

ALT  INTERNATIONAL CONFERENCE  
Advanced Laser Technologies

Jointly with the 22<sup>nd</sup> Asia-Pacific Conference on  
Fundamental Problems of Opto- and Microelectronics



# PROGRAMME

## THE 31<sup>ST</sup> INTERNATIONAL CONFERENCE ON ADVANCED LASER TECHNOLOGIES



VLADIVOSTOK • RUSSIA '24  
23-27 September



DEEPWATER

[www.ilightconnect.com](http://www.ilightconnect.com)

# Your OEM Partner

## Opto-mechanics



## Optical detection

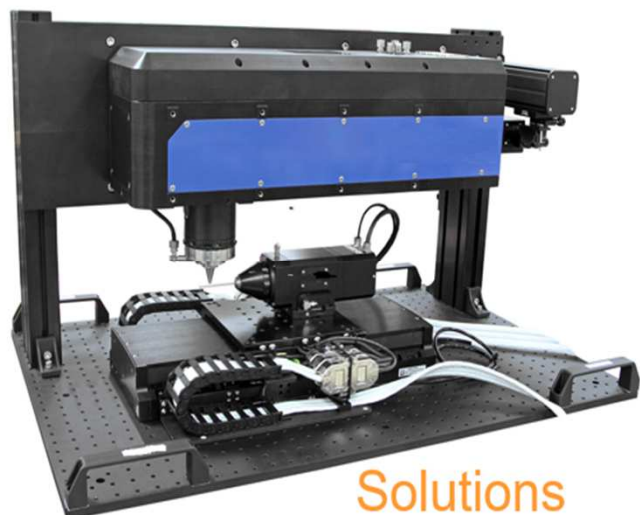


## Fine Motion



**Application:** Laser Micro-Machining, Laser Detection for Life & Medical , Semiconductor , Scientific Instruments.

- We have over 20 years of industry knowledge and expertise across a broad range of technologies allowing the company to continually deliver innovative products in the areas of **opto-mech**, **optical detection**, **fine motion**.
- We have built a strong history of partnering with OEM customers, delivering solutions from parts, subassemblies to full solutions including **design**, **testing** and **manufacturing**.



**Solutions**



Optic-Assembly



Controller & Software



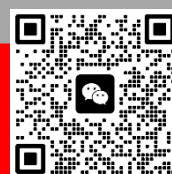
Vibration-Control

**iLightConnect Technology Co., Ltd.**

David. Sun, +86-195-3894-9001

**Address:** Rm9-925, No.299 of Fangcheng Avenue, Wuxi, China

**Email:** [sales@ilightconnect.com](mailto:sales@ilightconnect.com)



**Scan to obtain  
more information**



# JSC "LLS" IS RUSSIA'S MARKET LEADER IN OPTICS AND PHOTONICS



Head office  
in Saint Petersburg

## → THE COMPANY PROVIDES THE SELECTION AND SUPPLY OF HIGH-TECH INTEGRATED SOLUTIONS:

- Lasers and laser systems and amplifiers
- Technological equipment for operations with optical fibres
- Control-and-measuring, technological equipment
- Fibre optical components
- Educational kits
- Photodetectors and cameras
- Optical fibres
- Optical fiber transmission system and radiophotonics
- Optomechanics

## → PROJECT-BASED DISTRIBUTION

- Service centre for Shinho fiber fusion splicers and fiber cleavers
- Production audits of Chinese factories
- Consultation on handling with equipment
- In-house technical laboratory



[lenlasers.ru](http://lenlasers.ru)

8 (812) 507 81 00  
[info@lenlasers.ru](mailto:info@lenlasers.ru)

Birzhevaya line 16  
199034, St. Petersburg  
Russia



# CREATED BY ADVANCED TECHNOLOGIES

## PULSED Nd:YAG LASERS

### GRAPHITE and CORUNDUM



Pulsed Nd:YAG lasers of the Graphite and Corundum series are ideal for providing smart solutions to scientific research and industrial challenges.

- Wavelength options: 1064, 532, 355 and 266 nm
- Pulse energy: up to 1500 mJ
- Pulse repetition rate: up to 100 Hz
- Burst mode
- Built-in energy meter
- Compact housing
- Manufactured in the Republic of Belarus



· EASE OF OPERATION · HIGH RELIABILITY · EXTENDED WARRANTY ·

SLS Prime Technology has united leading experts in development and production of lasers and laser systems to provide domestic and foreign markets with the necessary equipment created by advanced technologies.

The Graphite and Corundum series lasers are an updated version of pulsed Nd:YAG lasers. Both series are built on the same platform, have enhanced reliability and offer a wide range of pulse energy combinations (up to 1.5 J) and pulse repetition rate (up to 100 Hz).

Graphite and Corundum lasers are an opportunity to choose the optimal solution for your task.

*For more details please contact our specialists:*

+375 (17) 382-00-55  
sales@sls-prime.com  
www.sls-prime.com

**SLS**  
PRIME TECHNOLOGY

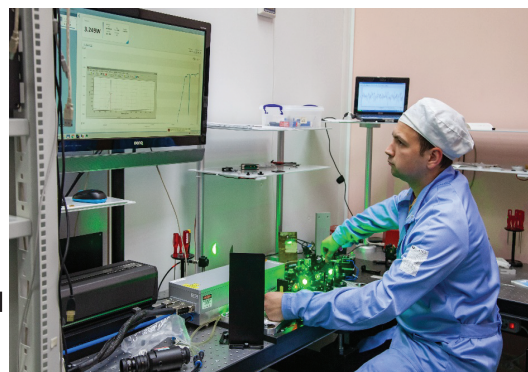




# АВЕСТА

## ЛАЗЕРЫ И ОПТИЧЕСКИЕ СИСТЕМЫ

- Российский производитель
- Более 30 лет на рынке
- Более 3000 клиентов по всему миру
- Прямая поставка от производителя
- Оптимальная стоимость и сроки поставки



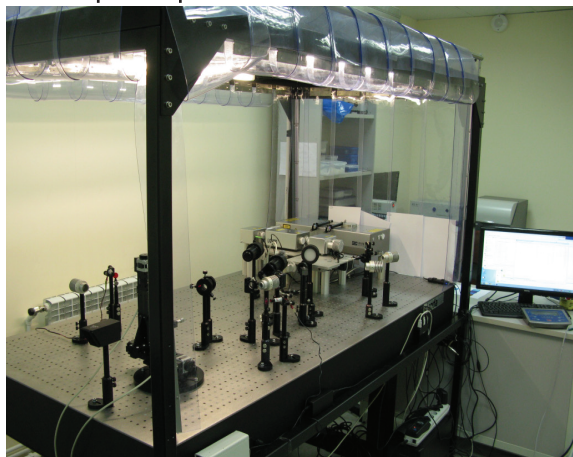
### Фемтосекундные лазерные системы

- Параметрические генераторы **200-9000 нм**
- Волоконные лазеры на **780, 1030-1064, 1560 нм**
- Лазеры со средней мощностью до **50 Вт**
- Оптический синтезатор частоты («комб-генератор»)
- Титан-сапфировые генераторы **от 6 до 100 фс**
- Системы с пиковой мощностью **до 20 ТВт**
- Лазерные модули для микрообработки



### Диагностика и компоненты

- Фотоприемники с усилителем, лавинные, **балансные**
- Изоляторы Фарадея 400-1250 нм, **до 60 дБ, до 15 мм**
- Селекторы импульсов **на 250-2700 нм до 2 МГц**
- Измерители длительности импульсов, SPIDER
- Электроника ФАПЧ для синхронизации
- Спектрометры **190-3450 нм**



- Чопперы
- Шаттеры
- Оптомеханика
- Столики
- Оправы

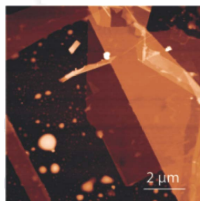


ООО «Авеста-Проект», ул. Физическая  
, 11  
рои к, 108840, Москва, Россия

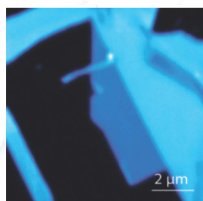
тел.: +7 (495) 241-00-92

[fs@avesta.ru](mailto:fs@avesta.ru)  
[www.avesta.ru](http://www.avesta.ru)

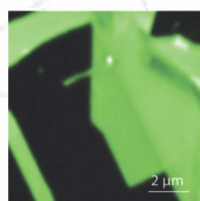
## NTEGRA Spectra for AFM – Raman – SNOM – TERS



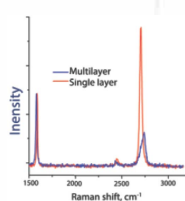
Topography



G band intensity

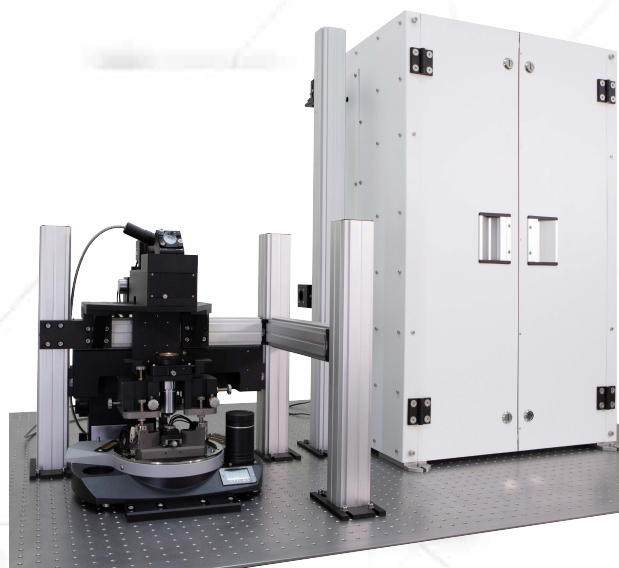


2D band intensity



Raman spectrum

Graphene flake on Si/  
SiO<sub>2</sub>



- A spectrometer of our own design
- High-performance versatile AFM techniques
- Optical access from top, side and bottom optimized for Raman, TERS and SNOM
- Flexible optical design providing any combination of excitation/collection configurations
- Automated AFM laser, probe and photodiode alignment
- User-friendly wavelength alteration of AFM registration system laser and photodiode
- Easy change of objectives

### We are a leading developer and manufacturer of:

- Equipment for Probe Microscopy and Spectroscopy
- High-class scientific instruments for experimental research in nanotechnology

### Our activities

- R&D of SPM and similar equipment
- Equipment/ expendables/ accessories
- Warranty and post-warranty service

### Our clients

- Leading institutes of the RAS
- Leading research universities
- Educational & research centres





ЭМТИОН – это российская инновационная компания, специализирующаяся на производстве и поставках аналитического и технологического оборудования.

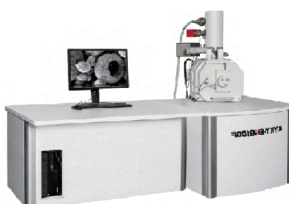
Ведущие специалисты компании имеют 15-летний опыт работы в области приборостроения. ЭМТИОН предлагает Заказчикам как отдельные решения, так и комплексное оснащение лабораторий, начиная с этапов проработки концепции и предпроектных работ и заканчивая вводом оборудования в эксплуатацию. Опытные инженеры осуществляют сервис в течении всего срока эксплуатации Оборудования.

## Рентгеновская дифрактометрия



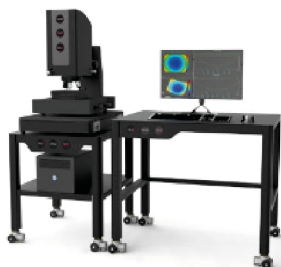
- Порошковые и монокристалльные дифрактометры
- Высокопроизводительные детекторы Mythen
- Вращение образца 360°
- Автосменщик до 12 образцов
- Высокоточный гониометр
- Угловой диапазон сканирования -110°/161°
- Минимальный шаг сканирования 0,0001°
- Температурный диапазон от -196°С до 1600°С
- База данных спектров, программа обработки

## Электронная микроскопия



- Термоэмиссионный катод
- Катод с полевой эмиссией типа Шоттки
- Ускоряющее напряжение от 0.1кВ до 30кВ
- Увеличение от 6 до 1 000 000x
- Разрешение до 1 нм
- Опции низкого вакуума и низкого ускоряющего напряжения
- Система энергодисперсионного микроанализа
- Опции EBSD, CL, AFM, Tensile stage и др.

## Оптические профилометры



- Быстрое бесконтактное сканирование 2D профиля образца и 3D топографии.
- Измерение шероховатости образца, кривизны поверхности, толщины пленок, анализ дефектов (микротрещины, сколы, царапины) и др.
- Вертикальное z разрешение до 0.1 (PSI)
- Возможность изменения поля зрения за счет использования разных объективов.
- Высокая повторяемость и воспроизводимость измерений

## Атомно-силовая микроскопия



- Поддержка всех существующих АСМ методик
- Прыжковая микроскопия для количественного нано-механического анализа
- Измерение линейной ВАХ в диапазоне токов от 50пА до 100мкА
- Диапазон сканирования 100x100x10мкм
- Разрешение по оси Z – 0,05 нм
- Опции нагрева, охлаждения, измерения в жидкости, в вакууме, в магнитном поле и др.

## Вибромагнитометры (VSM)



- Вибромагнетометры с охлаждением жидким азотом
- Диапазон магнитных полей до 9 Тл
- Широкий выбор опций
- Измерение кривой намагниченности, петли гистерезиса и множества других параметров
- Безжидкостные низкотемпературные вибромагнетометры 1.5-400 К

## КР (рамановская) спектроскопии и микроскопия



- До 5ти автоматически выбираемых лазеров
- Пространственное разрешение до 0,2мкм
- Спектральный диапазон 350-1100 нм
- Спектральное разрешение 0.25 см<sup>-1</sup>
- Четыре автоматизированные дифракционные решетки
- Возможность комбинации с жидкостными, газовыми, охлаждающими и вакуумными ячейками

## THE 31<sup>ST</sup> INTERNATIONAL CONFERENCE ADVANCED LASER TECHNOLOGIES ALT 2024

### COMMITTEE

#### Conference Chairman



Ivan SHCHERBAKOV  
Academician of RAS, scientific  
director of the Prokhorov  
General Physics Institute

#### Program Committee Co-Chairs



Vitaly KONOV  
Academician of RAS, Director of  
Natural Sciences Center of the  
Prokhorov General Physics Institute



Yuri KULCHIN  
Academician and Vice-President  
of the RAS, scientific director of  
the Institute of Automation and  
Control Processes FEB RAS

### ORGANIZERS



GPI RAS



### SPONSORS

#### General Sponsor



DEEPWATER

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#### Official Sponsor



JSC LLS / Russia

#### Sponsors



AVESTA  
LASERS AND OPTICAL SYSTEMS



SLS  
PRIME TECHNOLOGY





## ORGANIZING COMMITTEE CO-CHAIRS

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Prokhorov General Physics  
Institute of RAS

Aleksandr KUCHMIZHAK

Institute of Automation and  
Control Processes of FEB RAS

Boris KOROBETS

Far Eastern Federal University

## INTERNATIONAL PROGRAM COMMITTEE

Mukhsin ASHUROV (Republic of Uzbekistan)

Sergey BABIN (Russia)

Ekaterina BARMINA (Russia)

Elena BIBIKOVA (Russia)

Aladar CZITROVSKY (Hungary)

Boris DENKER (Russia)

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Sandeep KUMAR (India)

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Tofiq MAMMADOV (Republic of Azerbaijan)

Ashok Kumar MISHRA (India)

Beat NEUENSCHWANDER (Switzerland)

Kyung Hyun PARK (Korea)

Roman ROMASHKO (Russia)

Vladimir PAVELYEV (Russia)

Alexander PRIEZZHEV (Russia)

Sergey SEMJONOV (Russia)

Alexander SHKURINOV (Russia)

Perry SHUM (China)

Nishant TRIPATHI (Russia)

Valery TUCHIN (Russia)

Maria VEDUNOVA (Russia)

Vadim VEIKO (Russia)

Igor VLASOV (Russia)

Victor ZADKOV (Russia)

Irina ZAVESTOVSKAYA (Russia)

Dan ZHU (China)



FEFU Campus  
Seafront

## Local organizing committee

Aleksandr Kuchmizhak  
IACP FEB RAS / FEFU

E-mail:  
[alex.iacp.dvo@mail.ru](mailto:alex.iacp.dvo@mail.ru)  
Phone: +7 914 070-16-26

## Conference secretary

Natalia Khakamova  
GPI RAS

E-mail:  
[khakamova@nsc.gpi.ru](mailto:khakamova@nsc.gpi.ru)  
Phone: +7 499 503-87-77,  
add 2-96

## Conference operator

Dmitry Alekseev  
MESOL LLC

E-mail:  
[alt@mesol.ru](mailto:alt@mesol.ru)

## Website

<https://altconference24.ru/>



Road to  
Vladivostok



QR Map

Bus station

Main entrance



### FEFU Hotel

Building 2 booked  
for ALT participants



### Building B entrance

(Registration desk, Plenary  
sections, Poster sessions,  
Coffee break, Welcome  
party, Lunch)



### Building A entrance

(Conference sections:  
Level 8 [Rooms 1-3]  
Level 11 [Room 4])

## Venue

10 Ajax Bay, Far Eastern Federal University (FEFU),  
Russky Island, Vladivostok Russia



## TRANSFER FROM VLADIVOSTOK

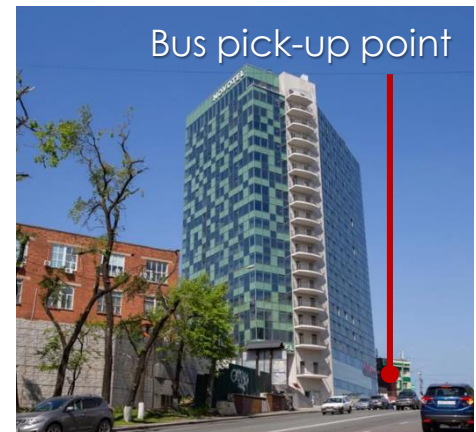
Organizers offer daily transfer from  
NOVOTEL / AVANTA / ASTORIA hotels.

**The bus will stop near NOVOTEL hotel and start at 7:50-8:00 a.m.**  
to bring the participants to the FEPU campus. You can also arrange  
the taxi to get to the campus. The taxi will drop you near the main  
gates in front of the Building A.

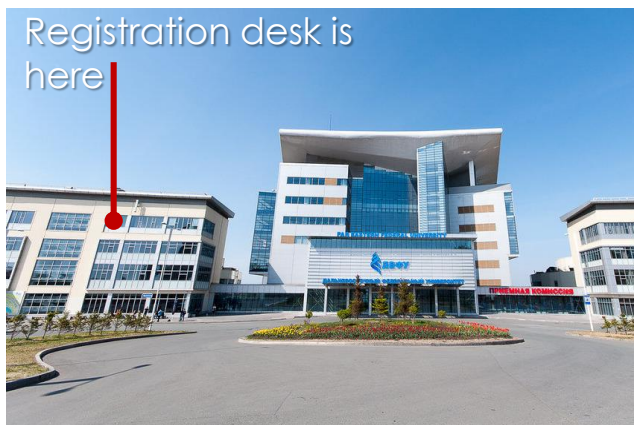
The taxi price is about 500 - 1000 rubles at the morning hours.

Public buses are also available.

Check <https://www.dvfu.ru/about/campus/students/how-to-get/>  
for main bus routes to FEPU campus. The official FEPU shuttle bus is  
also available. Please check the details in  
<https://www.dvfu.ru/about/campus/students/shuttle/>



Bus pick-up point



Registration desk is  
here

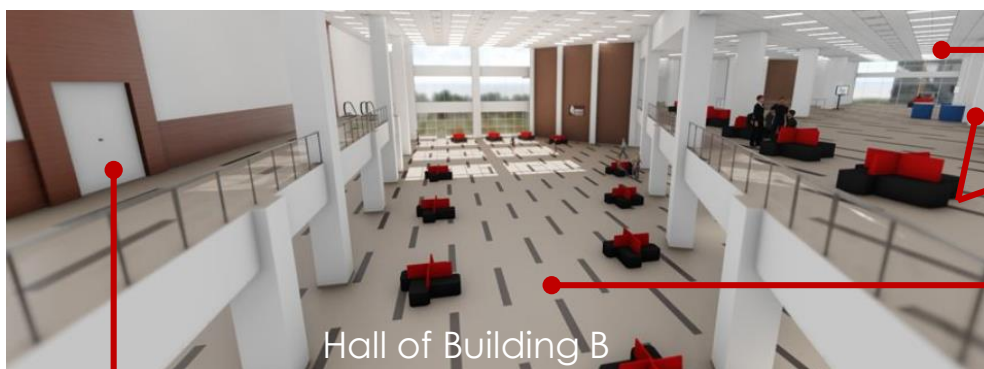
REGISTRATION AND ACCESS  
TO CONFERENCE VENUE

Registration desk located in front of the entrance to  
the Building B will be available during all the  
conference dates.

The entrance to the main campus buildings A and B  
are a subject of security check.

The registered participants can enter the campus  
building using their **conference badge**. Please keep  
your badge with you throughout the conference.

## CONFERENCE OPENING / PLENARY SECTIONS



Hall of Building B

Registration desk  
Building B / Level 6

Passage to  
Building A

Coffee breaks  
Building B / Level 5

Plenary hall  
Building B / Level 6

Opening/closing ceremony and Plenary/Poster sessions will be held in the  
plenary hall (Зал «Средний») located in the Building B / Level 6.  
The list of plenary speakers is provided in the technical program (**PAGES 19-23**).  
Coffee breaks will be served one level below the Plenary hall in the Open Hall  
area of the Building B.

## POSTER SESSIONS



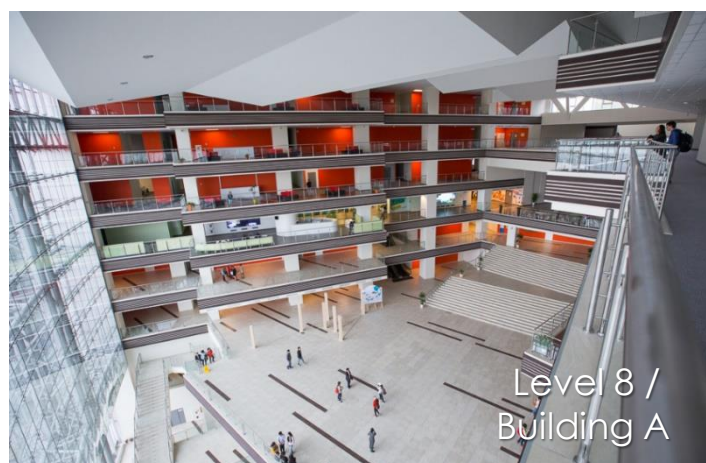
Plenary Hall

Both poster sessions (24 and 26 Sep) will be arranged in the plenary hall. The participants are asked to prepare their posters using **A1 format**. The boards for posters will be installed in the plenary hall. Participants should place their poster on the appropriate board following the numbering in the technical program (**PAGES 52-56**).

Participants are asked to place (remove) their poster during the day (after the day) of their poster session starts.

## ACCESS TO CONFERENCE PARALLEL SECTIONS

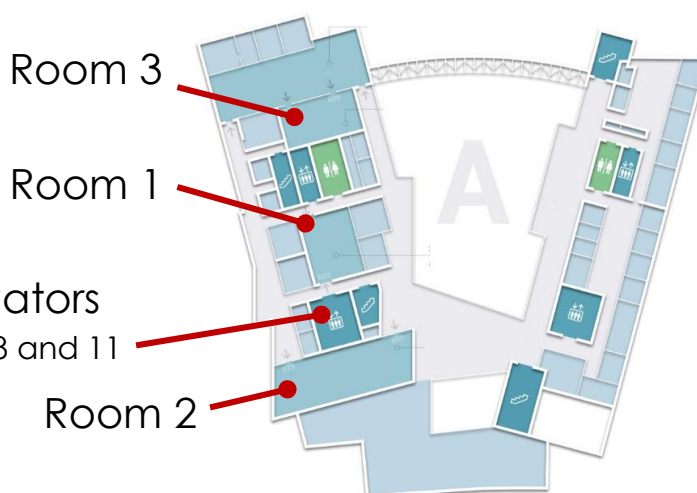
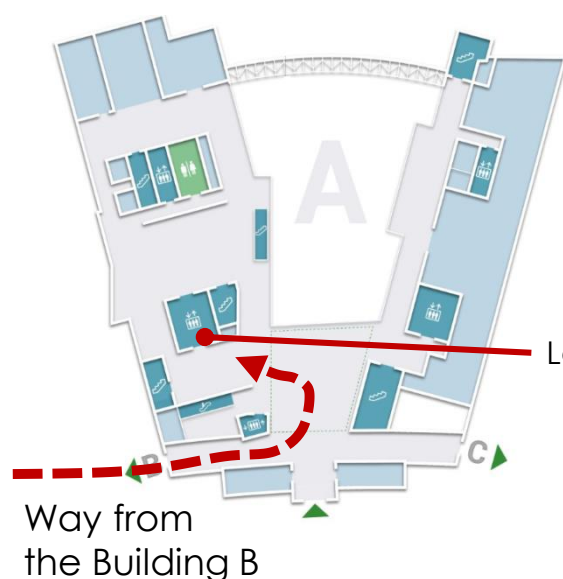
ALT conference sections will be held in the Building A directly connected with the Building B (participants do not need to go outside to move to the Building A). When reaching the hall of **Building A**, use elevators to move to **Level 8 (for Rooms No. 1-3)** and **Level 11 (for Room No. 4)**. The signposts will be installed to facilitate movement between different rooms.



Level 8 / Building A

### LEVEL 6 / BUILDING A

### LEVEL 8 / BUILDING A





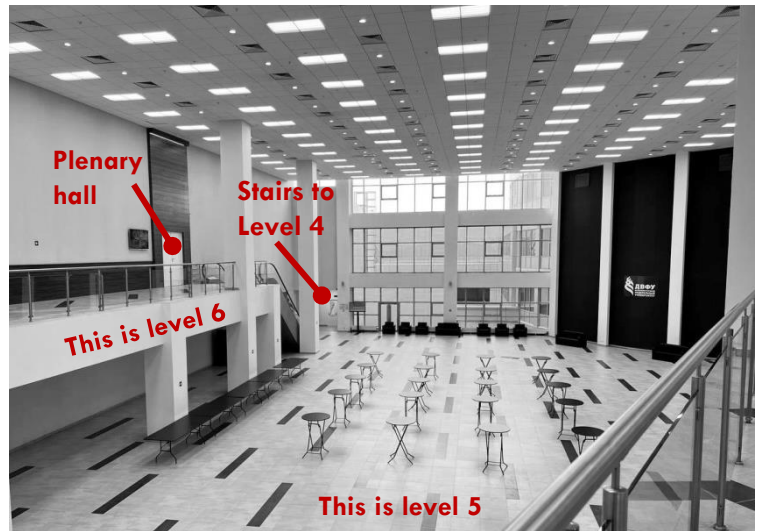
## WHERE TO EAT

**Free lunches** will be provided from 23 to 26 Sep for all conference participants during the lunch time. To get to the FEFU canteen:

1. Use escalator near the Plenary hall to move to Level 5
2. You will see the entrance to the stairs
3. Go one level down to reach canteen
4. Separate line will be arranged to provide the participants with the lunches.

You will need the **lunch ticket** provided in your participant bag.

There is also a number of cafes/canteen/cafeteria where you can eat in the FEFU campus. Please check <https://www.dvfu.ru/about/campus/cafe/> for actual information.



## SECTION COLOR SCHEME

LASER-MATTER  
INTERACTION

BIOMEDICAL  
PHOTONICS

LASER SYSTEMS  
AND MATERIALS  
(INCLUDING  
OPTICAL FIBERS)

LASER  
DIAGNOSTICS  
AND  
SPECTROSCOPY

NONLINEAR  
AND TERAHERTZ  
PHOTONICS

PHOTONICS IN  
QUANTUM  
TECHNOLOGIES

ADVANCED  
OPTICAL  
MATERIALS AND  
METAMATERIALS

AGRICULTURAL  
AND  
BIOPHYSICAL  
PHOTONICS

APCOM 2024  
(ASIA-PACIFIC CONFERENCE ON  
FUNDAMENTAL PROBLEMS OF  
OPTO- AND MICROELECTRONICS)

<b>08:30 - 09:00</b>	<b>Registration</b> Building B, Level 6, Registration desk			
<b>09:00 - 09:15</b>	<b>Opening ceremony</b> Building B, Level 6, Plenary Hall			
<b>09:15 - 10:00</b>	<b>Plenary session I</b> Building B, Level 6, Plenary Hall			
<b>10:00 - 10:20</b>	<b>Coffee break</b> Building B, Level 5, Open Hall			
<b>10:30 - 12:35</b>	<b>Laser-Matter Interaction</b>  Building A, Level 8, Room 1 («Начало»)	<b>Biomedical Photonics I</b>  Building A, Level 8, Room 2 («Великая стена»)	<b>Nonlinear and Terahertz Photonics</b>  Building A, Level 8, Room 3 («Тихоокеанский рубеж»)	<b>Agricultural and Biophysical Photonics</b>  Building A, Level 11, Room 4 («Профессорский клуб»)
<b>12:35 - 14:00</b>	<b>Lunch</b> Building B, Level 4, FEFU Canteen			
<b>14:00 - 16:55</b>	<b>Laser-Matter Interaction</b>  Building A, Level 8, Room 1 («Начало»)	<b>Biomedical Photonics II</b>  Building A, Level 8, Room 2 («Великая стена»)	<b>Nonlinear and Terahertz Photonics</b>  Building A, Level 8, Room 3 («Тихоокеанский рубеж»)	<b>Agricultural and Biophysical Photonics</b>  Building A, Level 11, Room 4 («Профессорский клуб»)
<b>17:15 - 18:00</b>	<b>Plenary session II</b> Building B, Level 6, Plenary Hall			
<b>18:00 - 20:00</b>	<b>Welcome party</b> Building B, Level 5, Open Hall			
<b>19:00 - 20:00</b>	<b>Program committee</b> Building B, Level 5, Organizer's room			



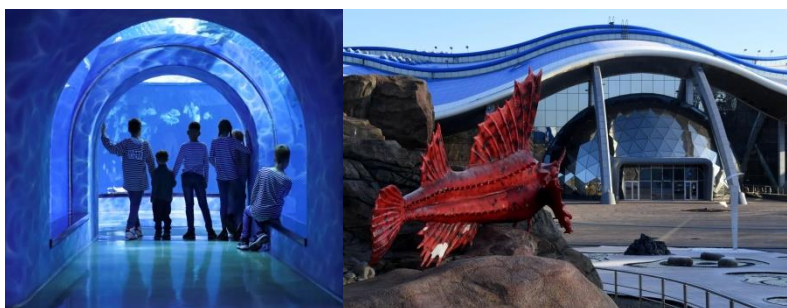
09:00 - 09:45	<b>Plenary session III</b> Building B, Level 6, Plenary Hall				
09:45 - 10:00	<b>Sponsor's presentation</b> Building B, Level 6, Plenary Hall				
10:00 - 10:20	<b>Coffee break</b> Building B, Level 5, Open Hall				
10:30 - 12:40	<b>Laser-Matter Interaction</b>  Building A, Level 8, Room 1 («Начало»)	<b>Biomedical Photonics III</b>  Building A, Level 8, Room 2 («Великая стена»)	<b>Nonlinear and Terahertz Photonics</b>  Building A, Level 8, Room 3 («Тихоокеанский рубеж»)	<b>Advanced Optical Materials &amp; Meta-materials</b>  Building A, Level 11, Room 4 («Профессорский клуб»)	<b>APCOM 2024</b>  Building B, Level 6, Plenary Room (Зал «Средний»)
12:40 - 14:00	<b>Lunch</b> Building B, Level 4, FEFU Canteen				
14:00 - 16:15	<b>Laser-Matter Interaction</b>  Building A, Level 8, Room 1 («Начало»)	<b>Biomedical Photonics IV</b>  Building A, Level 8, Room 2 («Великая стена»)	<b>Nonlinear and Terahertz Photonics</b>  Building A, Level 8, Room 3 («Тихоокеанский рубеж»)	<b>Advanced Optical Materials &amp; Meta-materials</b>  Building A, Level 11, Room 4 («Профессорский клуб»)	<b>APCOM 2024</b>  Building B, Level 6, Plenary Room (Зал «Средний»)
16:15 - 16:45	<b>Coffee break</b> Building B, Level 5, Open Hall				
16:45 - 17:30	<b>Plenary session IV</b> Building B, Level 6, Plenary Hall				
17:30 - 19:00	<b>Poster session I</b> <b>(Posters No. 1 - 35)</b> Building B, Level 6, Plenary Hall				

<b>09:00 - 09:45</b>	<b>Plenary session V</b> Building B, Level 6, Plenary Hall				
<b>09:45 - 10:00</b>	<b>Sponsor's presentation</b> Building B, Level 6, Plenary Hall				
<b>10:00 - 10:20</b>	<b>Coffee break</b> Building B, Level 5, Open Hall				
<b>10:30 - 12:35</b>	<b>Laser-Matter Interaction</b>  Building A, Level 8, Room 1 («Начало»)	<b>Biomedical Photonics V</b>  Building A, Level 8, Room 2 («Великая стена»)	<b>Laser Diagnostics and Spectroscopy</b>  Building A, Level 8, Room 3 («Тихоокеанский рубеж»)	<b>Advanced Optical Materials &amp; Meta-materials</b>  Building A, Level 11, Room 4 («Профессорский клуб»)	<b>APCOM 2024</b>  Building B, Level 6, Plenary Room (Зал «Средний»)
<b>12:35 - 14:00</b>	<b>Lunch</b> Building B, Level 4, FEFU Canteen				

## SOCIAL PROGRAMME

### Visit to Aquarium

A modern aquarium in a picturesque place of Russky island. You can visit free excursion with professional Aquarium guides and have a walk around the territory. The buses will be arranged to transfer the participants to aquarium from the FEFU campus.



### Dinner

Conference dinner will be held in the Presidium of Far Eastern Branch of RAS located in the historical center of the city. Please note that **the dinner tickets are not included into the student-type registration fee**. If you want to buy a dinner ticket please contact conference organizers in advance.



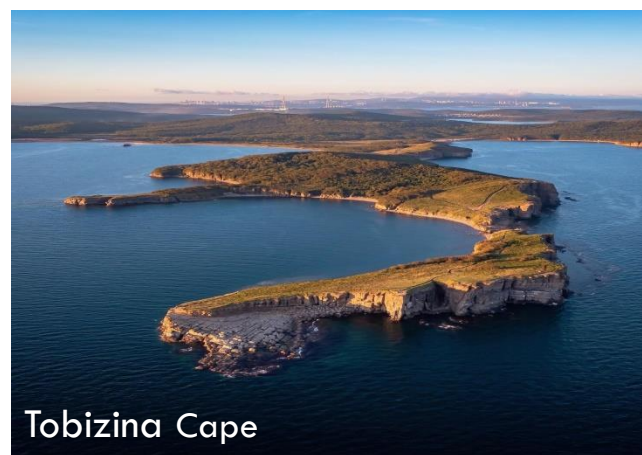


09:00 - 09:45	<b>Plenary session VI</b> Building B, Level 6, Plenary Hall				
09:45 - 10:00	<b>Sponsor's presentation</b> Building B, Level 6, Plenary Hall				
10:00 - 10:20	<b>Coffee break</b> Building B, Level 5, Open Hall				
10:30 - 12:35	<b>Laser Systems and Materials</b>  Building A, Level 8, Room 1 («Начало»)	<b>Photonics in Quantum Technologies</b>  Building A, Level 8, Room 2 («Великая стена»)	<b>Laser Diagnostics and Spectroscopy</b>  Building A, Level 8, Room 3 («Тихоокеанский рубеж»)	<b>Advanced Optical Materials &amp; Meta-materials</b>  Building A, Level 11, Room 4 («Профессорский клуб»)	<b>APCOM 2024</b>  Building B, Level 6, Plenary Room (Зал «Средний»)
12:35 - 14:00	<b>Lunch</b> Building B, Level 4, FEFU Canteen				
14:00 - 16:20	<b>Laser Systems and Materials</b>  Building A, Level 8, Room 1 («Начало»)	<b>Photonics in Quantum Technologies</b>  Building A, Level 8, Room 2 («Великая стена»)	<b>Laser Diagnostics and Spectroscopy</b>  Building A, Level 8, Room 3 («Тихоокеанский рубеж»)	<b>Advanced Optical Materials &amp; Meta-materials</b>  Building A, Level 11, Room 4 («Профессорский клуб»)	<b>APCOM 2024</b>  Building B, Level 6, Plenary Room (Зал «Средний»)
16:20 - 16:45	<b>Coffee break</b> Building B, Level 5, Open Hall				
16:45 - 17:30	<b>Plenary session VII</b> Building B, Level 6, Plenary Hall				
17:30 - 19:00	<b>Poster session II</b> <b>(Posters No. 36 - 78)</b> Building B, Level 6, Plenary Hall				

09:00 - 11:25	<b>Laser Systems and Materials</b>  Building A, Level 8, Room 1 («Начало»)	<b>Laser Diagnostics and Spectroscopy</b>  Building A, Level 8, Room 3 («Тихоокеанский рубеж»)	<b>Advanced Optical Materials &amp; Metamaterials</b>  Building A, Level 11, Room 4 («Профессорский клуб»)
11:25 - 11:50	<b>Coffee break</b>  Building B, Level 5, Open Hall		
11:50 - 12:35	<b>Plenary session VIII</b>  Building B, Level 6, Plenary Hall		
12:35 - 13:10	<b>Closing ceremony / ALT'25 and APCOM'25 presentations</b>  Building B, Level 6, Plenary Hall		

## FREE TIME

We invite conference Participants to sightsee the multiple places around the Vladivostok. We hope your stay in Vladivostok will be fruitful and leave remarkable memories.





## In situ fabricated perovskite quantum dots for photonic applications

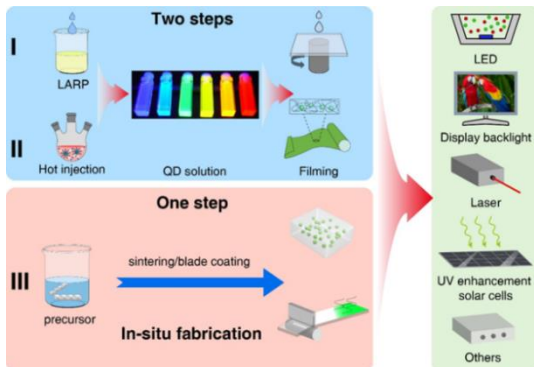
09:15 – 10:00 |  
23 September

Perovskite quantum dots (PQDs) are now emerging as functional materials for many photonic applications due to their superior optical properties and easy fabrication. In 2015, we report ligand-assisted reprecipitation (LARP) of brightly luminescent and color tunable perovskite quantum dots. In 2016, we reported the in-situ fabrication of PQDs in polymeric films with high transparency, superior photoluminescence emission and additional processing benefits for down-shifting applications.



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**Figure 1.** In-situ fabrication and ex-situ fabrication of perovskite quantum dots for photonic applications.

The potential use of in-situ fabricated PQDs as color converters in LCD backlights was successfully demonstrated, showing bright potential in display technology. Very recently, we developed the in-situ fabricated PQDs patterns for Micro LED and other down conversion applications. In addition, we also demonstrate the use of in-situ fabricated perovskite quantum dots for other applications including UV enhanced silicon photodetectors, photovoltaics, quantum dots based hyperspectrometer, CW laser etc. In all, the in-situ fabricated PQDs provide promising functional materials for many photonic and optoelectronic applications.

## Optical fiber-based technologies & applications

17:15 – 18:00 |  
23 September

Optical fiber-based devices have been widely deployed in recent years. There are many advantages of using fiber as a sensor. These include electrically-passive operation, light weight, immunity to radio frequency interference and electromagnetic interference, high sensitivity, compact size, corrosion resistance, easily multiplexing and potentially low cost. Several novel fiber-based sensors and technologies developed are presented here, including fiber Bragg grating (FBG) based sensors, photonic crystal fiber (PCF) based sensors, specialty fiber-based sensors and distributed fiber sensing systems. FBGs as instinctive sensors, are ingeniously designed as two-dimensional (2D) tilt sensors, displacement sensors, accelerometers and corrosion sensors here; PCF based evanescent field absorption sensor, PCF induced Mach-Zehnder interferometer and Fabry-Perot refractometer for temperature and refractive index sensing are presented; based on localized surface Plasmon resonant (LSPR) effect, nano-sized fiber tip with gold nanoparticles are demonstrated for live cell index bio-sensing applications.



Perry  
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Science & Technology /  
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**09:00 – 09:45 |**  
**24 September**

## Quantum technologies: state of the art and prospects



**Sergei KULIK**

Lomonosov Moscow State  
University / Russia  
[sergei.kulik@physics.msu.ru](mailto:sergei.kulik@physics.msu.ru)

The report examines the current state and prospects of the interdisciplinary field of knowledge – Quantum information processing or Quantum technologies.

The emphasis is on the basic physical principles underlying three sub-technologies developed in the world and, especially, in the Russian Federation, which will potentially lead or have already led to the creation of quantum simulators, quantum communication systems and highly sensitive sensors in the near future.

In the field of quantum computing devices, these are technologies that use neutral atoms and ions in traps, superconducting systems, impurity structures and linear-optical systems as working physical systems. In the field of quantum communication, this is the creation of a global network based on fiber-optic, atmospheric and space channels.

In the field of quantum sensorics, these are three groups of sensors: quantum clocks/gravimeters; electric and magnetic field sensors and quantum metrology/photometry. The main problems of physical and technical implementation of certain units/elements of quantum simulators and quantum communication systems are considered separately.

**16:45 – 17:30 |**  
**24 September**

## SiC nanostructures and their optoelectronic device applications



**Weiyou  
YANG**

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Technology / China  
[weiyoyang@tsinghua.org.cn](mailto:weiyoyang@tsinghua.org.cn)

Silicon carbide (SiC) is recognized as one of most important candidates of third generation semiconductors, owing to its superior properties such as outstanding mechanical properties, excellent chemical inertness, high thermal stability as well as high thermal conductivity, which allow the SiC materials to be serviced under high-temperature/high-voltage/high-power harsh environments. Here, we share our recent works on the controlled growth of SiC low-dimensional nanostructures, and their potential applications in optoelectronic devices, such as field emission cathodes, pressure sensors, photoelectric detection and energy storage.

## Modification of diamond by laser radiation: from ablation to single NV-centers formation

09:00 – 09:45 |  
25 September

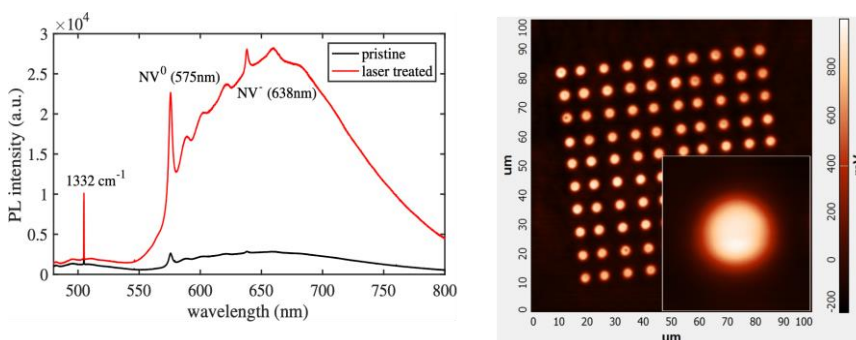


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Diamond is a unique material, the use of which is quite desirable in the different technological advances, from constructive elements operating in hot and aggressive media to the platform for quantum communication and computing. The downside is the extreme hardness of diamond crystal. While the problem of diamond synthesis has been largely solved and (poly)monocrystalline substrates are commercially available, the existing diamond processing techniques are still unable to meet the many application requirements and are in a thorough development process. Here, the fundamental aspects of the laser-diamond interaction are reviewed, focusing on the irreversible structural transformations that affect the physical and optical properties of the crystals. Experiments with harmonics of the Ti-sapphire laser (100 fs, 266-800 nm) and many other pico- and nanosecond pulsed sources have revealed a number of different laser-stimulated processes developing on the diamond surface. This diversity is due to two fundamental properties of diamond: the ability to graphitize, which completely changes the coordination geometry of the carbon bonds, and the ability to chemically react with ambient gases.

Modern pulsed lasers enable both scenarios: (1) heating of the crystal lattice up to  $\sim 2000$  °C with single pulse graphitization and ablation ( $\sim 10$  nm/pulse), and (2) nonlinear photoexcitation of the binding electrons with quite slow surface etching – "nanoablation" ( $< 10^{-2}$  nm/pulse). Special attention will be paid to the accumulative regime of the laser effect, when the laser fluence is lower than the single pulse ablation threshold and the graphitization develops with a certain delay – after multi-pulse laser treatment. Both accumulative graphitization and nanoablation are atomic-scale processes that pave the way for photolytic formation of structural defects in diamond.



**Figure 1.** PL spectra of irradiated and original diamond (left) and PL image of  $10 \times 10$  array with a period of  $8 \mu\text{m}$  and magnified image of individual pixel in the insert (right). The irradiation was made with a third harmonic of Ti-sapphire laser (100 fs, 266 nm,  $0.4 \text{ J/cm}^2$ , 0.5 million pulses).

Effective and controllable generation of color centers is a key problem in diamond-based quantum technologies. To date, several vacancy-based defects have been demonstrated to be created as a result of laser treatment of diamond. The most well-known of these is the nitrogen-vacancy complex (NV center), the formation mechanisms of which are discussed in both the accumulation and nanoablation regime. Luminescence measurements confirm that during long irradiation, e.g. with 266 nm femtosecond pulses, the NV concentration gradually increased and can increase tenfold. The correlation between the coloration of the diamond and the nanoablation of its surface is demonstrated. Taken together, the results presented here indicate that laser preablation irradiation is a promising tool to precisely control the number of generated vacancies in the lattice and thus the probability of formation of a single NV center at the desired location of a crystal.



**09:00 – 09:45 |**  
**26 September**

## Mid-Infrared quantum-cascade lasers



**Grigori  
SOKOLOVSKII**

Ioffe Institute / Russia  
[gs@mail.ioffe.ru](mailto:gs@mail.ioffe.ru)

The report will present an overview of the global state of research and development of the mid-infrared quantum cascade lasers, as well as discussion of the original research results at the Ioffe Institute. Among these, it is worth noting the demonstration of the output power of laser generation of more than 22 W at a wavelength around 4.5  $\mu\text{m}$  with pulse duration 100 ns and repetition rate 11 kHz and a record-high power exceeding 21 W achieved from QCLs of 8  $\mu\text{m}$  spectral range with pulse duration 100 ns and repetition rate 11 kHz, the dynamic characteristics of the mid-infrared quantum cascade lasers, as well as the characteristics of quantum cascade detectors for 7-9  $\mu\text{m}$  range fabricated from the structure of the record-high power quantum-cascade laser with measured sensitivity of 20 mA/W, which is superior to that of similar detectors with a specially optimized structure.

This work is supported by the Russian Science Foundation (project No. 21-72-30020).

**16:45 – 17:30 |**  
**26 September**

## Fiber lasers in modern medical technologies



**Vladimir MINAEV**

IRE-Polus LTD / Russia  
[minaev46@mail.ru](mailto:minaev46@mail.ru)

The first fiber laser (FL) was created by E. Schnitzer (Polaroid) in 1961 [1] and at 1989 their output power reached 120 mW. In 1990 V. Gapontsev and I. Samartsev presented FL with an output power of 2 W [2]. The following year, they presented a 3.9 W FL and proved the possibility of creating FL with an output power of more than 100 W [3]. Thus, prerequisites were created for expanding the field of FL use, including in medicine. In the early 2000s, NTO "IRE-Polys" developed and registered medical devices with FL with wavelengths  $\lambda = 1.55; 1.06; 1.94 \mu\text{m}$  and two independently controlled radiations  $\lambda = 0.97 + 1.55 \mu\text{m}$  [4].

The developed medical devices with FL, as well as with diode lasers, were revolutionary differs from devices based on traditional lasers:

- Making the optical part of the apparatus in the form of an integrated fiber device increases their reliability, reduces the impact of the environment and mechanical effects on them, simplifies and reduces the cost of use. They do not require me regular maintenance.
- They are distinguished by high efficiency, small dimensions, weight and consumption.
- Possibility to output in thin working fiber. It is simple to output several independently controlled radiations with different wavelengths into the working fiber.

Active work with leading Russian doctors, begun in the early 2000s, made it possible to develop and register more than 10 medical technologies, many of which have no analogues based on other methods of action.

Developed by D. Gapontsev and V. Kancharia (IPG-Photonics) lasers based on thulium FL with  $\lambda \approx 1.9 \mu\text{m}$  and output power of more than 100 W allowed N. Fried and K. Murray [5] to show their effectiveness in urology for lithotripsy and BPH surgery. Based on these results, the IRE-Polyus Ltd has developed, registered and continues to improve devices of the "UroLase" ("FiberLase U") family, superior in characteristics to analogues with solid-state lasers.

Urological devices with thulium FL from IPG are popular all over the world. With varying degrees of success, Russian and world manufacturers are trying to repeat them.

Now, the set of working wavelengths available in fiber lasers has been expanded, in particular:

- Visible laser family with wavelengths  $\lambda \approx 0.54, 0.56, 0.59, 0.62$  and  $0.66 \mu\text{m}$  with output power  $\geq 10 \text{ W}$  [6].
- Raman laser with a wavelength of  $\lambda \approx 1.68 \mu\text{m}$ , corresponding to the minimum absorption in hemoglobin, with an output power of  $\geq 10 \text{ W}$  [7].
- Optical parametric generators with pumping from FL and a wavelength of  $\lambda \approx 3 \mu\text{m}$ , corresponding to the maximum absorption in water with an output power of up to 25 W [8].

All this created a groundwork for the development of new medical devices and technologies.

## Laser nanotechnologies for perovskite photonics and optoelectronics

09:00 – 09:45 |  
27 September

Recently, nanostructured halide perovskites have attracted enormous attention due to their exceptional optical and electrical properties being useful various optoelectronic devices as shown in Fig.1. As a result, this family of materials can provide a prospective platform for modern nanophotonics and meta-optics, allowing us to overcome many obstacles associated with the use of conventional semiconductor materials. Here, we review the recent progress on laser ablation for application in halide perovskite nanophotonics starting from single-particle light-emitting nanoantennas and nano/micro-lasers to the large-scale designs working for surface coloration, anti-reflection, optical information encoding. Moreover, we discuss high potential of the femtosecond laser ablation for improvement of perovskite solar cells, creation of microscale light-emitting devices and photodetectors.



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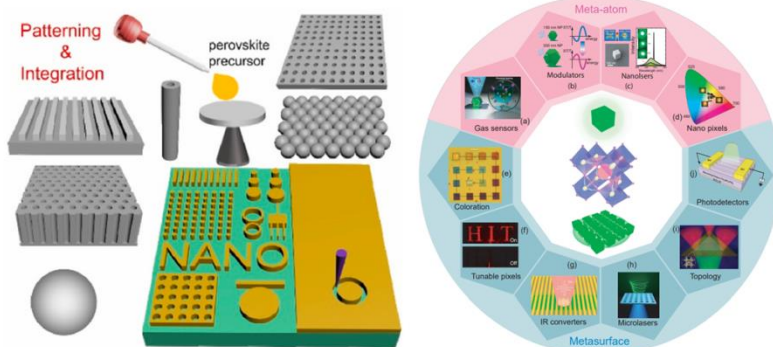


Figure 1. Schematic illustrations of methods for patterning and integration (left side) as well as applications of perovskite nanostructures in nanophotonics and optoelectronics (right side).

# Asia-Pacific Conference on Fundamental Problems of Opto- and Microelectronics (APCOM)

## Organizers:

- Institute of Automation and Control Processes Far Eastern Branch of RAS, Russia
- Far Eastern Federal University (FEFU)
- Far Eastern Branch of Russian Academy of Sciences, Russia
- IEEE Photonics Society

## Topics of APCOM-2024:

- Optoelectronic sensory and smart measurement systems
- Optoelectronics and photonics for medicine and life sciences
- Optoelectronics and photonics for nondestructive testing and structural health monitoring
- New materials and structures for photonics, optoelectronics and microelectronics
- Optical information and optical data processing. Holography
- Electromagnetic and microwave technologies
- Laser systems and their applications
- Laser industrial technologies

## Honorable chairmen:

- [Yuri KULCHIN](#), Chair, Academician of Russian Academy of Sciences (RAS), President of the Far Eastern Branch of RAS (FEB RAS), Vladivostok, Russia
- [Roman ROMASHKO](#), Co-Chair, Corresponding Member of RAS, Director of the Institute of Automation and Control Processes of FEB RAS, Vladivostok, Russia
- [Zhi ZHOU](#), Co-Chair, Dean, College of Civil Engineering and Architecture, Hainan University, Haikou, Hainan, China
- [Perry SHUM](#), Co-Chair, Southern University of Science and Technology, Shenzhen, China



## General Info About APCOM

22<sup>nd</sup> Asia-Pacific Conference on Fundamental Problems of Opto- and Microelectronics (APCOM-2024) which is held in this year jointly with 31<sup>st</sup> international conference Advanced Laser Technologies (ALT 2024).

Asia-Pacific Conferences on Fundamental Problems of Opto- and Microelectronics (APCOM) has been launched in 2000 in Vladivostok, Russia. Afterwards China, Korea, Japan, Taiwan and Russia have been taking turns hosting this significant scientific event.

Both APCOM-2024 and ALT-2024 participants will get an access to attend all sections of both conferences where 7 plenary and around 100 invited speakers will deliver their talks to all participants.

**APCOM  
2024**

**Building B, Level 6,  
Plenary Room**



**MONDAY, 23 SEPTEMBER****08:30 - 09:00** Registration**09:00 - 09:15** Opening ceremonyBuilding B, Level 6, Plenary Hall**09:15 - 10:00 In-situ fabricated perovskite nanocrystals: from properties to applications |**

| Plenary presentation Haizheng Zhong / Beijing Institute of Technology, China

**10:00 - 10:20** Tea/Coffee break**10:30 - 12:35** ALT conference sectionsBuilding A, Levels 8 - 11, Rooms 1-4**12:35 - 14:00** Lunch break**14:00 - 16:55** ALT conference sectionsBuilding A, Levels 8 - 11, Rooms 1-4Building B, Level 6, Plenary Hall**17:15 - 18:00 Optical fiber-based technologies and applications |** Plenary presentation

Perry Shum / Southern University of Science and Technology, China

**18:00 - 20:00** Welcome party**19:00 - 20:00** Program committee**TUESDAY, 24 SEPTEMBER**Building B, Level 6, Plenary Hall**09:00 - 09:45 Quantum technologies: state of the art and prospects challenges |**

| Plenary presentation Sergei Kulik / Lomonosov Moscow State University, Russia

**09:45 - 10:00** Sponsor's presentation iLightConnect, China**10:00 - 10:20** Tea/Coffee break

**TUESDAY, 24 SEPTEMBER**

## APCOM

Session chairs: Perry Shum,  
Roman Romashko

## APCOM

Session chairs: Oleg Vitrik,  
Viktor Krishtop

Building B, Level 6, Plenary Room

### **10:30 Smart ocean cable/pipe based on optical fiber sensing technologies**

Jianzhong Zhang (invited)  
Harbin Engineering University, China

### **10:50 Sub-nanosecond light pulse generator based on FDML-laser**

Xiaoyu Yang  
Harbin Engineering University, China

### **11:05 Light guiding nanostructures based on non-van-der-Waals InGaS<sub>3</sub> thin layers**

Alexey Kuznetsov  
Moscow Institute of Physics and Technology, Russia

### **11:20 Laser beam steering via optical phased array antenna**

Nikolai Laskavyi  
Perm National Research Polytechnic University, Russia

### **11:35 Photoelectric converter with aperture correction unit for Power-over-Fiber system**

Viktor Krishtop  
Perm National Research Polytechnic University, Russia

### **11:50 Reducing the number of measuring lines in a fiber-optic tomographic measuring network**

Oleg Kamenev  
Institute of Automation and Control Processes of FEB RAS,  
Russia

**12:40 - 14:00** Lunch break

Building B, Level 6, Plenary Room

### **14:00 Smart sensors for structural health monitoring**

Zhou Zhi (invited)  
Hainan University, China

### **14:20 Design and testing of a subgrade hollowing monitoring sensor based on BOTDA**

Wanqiu Liu  
Hainan University, China

### **14:40 Efficient desalination of seawater under sunlight**

Alexander Syuy  
Moscow Institute of Physics and Technology, Russia

### **14:55 Contact lens integrated stereogram for eye tracking sensor**

Ilia Fradkin  
Emerging Technologies Research Center, XPANCEO, United Arab Emirates

### **15:10 Piezoelectric sensor for seismic stress monitoring in RC structures**

Haibin Zhang  
Hainan University, China

**16:15 - 16:45** Coffee break

Building B, Level 6, Plenary Hall

### **16:45 - 17:30 SiC nanostructures and their optoelectronic device applications |**

| Plenary presentation Weiyu Yang / Ningbo University of Technology, China

**17:30 - 19:00** Poster session I

## WEDNESDAY, 25 SEPTEMBER

**09:00 - 09:45** **Modification of diamond by laser radiation: from ablation to single NV-centers formation** | Plenary presentation Building B, Level 6, Plenary Hall

Vitali Kononenko / Prokhorov General Physics Institute of RAS, Russia

**09:45 - 10:00** Sponsor's presentation JSC "LLS", Russia

**10:00 - 10:20** Tea/Coffee break

## APCOM

Session chairs: Igor Sokolov,  
Zhou Zhi

Building B, Level 6, Plenary Room

**10:30** **Space-and-time current spectroscopy of high-resistive photoconductors: techniques and applications**

Mikhail Bryushinin (invited)  
Ioffe Institute, Russia

**10:50** **Colloidal synthesis of halide perovskite microwires for photonics and optoelectronics**

Anatoly Pushkarev (invited)  
ITMO University, Russia

**11:10** **The generation of vortex light fields using a sector spiral plate based on ferroelectric and ferrielectric liquid crystals**

Svetlana Kotova (invited)  
Lebedev Physical Institute of RAS, Samara Branch, Russia

Building B, Level 6, Plenary Room

**11:30** **Emission sources based on hydrothermal ZnO nanostructures**

Svetlana Kadinskaya  
Moscow Institute of Physics and Technology, Russia

**11:45** **Emission characteristics of liquid droplet aerosols excited by femtosecond laser filaments**

Alexey Ilyin  
Institute of Automation and Control Processes of FEB RAS, Russia

**12:00** **Si nanowire-based Schottky sensors for selective sensing of NH<sub>3</sub> and HCl via impedance spectroscopy**

Valeriy Kondratev  
Moscow Institute of Physics and Technology, Russia

**12:15** **Luminescent nanothermometry with quantum emitters**

Andrei Naumov (invited)  
Lebedev Physical Institute of RAS, Troitsk Branch, Russia

**12:35 - 14:00** Lunch break

**14:00 - 21:00** Social Program / Dinner



## THURSDAY, 26 SEPTEMBER

Building B, Level 6, Plenary Hall

**09:00 - 09:45 Mid-infrared quantum-cascade lasers** | Plenary presentation

Grigori Sokolovskii / Ioffe Institute, Russia

**09:45 - 10:00** Sponsor's presentation SLS Prime Technology, Republic of Belarus

**10:00 - 10:20** Tea/Coffee break

### APCOM

Session chairs: Alexei Kamshilin,  
Svetlana Kotova

### APCOM

Session chairs: Nikolay Petrov,  
Jianzhong Zhang

Building B, Level 6, Plenary Room

**10:30 Holographic and quantitative phase imaging & wavefront shaping in the visible and terahertz frequency ranges**

Nikolay Petrov (invited)

ITMO University, Russia

**10:50 Optical properties of biaxial van der Waals crystals for photonic applications**

Aleksandr Slavich

Moscow Institute of Physics and Technology, Russia

**11:05 Ultra-dense photonic integration of e-skid waveguides enabled by van der Waals materials**

Dmitriy Grudinin

Moscow Institute of Physics and Technology, Russia

**11:20 Quasi-two dimensional gold films for plasmonic and optoelectronic applications**

Dmitry Yakubovsky

Moscow Institute of Physics and Technology, Russia

**11:35 Diffraction efficiency of a transmission hologram**

Maral Amanova

Institute of Telecommunications and informatics of Turkmenistan, Turkmenistan

**11:50 Features of thermal elastic deformation of polymer film caused by laser radiation of different powers**

Irina Zisser

Far Eastern State Transport University, Russia

Building B, Level 6, Plenary Room

**12:05 Spatial and fine energy structure of indirect excitons in dielectric heterostructures**

Vladimir Dzyuba

Institute of Automation and Control Processes of FEB RAS, Russia

**12:35 - 14:00** Lunch break

**14:00 Non-contact monitoring of cortical perfusion by imaging photoplethysmography**

Alexei Kamshilin (invited)

Institute of Automation and Control Processes of FEB RAS, Russia

**14:20 Peculiarities of pulse arrival time revealed in human arms by imaging photoplethysmography**

Natalia Podolyan

Institute of Automation and Control Processes of FEB RAS, Russia

**14:35 Laser nanostructuring of thin films for magnetic biosensing application**

Irina Dzhun

Lomonosov Moscow State University, Russia

**14:50 Bioprinting of hierarchical auxetic coronary stents: from design to mechanical testing**

Igor Shishkovsky (online)

Lebedev Physical Institute of RAS, Samara Branch, Russia

## THURSDAY, 26 SEPTEMBER

## APCOM

Session chairs: Nikolay Petrov,  
Jianzhong Zhang

Building B, Level 6, Plenary Room

**15:05 Fluorescence monitoring for predicting harmful algae blooms**

Alexander Popik

Institute of Automation and Control Processes of FEB RAS,  
Russia

**15:20 Effect of linearly polarized light on the dynamics of maize plants development**

Sergei Kozhanov

Institute of Automation and Control Processes of FEB RAS,  
Russia

**15:35 Artificial monochromatic red light induces the biosynthesis of chlorogenic acids in calli of *Cynara cardunculus***

Olga Tikhonova

Federal Scientific Center of the East Asia Terrestrial Biodiversity  
of FEB RAS, Russia

**15:50 Nuclear and nano-biotechnologies for medicine**

Irina Zavestovskaya (invited)

NRC "Kurchatov Institute", Russia

**16:20 - 16:45** Coffee break

Building B, Level 6, Plenary Hall

**16:45 - 17:30 Fiber lasers in modern medical technologies** | Plenary presentation

Vladimir Minaev / IRE-Polus LTD, Russia

**17:30 - 19:00** Poster session II

## FRIDAY, 27 SEPTEMBER

**09:00 - 11:25** ALT conference sections

Building A, Levels 8 - 11, Rooms 1,2,4

**11:25 - 11:50** Coffee break

Building B, Level 6, Plenary Hall

**11:50 - 12:35 Laser nanotechnologies for perovskite photonics and optoelectronics** |

| Plenary presentation Sergey Makarov / ITMO University, Russia

**12:35 - 13:10** Closing ceremony / ALT'25 and APCOM'25

**08:30 - 09:00** Registration

**09:00 - 09:15** Opening ceremony

Building B, Level 6, Plenary Hall

**09:15 - 10:00** **In-situ fabricated perovskite nanocrystals: from properties to applications |**

| Plenary presentation Haizheng Zhong / Beijing Institute of Technology, China

**10:00 - 10:20** Tea/Coffee break

## Laser-Matter Interaction

Session chair: Sergey Klimentov

## Biomedical Photonics I

Session chair: Alexander Priezzhev

Building A, Level 8, Room 1

**10:30** **Interaction of optical, soft X-ray, and hard X-ray lasers with solids**

Nail Inogamov (invited)

Landau Institute for Theoretical Physics of RAS, Russia

**10:50** **Nonlinear absorption and photoluminescence of direct and charge-transfer excitons in CdTe/CdSe nanotetrapods**

Aleksandr Smirnov (invited)

Lomonosov Moscow State University, Russia

**11:10** **The mechanisms of laser-induced rGO/polymer composite formation**

Evgeniya Sheremet (invited)

National Research Tomsk Polytechnic University, Russia

**11:30** **Femtosecond laser printing of structural colors for information encryption and anti-counterfeit labeling**

Vasily Lapidás

Institute of Automation and Control Processes of FEB RAS, Russia

**11:45** **Liquid-assisted laser texturing: a game-change technology toward advanced Si optoelectronics**

Yulia Borodaenko

Institute of Automation and Control Processes of FEB RAS, Russia

**12:00** **Lead halide perovskite micro-optics fabrication by femtosecond laser ablation**

Artem Cherepakhin

Institute of Automation and Control Processes of FEB RAS, Russia

Building A, Level 8, Room 2

**10:30** **Where does photonics meet acoustics and nanostructured materials for biomedical applications?**

Dmitry Gorin (invited)

Skolkovo Institute of Science and Technology, Russia

**10:50** **Resonant dielectric nanoparticles for all-optical nanoscale heating and temperature sensing in cells**

Mikhail Zyuzin (invited)

ITMO University, Russia

**11:10** **Erythrocyte-ghost integrated gold nanostars for synergistic therapy in hypoxic tumors**

Artashes Karmenyan

National Dong Hwa University, Taiwan

**11:25** **Fluorescent sensing of metal ions in biological environment with carbon dots**

Landysh Fatkhutdinova

ITMO University, Russia

**11:40** **Application of laser-synthesized boron nanoparticles for boron neutron capture therapy**

Anna Kasatova

Budker Institute of Nuclear Physics of SB RAS, Russia

**11:55** **Colloidal stability of gold nanoparticles conjugates with lysozyme under the influence of both environmental acidity and temperature factors**

Elena Molkova

Prokhorov General Physics Institute of RAS, Russia



## Nonlinear and Terahertz Photonics

Session chairs: Sergey Morozov,  
Nazar Nikolaev

Building A, Level 8, Room 3

### 10:30 On the possibility of measuring the number of THz photons using a superconducting HEB bolometer

Galiya Kitaeva (invited)

Lomonosov Moscow State University, Russia

### 10:50 Gyrotrons: towards to the design of powerful THz radiation source

Mikhail Glyavin (invited)

Institute of Applied Physics of RAS, Russia

### 11:10 Gapped bilayer graphene for terahertz and infrared photodetection

Elena Titova (invited)

Moscow Institute of Physics and Technology, Russia

### 11:30 Detectors of THz radiation based on 2D materials

Igor Gayduchenko (invited)

National Research University Higher School of Economics, Russia

### 11:50 Towards closing "terahertz gap" of quantum cascade lasers

Alexander Dubinov

Institute for Physics of Microstructures of RAS, Russia

### 12:05 Efficient strong-field THz generation from organic crystal BNA pumped by 1030 nm Yb-laser

Kirill Brekhov

MIREA — Russian Technological University, Russia

## Agricultural and Biophysical Photonics

Session chair: Sergey Gudkov

Building A, Level 11, Room 4

### 10:30 Laser methods and technologies in agriculture

Sergey Gudkov

Prokhorov General Physics Institute of RAS, Russia

### 10:45 Laser spectroscopy for environment sensing and agriculture applications

Vasily Lednev

Prokhorov General Physics Institute of RAS, Russia

### 11:00 Biophysical aspects of increasing plant productivity when grown under nanocomposite photoconversion materials

Mark Pashkin

Prokhorov General Physics Institute of RAS, Russia

### 11:15 Detection of mycotoxins using SERS-based aptamers

Maksim Moskovskiy

Federal Scientific Agro Engineering Center VIM, Russia

### 11:30 Study of pearl barley by THz high resolution spectroscopy

Vladimir Vaks

Institute for Physics of Microstructures of RAS, Russia

### 11:45 Effect of astrocyte's optogenetic stimulation on neural network activity in Alzheimer's disease modeling in vitro

Maria Vedunova

Lobachevsky State University of Nizhny Novgorod, Russia

## Laser-Matter Interaction

Session chair: Sergey Klimentov

Building A, Level 8, Room 1

### 12:15 Laser centrifugal atomization

Yuri Chivel

MerPhotonics, France

## Biomedical Photonics I

Session chair: Alexander Priezzhev

Building A, Level 8, Room 2

### 12:10 New generation of nanostructures with laser-controllable biological and luminescence properties

Gulia Bikbaeva

Saint-Petersburg State University, Russia

**12:35 - 14:00** Lunch break

## Laser-Matter Interaction

Session chairs: Ekaterina Barmina,  
Maxim Savinov

Building A, Level 8, Room 1

### 14:00 Laser control of wettability metals and glass surfaces: new applications

Galina Romanova (invited)

ITMO University, Russia

### 14:20 Laser-induced thermo-mechanical effect in regenerative medicine

Olga Baum (invited)

NRC "Kurchatov Institute", Russia

### 14:40 Laser-induced alloying and crystallization of multielemental nanostructures in liquids

Nikolai Tarasenko (invited)

National Academy of Sciences of Belarus, Belarus

### 15:00 Laser swelling at femtosecond nanostructuring of material

Nikita Bityurin (invited)

Institute of Applied Physics RAS, Russia

### 15:20 Synthesis, properties and applications of innovative nanoformulations for binary technologies of medial treatment

Sergey Klimentov (invited)

National Research Nuclear University (MEPhI), Russia

## Biomedical Photonics II

Session chair: Pavel Subochev

Building A, Level 8, Room 2

### 14:00 Detecting the raman signature responsible for the life activity of regenerating worm A. Viride using raman and two-photon fluorescence lifetime imaging spectroscopy

Chia-Liang Cheng (invited)

National Dong Hwa University, Taiwan

### 14:20 Novel analytical and numerical models for spectral and fluorescence optical modalities

Mikhail Kirillin (invited)

Institute of Applied Physics of RAS, Russia

### 14:40 Spectral characterization of transparency mechanisms in cardiac muscle

Luis Oliveira (invited)

Institute for Systems and Computer Engineering, Technology and Science, Portugal

### 15:00 Spectroscopic studies of cyanobacteria and its potential in bioenergetics

Elena Perevedentseva (invited)

Lebedev Physical Institute, Russia

### 15:20 The diagnostic capabilities of the optical spectroscopy of blood serum after freezing

Polina Nurgalieva (invited)

Lomonosov Moscow State University, Russia

## Nonlinear and Terahertz Photonics

Session chairs: Sergey Morozov,  
Nazar Nikolaev

Building A, Level 8, Room 3

**12:20 Microwave-range soliton combs  
formed based on nonlinear electron-wave  
interaction**

Irina Zotova

Institute of Applied Physics of RAS, Russia

## Agricultural and Biophysical Photonics

Session chair: Sergey Gudkov

Building A, Level 11, Room 4

## Nonlinear and Terahertz Photonics

Session chairs: Galiya Kitaeva,  
Mikhail Glyavin

Building A, Level 8, Room 3

**14:00 Stimulated emission in HgCdTe-based  
quantum wells: toward continuous wave lasing  
in THz range**

Sergey Morozov (invited)

The Institute for Physics of Microstructures of RAS, Russia

**14:20 Joint generation of THz radiation and  
electron flow in gas-cluster media under laser  
excitation**

Alexei Balakin (invited)

Lomonosov Moscow State University, Russia

**14:40 THz imaging and spectroscopy of  
molecular condensed matter**

Andrei Plekhanov (invited)

National Research Nuclear University (MEPhI), Russia

**15:00 Terahertz photonics of nonlinear  
crystals**

Nazar Nikolaev (invited)

Institute of Automation and Electrometry of SB RAS, Russia

## Agricultural and Biophysical Photonics

Session chair: Maksim Moskovskiy

Building A, Level 11, Room 4

**14:00 Simulation modeling of multiple  
scattering media to optimize the geometry of  
nephelometric sensors in agriculture**

Maxim Astashev

Prokhorov General Physics Institute of RAS, Russia

**14:15 Prototype of an optical system for  
identifying micro- and macrodamage to plant  
tissues**

Alexei Sibirev

Federal Scientific Agroengineering Center VIM, Russia

**14:30 Application of fluorescence  
spectroscopy for early detection of fungal  
infection of winter wheat grains**

Tatiana Matveeva

Prokhorov General Physics Institute of RAS, Russia

**14:45 Analysis of the dispersion composition  
of highly scattering polydisperse media using  
laser diagnostics**

Dmitry Ignatenko

Prokhorov General Physics Institute of RAS, Russia



## Laser-Matter Interaction

Session chairs: Ekaterina Barmina,  
Maxim Savinov

## Biomedical Photonics II

Session chair: Pavel Subochev

### Building A, Level 8, Room 1

**15:40 Plasmonic laser-synthesized transition metal nitrides nanoparticles as novel prospective biomedical agents**

Maxim Savinov

National Nuclear Research University (MEPHI), Russia

**15:55 Highly efficient laser-induced synthesis of sensor-active materials on flexible surfaces from deep eutectic solvents**

Aleksandra Levshakova

Saint Petersburg State University, Russia

**16:10 Laser-assisted synthesis of materials for electrochemical applications**

Evgeniia Khairullina

Saint Petersburg State University, Russia

**16:25 Investigation of physical mechanisms of laser cleaning applicable for cleaning rolled metal from mill scale**

Danila Zhurba

ITMO University, Russia

**16:40 Formation of a weld joint using laser radiation with different pulse shapes**

Elena Surmenko

Yuri Gagarin State Technical University of Saratov, Russia

### Building A, Level 8, Room 2

**15:40 Recent advances in dual-wavelength fluorescence imaging with chlorin-based photosensitizers**

Aleksandr Khilov

Institute of Applied Physics of RAS, Russia

**15:55 Separate reconstruction of absorption and scattering coefficients spectra from the diffuse reflectance spectroscopy data based on the refined analytical model**

Ekaterina Sergeeva

Institute of Applied Physics of RAS, Russia

**16:10 Spectroscopic study of methylene blue to the leucomethylene blue transition in vitro and in vivo**

Daria Pominova

Prokhorov General Physics Institute of RAS, Russia

**16:25 Cancer cells' response to chemotherapeutic treatment in the presence of collagen: monitoring with fluorescence and phosphorescence lifetime imaging techniques**

Irina Druzhkova

Privolzhsky Research Medical University, Russia

**16:40 Monte Carlo-based semi-analytical approximation for diffuse reflectance spectroscopy**

Valeriya Perekatova

Institute of Applied Physics of RAS, Russia

### Building B, Level 6, Plenary Hall

**17:15 - 18:00 Optical fiber-based technologies and applications** | Plenary presentation  
Perry Shum / Southern University of Science and Technology, China

**18:00 - 20:00** Welcome party

**19:00 - 20:00** Program committee

## Nonlinear and Terahertz Photonics

Session chairs: Galiya Kitaeva,  
Mikhail Glyavin

Building A, Level 8, Room 3

**15:20 The NovoFEL facility – source of high-power, narrow-band, tunable in wide range terahertz radiation**

Oleg Shevchenko (invited)

Budker Institute of Nuclear Physics of SB RAS, Russia

**15:40 Characteristics of THz surface waves propagating through metal and composite graphene nanofilms**

Vasily Gerasimov (invited)

Budker Institute of Nuclear Physics of SB RAS, Russia

**16:00 Broadband THz emitters: from single chips to large-area devices**

Dmitry Ponomarev (invited)

Mokrov Institute of Ultra-High Frequency Semiconductor Electronics of RAS, Russia

**16:20 Generation of terahertz multimode vortex surface plasmon polariton**

Natalya Osintseva

Budker Institute of Nuclear Physics of SB RAS, Russia

**16:35 Narrowband terahertz sources based on the molecular crystals and metasurface terahertz filters**

Anton Sinko

NRC "Kurchatov Institute", Russia

## Agricultural and Biophysical Photonics

Session chair: Maksim Moskovskiy

Building A, Level 11, Room 4

**15:00 SERS identification of Fusarium fungi**

Vasiliy Novikov

Prokhorov General Physics Institute of RAS, Russia

**15:15 Raman spectroscopy method for evaluation of punicic acid content in pomegranate seed oil**

Sergey Kuznetsov

Prokhorov General Physics Institute of RAS, Russia

**15:30 Neural networks determining wine composition with IR spectroscopy: overcoming data scarcity issues**

Olga Sarmanova

Lomonosov Moscow State University, Russia

Building B, Level 6, Plenary Hall

- 09:00 - 09:45 Quantum technologies: state of the art and prospects challenges |**  
 | Plenary presentation Sergei Kulik / Lomonosov Moscow State University, Russia
- 09:45 - 10:00** Sponsor's presentation iLightConnect, China
- 10:00 - 10:20** Tea/Coffee break

## Laser-Matter Interaction

Session chairs: Vadim Veiko,  
Nail Inogamov

Building A, Level 8, Room 1

**10:30 Nanosecond laser ablation in a free expansion and in confined modes of erosion laser plasma: physical aspects and applications**

Vadim Veiko (invited)  
ITMO University, Russia

**10:50 Does a custom-designed metasurface outperform a self-assembled nanoparticle array in chemiluminescence enhancement?**

Tigran Vartanyan (invited)  
ITMO University, Russia

**11:10 Multifunctional superhydrophobic platform for control of water microdroplets by non-uniform electrostatic field**

Georgii Pavliuk  
Institute of Automation and Control Processes of FEB RAS, Russia

**11:45 Laser field enhancement near defects in close-packed colloidal monolayers of dielectric spherical microlenses**

Alexander Pikulin  
Institute of Applied Physics, Russia

## Biomedical Photonics III

Session chair: Mikhail Kirillin

Building A, Level 8, Room 2

**10:30 Effect of optical clearing agents on microcirculation studied in vivo with digital capillaroscopy and laser speckle contrast imaging**

Andrei Lugovtsov (invited)  
Lomonosov Moscow State University, Russia

**10:50 IR and terahertz spectroscopy and machine learning for medical and ecological applications**

Yury Kistenev (invited)  
Tomsk State University, Russia

**11:10 Optical clearing as a new approach to increasing the efficiency of laser thermolysis of adipose tissue**

Irina Yanina (invited)  
Saratov State University, Russia

**11:30 Correlation of pathologic alterations of microrheologic and microcirculation parameters measured by laser-optical techniques**

Alexander Priezzhev  
Lomonosov Moscow State University, Russia

**11:45 Development of the analysis of experimental data in laser diffractometry of erythrocytes**

Mariia Lebedeva  
Lomonosov Moscow State University, Russia



## Nonlinear and Terahertz Photonics

Session chairs: Nikita Chernomyrdin,  
Olga Cherkasova

Building A, Level 8, Room 3

### 10:30 Periodically poled ferroelectric crystals and thin films for light frequency conversion

Vladimir Shur (invited)  
Ural Federal University, Russia

### 10:50 Frequency-angular properties of terahertz emission during single-color filamentation

Leonid Seleznev (invited)  
Lebedev Physical Institute of RAS, Russia

### 11:10 Emission of energetic electrons from a nanotip under combined exposure to intense terahertz and femtosecond laser fields

Andrey Stepanov (invited)  
Institute of Applied Physics of RAS, Russia

### 11:30 Quasi-phase matching of elliptically polarized high-order harmonic generation by atomic systems in two-color laser fields

Sergey Stremoukhov (invited)  
Lomonosov Moscow State University, Russia

### 11:50 Eclipse z-scan for sensitivity increasing of cubic nonlinearity measurements in THz frequency range

Azat Ismagilov (invited)  
ITMO University, Russia

## Advanced Optical Materials & Metamaterials

Session chair: Aleksandr Kuchmizhak

Building A, Level 11, Room 4

### 10:30 Study on dynamic photo-thermal regulation of vanadium dioxide

Shuliang Dou (invited)  
Harbin Institute of Technology, China

### 10:50 Biomimetic microstructures for radiative cooling

Hongbo Xu (invited)  
Harbin Institute of Technology, China

### 11:10 The influence of copper ions on eumelanin hydration examined by mid-infrared spectroscopy

Pavel Abramov  
Moscow Institute of Physics and Technology, Russia

### 11:25 Goos-Hänchen shift spatially resolves magneto-optical Kerr effect enhancement in magnetoplasmonic crystals

Aleksandr Frolov  
Lomonosov Moscow State University, Russia

### 11:40 Enigmatic color centers in diamonds with bright, stable, and narrow-band fluorescence

Arthur Nelyubov  
Skolkovo Institute of Science and Technology

## Laser-Matter Interaction

Session chairs: Vadim Veiko,  
Nail Inogamov

[Building A, Level 8, Room 1](#)

**12:00 Evolution from high-spatial-frequency laser-induced periodic surface structures to laser-induced periodic surface structures on surface of Ti and stainless steel target by sub-nanosecond laser ablation in air**

Dmitry Antipov  
IRE-Polus LTD, Russia

## Biomedical Photonics III

Session chair: Mikhail Kirillin

[Building A, Level 8, Room 2](#)

**12:00 Marker-free diagnostics for assessing pancreas and islet quality**

Polina Ermakova  
Privolzhsky Research Medical University, Russia

**12:15 Optimizing railway safety: a real-time journey with FBG sensors**

Khamar Saara (invited)  
Dayananda Sagar University, India

**12:40 - 14:00** Lunch break

## Laser-Matter Interaction

Session chair: Galina Romanova

[Building A, Level 8, Room 1](#)

**14:00 Modeling of short-pulse laser interactions with monolithic and porous silicon targets with an atomistic-continuum approach**

Maria Grigoryeva  
Lebedev Physical Institute of RAS, Russia

**14:15 Non-Markovian behavior of exciton-polaritonic Bose-Einstein condensates**

Denis Makarov  
V.I. Il'ichev Pacific Oceanological Institute of FEB RAS, Russia

**14:30 Numerical analysis of anomalous optical transmittance dynamics in Au-Bi:YIG metasurface**

Danil Safiullin  
Lomonosov Moscow State University, Russia

## Biomedical Photonics IV

Session chair: Andrey Lugovtsov

[Building A, Level 8, Room 2](#)

**14:00 Laser-assisted microbiology: engineering of microbial systems with laser bioprinting**

Nikita Minaev (invited)  
Kurchatov Complex for Crystallography and Photonics of NRC "Kurchatov Institute", Russia

**14:20 An innovative approach to phototherapy of model cancer in rats: skin optical clearing and combined PDT/PTT**

Elina Genina (invited)  
Saratov State University, Russia

**14:40 Effect of methylene blue on the NADH metabolic index of tumor cells before and after PDT**

Anastasia Ryabova  
Prokhorov General Physics Institute of RAS, Russia

## Nonlinear and Terahertz Photonics

Session chairs: Nikita Chernomyrdin,  
Olga Cherkasova

Building A, Level 8, Room 3

**12:10 Nonlinear control of coherent tunnelling by adiabatic passage in hybrid integrated waveguides**

Olga Borovkova  
Russian Quantum Center, Russia

**12:25 Second harmonic generation due to the spatial structure of radiation beam**

Mikhail Durnev  
Ioffe Institute, Russia

## Advanced Optical Materials & Metamaterials

Session chair: Aleksandr Kuchmizhak

Building A, Level 11, Room 4

**11:55 Magnetic-field-induced modulation of Goos-Hänchen effect in magnetophotonic crystals**

Anastasia Nerovnaya  
Lomonosov Moscow State University, Russia

**12:10 Creation and study of thin-film heavy metal/ferro-(ferri)magnet nanostructures promising for spintronics**

Andrei Telegin  
M.N. Mikheev Institute of Metal Physics of UB RAS, Russia

## Nonlinear and Terahertz Photonics

Session chair: Vladimir Shur

Building A, Level 8, Room 3

**14:00 The Ewald-Oseen extinction theorem in THz reflection experiments**

Alexander Shkurinov (invited)  
Lomonosov Moscow State University, Russia

**14:20 Biomedical application of terahertz radiations in the coming years**

Olga Cherkasova (invited)  
Institute of Automation and Electrometry of SB RAS, Russia

**14:40 THz high resolution spectroscopy for medical diagnostics of cancer diseases of urinary tract**

Vladimir Vaks (invited)  
Institute for Physics of Microstructures of RAS, Russia

## Advanced Optical Materials & Metamaterials

Session chair: Dmitriy Zuev

Building A, Level 11, Room 4

**14:00 Novel approaches to chiral meta-mirrors, asymmetric cavities, and polaritons**

Denis Baranov (invited)  
Moscow Institute of Physics and Technology, Russia

**14:20 2D materials for quantum applications**

Alexander Chernov (invited)  
Moscow Institute of Physics and Technology, Russia

**14:40 Semiconductor nanowires for integrated and nonlinear photonics**

Alexey Bolshakov (invited)  
Moscow Institute of Physics and Technology, Russia



## Laser-Matter Interaction

Session chair: Galina Romanova

## Biomedical Photonics IV

Session chair: Andrey Lugovtsov

Building A, Level 8, Room 1

**14:45 High-power laser interaction with transparent solid-solid interface: applications to laser damage of optical coatings**

Vitaly Gruzdev (invited)

Vavilov State Optical Institute, Russia

**15:05 Formation, stabilization and orientation of linear carbon chains using arc discharge and laser radiation**

Anton Osipov

Stoletov Vladimir State University, Russia

**15:20 Spherical microlasers with carbon dots and organic dyes**

Anton Starovoytov (invited)

ITMO University, Russia

**15:40 Merging of defect modes in one-dimensional photonic crystals with two defect layers**

Aleksei Kamenev

Institute of Automation and Control Processes of FEB RAS, Russia

Building A, Level 8, Room 2

**14:55 Thermal modulation of the electrophysiological properties of neurons and HEK 293 cells using diamond heater-thermometer**

Alexey Romshin

Prokhorov General Physics Institute of RAS, Russia

**15:10 Laser-induced agonist release for blood platelets activation control**

Ezhena Starodubtseva

Novosibirsk State University, Russia

**15:25 In scattered light of cell proliferation: cell growth and attachment monitoring**

Mariia Naumenko

Novosibirsk State University, Russia

**15:40 Drug-free inhibition of cancer cells by visible optical radiation**

Vitalii Plavskii

B.I. Stepanov Institute of Physics of NASB, Belarus, Russia

**15:55 Optimizing photothermal therapy for melanoma: the role of peptide-coated gold nanorods and laser irradiation parameters**

Lidia Mikhailova

ITMO University, Russia

**16:15 - 16:45** Coffee break

Building B, Level 6, Plenary Hall

**16:45 - 17:30 SiC nanostructures and their optoelectronic device applications |**

| Plenary presentation Weiyou Yang / Ningbo University of Technology, China

**17:30 - 19:00** Poster session I

## Nonlinear and Terahertz Photonics

Session chair: Vladimir Shur

Building A, Level 8, Room 3

### 15:00 Super-resolution THz microscopy and endoscopy of biological tissues

Nikita Chernomyrdin (invited)

Prokhorov General Physics Institute of RAS, Russia

### 15:20 THz-IR spectroscopy of astrophysical ices: recent achievements and challenges

Arsenii Gavdush (invited)

Prokhorov General Physics Institute of RAS, Russia

### 15:40 Nonlinear terahertz spectroscopy of single-walled carbon nanotubes

Maksim Paukov

Moscow Institute of Physics and Technology, Russia

## Advanced Optical Materials & Metamaterials

Session chair: Dmitriy Zuev

Building A, Level 11, Room 4

### 15:00 InGaN nanowires: MBE growth, physical properties and application

Vladislav Gridchin

Saint Petersburg Academic University, Russia

### 15:15 Gradient optical metasurfaces for analog image processing

Viacheslav Iushkov

Lomonosov Moscow State University, Russia

### 15:30 Tunable metasurface for ultrafast Fourier filtering

Viacheslav Iushkov

Lomonosov Moscow State University, Russia

### 15:45 Fizeau fringes in resonant photonic structures with spatially varying parameters

Dmitry Bykov

Samara National Research University, Russia

### 16:00 The effect of HIP on the microstructure and luminescent properties of SPS

**Al<sub>2</sub>O<sub>3</sub>-Ce:YAG composites**

Anastasia Vornovskikh

Far Eastern Federal University, Russia

- 09:00 - 09:45** **Modification of diamond by laser radiation: from ablation to single NV-centers formation** | Plenary presentation [Building B, Level 6, Plenary Hall](#)  
Vitali Kononenko / Prokhorov General Physics Institute of RAS, Russia
- 09:45 - 10:00** Sponsor's presentation JSC "LLS", Russia
- 10:00 - 10:20** Tea/Coffee break

## Laser-Matter Interaction

Session chair: Alexey Kucherik

[Building A, Level 8, Room 1](#)

### 10:30 Oriented carbon chain – new route for thin-films photonics devices

Alexey Kucherik (invited)

Stoletov Vladimir State University, Russia

### 10:50 Laser-driven formation of chiral and achiral plasmonic nanostructures for biosensing applications

Daler Dadadzhyanov (invited)

ITMO University, Russia

### 11:10 Ultrafast hot electron transfer in nickel one-dimensional plasmonic crystals

Maxim Kiryanov

Lomonosov Moscow State University, Russia

### 11:25 Laser pump – X-Ray probe diagnostics of nanosecond dynamics in LiNbO<sub>3</sub>

Evgenii Mareev

Kurchatov Complex for Crystallography and Photonics of NRC "Kurchatov Institute", Russia

### 11:40 The progress of rl-SNMS machine development in Yekaterinburg: what already has been done and what has to be done soon?

Vadim Gadelshin

Ural Federal University, Russia

### 11:55 Advancements in laser processing techniques for enhancing organic thin-film transistor performance

Prachi Sharma (invited)

Vellore Institute of Technology, India

## Biomedical Photonics V

Session chair: Alexander Priezzhev

[Building A, Level 8, Room 2](#)

### 10:30 Optical coherence elastography for quantitative visualization of diffusion processes in biotissues

Vladimir Zaitsev (invited)

Institute of Applied Physics of RAS, Russia

### 10:50 Advances in wideband (0.3-30 MHz) laser optoacoustic diagnostics

Pavel Subochev (invited)

Institute of Applied Physics of RAS, Russia

### 11:10 Optoacoustic angiography and diffuse optical spectroscopy to study tumor vascularization and oxygenation dynamics

Anna Orlova

Institute of Applied Physics of RAS, Russia

### 11:25 Multimodal OCT detection of uterine tissue pathologies

Anton Plekhanov

Privolzhsky Research Medical University, Russia

### 11:40 Thermal modulation of the electrophysiological properties of neurons and HEK 293 cells using diamond heater-thermometer

Alexey Romshin

Prokhorov General Physics Institute of RAS, Russia



## Laser Diagnostics and Spectroscopy

Session chairs: Tatiana Dolenko,  
Ilya Milekhin

Building A, Level 8, Room 3

### 10:30 Magneto-optical harmonics generation spectroscopy of semiconductors and dielectrics

Victor Pavlov (invited)

Ioffe Institute, Russia

### 10:50 Anomalous femtosecond dynamics in hybrid and all-metal magnetophotonic metasurfaces

Tatyana Dolgova (invited)

Lomonosov Moscow State University, Russia

### 11:10 Nonlinear optical microscopy of epitaxial garnet films

Tatiana Murzina (invited)

Lomonosov Moscow State university, Russia

### 11:30 Carrier-envelope phase control of single cycle pulse generation and pump-probe spectroscopy

Andrei Fedotov (invited)

Lomonosov Moscow State University, Russia

### 11:50 Quantitative ultrafast carrier imaging in perovskite microlaser with optical coherence microscopy

Anna Popkova

Lomonosov Moscow State University, Russia

### 12:05 Localization of dye molecules in zero mode waveguides

Anton Gritchenko

Institute of Spectroscopy of RAS, Russia

### 12:20 Dynamic speckle diagnostics of irreversible processes in biological and technical objects

Alexander Vladimirov

Institute of Engineering Science of UB RAS, Russia

## Advanced Optical Materials & Metamaterials

Session chair: Aleksandr Kuchmizhak

Building A, Level 11, Room 4

### 10:30 Ultrafast diamond nanophotonics in quantum technologies and gemology

Sergey Kudryashov (invited)

Lebedev Physical Institute of RAS, Russia

### 10:50 Continuously fabricating macro/micro textures on freeform surface by optical-mechanical coupled on-the-fly five-axis laser micromachining

Junjie Zhang (invited)

Harbin Institute of Technology, China

### 11:10 From concept to reality: pioneering flexible electronics with laser engineering

Raul Rodriguez (invited)

Tomsk Polytechnic University, Russia

### 11:30 Highly reflective materials for radiative cooling and laser protection

Lei Pan (invited)

Harbin Institute of Technology, China

### 11:50 Promoted performance of curved surface laser texturing by 7-axis opto-mechanical synchronization

Wenqi Ma

Harbin Institute of Technology, China

### 12:05 In-situ laser-assisted turning of particle-reinforced aluminum matrix composites Technology

Wangjie Hu

Harbin Institute of Technology, China

Building B, Level 6, Plenary Hall

**09:00 - 09:45 Mid-infrared quantum-cascade lasers** | Plenary presentation

Grigorii Sokolovskii / Ioffe Institute, Russia

**09:45 - 10:00** Sponsor's presentation SLS Prime Technology, Republic of Belarus

**10:00 - 10:20** Tea/Coffee break

## Laser Systems and Materials

Session chairs: Grigorii Sokolovskii,  
Alexey Gladyshev

## Photonics in Quantum Technologies

Session chair: Igor Vlasov

Building A, Level 8, Room 1

**10:30 The emission and laser properties of Nd<sup>3+</sup> doped silica glass and fiber around 900 nm**

Lili Hu (invited)

Shanghai Institute of Optics and Fine Mechanics, China

**10:50 Cr<sup>2+</sup> - Fe<sup>2+</sup> ions interaction in ZnSe based solid solutions**

Maxim Doroshenko (invited)

Prokhorov General Physics Institute of RAS, Russia

**11:10 Lasers for mid IR range on the base of rare earth ions doped chalcogenide glasses**

Vasily Koltashev (invited)

Prokhorov General Physics Institute of RAS, Russia

**11:30 Competition between stimulated Raman scattering and nonlinear phase modulation in crystals under pumping by powerful subpicosecond laser**

Sergei Smetanin (invited)

Prokhorov General Physics Institute of RAS, Russia

**11:50 Russian development and production of lasers: hybrid, solid-state and fiber laser systems**

Dmitry Sachenko

SC LLS, Russia

Building A, Level 8, Room 2

**10:30 Quantum light sources for quantum repeaters**

Alexey Kalachev (invited)

Kazan Scientific Center of RAS, Russia

**10:50 Single quantum dots spectromicroscopy: state of art under the Nobel prize 2023 spotlight**

Andrei Naumov (invited)

Lebedev Physical Institute of RAS, Troitsk Branch, Russia

**11:10 Towards a fully integrated quantum optical chip**

Vadim Kovalyuk (invited)

National University of Science and Technology «MISIS», Russia

**11:30 Generation, detection and characterization of ultralow energy light**

Valery Kovalev (invited)

Lebedev Physical Institute of RAS, Russia

**11:50 Quantum memristors as a new stage on the way from quantum to neuromorphic computing**

Sergey Stremoukhov

Lomonosov Moscow State University, Russia

## Laser Diagnostics and Spectroscopy

Session chairs: Tatiana Murzina,  
Dmitrii Shuleiko

Building A, Level 8, Room 3

**10:30 Chiral atomically thin AlIBVI nanostructures: colloidal growth and chiroptical properties of 2D excitons**

Roman Vasiliev (invited)

Lomonosov Moscow State University, Russia

**10:50 Resonant phenomena in luminescence response of low-dimensional silicon photonic structures**

Margarita Stepikhova (invited)

Institute for Physics of Microstructures of RAS, Russia

**11:10 Raman study of phase transitions in thin films of hafnium oxide**

Alexander Pavlikov (invited)

Lomonosov Moscow State University, Russia

**11:30 Raman spectroscopy and photoluminescence of semiconductor nanostructures with nanometer spatial resolution**

Alexander Milekhin (invited)

Rzhanov Institute of Semiconductor Physics of SB RAS, Russia

**11:50 Polarization-dependent TERS analysis of a single AlN nanowire with nanoscale spatial resolution**

Ilya Milekhin

Novosibirsk State University, Russia

## Advanced Optical Materials & Metamaterials

Session chair: Stanislav Zobotnov

Building A, Level 11, Room 4

**10:30 Laser-driven nanoparticle synthesis with tunable size, shape and composition from 2D materials**

Gleb Tselikov (invited)

Emerging Technologies Research Center, XPANCEO, United Arab Emirates

**10:50 Laser synthesis of hybrid nanoparticles for optical nanosensing and light-to-heat conversion**

Evgenii Mitsai (invited)

Institute of Automation and Control Processes of FEB RAS, Russia

**11:10 Optical and electrophysical anisotropy in amorphous silicon films irradiated with femtosecond laser pulses**

Stanislav Zobotnov (invited)

Lomonosov Moscow State University, Russia

**11:30 Laser treatment of materials to obtain superhydrophilicity for controlling heat exchanges**

Sergey Starinskiy (invited)

Kutateladze Institute of Thermophysics, Russia

**11:50 Laser-based preparation of simple and complex oxide nanoparticles for photocatalytic applications**

Elena Fakhruddinova

National Research Tomsk State University, Russia

## Laser Systems and Materials

Session chairs: Grigori Sokolovskii,  
Alexey Gladyshev

## Photonics in Quantum Technologies

Session chair: Igor Vlasov

### Building A, Level 8, Room 1

**12:05 Research progress of Bi-doped silica-based fibers for wide-band amplifier and laser application in SIOM**

Mengting Guo

Shanghai Institute of Optics and Fine Mechanics, China

**12:20 Glass-forming tendency in fiber optics Ge-As-Se-S chalcogenide glass materials**

Samir Mammadov

Republic of Azerbaijan Ministry of Science and Education  
Institute of Physics

### Building A, Level 8, Room 2

**12:05 MBE growth and properties of III-V quantum dots in nanowires for single photon sources**

Rodion Reznik

Saint Petersburg State University, Russia

**12:35 – 14:00** Lunch break

## Laser Systems and Materials

Session chair: Lili Hu

## Photonics in Quantum Technologies

Session chair: Alexei Vitukhnovsky

### Building A, Level 8, Room 1

**14:00 Gas fiber lasers: recent advances and prospects**

Alexey Gladyshev (invited)

Prokhorov General Physics Institute of RAS, Russia

**14:20 Er-Yb all-fiber lasers with sub-GHz pulses repetition rates based on composite active fibers**

Andrei Zverev (invited)

Prokhorov General Physics Institute of RAS, Russia

**14:40 Artificial intelligence for fiber lasers and sensors**

Alexey Kokhanovskiy (invited)

ITMO University, Russia

### Building A, Level 8, Room 2

**14:00 Recent advances in quantum frequency standards and other quantum sensors**

Aleksei Taichenachev (invited)

Institute of Laser Physics of SB RAS, Russia

**14:20 Photonic elements with nonclassical sources of light fabricated by Two-Photon Lithography**

Danila Kolymagin

Moscow Institute of Physics and Technology, Russia

**14:35 Promising applications of fluorescent nanodiamonds**

Igor Vlasov (invited)

Prokhorov General Physics Institute of RAS, Russia



## Laser Diagnostics and Spectroscopy

Session chairs: Tatiana Murzina,  
Dmitrii Shuleiko

Building A, Level 8, Room 3

**12:05 Raman evaluation of structure of poly(L-lactide-co- $\epsilon$ -caprolactone) and poly(L-lactide)/poly( $\epsilon$ -caprolactone) blends**

Vasiliy Novikov

Prokhorov General Physics Institute of RAS, Russia

**12:20 Structural and optical properties of PbSe(S) thin films**

Sara Yasinova

Institute of Natural Resources, Azerbaijan

## Advanced Optical Materials & Metamaterials

Session chair: Stanislav Zaboltnov

Building A, Level 11, Room 4

**12:05 Multi-level phase transitions in GST225 thin film coated on a fiber end face**

Denis Guryev

Prokhorov General Physics Institute of RAS, Russia

## Laser Diagnostics and Spectroscopy

Session chairs: Margarita Stepikhova,  
Alexander Pavlikov

Building A, Level 8, Room 3

**14:00 Raman-fluorescence tags for bioimaging by plasmon-enhanced spectroscopy**

Elena Solovyeva (invited)

Saint Petersburg State University, Russia

**14:20 Mechanisms of interactions of carbon nanoparticles with metal ions and biomacromolecules**

Tatiana Dolenko (invited)

Lomonosov Moscow State University, Russia

**14:40 Optical properties of silicon nanowires for sensor applications**

Kirill Gonchar (invited)

Lomonosov Moscow State University, Russia

## Advanced Optical Materials & Metamaterials

Session chair: Sergey Kudryashov

Building A, Level 11, Room 4

**14:00 Hybrid metal-dielectric nanostructures: fundamentals, applications and perspectives**

Dmitry Zuev (invited)

ITMO University, Russia

**14:20 High-Q IR plasmonic platforms produced by direct femtosecond laser printing**

Aleksandr Kuchmizhak (invited)

Institute of Automation and Control Processes of FEB RAS, Russia

**14:40 Highly regular nanogratings on metal and amorphous semiconductor thin films: diversity of formation mechanisms, properties and applications**

Alexander Dostovalov (invited)

Institute of Automation and Electrometry of SB RAS, Russia

## Laser Systems and Materials

Session chair: Lili Hu

## Photonics in Quantum Technologies

Session chair: Alexei Vitukhnovsky

### Building A, Level 8, Room 1

**14:55 SRS-assisted pulse frequency conversion in mode-locked fiber lasers and its application in a deep tissues multiphoton microscopy**

Denis Kharenko (invited)

Institute of Automation and Electrometry of SB RAS, Russia

**15:15 Multimode-diode-pumped watt-level bismuth-doped fiber lasers and amplifiers**

Sergey Alyshev (invited)

Prokhorov General Physics Institute of RAS, Russia

**15:40 Comb generation in fiber laser with integrated ring microcavity**

Yuriy Gladush (invited)

Skolkovo Institute of Science and Technology, Russia

### Building A, Level 8, Room 2

**14:55 Luminescence properties of single-photon sources in hexagonal boron nitride flakes**

Alexander Gritsienko

Lebedev Physical Institute of RAS, Russia

**15:10 New type of fluorescence in hydrogen-terminated nanodiamond**

Dmitrii Pasternak

Prokhorov General Physics Institute of RAS, Russia

**16:20 - 16:45** Coffee break

Building B, Level 6, Plenary Hall

**16:45 - 17:30 Fiber lasers in modern medical technologies** | Plenary presentation

Vladimir Minaev / IRE-Polus LTD, Russia

**17:30 - 19:00** Poster session II

## Laser Diagnostics and Spectroscopy

Session chairs: Margarita Stepikhova,  
Alexander Pavlikov

Building A, Level 8, Room 3

**15:00 Au/Ag-functionalized silicon nanostructures: A comprehensive study of SERS efficiency for rapid detection and analysis of chemicals, biomolecules and bioobjects**

Liubov Osminkina (invited)

Lomonosov Moscow State University, Russia

**15:20 SERS detection of anticancer drugs using a composite nanostructure based on porous silicon and gold nanoparticles**

Daria Nazarovskaia

Lomonosov Moscow State University, Russia

**15:35 Nanosensor based on carbon dots with anti-stokes luminescence**

Sergey Burikov

Lomonosov Moscow State University, Russia

**15:50 On the possibility of using neural network in tasks of laser induced breakdown spectroscopy**

Alexey Bulanov

V.I. Il'ichev Pacific Oceanological Institute of FEB RAS, Russia

## Advanced Optical Materials & Metamaterials

Session chair: Sergey Kudryashov

Building A, Level 11, Room 4

**15:00 The Fabrication of Micro-structures on the Fiber end by Femtosecond laser two-photon polymerization technique**

Changpeng Lang

Changchun Institute of Optics, Fine Mechanics and Physics, China

**15:15 Multilayer polymer microoptical elements in solid porous silicon dioxide made by two-photon lithography**

Tigran Baluian

Lomonosov Moscow State University, Russia

**15:30 Femtosecond laser-printed gold nanoantennas for electrically driven nanoscale light sources**

Denis Lebedev

Saint Petersburg Academic University, Russia

**15:45 Femtosecond laser-induced periodic surface structuring of BaGa<sub>4</sub>Se<sub>7</sub> crystal for near-infrared anti-reflection enhancement**

Sergey Syubaev

Institute of Automation and Control Processes of FEB RAS, Russia

**16:00 Laser-synthesized orthorhombic carbon flakes intercalated with Au-Ag nanoparticles as advanced optical material**

Alina Manshina (invited)

Saint Petersburg State University, Russia

# Laser Systems and Materials

Session chair: Sergey Smetanin

## Building A, Level 8, Room 1

### **09:00 GHz pulse repetition rate in waveguide lasers at 1-2 $\mu\text{m}$ with graphene**

Mariya Ponarina (invited)

Prokhorov General Physics Institute of RAS, Russia

### **09:20 Direct laser metallization from deep eutectic solvents on polymer substrates**

Lev Logunov

ITMO university, Russia

### **09:35 Effective picosecond pulse amplification schemes based on Nd-doped crystals at saturation conditions**

Vyacheslav Morozov

Lomonosov Moscow State University, Russia

### **09:50 Optically pumped rare gas laser**

Yury Adamenkov

Russian Federal Nuclear Center, Russia

### **10:05 Simultaneous generation at three wavelengths in an optically pumped He-Ar-Kr active medium**

Alexey Juriev

Russian Federal Nuclear Center, Russia

### **10:20 Faraday fiber-optic sensor for measuring ultrahigh currents**

Yan Przhiyalkovskiy

Kotelnikov Institute of Radio Engineering and Electronics (Fryazino Branch) of RAS, Russia

### **10:35 The effect of ethyl alcohol on the mechanical parameters of optical fibers in an acrylate protective coating**

Mikhail Naparin

Perm Scientific-industrial Instrument Making Company, Russia

### **10:50 New stabilization mechanisms in harmonically mode-locked fiber lasers**

Valeriia Ribenek (invited)

Ulyanovsk State University, Russia

### **11:10 Stimulated Raman scattering of broadband chirped Ti:sapphire laser pulse in calcium carbonate with Stokes seeded by narrowband nanosecond Nd:YAG laser pulse**

Valery Kovalev

Lebedev Physical Institute of RAS, Russia

**11:25 - 11:50** Coffee break

**11:50 - 12:35** **Laser nanotechnologies for perovskite photonics and optoelectronics** | Building B, Level 6, Plenary  
| Plenary presentation Sergey Makarov / ITMO University, Russia

**12:35 - 13:10** Closing ceremony / ALT'25 and APCOM'25 presentations: Alexey Kalachev Hall



## Laser Diagnostics and Spectroscopy

Session chairs: Liubov Osminkina,  
Kirill Gonchar

Building A, Level 8, Room 3

**09:00 Femtosecond laser-structured chalcogenide vitreous semiconductor films: hierarchical surface relief and optical anisotropy**

Dmitrii Shuleiko (invited)

Lomonosov Moscow State University, Russia

**09:20 The effect of concentrated deposition of nanoparticles during the evaporation of bicomponent droplets and its application in optical sensors**

Georgii Pavliuk

Institute of Automation and Control Processes of FEB RAS,  
Russia

**09:35 Determination of heavy metal ions in river water by spectroscopy and machine learning: use of transfer learning approach**

Sergey Dolenko

Lomonosov Moscow State University, Russia

**09:50 Development of a multimodal optical carbon ion nanosensor using neural networks**

Galina Chugreeva

Lomonosov Moscow State University, Russia

**10:05 Machine learning techniques in the analysis of Raman data**

Ekaterina Prikhozhenko

Saratov State University, Russia

**10:20 Ultrafast dynamics in HgTe quantum dots**

Davide Boschetto (invited)

ENSTA ParisTech, France

## Advanced Optical Materials & Metamaterials

Session chair: Sergey Makarov

Building A, Level 11, Room 4

**09:00 Development of high performance photodetectors based on Porous Si-2D materials heterostructures**

Nishant Tripathi (invited)

Samara National Research University, Russia

**09:20 Dielectric nanostructures for efficiency improvement of perovskite solar cells**

Aleksandra Furasova (invited)

ITMO university, Russia

**09:40 Superconducting Niobium diselenide NbSe<sub>2</sub>: a promising material for broadband frequency detection applications**

Kirill Shein

Moscow Pedagogical State University, Russia

**09:55 Laser processing of the trivial semimetals towards advanced transparent conductors**

Aleksandr Shevlyagin

Institute of Automation and Control Processes of FEB RAS,  
Russia

**10:10 Telluride-based PCMs for controlling active THz devices**

Maria Konnikova

Lomonosov Moscow State University, Russia

**10:25 The influence of hyperdoping gold film thickness on the photoresponse of laser hyperdoped silicon**

Andrey Akhmatkhanov

Ural Federal University, Russia

**10:40 Excitation of surface plasmon polaritons by inhomogeneities of the surface of a plasmonic material**

Vitrik Oleg (invited)

Institute of Automation and Control Processes of FEB RAS,  
Russia

## **I-LMI-1 Photothermal and dissolution properties of germanium nanoparticles for biomedical applications**

Andrei Kanavin

Lebedev Physical Institute of RAS, Russia

## **I-LMI-2 Pressure generation mechanisms in picosecond laser – metal interaction**

Alexander Samokhin

Prokhorov General Physics Institute of RAS, Russia

## **I-LMI-3 Broadband radiation detector based on laser-induced graphene embedded in polyimide**

Andrei Telegin

M.N. Mikheev Institute of Metal Physics of UB RAS, Russia

## **I-LMI-4 Features of the "Radiation shaking" process in complex environments when exposed to highly intense radiation with a wide energy spectrum**

Boris Oksengendler

Institute of Materials Science of the Academy of Sciences, Republic of Uzbekistan

## **I-LMI-5 Processes accompanying ablation of thin-film and bulk chalcogenide glass $As_2Se_3$ under multipulse femtosecond laser irradiation**

Dmitry Polyakov

ITMO University, Russia

## **I-LMI-6 Features of the Bragg diffraction on the regular domain structures with inclined walls in $MgO:LiNbO_3$**

Evgeny Savchenkov

Tomsk State University of Control Systems and Radioelectronics, Russia

## **I-LMI-7 Influence of non-equilibrium heating of gold nanospheres on the dynamics of ultrafast optical response of a multiresonant metasurface**

Grigorii Ostanin

Lomonosov Moscow State University, Russia

## **I-LMI-8 Laser synthesis of boron nanoparticles for BNCT**

Kuder Aiiyyzhy

Prokhorov General Physics Institute of RAS, Russia

## **I-LMI-9 Liquid-phase laser synthesis of magnetic nanoparticles from thin Co films**

Stanislav Zabotnov

Lomonosov Moscow State University, Russia

## **I-LMI-10 Development and creation of an activation station for irradiation of photocatalytic coatings based on titanium oxides**

Valery Khmelevsky

ITMO University, Russia

## **I-LMI-11 The blue color of the sky before sunrise**

Valery Ogluzdin

Prokhorov General Physics Institute of RAS, Russia

## **I-LMI-12 Duality of Au-dopant forms in laser hyperdoping of Si surface**

Victoria Pryakhina

Ural Federal University, Russia

## **I-LMI-13 Hand-held device "Laser brush" for creating art objects: new functional and technological capabilities**

Valeriy Romanov

ITMO University, Russia

## **I-LMI-14 Hardness increases of titanium samples by laser treatment under compressed graphite powder**

Xenia Egorova

ITMO University, Russia

## **I-LMI-15 Investigation of microrelief formation features under multi-pulse nanosecond laser irradiation of metal surface under increased pulse repetition rate**

Yulia Karlagina

ITMO University, Russia

## **I-ABP-16 Irreversible aggregation of Au nanoparticles in aqueous colloids resulting in formation of chain-like structures during solvent evaporation**

Alexandr Simakin

Prokhorov General Physics Institute of RAS, Russia

**I-ABP-17 The behavior of the protein-nanoparticle complex under laser-induced optical breakdown: an optical study**

Anna Vedunova

Lobachevsky State University of Nizhny Novgorod, Russia

**I-LSM-18 Fiber optic magnetometer on SPUN fiber**

Anton Chuvyrgalov

Perm National Research Polytechnic University, Russia

**I-LSM-19 Stimulated emission in HgCdTe heterostructures with quantum wells in 3 – 5  $\mu\text{m}$  spectral window**

Alexander Dubinov

Institute for Physics of Microstructures RAS, Russia

**I-LSM-20 The correlation of SHG responses with the (M) cation in  $\text{TbM}_3(\text{BO}_3)_4$  (M = Al, Sc, Ga) orthoborates**

Ammar Jamous

Tomsk State University, Russia

**I-LSM-21 Kinetic processes in argon-helium plasma**

Alexey Juriev

FSUE "Russian Federal Nuclear Center - VNIIEF"

**I-LSM-22 Microlenses at the ends of optical fibers that preserve radiation polarization**

Anatoly Pankov

Perm State University, Russia

**I-LSM-23 Laser speckle-vibrometer for detection of transverse and angular displacements**

Anton Trikshev

Prokhorov General Physics Institute of RAS, Russia

**I-LSM-24  $\text{Tm}^{3+}$ ,  $\text{Li}^+$   $\text{ZnWO}_4$ : novel 2- $\mu\text{m}$  laser crystal**

Denis Lis

Prokhorov General Physics Institute of RAS, Russia

**I-LSM-25 Optical properties of  $\text{LiNb}_{1-x}\text{Ta}_x\text{O}_3$  solid solution crystals**

Evgeniia Zabelina

National University of Science and Technology «MISIS», Russia

**I-LSM-26 Monolithic growth of GaAs templates on silicon**

Igor Ilkiv

Saint Petersburg State University, Russia

**I-LSM-27 Enhanced stability in WGM microresonator coupling using reinforced tapered fiber**

Kirill Minkov

Russian Quantum Center, Russia

**I-LSM-28 The effect of post-growth annealing on  $\text{CaMoO}_4$  optical properties and elemental composition**

Nina Kozlova

National University of Science and Technology «MISIS», Russia

**I-LSM-29 The optimal dopants concentrations search of  $\text{Yb,Li:ZnWO}_4$  laser crystals**

Olga Lis

Prokhorov General Physics Institute of RAS, Russia

**I-LSM-30 Lasing on optically pumped Ar-Ne active medium at 912 nm**

Valentina Shaidulina

FSUE "Russian Federal Nuclear Center – VNIIEF", Russia

**I-LSM-31 Lasing on optically pumped metastable krypton atoms at 893 nm**

Valentina Shaidulina

FSUE "Russian Federal Nuclear Center - VNIIEF", Russia

**I-LSM-32 Specific features of measuring the electrophysical parameters in polar crystals**

Vladislav Umylin

National University of Science and Technology «MISIS», Russia

**I-AOM-33 Optical conductivity and plasma frequency of  $\text{ZnIn}_2\text{Se}_4$  crystals**

Irada Mamedova

Institute of Physics of ANAS, Azerbaijan

**I-AOM-34 BBO crystals for nonlinear- and electro-optics applications**

Alexander Kokh

V.S. Sobolev Institute of Geology and Mineralogy of SB RAS, Russia

**I-AOM-35 The impact of cationic isomorphism on the optical properties of a solid solution based on  $\text{TbAl}_3(\text{BO}_3)_4$**

Artem Kuznetsov

V.S. Sobolev Institute of Geology and Mineralogy of SB RAS, Russia

## **II-APC-36 Prospects for the development of the additive process of direct supply of laser energy and material based on artificial intelligence**

Artem Basakin

Institute of Automation and Control Processes of FEB RAS, Russia

## **II-APC-37 Window functions applied in laser interferometry to investigate the spatial inhomogeneities and characteristics of waveguide elements optically induced in a lithium niobate crystal**

Alexander Bezpalý

Tomsk State University of Control Systems and Radioelectronics, Russia

## **II-APC-38 Detection of weak seismic waves in land-sea interface by fiber-optic interferometric accelerometers**

Aleksei Kamenev

Institute of Automation and Control Processes of FEB RAS, Russia

## **II-APC-39 Periodically spallated Ag film as a high-performing SERS substrate for biogenic amines detection**

Andrei Pilnik

Institute of Automation and Control Processes of FEB RAS, Russia

## **II-APC-40 Numerical approach of spherical bubble oscillations in laser-induced microcavitations: Effect of enthalpy**

Ahmed Kamal Abu-Nab

Moscow Institute of Physics and Technology, Russia

## **II-APC-41 Material properties and shear bucking behavior of QN1803 high-strength stainless steel plate girders: Testing, numerical modelling and design rules**

Boshan Chen

Hainan University, China

## **II-APC-42 Beluga whale optimization: a bio-inspired metaheuristic algorithm and its application**

Changting Zhong

Hainan University, China

## **II-APC-43 Diffraction of light on multiplexed multilayer holographic diffraction structures with varying periods**

Daniil Rastrygin

Tomsk State University of Control Systems and Radioelectronics, Russia

## **II-APC-44 The impact of Cd-doping on optical properties of all-inorganic halide perovskite microdisks**

Elizaveta Sapozhnikova

ITMO University, Russia

## **II-APC-45 Mode shape extraction using the residual responses of contact points from moving vehicles on a beam bridge**

Guandong Qiao

Hainan University, China

## **II-APC-46 Multimodal neural network analysis of Raman spectra and dermoscopic images of skin tumors**

Irina Matveeva

Samara National Research University, Russia

## **II-APC-47 SERS performance of plasmonic inks based on laser-ablated layered-material/gold hybrids**

Ilya Zavidovskiy

Moscow Institute of Physics and Technology, Russia

## **II-APC-48 The temperature influence on the characteristics of the sensitive element of a resonator fiber-optic gyroscope**

Konstantin Ovchinnikov

Perm Scientific-industrial Instrument Making Company, Russia

## **II-APC-49 The potential to integrate BIM with scanning data and IoT data to achieve intelligent building operation**

Liu Jiang

Ningbo University of Technology, China



**II-APC-50 Adaptive holographic interferometer resistant to polarization fluctuations based on a gyrotropic photorefractive crystal**

Mikhail Bezruk

Institute of Automation and Control Processes of FEB RAS, Russia

**II-APC-51 Use of circular polarization in imaging photoplethysmography**

Nikolay Nikitin

Institute of Automation and Control Processes of FEB RAS, Russia

**II-APC-52 Broadband optical properties of anisotropic palladium diselenide**

Nikolay Pak

Moscow Institute of Physics and Technology, Russia

**II-APC-53 Casimir energy and Casimir torque in twisted stack of anisotropic gratings**

Natalia Salakhova

Skolkovo Institute of Science and Technology, Russia

**II-APC-54 Effect of elastic stresses in FRP composite on the frequency characteristics of acoustic emission signals recorded by a fiber-optic sensor**

Oleg Bashkov

Komsomolsk-na-Amure State University, Russia

**II-APC-55 Advanced techniques for evaluating the mechanical properties of asphalt mastic**

Sohrab Zarei

Hainan University, China

**II-APC-56 Laser microchemical sensor for measurement of the mass of bacterial cell colonies**

Timofey Efimov

Institute of Automation and Control Processes of FEB RAS, Russia

**II-APC-57 Optimal view and path planning method for high-quality 3D reconstruction of civil structures using unmanned aerial vehicles**

Zhexiong Shang

Hainan University, China

**II-APC-58 Spectral properties of substituted arylpolyenes and cross-conjugate ketones perspective for photonics applications**

Andrei Naumov

Lebedev Physical Institute of RAS, Troitsk Branch, Russia

**II-APC-59 Novel metal and hybrid nanomaterials for electronics and photonics applications synthesized by template synthesis in the pores of polymer track membranes**

Andrei Naumov

Lebedev Physical Institute of RAS, Troitsk Branch, Russia

**II-APC-60 Numerical simulation of the single silicon pillar scattering modes for second harmonic generation**

Maria Anikina

Moscow Institute of Physics and Technology, Russia

**II-APC-61 Application of adaptive fiber optic hydrophone for detecting low frequency acoustic signals in a coastal water**

Mikhail Bezruk

Institute of Automation and Control Processes of FEB RAS, Russia

**II-NTP-62 Photo- and electroluminescence in mid-infrared range from HgCdTe based waveguide structures**

Sergey Morozov

The Institute for Physics of Microstructures of RAS, Russia

**II-BP-63 Two-dimensional metalenses for creation of portable biosensors of single molecules**

Aleksandr Barulin

Moscow Institute of Physics and Technology, Russia

**II-BP-64 Peculiarities of generation of silver nanoparticles created for giving antibacterial properties to polymers in different fluids**

Denis Fominov

ITMO University, Russia

**II-BP-65 Recognition of malignant cutaneous melanoma by multimodal analysis of optical biopsy data**

Irina Matveeva

Samara National Research University, Russia

**II-BP-66 The impact of interferon-alpha on RBC-endothelium interaction assessed with optical tweezers**

Matvei Maksimov

Lomonosov Moscow State University, Russia

## **II-BP-67** Diagnostics of bacteria using Fabry-Perot interference in silicon nanostructures of various morphologies

Mengyuan Wang

Lomonosov Moscow State University, Russia

## **II-BP-68** Skin optical clearing in vivo: application for photodynamic therapy

Vadim Genin

Saratov State University, Russia

## **II-BP-69** The role of endogenous porphyrin photosensitizers in the inhibitory effect of blue light on cancer cells

Vitalii Plavskii

B.I. Stepanov Institute of Physics of NASB, Belarus, Russia

## **II-PQT-70** Wigner crystal state in two-dimensional semiconductor

Artem Abramov

ITMO University, Russia

## **II-PQT-71** Optical characterization of individual single-walled carbon nanotubes

Fedor Maksimov

Moscow Institute of Physics and Technology, Russia

## **II-PQT-72** Photodetectors based on 2D superconducting NbSe<sub>2</sub> films integrated on silicon nitride waveguide

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## **II-PQT-73** Inhomogeneous broadening in the luminescence spectra of single SnV and GeV centers in CVD diamonds at cryogenic temperatures

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## **II-PQT-74** The influence of the hydrogen-containing surface of nanodiamonds on the luminescence intensity of «silicon-vacancy» centers

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## **II-LDS-75** The results of lidar studies of long-range aerosol transport from the Gobi and Taklamakan deserts

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## **II-LDS-76** SERS substrates for glucose determination: a study on the use of polymer substrate functionalized with metal nanoparticles

Olga Gusliakova

Saratov State University, Russia

## **II-LDS-77** Growth, thermal and spectroscopic properties of Tm:MgMO<sub>4</sub> crystal

Sergey Pavlov

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## **II-LDS-78** Silicon nanowires uniformly decorated with Au nanoparticles for SERS detection of viruses

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