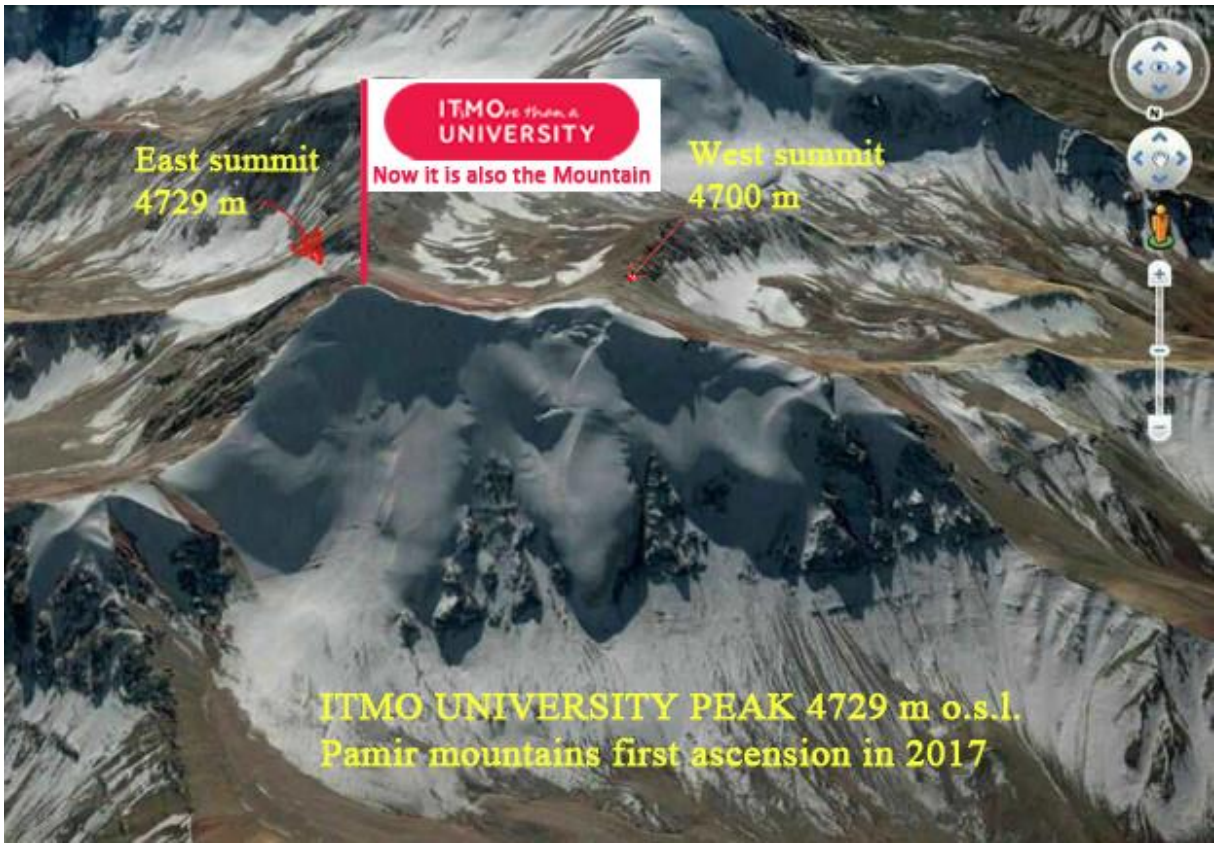
INTERNATIONAL SYMPOSIUM FLAMN-19

Fundamentals of Laser Assisted Micro– & Nanotechnologies

Dedicated to the 50th anniversary of the first Conference of Non-resonant Laser-Matter Interaction

June 30 - July 4, 2019
St. Petersburg, Russia



Important dates

March 1, 2019	Abstracts submission due to date
March 15, 2019	Notification of paper acceptance
April 1, 2019	Visa application deadline
May 31, 2019	Final program
June 30 - July 4, 2019	**Manuscript due date**
June 30 - July 4, 2019	**Symposium**

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Introduction

FLAMN Symposium continues well-known symposia ILATA (Intensive Laser Actions and Technological Applications) consisted of LAMN (Laser-Assisted Microtechnologies) and LMI (Laser-Matter Interaction) conferences used to be organized in former Leningrad, USSR, since the middle of the sixties of the past century.

Laser-assisted micro- and nanotechnologies are rapidly growing areas of research, development and production.

The Symposium will be devoted to the broad spectrum of laser micro– and nanoprocessing from physical fundamentals of different processes and their experimental demonstration to the development and realization of industrial equipment.

FLAMN-19 will include two main sections:

Laser-Assisted Micro- and Nanotechnologies and **Laser-Matter Interaction**
and special scientific events:

- **Conference for young scientists, engineers, and students "Intensive Laser Actions and Applications"**
- **Conference "Intensive Laser Actions in Biology and Medicine"**
- **Workshop "Photophysics of Nano-scale Systems"**
- **Workshop "Laser Technologies for Nanophotonics"**
- **Workshop "Ultrafast Laser-Matter Interaction & Technologies"**
- **Workshop "Laser Surface Microstructuring"**
- **Workshop "Lasers for Surfaces Cleaning, Characterisation and Artifacts Restoration"**
- **Workshop "Industrial Application of Lasers"**

Main Topics of the Symposium

Laser-Assisted Micro- and Nanotechnologies

- physical fundamentals of laser-based microtechnologies, modeling, and quantitative analysis;
- precision laser microshaping: cutting, drilling, etc.;
- local laser modification of different materials composition and properties;
- laser surface microstructuring;
- laser melting, welding, and soldering of microcomponents including plastics;
- laser-based methods
- laser processing of thin films;
- laser trimming of electronic and optical components, mask saving;
- laser technology for MEMs and fluidic devices;
- physical, optical and computer feedbacks on laser microtechnologies;
- in-situ measurements of laser processing properties;
- laser and optical devices and laser systems for microtechnologies;
- laser soldering and micro-welding;
- physical conceptions of laser cleaning of solid surfaces;
- applications of laser cleaning in mechanical engineering (cleaning pipes, removal of surface layers and coatings, cleaning cutting edges, etc.);
- laser decontamination of radioactively polluted surfaces;
- advanced applications of phase-change phenomena in optical materials and memory alloys ds of photonics components fabrication;
- laser cleaning of the surface;
- laser forming;
- laser-induced processes in 2D materials.

Laser-Matter Interaction

- mechanisms of laser heating, structural and phase transitions in condensed matter;
- nonlinear optical effects in the matter under intensive laser irradiation;
- physical mechanisms of laser damage of optical materials and elements;
- laser-induced surface phenomena;
- laser-matter interaction in the near-field optics;
- mechanisms and regularities of laser ablation;
- instabilities and self-organization processes under laser conditioning;
- adsorption and orientation of organic molecules on surfaces;
- interaction of ultrashort laser pulses with a matter;

- electronic and optical properties of nanostructures;
- interaction of light with clusters and nanostructures;
- near-field phenomena;
- ultrafast dynamics of plasmon excitations in nanostructures;
- physical fundamentals of femtosecond laser action technologies;
- ultrafast laser heating, melting, and ablation;
- laser-induced reversible structural transformations in solids;
- photo-induced crystallization and amorphization.

Conference for young scientists, engineers, and students "Intensive Laser Actions and Applications"

Co-chairman: **Maksim Sergeev**, **Tigran Vartanyan.**

- fundamental aspects of laser-based microtechnologies (modeling, quantitative analysis);
- electronic and optical properties of nano- and micro-particles, nanostructures;
- laser nanotechnology and nanofabrication including 3D forms;
- precision laser microshaping: cutting, drilling, etc.;
- laser modification of materials composition (structure and properties);
- laser melting, welding, and soldering of microcomponents including organic materials;
- pulsed laser deposition including local laser-plasma deposition of thin films;
- laser/optical systems and devices for microtechnologies;
- mechanisms of laser heating, structural and phase transitions in glass/ceramic materials;
- intensive laser processing and nonlinear optical effects in laser-matter interaction;
- physical mechanisms of laser damage of optical materials;
- laser-induced surface phenomena and treatment: cleaning, texturing, marking, annealing, modification, etc.

Conference "Intensive Laser Actions in Biology and Medicine"

Co-chairman: **Andrey Belikov**, **Valery Tuchin**.

- light-tissue interaction;
- mechanisms of laser-tissue interaction;
- surgical and other applications of lasers;
- laser and optical diagnostics;
- optical clearing and light propagation in cells and biotissues;
- laser-tissue microprocessing and drug delivery;
- laser printing of living cells;
- photodynamic therapy;
- optical coherence tomography and its application;
- laser action on cartilage tissues;
- laser-induced biotissue regeneration;
- selective laser photothermolysis and its applications;
- subablative laser processing of biotissues;
- adaptive laser for biotissues processing;
- ultrafast lasers for biomedical applications;
- terahertz waves interaction with cells and tissues.

Workshop "Photophysics of Nano-scale Systems"

Co-chairman: **Tigran Vartanyan**, **Nathalie Destouches**.

- physics behind laser methods of nanostructures manufacturing;
- nanostructures modification and conditioning via optical means;
- laser-driven self-assembly of nanoparticles;
- spectral and time-resolved optical characterization of nanostructures;
- enhancement of exciton-plasmon interactions in hybrid nanostructures;
- linear and nonlinear optical processes in nanostructured materials;
- nanostructures-based photodetectors and solar cells;
- nanostructures for non-electrical conversion of optical energy: water boiling, chemical reaction, etc.;
- nanocomposite materials for optical chemo- and biosensors;
- plasmon enabled near-infrared overtone molecular sensing;
- nanoscale lasers and spasers;
- advanced computational methods for modeling of photophysical processes in nanostructures.

Workshop "Laser Technologies for Nanophotonics"

Co-chairman: **Sergey Makarov**, **Boris Chichkov.**

- laser fabrication of plasmonic nanostructures;
- laser fabrication of nanoparticles;
- nanostructures under strong laser field;
- laser fabrication of functional nano- and microstructures;
- laser processing of advanced optical materials;

- laser-assisted bio-nanophotonics;
- 3D laser printing;
- nanoscale laser ablation;
- laser-assisted self-organization of nanostructures;
- laser-matter interaction at the nanoscale;
- laser transfer of nano- and microparticles;
- new designs for laser-matter interaction;
- new methods of optical nanolithography.

Workshop “Ultrafast Laser-Matter Interaction & Technologies”

Co-chairman: **Dmitry Ivanov, Andrey Rode, Dmitry Polyakov.**

- physical fundamentals of ultrafast laser action technologies;
- experimental study of pico- and femtosecond laser-matter interaction;
- ultrafast laser heating, melting and ablation;
- ultrafast laser microshaping;
- pico- and femtoseconds laser bulk processing;
- ultrafast laser modification of different materials composition.

Workshop “Laser Surface Microstructuring”

Co-chairman: **Tatiana Itina, Sergey Klimentov, Galina Odintsova**.

- physical fundamentals of laser microstructuring of solid surfaces;
- laser structuring of hard and soft materials;
- laser-induced periodic surface structures;
- main functional surfaces in medical, solar cell, instrumentation and other industrial fields;
- peculiarities of laser control of various properties of materials: optical, chemical, electrical, mechanical, biocompatibility, etc.;
- measuring of surface geometry and properties;
- laser smoothing.

Workshop “Lasers for Surfaces Cleaning, Characterisation and Artifacts Restoration” (LOSCAR-2019)

Co-chairman: **Vincent Detalle**, **Alexandre Semerok**, **Sergey Sirro**, **Elena Shahno.**

- fundamental aspects of laser cleaning and characterization;
- lasers and Instrumentation;
- laser cleaning of stone, metals, wood, paper, parchments, painted surfaces;
- pulse duration, wavelength, repetition rate, and other laser parameter effects;
- combined methods for surface characterization: LIBS/Raman/LIF, LA-ICP-MS, SEM and EDS, SIMS, GD-OES et GD-MS, etc.;
- NDT techniques: spectroscopy, IR-thermography, speckle interferometry, holography, optical coherence tomography, etc.;
- imaging and testing: Terahertz, hyperspectral and multispectral imaging;
- portable device development and applications;
- preservation and conservation methods;
- elemental and isotopic micro and nano cartography (micro-LIBS and RAMAN, near-field, etc.).

Workshop “Industrial Application of Lasers"

Chairman: **Sergey Gorny**.

Organizers

– St. Petersburg National Research University of Information Technologies, Mechanics and Optics (ITMO University), St. Petersburg, Russia
– Prokhorov General Physics Institute of the Russian Academy of Sciences (GPI RAS), Moscow, Russia

In cooperation with:

– The State Russian Museum;
– Laser Association;
– D.S. Rozhdestvensky Russian Optical Society;
and other organizations.

General Sponsor

– LLC "OES Special Delivery";

Expected Sponsors

– Russian Federation Ministry of Education and Science;
– Russian Foundation for Basic Researches;
– St. Petersburg National Research University of Information Technologies, Mechanics and Optics;
– Prokhorov General Physics Institute of the Russian Academy of Sciences;
– Journal “Photonics Russia”;
- LLC “Avesta”.

Proceedings

Selected papers of the Symposium will be published in Springer journal *“Optical and Quantum Electronics”* and Russian bilingual journals *“Quantum Electronics,”* “*Journal of Optical Technologies,” “Journal of Instrument Engineering*,” *“Scientific and Technical Journal of Information Technologies, Mechanics and Optics.”*

Language

The official language of the Symposium is English.

Elaboration of Contributions

Authors are invited to submit electronically 1-page abstracts of 250-300 words (**in MS WORD only**).
The abstract submission form will be available online after registration at the Symposium web site.

Registration fees

Regular* - 600 €, early registration - 550 € (till 30.04.2019)
Student** - 150 €, early registration - 100 € (till 30.04.2019)
Accompanying person - 200 €

* Regular registration fee includes admission to the technical sessions, coffee-breaks, symposium attendee kit, symposium program & book of abstracts, visa invitation service (including mailing), transportation service (including a meeting at the airport and hotel transfer), bus sightseeing tour and welcome reception.

** Student registration fee includes admission to the technical sessions, coffee-breaks, symposium attendee kit, symposium program & book of abstracts, bus sightseeing tour and welcome reception.

CIS citizens***:
Regular - 10000 RUR, early registration – 7000 RUR (till 30.04.2019)
Student - 3000 RUR, early registration - 1500 RUR (till 30.04.2019)

*** Participation of CIS citizens is partly sponsored by the Russian Foundation for Basic Research.

The registration & accommodation guidance and the list of invited speakers will be presented in the Second Announcement.

Symposium venue

International Symposium FLAMN-19 will be held on June 30 - July 4, 2019 and hosted by ITMO University. For the first time ever, the symposium will take place in the historical building of the university campus at the heart of Saint Petersburg: 9 Lomonosova str., St. Petersburg, Russia.

Saint-Petersburg has earned the reputation of being one of the most beautiful cities in the world thanks not only to its unique palaces and churches but also to its inimitable architectural ensembles of streets, canals, and squares. St. Petersburg is a city of splendid palaces and beautiful buildings, it's most common architectural styles being baroque and classical, which reached their peak here on Russian soil.
There are more than 90 museums in the city and it's surroundings, including the State Hermitage museum - one of the world's leading treasures stores of art. St. Petersburg is the home of the famous Russian classical ballet school, and numerous ballet and opera theaters will be available during Symposium time.
Symposium time is a time of world known White Nights when many cultural events (musical, theatrical and art show) take place here.

Contact Information for FLAMN–19 Program & Organizing Committees

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