelian, A. Kucherik, D. Bukharov, T. Khudaiberganov

Stoletovs Vladimir State University, Vladimir, Russia

Date and Time	September 07 (Tuesday) / 16:40-18:05
Place	Room 1
Session Title	[LM-2.4] Laser-Matter Interaction 2.4
Session Chair	Leonid Zhigilei (*USA*) , Maximilian Spellauge *(Germany)*

LM-I-27 16:40-17:00

[Invited] Atomistic view of laser ablation and nanoparticle fragmentation in liquids

L.V. Zhigilei

University of Virginia, Department of Materials Science and Engineering, Charlottesville, Virginia, USA

LM-O-5 17:00-17:15

Laser ablation in liquid, structures, and shock peening

V. Zhakhovsky, Yu. Petrov, V. Khokhlov, V. Shepelev, S. Fortova, N. Inogamov

Center for Fundamental and Applied Research, Dukhov Research Institute of Automatics, Landau Institute for Theoretical Physics of the Russian Academy of Sciences, Moscow, Russia

LM-O-6 17:15-17:30

Ultrafast time-resolved experiments reveal the influence of a liquid confinement layer on the laser ablation dynamics of gold

M. Spellauge, C. Doñate-Buendía, S. Barcikowski, B. Gökce, H.P. Huber

Munich University of Applied Sciences, University of Duisburg-Essen, Germany

LM-I-28 17:30-17:50

[Invited] Studies of surface modifications with few cycle (about 3-4 cycles) laser pulses

Yingjie Chai, and M. J. Soileau

CREOL, the College of Optics and Photonics, University of Central Florida (UCF), Orlando, Florida, USA

LM-O-7 17:50-18:05

Generation of rarefaction and shock waves due to metal-nonmetal transition in laser ablation process

A.A. Samokhin, P.A. Pivovarov

Prokhorov General Physics Institute of the Russian Academy of Sciences, 119991, Moscow, Russia

Date and Time	September 07 (Tuesday) / 15:00-16:20
Place	Room 2
Session Title	[B-2.3] Biophotonics 2.3
Session Chair	Mikhail Kirillin *(Russia)*

B-I-21 15:00-15:20

[Invited] Phototheranostics of COVID-19: mechanisms, photosensitizers, experiment, clinic

V.B. Loschenov, A.A. Shiryaev, E.I. Kozlikina, K.T. Efenduev, D.V. Pominova, I.D. Romanishkin, A.V. Ryabova, A.A. Agumava, D.V. Bulgin, A.A. Shevalgin, Yu.Yu. Yurichenko, D.A. Sidorenkov, I.V. Reshetov

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

B-I-22 15:20-15:40

[Invited] Human visual perception of polarised light and helical wave fronts

I. Lopushenko, G. Piavchenko, S.J. Anderson, G. Misson, A.N. Yatskovskiy, A. Bykov and I. Meglinski

Optoelectronics and Measurement Techniques, University of Oulu, Oulu, Finland

B-I-23 15:40-16:00

[Invited] PDT-Duo: Dual-wavelength approaches in performance and monitoring of photodynamic therapy

M. Kirillin, D. Kurakina, A. Khilov, A. Orlova, M. Shakhova, V. Perekatova, N. Shishkova, A. Mironycheva, A. Malygina, I. Shlivko, S. Gamayuov, I. Turchin, N. Orlinskaya, and E. Sergeeva

Institute of Applied Physics RAS, Nizhny Novgorod, Russia

B-I-24 16:00-16:20

[Invited] Multimodal optical coherence tomography: biomedical achievements

M. Sirotkina, E. Gubarkova, E. Kiseleva, A. Plekhanov, K. Achkasova, D. Vorontsov, S. Kuznetsov, A. Moiseev, E. Zagaynova, G. Gelikonov, V. Zaitsev, N. Gladkova

Research Institute of Experimental Oncology and Biomedical Technologies, Privolzhsky Research Medical University, Nizhny Novgorod, Russia

Date and Time	September 07 (Tuesday) / 16:40-18:00
Place	Room 2
Session Title	[B-2.4] Biophotonics 2.4
Session Chair	Kirill Zaitsev *(Russia)*

B-I-25 16:40-17:00

[Invited] Multimodal sapphire medical instruments for laser exposure, diagnosis and treatment of tissues

I.N. Dolganova, A.K. Zotov, I.A. Shikunova, D.A. Varvina, P.A. Karalkin, K.I. Zaytsev, V.V. Tuchin, and V.N. Kurlov

Institute of Solid State Physics of the Russian Academy of Sciences, Institute for Regenerative Medicine, Sechenov University, Russia

B-I-26 17:00-17:20

[Invited] Optothermal fiber converters and their medical applications

Andrey V. Belikov, Do Thanh Tung, Yulia V. Fyodorova

ITMO University, Pavlov First Saint Petersburg State Medical University, Saint-Petersburg, Russia

B-I-27 17:20-17:40

[Invited] Photonic regulation of secondary metabolite biosynthesis by binary spectral stress

Y.N. Kulchin, V.P. Bulgakov, E.P. Subbotin, D.O. Goltsova, A.S. Kholin, L.P. Lyakhova, N.I. Subbotina,

I.V. Gafitskaya, V.P. Grigorchuk, E.V. Burkovskaya, Yu.A. Khrolenko, I.Yu. Orlovskaya, O.V. Nakonechnaya

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

B-I-28 17:40-18:00

[Invited] THz pulsed spectroscopy and solid immersion microscopy of brain gliomas: A road toward intraoperative THz diagnosis

K.I. Zaytsev, A.A. Gavdush, N.V. Chernomyrdin, I.N. Dolganova, P.V. Nikitin, G.A. Komandin, I.V. Reshetov, and V.V. Tuchin

Prokhorov General Physics Institute of the Russian Academy of Sciences, Institute for Regenerative Medicine, Sechenov University, Russia

Date and Time	September 07 (Tuesday) / 15:00-16:20
Place	Room 3
Session Title	[LD-2.3] Laser Diagnostics and Spectroscopy 2.3
Session Chair	Attila Nagy *(Hungary)*

LD-I-4 15:00-15:20

[Invited] Tunable Thermoplasmonics for Probing Phase Transitions at the Nanoscale

S.S. Kharintsev, E.A. Chernykh, A.V. Shelaev and S.G. Kazarian

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

LD-I-5 15:20-15:40

[Invited] Optical harmonics spectroscopy for the study of spin-induced nonlinearities

V. V. Pavlov

Ioffe Institute, St. Petersburg, Russia

LD-I-6 15:40-16:00

[Invited] Circular anisotropy of the third harmonic generated in tilted silicon nanowire array

A. S. Ustinov, L. A. Osminkina, D. E. Presnov, L. A. Golovan

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

LD-I-7 16:00-16:20

[Invited] Study of colloidal suspensions of carbon nanoparticles using fluorescence, Raman and CARS spectroscopy

S. Burikov, K. Laptinskiy, T. Dolenko

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

Date and Time	September 07 (Tuesday) / 16:40-18:00
Place	Room 3
Session Title	[LD-2.4] Laser Diagnostics and Spectroscopy 2.4
Session Chair	Tigran Vartanyan *(Russia)*

LD-I-8 16:40-17:00

[Invited] Monodisperse formamidinium tin iodide nanocrystals

D. N. Dirin, A. Vivani, M. I. Bodnarchuk, M. Aebli, I. Cherniukh, A. Guagliardi, M. V. Kovalenko

Department of Chemistry and Applied Biosciences, ETH Zürich, Laboratory for Thin Films and Photovoltaics, Empa, Switzerland

LD-I-9 17:00-17:20

[Invited] Fluctuating potentials in Cu(In,Ga)Se2 solar cells: recombination channels and limiting effects on open circuit voltage

J. P. Leitão, J. P. Teixeira, P. M. P. Salomé

Departamento de Física and i3N, Universidade de Aveiro, 3810-193 Aveiro, Portugal

LD-I-10 17:20-17:40

[Invited] Low noise GaInAsSb/GaAlAsSb Avalanche Photodiodes for Detecting Radiation of Solid-State Lasers

M.P. Mikhailova, A.P. Dmitriev, I.A. Andreev, E.V. Kunitsyna, E.V. Ivanov, Yu.P. Yakovlev

Ioffe Institute, St. Petersburg, Russia

LD-O-2 17:40-17:55

Picosecond recording and optical features of nanostructures in AlZnOAg films

Sergeev M.M., Dolgopolov A.D., Gresko V.R.

ITMO University, Faculty of Nanoelectronics, Saint Petersburg, Russia

Date and Time	September 08 (Wednesday) / 10:00-10:40
Place	Room 1
Session Title	[P-3] Plenary session 3
Session Chair	Vitaly Konov *(Russia)*

P-3 10:00-10:40

[Plenary] Optical phenomena in micrometer dielectric spheres

Boris Lukiyanchuk

Physical Faculty, Lomonosov Moscow State University, Moscow, Russia

Date and Time	September 08 (Wednesday) / 11:00-12:20
Place	Room 1
Session Title	[LM-3.1] Laser-Matter Interaction 3.1
Session Chair	Andrei Savel'ev (*Russia*)

LM-I-29 11:00-11:20

[Invited] Relativistic plasma source optimization and applications

I.N.Tsymbalov, K.A.Ivanov, S.A.Shulyapov, D.A.Gorlova, A. B. Savel'ev

Faculty of Physics, Lomonosov Moscow State University, P.N. Lebedev Physical Institute of the Russian Academy of Sciences, Moscow, Russia

LM-I-30 11:20-11:40

[Invited] Undesired X-ray emission during ultrashort pulse laser material processing

H. Legall, J. Bonse, J. Krüger

Bundesanstalt für Materialforschung und -prüfung (BAM), Berlin, Germany

LM-I-31 11:40-12:00

[Invited] Ultrafast laser-matter interactions in solids with tightly-focused mid-IR laser pulses

F. Potemkin

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

LM-O-8 12:00-12:15

Applying Density Functional Tight Binding approach to study X-ray-induced phase transitions in solids

V. Lipp, V. Tkachenko, M. Stransky, B.Aradi, T. Frauenheim, and B. Ziaja

Institute of Nuclear Physics, Polish Academy of Sciences, Krakow, Poland, [2]Center for Free-Electron Laser Science CFEL, Germany

Date and Time	September 08 (Wednesday) / 12:40-14:00
Place	Room 1
Session Title	[LM-3.2] Laser-Matter Interaction 3.2
Session Chair	John Lopez (*France*)

LM-I-32 12:40-13:00

[Invited] Damage density measurements with small and large beams of op-tical components for high power lasers

L. Lamaignère, M. Veinhard, C. Bouyer, N. Roquin, R. Parreault

CEA-CESTA, Cedex, France

LM-I-33 13:00-13:20

[Invited] Cutting of glass with an Airy Beam

D. Sohr, J. U. Thomas, S. Skupin

Institut Lumière Matière, UMR 5306 Université Lyon 1 - CNRS, Université de Lyon, , France

LM-I-34 13:20-13:40

[Invited] Fabrication of dense arrays of micro/nano-channels in fused silica by picosecond laser processing

N. Sanner, X. Liu, O. Utéza

Aix Marseille Univ., CNRS, LP3 UMR, Marseille, France

LM-I-35 13:40-14:00

[Invited] Ultrafast-laser writing of birefringent nanogratings in alkali-containing glasses

S.V. Lotarev, S.S. Fedotov, A.I. Pomigueva, A.S. Lipatiev, V.N. Sigaev

Mendeleev University of Chemical Technology, Moscow, Russia

Date and Time	September 08 (Wednesday) / 11:00-12:20
Place	Room 2
Session Title	[B-3.1] Biophotonics 3.1
Session Chair	Evgeny Shirshin *(Russia)*

B-I-29 11:00-11:20

[Invited] Towards Automated Digital Histopathology with Circularly Polarized Light

A. Bykov, M. Borovkova, V. Dremin, O. Sieryi, I. Meglinski

Optoelectronics and Measurement Techniques Unit, University of Oulu, Oulu, Finland

B-I-30 11:20-11:40

[Invited] Diagnosis of glioma molecular markers in blood using spectroscopy and machine learning

O. Cherkasova, A. Mankova, M. Konnikova, D. Vrazhnov, Yu. Kistenev, Y.Peng, A. Shkurinov

Institute of Laser Physics of SB RAS, Institute on Laser and Information Technologies - Branch of the Federal Scientific Research Centre, Novosibirsk, Russia.

B-I-31 11:40-12:00

[Invited] Laser Tweezers and Prospects for Live Cells Study

A. Priezzhev, A. Lugovtsov, A. Semenov, Kisung Lee, P. Ermolinskiy, A. Kapkov

Physics Department, Lomonosov Moscow State University, Moscow, Russia

B-I-32 12:00-12:20

[Invited] Advances in tissue optical clearing for laser diagnostics and treatment

V.V. Tuchin

Saratov State University, Saratov, Russia

Date and Time	September 08 (Wednesday) / 12:40-14:00
Place	Room 2
Session Title	[B-3.2] Biophotonics 3.2
Session Chair	Alexander Priezzhev *(Russia)*

B-I-33 12:40-13:00

[Invited] Combatting bacterial biofilms and bacterial plankton for medicine and food industry via laser nanotechnology

A.A. Ionin, S.A. Gonchukov, S.I. Kudryashov, A.A. Nastulyavichus, Yu.M. Romanova, I.N. Saraeva, A. A. Semenova, N.A. Smirnov, E.R. Tolordava, Yu. K. Yushina

Lebedev Physical Institute, Moscow, Russia;

B-O-7 13:00-13:15

Scaffolds structural heterogeneity influence on the efficiency of stem cells osteogenic differentiation

Shchechkin I.D. [1,2], Rodimova S.A. [1,2], Elagin V.V. [1], Karabut M.M. [1], Minaev N.V. [3], Shpichka A.I. [3], Timashev P.S. [3], Zagaynova E.V. [1,2], Kuznetsova D.S.

Research Institute of Experimental Oncology and Biomedical Technologies, Privolzhsky Research Medical University, Nizhny Novgorod, Russia

B-O-8 13:15-13:30

Histological and in situ microscopic observation of femtosecond laser induced incisions in the crystalline lens

A. Talbi, O. Ben Moussa, G. Thuret, P. Gain, X. Sedao and C. Mauclair

University of Saint Etienne, Université de Lyon, Université Jean Monnet, Saint Etienne, France

B-O-9 13:30-13:45

Raman characterization of aqueous solutions of diols

V.S. Novikov, K.A. Prokhorov, P.V. Ivchenko, E.A. Sagitova, V.V. Kuzmin, L.Yu. Ustynyuk, G.Yu. Nikolaeva

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

B-O-10 13:45-14:00

Optical properties of functionalized microstructured fibers and their sensing capabilities

T. Ermatov, R.E. Noskov, J.S. Skibina, V.V. Tuchin, D.A. Gorin

Skolkovo Institute of Science and Technology, Moscow, Russia

Date and Time	September 08 (Wednesday) / 11:00-12:20
Place	Room 3
Session Title	[LD-3.1] Laser Diagnostics and Spectroscopy 3.1
Session Chair	Nikolay Surovtsev *(Russia)*

LD-I-11 11:00-11:20

[Invited] Plasmon-enhanced optical spectroscopies of semiconductor nanostructures

A.G. Milekhin, M. Rahaman, T.A. Duda, E.E. Rodyakina, R.B.Vasiliev, I.A. Milekhin, K.V. Anikin, S.A. Kuznetsov, V.G. Mansurov, A.V. Latyshev, D.R.T. Zahn

Rzhanov Institute of Semiconductor Physics, Novosibirsk State University, Novosibirsk, Russia

LD-I-12 11:20-11:40

[Invited] Tuning of the optical properties of CdSe atomically thin nanosheets by spontaneous folding: effect of the length and type of ligands

D.A. Kurtina, A.V. Knotko, A.V. Garshev, R.B. Vasiliev

Department of Chemistry, Department of Material Science, Lomonosov Moscow State University, Moscow, Russia

LD-I-13 11:40-12:00

[Invited] Luminescence Solar Concentrators with Silicon Quantum Dots

I. Sychugov

Department of Applied Physics, KTH – Royal Institute of Technology, Stockholm, Sweden

LD-I-14 12:00-12:20

[Invited] Probing with single quantum emitters: measuring at nano-scale and characterizing at micro- and macro level

A. V. Naumov

Institute of Spectroscopy RAS, Troitsk, Moscow State Pedagogical University, Moscow, Russia

Date and Time	September 08 (Wednesday) / 12:40-14:00
Place	Room 3
Session Title	[LD-3.2] Laser Diagnostics and Spectroscopy 3.2
Session Chair	Luigi Bonacina *(Switzerland)*

LD-I-15 12:40-13:00

[Invited] Re-scan Confocal Microscopy of ESCRT-mediated lysosome repair

S.G. Stanciu, I. Floroiu, R. Hristu, E. Fiorentis, M. Radulovic, C.Raiborg, H.A. Stenmark

Center for Microscopy-Microanalysis and Information Processing, Politehnica University of Bucharest, Bucharest, Romania

LD-I-16 13:00-13:20

[Invited] Raman spectroscopy of phospholipid membranes

N.V. Surovtsev

Institute of Automation and Electrometry, Russian Academy of Sciences, Novosibirsk, Russia

LD-I-17 13:20-13:40

[Invited] SERS-active substrates based on Au/Ag-decorated silicon nanostructures for the rapid detection of chemical and biomolecules

L.A. Osminkina

Lomonosov Moscow State University, Physics Department, Institute for Biological Instrumentation of Russian Academy of Sciences, Moscow, Russia

LD-I-18 13:40-14:00

[Invited] Raman diagnostics of porous silicon nanoparticles biodegradation

M.B. Gongalsky

Lomonosov Moscow State University, Physics Department, Moscow, Russia

Date and Time	September 08 (Wednesday) / 15:00-16:20
Place	Room 1
Session Title	[LM-3.3] Laser-Matter Interaction 3.3
Session Chair	Tatiana Itina (*France)*

LM-I-36 15:00-15:20

[Invited] Laser-Induced Changes in Surface Wettability: From Modeling to Applications

I. S. Omeje and T. E. Itina

Laboratoire Hubert Curien, UMR CNRS 5516, Université Jean Monnet, Saint-Etienne, France

LM-O-9 15:20-15:35

On the sliding of steel surfaces subjected to ultra-short laser pulses on different kinds of snow

E. Maggiore, I. Mirza, D. Dellasega M. Tommasini, P.M. Ossi

Dipartimento di Chimica, Materiali, Ingegneria Chimica "G. Natta", Politecnico di Milano, Italy

LM-O-10 15:35-15:50

Numerical Modeling of Thermal Response of Molybdenum Thin Film on Different Substrates Irradiated by Short Laser Pulse

K. Hlinomaz, Y. Levy, T. J. Y. Derrien and N. M. Bulgakova

HiLASE Centre, Institute of Physics of the Czech Academy of Sciences, Czech Technical University in Prague, Faculty of Nuclear Sciences and Physical Engineering, Praha, Czech Republic

LM-O-11 15:50-16:05

Ultrashort laser pulse ablation of bilayer Ti-Al thin films – effects of the thicknesses and layer position on the surface morphology

B. Gaković, S.I. Kudryashov, P.A. Danilov, D. Milovanović, P. Panjan, A.A. Ionin

Vinca Institute of Nuclear Sciences - National Institute of the Republic of Serbia, Belgrade, Serbia

LM-O-12 16:05-16:20

Silicon surface amorphization and re-crystallization via single femtosecond laser pulses

C. Florian, D. Fischer, K. Freiberg, M. Duwe, M. Sahre, S. Schneider, A. Hertwig, J. Krüger, M. Rettenmayr, U. Beck, A. Undisz, J. Bonse

Bundesanstalt für Materialforschung und -prüfung (BAM), Berlin, Germany; Princeton University, USA

Date and Time	September 08 (Wednesday) / 16:40-18:10
Place	Room 1
Session Title	[LM-3.4] Laser-Matter Interaction 3.4
Session Chair	Joern Bonse (*Germany*)

LM-I-37 16:40-17:00

[Invited] Ultrafast laser nanopatterning of metals below 100 nm

J.P. Colombier, A. Nakhoul, A. Rudenko, C. Maurice, F. Garrelie, F. Pigeon

University Lyon, UJM-St-Etienne, CNRS, Institute of Optics Graduate School, Saint-Etienne, France

LM-I-38 17:00-17:15

[Invited] Three-Step Description of Single-Pulse Formation of Laser- Induced Periodic Surface Structures on Metals

Y. Levy, E. L. Gurevich, and N. M. Bulgakova

HiLASE Centre, Institute of Physics of the Czech Academy of Sciences, Dolní Břežany, Czech Republic

LM-O-13 17:15-17:30

Formation of hollow microneedles on silicon surface by doughnut-shaped laser pulses using single- and multi-shot irradiation

J. Hrabovský, M. Zukerstein, J. Sládek, I. Mirza, Y. Levy, and N. M. Bulgakova

HiLASE Centre, Institute of Physics of CAS, Dolni Brezany, Czechia

LM-O-14 17:30-17:50

Laser Synthesis of Chemically Pure Multielement Metal-Based Nanostructures

M. Flimelova, Y.V. Ryabchikov

HiLASE Centre, Institute of Physics of the Czech Academy of Sciences, Scientific Laser Application Department, Czech Republic

LM-I-39 17:50-18:10

[Invited] Fs laser ablation of bone tissue for high resolution bone surgery

L. Gemini, S. Al Bourgol, G. Machinet, M. Fauçon, R. Kling

ALPhANOV, Rue François Mitterrand, France

Date and Time	September 08 (Wednesday) / 15:00-16:20
Place	Room 2
Session Title	[THz-3.3] THz Photonics and Optoelectronics 3.3
Session Chair	Alexander Shkurinov *(Russia)*

THz-I-1 15:00-15:20

[Invited] Terahertz gyrotrons and their applications: resent results

M. Glyavin

Institute of Applied Physics RAS, Nizhny Novgorod, Russia

THz-I-2 15:20-15:40

[Invited] "Perfect" Vortex Beams in the THz Range: Generation and Application

B. Knyazev, Yu. Choporova, V. Gerasimov, O. Kameshkov, A. Lemzyakov, N. Osintseva, V. Pavelyev, K. Tukmakov

Novosibirsk State University, Budker Institute of Nuclear Physics of SB RAS, Novosibirsk, Russia

THz-I-3 15:40-16:00

[Invited] Terahertz spectroscopy of nano-carbon materials

B. Gorshunov

Moscow Institute of Physics and Technology, Moscow, Russia

THz-I-4 16:00-16:20

[Invited] High-temperature THz quantum cascade lasers: novel designs and MBE growth challenges

R.A. Khabibullin

V.G. Mokerov Institute of Ultra High Frequency Semiconductor Electronics, RAS Russia

Date and Time	September 08 (Wednesday) / 16:40-18:00
Place	Room 2
Session Title	[THz-3.4] THz Photonics and Optoelectronics 3.4
Session Chair	Boris Gorshunov *(Russia)*

THz-I-5 16:40-17:00

[Invited] Directional Diagram of THz radiation from DC Biased Filament

O. Kosareva

Lomonosov Moscow State University, Russia

THz-I-6 17:00-17:20

[Invited] Surprising nonlinear optics of pulsed terahertz radiation

S. Kozlov

ITMO University, Faculty of Nanoelectronics, Saint Petersburg, Russia

THz-I-7 17:20-17:40

[Invited] Methods of intense THz generation by multiterawatt, 800 nm laser pulses

M. Nazarov
NRC «Kurchatov Institute», Moscow, Russia

THz-I-8 17:40-18:00

[Invited] Terahertz emission from ionized air under single-color filamentation

L.V. Seleznev, G.E. Rizaev, D.V. Pushkarev, A.V. Koribut, Y.A. Gerasimova, Y.V. Grudtsyn, S.A. Savinov, Y.A. Mityagin, D.V. Mokrousova, A.A. Ionin
Lebedev Physical Institute of the Russian Academy of Sciences, Moscow, Russia

Date and Time	September 08 (Wednesday) / 15:00-16:20
Place	Room 3
Session Title	[LD-3.3] Laser Diagnostics and Spectroscopy 3.3
Session Chair	Liubov Osminkina *(Russia)*

LD-I-19 15:00-15:20

[Invited] Multi-order Nonlinear Mixing in Dielectric Nanoparticles for Bio-Applications

L. Bonacina
Department of Applied Physics, Université de Genève, Switzerland

LD-O-3 15:20-15:35

Raman spectra and a CH2-chain length of organic molecules

V.V. Kuzmin, K.A. Prokhorov, E.A. Sagitova, S.M. Kuznetsov, M.S. Iablochnikova, P.V. Ivchenko, I.E. Nifant'ev, G.Yu. Nikolaeva
Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

LD-O-4 15:35-15:50

Non-Destructive Monitoring of Apples under Long-Term Storage

Ana-Maria Bratu, Cristina Popa, Mihaela Bojan, Petre Catalin Logofatu, Mioara Petrus
National Institute for Laser, Plasma and Radiation Physics, Bucharest, Romania

LD-I-20 15:50-16:10

[Invited] High power CW laser heating for the study of materials at very high temperature

L. Gallais, G. Kermouche, M. Minissale, Y. Pontillon, M. Richou, J.L. Rullier
Aix Marseille Univ, CNRS, Centrale Marseille, Institut Fresnel, Marseille, France

LD-O-5 16:10-16:25

Laser Induced Heating of Germanium Nanostructures

A.V.Pavlikov, A.M.Sharafutdinova, S.N.Bokova-Sirosh, A.M.Rogov, A.L.Stepanov
Department of Physics, Lomonosov Moscow State University, National Research Centre "Kurchatov Institute", Moscow, Russia

Date and Time	September 08 (Wednesday) / 16:40-18:05
Place	Room 3
Session Title	[LD-3.4] Laser Diagnostics and Spectroscopy 3.4
Session Chair	Andrey Naumov *(Russia)*

LD-I-21 16:40-17:00

[Invited] Near-field infrared nano-imaging and nano-spectroscopy of correlated quantum materials

Mengkun Liu

Stony Brook University, Department of Physics and Astronomy, USA

LD-O-6 17:00-17:15

Design and fabrication of a compact multispectral laser based optical beam induced current (OBIC) microscope

A. Gogoi

Department of Physics, Jagannath Barooah College, Assam, India

LD-O-7 17:15-17:30

A 3-ns pulsed diode laser for a high spatial resolution lidar

S. M. Pershin, M.Ya. Grishin, V. A. Zavozin, V. S. Makarov, V. N. Lednev, A.V. Myasnikov, A.V. Turin

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

LD-O-8 17:30-17:45

Omnidirectional modulation of the Earth's crust seasonal compression and the aerosol output decrease in the adit over the Elbrus volcano magmatic chamber

S. M. Pershin, M.Ya. Grishin, V. A. Zavozin, V. S. Makarov, V. N. Lednev, A.V. Myasnikov

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

LD-I-22 17:45-18:05

[Invited] Pulsed laser fabrication of Zn and ZnO nanoparticles meant for implementation in chemical sensors

M.D. Komissarov, N.B. Leonov, T.A. Vartanyan

ITMO University, St. Petersburg, Russia

Date and Time	September 08 (Wednesday) / 18:00-19:00
Place	Room
Session Title	**Poster session**
Session Chair	

Date and Time	September 09 (Thursday) / 10:00-10:40
Place	Room 1
Session Title	[P-4] Plenary session 4
Session Chair	Alexander Shkurinov *(Russia)*

P-4 10:00-10:40

[Plenary] Generation and detection of quantum-correlated pairs of optical and terahertz photons

Galiya Kitaeva

Physical Faculty, Lomonosov Moscow State University, Moscow, Russia

Date and Time	September 09 (Thursday) / 11:00-12:20
Place	Room 1
Session Title	[LM-4.1] Laser-Matter Interaction 4.1
Session Chairs	Sergey Klimentov *(Russia)*, Jan Siegel (*Spain*)

LM-I-40 11:00-11:20

[Invited] Ultrafast time-resolved microscopy during femtosecond laser structuring

M. Garcia-Lechuga, D. Puerto, J. Bonse, Y. Fuentes-Edfuf, J. Solis, and J. Siegel

Laser Processing Group, Instituto de Óptica, Madrid, Spain

LM-I-41 11:20-11:40

[Invited] Functional surfaces for industrial applications due to direct laser texturing

G. Mincuzzi, L. Gemini, A. Sikora, A. Bourtereau, S. Nourry, M. Faucon, R. Kling

Alphanov Technology Center, Rue François Mitterrand, France

LM-I-42 11:40-12:00

[Invited] Laser nano- and microstructuring of halide perovskites

A.Y. Zhizhchenko, A.A. Kuchmizhak, S.V. Makarov

ITMO University, Saint Petersburg, Russia

LM-I-43 12:00-12:20

[Invited] Anisotropic resistivity surfaces produced in TCO-ITO films by fs-laser induced self organization in the nanoscale

C. Lopez-Santos, D. Puerto, J. Siegel, M. Macias-Montero, C. Florian, J. Gil-Rostra, V. López-Flores, A. Borras, A. R. González-Elipe1, J. Solis

Nanotechnology on Surfaces Group, Institute of Material Science of Seville (US-CSIC), Spain

Date and Time	September 09 (Thursday) / 12:40-14:05
Place	Room 1
Session Title	[LM-4.2] Laser-Matter Interaction 4.2
Session Chairs	Razvan Stoyan (*France)*

LM-I-44 12:40-13:00

[Invited] Non-instantaneous third-order polarization at low intensities

A. Husakou, F. Morales, M. Richter, and V. Olvo

Max Born Institute, Berlin, Germany

LM-O-15 13:00-13:15

Polarization singularities of a plane electromagnetic wave scattered on a dielectric spherical nanoparticle

N. Y. Kuznetsov, K. S. Grigoriev, V. A. Makarov

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

LM-O-16 13:15-13:30

Peculiarities of Interaction of Radially and Azimuthally Polarized Laser Pulses with Transparent Dielectrics

V.P. Zhukov, N.M. Bulgakova, M.P. Fedoruk

HiLASE Centre, Institute of Physics of the Czech Academy of Sciences, Czech Republic,
Federal Research Center for Information and Computational Technologies, Novosibirsk, Russia

LM- O-17 13:30-13:45

Ultrashort laser-induced damage and ablation of silicon in water and air environments

A. V. Bulgakov, M. Stehlík, I. Mirza, O. Gatsa, J. Hrabovský, N. M. Bulgakova

HiLASE Centre, Institute of Physics of the Czech Academy of Sciences, Czech Republic
S.S. Kutateladze Institute of Thermophysics SB RAS, Novosibirsk, Russia

LM- I-45 13:45-14:05

[Invited] Laser synthesis of copper oxides 2D structures with high thermosensitivity and high thermoelectric figure of merit

S.A. Mulenko, N. Stefan, E.G.Len, M.A.Skoryk, V.M.Popov, O.Yo.Gudymenko

G.V.Kurdyumov Institute for Metal Physics NAS of Ukraine, Kyiv, Ukraine

Date and Time	September 09 (Thursday) / 11:00-12:20
Place	Room 2
Session Title	[THz-4.1] THz Photonics and Optoelectronics 4.1
Session Chair	Luke Berge *(France)*

THz-I-9 11:00-11:20

[Invited] Latest Developments in Terahertz Imaging Technologies at ETRI

D.-H. Choi, E.S. Lee, M. Kim, D.W. Park, J.-H. Shin, I.-M. Lee, K. H. Park

Terahertz Research Section, Electronics and Telecommunications Research Institute (ETRI), Republic of Korea

THz-I-10 11:20-11:40

[Invited] Laser-driven terahertz sources and their applications

L. Bergé

Commissariat à l'Énergie Atomique et aux Énergies Alternatives, CEA, DAM, Arpajon, France

THz-I-11 11:40-12:00

[Invited] High resolution spectroscopy based on frequency sweeping with using THz quantum cascade lasers

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-12 12:00-12:20

[Invited] Cavity Assisted High-Resolution THz Spectroscopy

F. Hindle

Université du Littoral Côte d'Opale, Dunkerque, France

Date and Time	September 09 (Thursday) / 12:40-14:00
Place	Room 2
Session Title	[THz-4.2] THz Photonics and Optoelectronics 4.2
Session Chair	Patrick Mounaix *(France)*

THz-I-13 12:40-13:00

[Invited] Extraction of non linear coefficient of gaz from polarization state modulation of THz pulse generated by filament

M. Bernier

University of Savoie Mont Blanc, France

THz-I-14 13:00-13:20

[Invited] Practical aspects of terahertz systems for biomedical diagnostics

I. Ozheredov

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

THz-I-15 13:20-13:40

[Invited] Graphene based sensor for THz imaging

A. Stepanov

Institute of Applied Physics RAS, Nizhny Novgorod, Russia

THz-I-16 13:40-14:00

[Invited] Terahertz spectroscopy of nanowires

V. Trukhin

Ioffe Institute, St.-Peterrsburg, Russia

Date and Time	September 09 (Thursday) / 15:00-16:20
Place	Room 1
Session Title	[LM-4.3] Laser-Matter Interaction 4.3
Session Chairs	Alexandros Mouskeftaras (*France)*

LM-I-46 15:00-15:20

[Invited] Femtosecond laser-generated shockwaves in transparent media: Experiments and Simulation

A. Mouskeftaras, O. Koritsoglou, O. Utéza, D. Grojo, N. Sanner and D. Loison

Aix Marseille University, CNRS, LP3 UMR, Marseille, France

LM-O-18 15:20-15:35

Picosecond-laser-induced damage and ablation of gold in water: Effects of the water layer thickness

O. Gatsa, A. V. Bulgakov

HiLASE Centre, Institute of Physics of the Czech Academy of Sciences, Czech Republic

LM- O-19 15:35-15:50

Three-dimensional hybrid optoacoustic imaging of the laser-induced plasma and deposited energy density under femtosecond laser excitation of condensed medium

Rumiantsev B.V., Mareev E.I., Bychkov A.S., Karabutov A.A., Makarov V.A., Cherepetskaya E.B. and Potemkin F.V.

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

LM-I-47 15:50-16:10

[Invited] Laser-matter interaction from ps to continuous regime: experiments and modeling

L.Videau, B.Bernecker, L. Berthe, L .Lecherbourg, M.Scius-Bertrand

Paris-Saclay University, CEA, France

Date and Time	September 09 (Thursday) / 16:40-18:00
Place	Room 1
Session Title	[LM-4.4] Laser-Matter Interaction 4.4
Session Chairs	Stephane Guizard (*France)*

LM-I-48 16:40-17:00

[Invited] Challenges of Direct Laser Writing of Single-crystal Waveguides in Oxide Glasses

Lipatiev A.S. , Lotarev S.V., Okhrimchuk A.G., Naumov A.S., Lipateva T.O., Fedotov S.S., Sigaev V.N.

Mendeleev University of Chemical Technology, Moscow, Russia

LM-O-20 17:00-17:15

Direct Laser Writing in Silica and K8 Glass in Athermal Regime

V. Likhov, A. Okhrimchuk

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

LM-O-21 17:15-17:30

Investigation of Laser-Induced Formation of Polychrome Marks on Glass

A. Ramos Velazquez, N.O. Gudz, R.A. Zakoldaev, V.P. Veiko

ITMO University, St. Petersburg, Russia

LM- O-22 17:30-17:45

Laser-Induced Crystallization Kinetics of GeTe and Ge2Sb2Te5 Thin Films

A.A. Burtsev, V.V. Ionin, A.V. Kiselev, N.N. Eliseev, V.A. Mikhalevsky, and A.A. Lotin a

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

LM- O-23 17:45-18:00

Morphological and phase modifications of amorphous Ge2Sb2Te5 thin films on dielectric substrate induced by femtosecond laser irradiation

A.V. Kolchin, S.V. Zabotnov, D.V. Orlov, D.V. Shuleiko, L.A. Golovan, D.E. Presnov, T.P. Kamenskaya, P.I. Lazarenko, T.S. Kunkel, S.A. Kozyukhin, P.K. Kashkarov

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

Date and Time	September 09 (Thursday) / 15:00-16:20
Place	Room 2
Session Title	[THz-4.3] THz Photonics and Optoelectronics 4.3
Session Chair	Jean-Louis Coutaz *(France)*

THz-I-17 15:00-15:20

[Invited] Optical rectification in various non-linear crystals pumped from below to above their bandgap

E. Herault

IMEP-LAHC, University Savoie Mont Blanc, Le Bourget du Lac Cedex, France

THz-I-18 15:20-15:40

[Invited] Terahertz multiple plane phase retrieval for imaging

P. Mounaix

Université Bordeaux, France

THz-I-19 15:40-16:00

[Invited] Theory of High Harmonics Generation in Extended Gas Media by Femtosecond Laser Field Having Different Wavelengths

S. Stremoukhov

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

THz-I-20 16:00-16:20

[Invited] Nonlinear optical phenomena with terahertz pulses

A. Shkurinov

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

Date and Time	September 09 (Thursday) / 16:40-18:00
Place	Room 2
Session Title	[THz-4.4] THz Photonics and Optoelectronics 4.4
Session Chair	Leonid Seleznev *(Russia)*

THz-I-21 16:40-17:00

[Invited] Thin-film structures based on bismuth and antimony for terahertz photonics

M. Khodzitsky

ITMO University, St. Petersburg, Russia

THz-O-1 17:00-17:15

Sub-THz radiation of human skin under the influence of mental stress

K.A. Baksheeva, R.V. Ozhegov, G.N. Goltsman, N.V. Kinev, V.P. Koshelets, A. Kochnev, N. Betzalel, A. Puzenko, P. Ben Ishai and Y. Feldman

Moscow Pedagogical State University, Moscow, Russia

THz-O-2 17:15-17:30

Nanosecond pulsation of THz NH3 laser emission under optical pumping by "long" (~ 100 μs) CO2 laser pulses

A.A. Ionin, I. O. Kinyaevskiy, Yu.M. Klimachev, D.I. Kormashova, A.A. Kotkov, A.A. Kozlov, J.-F. Lampin, Yu.A. Mityagin, S.A. Savinov, A.M. Sagitova, D.V. Sinitsyn, M.V. Ionin

Lebedev Physical Institute of the Russian Academy of Sciences, Moscow, Russia

THz-O-3 17:30-17:45

Detection of skin pathologies using THz spectroscopy

I. Yanina, V. Nikolaev, A. Borisov, A. Knyazkova, E. Buyko, V. Kochubey, V. Ivanov, Yu. Kistenev, V.Tuchin

Saratov State University (National Research University, Tomsk State University, Russia

Date and Time	September 08 (Wednesday) / 18:00-19:00
Place	Room
Session Title	**Poster session**
Session Chair	

Section LASER-MATTER INTERACTION

LM-P-1

Luminescent Ce-based nanoparticles embedded into polycrystalline diamond matrix: synthesis and optical properties

V. Sedov, S. Kuznetsov, I. Kamenskikh, A. Martyanov, D. Vakalov, V. Konov

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

LM-P-2

Creation of needle-like microstructures with a high aspect ratio of geometric parameters by special laser milling

E. Surmenko, T. Sokolova, D. Bessonov, Yu. Chebotarevskiy, A. Klushev

Saratov State Technical University, Saratov, Russia

LM-P-3

Laser fragmentation of silicon microparticles in liquids

V. Nesterov, D. Shuleiko, A. Kolchin, D. Presnov, S. Zabotnov, L. Golovan, P. Kashkarov, E. Sergeeva, D. Kurakina, M. Kirillin

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

LM-P-4

Laser direct writing technique for creation of metallic micropatterns in deep eutectic solvents

A. Shishov, D. Gordeychuk, L. Logunov, A. Levshakova, El. Danilova, M. Panov, E. Khairullina, I. Tumkin

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

Section LASER SYSTEMS AND MATERIALS

LS-P-5

Q-switched two-micron lasing on ZrO2-Y2O3-Ho2O3 crystals

S.A. Artemov, E.A. Artemov, E.E. Lomonova, P.A. Ryabochkina, A.N. Chabushkin

N.P. Ogarev Mordovian State University, Saransk, Russia

LS-P-6

Refractive index of silica for temperatures far beyond the glass transition, measured using intrinsic thermal radiation

G. Bufetova, A. Kosolapov, V. Tsvetkov, I. Bufetov

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

LS-P-7

(Ca1−xSrx)3(VO4)2 solid solutions - the new crystalline materials for ultrafast Raman lasers

I. S. Voronina, E. E. Dunaeva, V. V. Voronov, V. E. Shukshin, S. N. Smetanin, L. I. Ivleva

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

LS-P-8

Investigation of Q-switch mode-locking lasing regime in Yb:YAG disk laser with SWCNT

D. Guryev, D. Nikolaev, N. Arutyunyan, E. Obraztsova, V. Tsvetkov

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

LS-P-9

Influence of ionizing irradiations on the optical characteristics of the Gadolinium-Aluminum-Gallium-garnet single crystals

N. Kozlova, O. Buzanov, *E. ZABELINA*, P. Lagov, V. Kasimova, Y. Pavlov, V. Stolbunov

National University of Science and Technology MISiS, Moscow, Russia

LS-P-10

Synthesis, Microstructure and Spectroscopic Properties of Erbium-Doped (ScxY1-x)2O3 Transparent Ceramics

Roman Maksimov, Liza Basyrova, Vladislav Shitov, Danil Vasin, Jean-Louis Doualan, Patrice Camy, and Pavel Loiko

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

LS-P-11

The Spectral Properties of Nd-disk Laser with Degenerate Cavity Configuration

D.A.Nikolaev, V.B.Tsvetkov

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

LS-P-12

Double-range RF Discharge Slab CO Laser

A.A. Ionin, A.Yu. Kozlov, A.A. Kotkov, Yu.M. Klimachev, O.A. Rulev, D.V. Sinitsyn

Lebedev Physical Institute of Russian Academy of Sciences, Moscow, Russia

LS-P-13

Laser device designed for treatment of capillary skin angiodysplasia and telangiectasia

O. Tikhonevich, G. Kuzmin, A. Sirotkin, N. Gorbatova, D. Safin, M. Remennikova, D. Seleznev

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

LS-P-14

Fabrication of laser Ca3(VO4)2:Mn crystals by the method of impurity diffusion from a solid source

I.S. Voronina, E.E. Dunaeva, A.G. Papashvili, L.D. Iskhakova, M.E. Doroshenko, L.I. Ivleva

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

Section BIOPHOTONICS

B-P-15

Mutual influence of intense LED light and cold signaling through the CRISPR/Cas9-edited *HOS1* gene

V.P. Bulgakov, G.N. Veremeichik, T.Y. Gorpenchenko, Y.A. Yugay, T.V. Avramenko, Y.N. Shkryl, E.P. Subbotin, Y.N. Kulchin

Federal Scientific Center of the East Asia Terrestrial Biodiversity (Institute of Biology and Soil Science), Far Eastern Branch of the Russian Academy of Sciences, Vladivostok, Russia

B-P-16

Laser based oblique incidence reflectometry for meat quality as-sessment

A. Gogoi.

Department of Physics, Jagannath Barooah College, Jorhat 785001, Assam, India

B-P-17

A study of activated macrophages in the accumulation of different photosensitizers and the PDT effect on their metabolic changes

Klementeva M.V., Sadykova E.Z. , Skobeltcin A.S., Romanishkin I.D., Pominova D.V., Loschenov V.B., Ryabova A.V

National Research Nuclear University, MEPhI (Moscow Engineering Physics Institute), Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia

B-P-18

Refractive properties of glycated albumin and hemoglobin in a wide range of wavelengths and temperatures

E. N. Lazareva, A.Y. Zyubin, I.G. Samusev, V.V. Tuchin

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

B-P-19

Effect of photoactivatable iron oxide nanoparticles on the autofluorescence lifetime of polarized macrophages

E.Z. Sadykova, I.D. Romanishkin, D.V. Pominova, A.V. Ryabova

National Research Nuclear University, MEPhI (Moscow Engineering Physics Institute), Moscow, Russia

B-P-20

Promising target areas for selective laser photothermolysis in treatment of capillary skin angiodysplasia and telangiectasia

O. Tikhonevich, G. Kuzmin, A. Sirotkin, N. Gorbatova

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