



10th International Fall School on Organic Electronics

School Program



September 22-26, 2024
Moscow region, Russia
Hotel Soyuz
<http://www.ifsoe.ru>

10th INTERNATIONAL FALL SCHOOL ON ORGANIC ELECTRONICS – 2024 (IFSOE-2024)

Organizers

Division of Chemistry and Material Science of Russian Academy of Sciences

The Ministry of Science and Education of Russia

Enikolopov Institute of Synthetic Polymeric Materials of Russian Academy of Sciences (ISPM RAS)

Lomonosov Moscow State University (MSU)

MESOL LLC

Scientific program

- 1) **Fundamentals of organic electronics:** charge transport, modeling, photophysics, etc.
- 2) **Design and synthesis of materials for organic electronics:** organic conductors and semiconductors, dielectrics, substrates, etc.
- 3) **Organic field-effect transistors:** single crystal, polymer and monolayer OFETs, integrated circuits and related devices.
- 4) **Organic light-emitting devices:** OLEDs and OLETs, white light-emitting devices, TADF devices, organic lasers.
- 5) **Organic and hybrid solar cells:** small molecules and polymer photovoltaics, tandem cells, perovskites-based photovoltaics, etc.
- 6) **Organic sensors:** physical (pressure, temperature, photo, etc.) sensors, chemo- and biosensors.
- 7) **Characterization techniques:** various spectroscopy, microscopy, and x-ray scattering techniques, charge mobility measurements, thermal and surface analysis, HOMO and LUMO evaluation, biomedical applications, etc.
- 8) **Technologies of organic electronics:** printing of organic materials and devices, roll-to-roll techniques, ink formulations, encapsulation, etc.

School-conference Chairs

Prof. Sergey Ponomarenko (Enikolopov Institute of Synthetic Polymeric Materials of RAS, Russia)

Prof. Dmitry Paraschuk (Lomonosov Moscow State University, Russia)

International Advisory Board

Prof. Mikhail Alfimov (Photochemistry Center of RAS, Russia)

Prof. Paul Berger (Ohio State University, USA)

Prof. Sergei Chvalun (National Research Center “Kurchatov Institute”, Russia)

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Prof. Antonio Facchetti (Northwestern University, USA)

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Prof. Guglielmo Lanzani (Politecnico di Milano, Italy)

Prof. Natalie Stingelin (Georgia Tech, the USA)

Dr. Abderrahim Yassar (Ecole Polytechnique, France)

Local Organizing Committee

Dr. Victoria Gaidarzhi – *workshop secretary*

Alina Khmel'nitskaia

Yaroslava Titova

Dr. Askold Trul

Dr. Elena Kleimyuk

Dr. Artur Mannanov

Evgeniy Zaborin

School program

The 10th International Fall School on Organic Electronics – 2024 Time Schedule

Moscow, Russia (GMT+3)

	Sunday September 22nd	Monday September 23rd	Tuesday September 24th	Wednesday September 25th	Thursday September 26th			
	<i>School</i>							
9:00		Sergey Ponomarenko	Dmitry Paraschuk	Maxim Kazantsev	Vladimir Dyakonov	9:00		
10:00		Pavel Troshin	Johannes Gierschner	Marta Mas-Torrent	Alessandro Troisi	10:00		
		Jie Min	Surya Prakash Singh	Oleg Borshchev	Jian Liu			
11:00		Leonid Kulik	Alexander Yakubovich	<u>Oral talks 4</u>	<u>Oral talks 6</u>	11:00		
	Coffee-break							
12:00	Registration at ISPM RAS 16:00 Departure to Conference site	Han Yan	Alexey Tameev	Roland Resel	School Closing	12:00		
		<u>Oral talks 1</u>	<u>Oral talks 3</u>	Mikhail Khrizanforov				
13:00		Lunch				13:00		
14:00		Lunch				14:00		
15:00		Yuriy Luponosov	Trip to New Jerusalem (optional) / Sport activities	Zhengxu Cai	14:30 Departure to Moscow	15:00		
		Carlos Graeff		<u>Oral talks 5</u>				
16:00		<u>Oral talks 2</u>					16:00	
	Coffee-break							
17:00	Hotel arrival.	<u>Poster session 1</u>	Evening lecture	<u>Poster session 2</u>			17:00	
18:00	Registration							
19:00	Dinner			Conference dinner		19:00		
20:00	Opening ceremony <u>Vitaly Podzorov</u>	Moscow sightseeing tour	Sport activities			20:00		
21:00	Welcome-party					21:00		
22:00-22:30					Leisure time		22:00-22:30	

Sunday, September 22nd

12:30 – 16:00	Registration at ISPM RAS. Departure to conference site
17:00 – 19:00	Hotel arrival. Registration.
19:00 – 20:00	Dinner
20:00 – 20:15	School opennig
20:15 – 21:00	T-1. Vitaly Podzorov. High-Resolution ac-Hall Effect Measurements of Charge Transport Properties of Emergent Materials
21:00 – 22:30	Welcome-party.

Monday, September 23rd

8:00 – 9:00	Breakfast
	Chair: <i>Yuriy Luponosov</i>
9:00 – 9:45	T-2. Sergey Ponomarenko. Annulated Small Molecules, Oligomers and Polymers in Organic Electronics
9:45 – 10:30	T-3. Pavel Troshin. Probing Intrinsic Photochemical Stability and Radiation Hardness of Organic Semiconductors: New Lessons we Learned From Materials Chemistry
10:30 – 11:00	I-1. Jie Min. Modification of Metastable Phase in Organic Solar Cells
11:00 – 11:30	I-2. Leonid Kulik. Volatile and Non-Volatile Additives to Active Layer of Organic Solar Cells
11:30 – 12:00	Coffee-break
	Chair: <i>Pavel Troshin</i>
12:00 – 12:45	T-4. Han Yan. Spontaneous Charge Photogeneration in Non-Fullerene Acceptor: Discovery and Potential Application
	Oral talks 1.
12:45 – 13:00	O-1. Alina Sonina. Template-Induced Crystallization of Novel Orthorhombic 9,10-Diphenylanthracene Polymorph
13:00 – 13:15	O-2. Valeriy Postnikov. On the Influence of the Molecular Structure of Linear Thiophene-Phenylene Oligomers with a Central Benzothiadiazole Fragment on the Growth, Structure and Properties of Crystals
13:15 – 13:30	O-3. Georgiy Yurasik. Crystals of 4,7-di-2-thienyl-2,1,3-benzothiadiazole and its Derivatives with Terminal Trimethylsilyl and Alkyl Substituents: Synthesis, Growth, Structure, Electrical and Optical-Fluorescent Properties
13:30 – 14:30	Lunch

	Chair: <i>Jie Min</i>
14:30 – 15:00	I-3. <i>Yuriy Luponosov.</i> Development of Conjugated Donor-Acceptor Molecules for Organic and Perovskite Optoelectronics
15:00 – 15:30	I-4. <i>Carlos Frederico de Oliveira Graeff.</i> $\text{Ti}_3\text{C}_2\text{T}_x$ MXene for Efficient and Stable Perovskite Solar Cells
	<u>Oral talks 2.</u>
15:30 – 15:45	O-4. <i>Azat Akbulatov.</i> The Impact of ZnO Surface on the Stability of Perovskite Films and Solar Cell
15:45 – 16:00	O-5. <i>Danila Saranin.</i> Towards Adaptation of the Industrial Requirements for Up-Scaling of Perovskite Solar Modules
16:00 – 16:15	O-6. <i>Dmitriy Shikin.</i> New Non-Fused Asymmetric Nonfullerene Acceptors for Polymer Solar Cells
16:15 – 16:30	O-7. <i>Polina Sukhorukova.</i> Self-Assembled Monolayer Materials Based on Triphenylamine with Anchor Groups for Perovskite Solar Cells
16:30 – 17:00	Coffee-break
17:00 – 19:00	<u>Poster session 1 (P-1 – P-18)</u>
19:00 – 20:00	Dinner
20:00 – 23:00	Moscow sightseeing tour (optional)

Tuesday, September 24th

8:00 – 9:00	Breakfast
	Chair: <i>Sergey Ponomarenko</i>
9:00 – 9:45	T-5. <i>Dmitry Paraschuk.</i> Non-Radiative Processes in Organic Luminophores
9:45 – 10:30	T-6. <i>Johannes Gierschner.</i> Color-Pure All-Organic Emitter Design on Physical Grounds
10:30 – 11:00	I-5. <i>Surya Prakash Singh.</i> π -Conjugated Small Molecules: Rational Design, Synthesis and their Applications in Photonic Devices
11:00 – 11:30	I-6. <i>Alexander Yakubovich.</i> Computational Discovery of Materials for Deep Blue PHOLED Emitters
11:30 – 12:00	Coffee-break
	Chair: <i>Dmitry Paraschuk</i>
12:00 – 12:30	I-7. <i>Alexey Tameev.</i> Photo- and Electrical Features of Semisynthetic Macrocyclic Compounds

	<u>Oral talks 3.</u>
12:30 – 12:45	O-8. <i>Nikita Dubinets.</i> Multiscale Quantum Chemical Calculations of Highly Efficient Narrowband Deep-Blue Fluorophores
12:45 – 13:00	O-9. <i>Vladimir Nikitenko.</i> Geminate Recombination Kinetics in Organic Semiconductors, Controlled by Extremely Non-Equilibrium Hopping Transport
13:00 – 13:15	O-10. <i>Anna Saunina.</i> Analytical Modeling of Hopping Transport of Charge Carriers and Excitations in Materials with Correlated Disorder
13:30 – 14:30	Lunch
14:30 – 17:30	Trip to New Jerusalem (optional)
14:30 – 17:30	Sport activities
16:30 – 17:30	Coffee-break
17:45 – 19:00	Evening lecture. <i>Mikhail Nechaev.</i> A Guide to Quickly Writing a PhD Thesis
19:00 – 20:00	Dinner
20:00 – 21:00	Sport activities / Leisure time

Wednesday, September 25th

8:00 – 9:00	Breakfast
	Chair: <i>Zhengxu Cai</i>
9:00 – 9:45	T-7. <i>Maxim Kazantsev.</i> Controlling the Structure and Functional Properties of Crystalline Organic Materials
9:45 – 10:30	T-8. <i>Marta Mas-Torrent.</i> Organic Field-Effect Transistors: Crystal Structure/ Performance Correlations
10:30 – 11:00	I-8. <i>Oleg Borshchev.</i> Synthesis and Properties of Thiophene/Phenylene Co-Oligomers for Organic Electronics and Photonics
	<u>Oral talks 4.</u>
11:00 – 11:15	O-11. <i>Andrey Sosorev.</i> Impact of Electronegative Atoms on Dynamic Disorder in Crystalline BTBT Derivatives
11:15 – 11:30	O-12. <i>Askold Trul.</i> Electronic Nose Based on Siloxane Derivatives of BTBT with Different Length of Terminal Alkyl Group
11:30 – 12:00	Coffee-break
	Chair: <i>Askold Trul</i>
12:00 – 12:45	T-9. <i>Roland Resel.</i> Film Structure by X-ray Diffraction Methods: The Example of OEG-BTBT
12:45 – 13:15	I-9. <i>Mikhail Khrizanforov.</i> Expanding the Scope of Electrochemistry: Methods and Applications

13:15 – 13:30	<u>I-10.</u> <i>Alexei Komolov.</i> Electron Spectroscopy Investigation of Energy Band Profiles of Conjugated Molecular Films on Semiconductor and on Metal Oxide Surface
13:30 – 14:30	Lunch
	Chair: <i>Carlos Frederico de Oliveira Graeff</i>
14:30 – 15:15	<u>T-10.</u> <i>Zhengxu Cai.</i> Host-Guest Doping Systems Towards Organic Room-Temperature Phosphorescence
	<u>Oral talks 5.</u>
15:15 – 15:30	<u>O-13.</u> <i>Gagik Ghazaryan.</i> A Close Look at Dielectric Elastomer Actuators
15:30 – 15:45	<u>O-14.</u> <i>Oleg Kharlanov.</i> Intermolecular Interaction Energy-Based Computational Screening of High-Mobility Organic Semiconductors
15:45 – 16:00	<u>O-15.</u> <i>Polina Shaposhnik.</i> Towards the High Shelf Life Stability of BTBT Semiconductor Materials
16:00 – 16:15	<u>O-16.</u> <i>Vadim Krylov.</i> The Design of Bio-Recognizing Surfaces for Application in Sensors for Fungal Pathogen Detection
16:15 – 16:30	<u>O-17.</u> <i>Elena Poimanova.</i> Universal Approach to Fabrication of Reusable EGOFET Aptasensors Based on Track Membranes
16:30 – 17:00	Coffee-break
17:00 – 19:00	<u>Poster session 2 (P-19 – P-36)</u>
19:00 – 23:00	Conference Dinner

Thursday, September 26th

8:00 – 9:00	Breakfast
	Chair: <i>Maxim Kazantsev.</i>
9:00 – 9:45	<u>T-11.</u> <i>Vladimir Dyakonov.</i> Efficiency-Limiting Pathways in Organic Materials and Opto-Electronic Devices - the Role of Triplets
9:45 – 10:30	<u>T-12.</u> <i>Alessandro Troisi.</i> Digital Materials Discovery in Organic Electronics
10:30 – 11:00	<u>I-11.</u> <i>Jian Liu.</i> n-Type Organic Ionic-Electronic Mixed Conductors for Electronic Devices
	<u>Oral talks 5.</u>
11:00 – 11:15	<u>O-18.</u> <i>Abhay Sagade.</i> Engineering Performance of High-Frequency Organic Electronic Devices
11:15 – 11:30	<u>O-19.</u> <i>Tao Wang.</i> The Design and Application of Organic Room-temperature Phosphorescent Materials
11:30 – 12:00	Coffee-break

12:00 – 13:00	School closing
13:00 – 14:30	Lunch / Hotel check out
14:30 – 14:45	Departure to Moscow

Poster session 1

Monday, September 23rd, 17:00

Bobrova, Elizaveta A.	P1	Synthesis and Properties of New BTBT Derivatives for Organic Electronics
Cheshkina, Darya S.	P2	Synthesis and Aggregation-Induced Emission of 1,4-bis((9H-diazafluoren-9-ylidene)methyl)phenylenes
Chuyko, Irina A.	P3	Synthesis of Conjugated Polymers Based on Triphenylamine for Application in Perovskite Solar Cells and Metal-Ion Batteries
Dominskiy, Dmitry I.	P4	Tuning Molecular Packing and Charge Transport in Thiophene-Phenylene Co-Oligomer Single Crystals for Field-Effect Devices
Fedorenko, Roman S.	P5	Thiophene-Phenylene Co-Oligomers for Organic Field-Effect Phototransistors
Filipenkov, Dmitry A.	P6	Influence of Charge Carrier Mobility on the Form of Charge Carrier Recombination Rate Spatial Distribution in Organic Light Emitting Diodes
Gradova, Anna V.	P7	Novel Annulated Organic <i>p</i> -Type Semiconductor: Synthesis and Properties
Gudkova, Irina O.	P8	Synthesis Strategy of a Novel Organosilicon Polymer with Dihexyl-Substituted [1]BenzoThieno[3,2-b][1]BenzoThiophene Fragments in the Main Chain
Isaeva, Yulia A.	P9	Nanoparticles Based on Organic Conjugated Donor-Acceptor Molecules for Cancer Phototherapy
Karaman, Polina N.	P10	Biorecognition of Monoclonal Antibodies by EGOFET Based on Oligosaccharides
Khmelnitskaia, Alina G.	P11	Circular Dielectric Elastomer Actuators Based on PDMS/MQ Composites
Kleymyuk, Elena A.	P12	Polyvinylidene Fluoride Grafted with Polyethyl Methacrylate Chains for Pressure Sensors
Koptyaev, Andrey I.	P13	Gentle Substrate Cooling in Vacuum Deposition of Small-Molecules Semiconductors
Krasnikov, Danila A.	P14	The Specificity of the Sensitivity of Organic Field-Effect Transistors with Various Interface Dielectrics
Kravets, Natalia V.	P15	Ternary Composite of Polymer, Fullerene and Fluorinated Multi-Walled Carbon Nanotubes as the Active Layer of Organic Solar Cells
Kretova, Elena A.	P16	I-Motif Aptamer for Biosensing by Electrolyte-Gated Organic Field-Effect Transistors

Kuleshov, Bogdan S.	P17	Crown Ether-Based Electrolyte-Gated Organic Field-Effect Transistor for Detection of Alkali Metals
Titova, Yaroslava O.	P18	Inkjet Printed Organic Semiconductor Devices Based on C8-BTBT Materials

Poster session 2

Wednesday, September 25th, 17:00

Bezsudnov, Igor V.	P19	Conductivity of Filled Polymers Modelled by the Cooperative Systems Approach
Gaikov, Dmitry K.	P20	A new approach to the production of organosilicon photo conversion and photo-curable films
Levkov, Lev L.	P21	Tuning of Physical and Chemical Properties of Dithienyl Derivatives of [1]BenzoThieno[3,2-b] [1]BenzoThiophene by Variation of the Position of Solubilizing Alkyl Groups
Mannanov, Artur L.	P22	Blue Organic Light-Emitting Diodes Based on New Multi-Resonance Fluorescence Materials
Mikhailov, Maxim S.	P23	Indolocarbazole- and Diindolophenazine-Based Fluorophore with High-Efficiency Blue Electroluminescence
Molchanov, Ivan A.	P24	Tuning the Morphology of PM6/Y6 Active Layer of Organic Solar Cells via Intermediate Ternary Donor/Acceptor/Volatile Additive Blend
Moshkina, Tatiana N.	P25	Catalyst-Free Synthesis of Carbazolyl-Containing Fluorophores as Perspective Functional Materials
Papkovskaya, Elizaveta D.	P26	Synthesis and Properties of New Non-Fullerene Acceptors for Organic Solar Cells
Poletavkina, Liya A.	P27	Synthesis and Structure-Property Relationship Study for New Push-Pull Fused Oligomers Based on Indole[3,2-b]Indole and BenzoThieno[3,2-b]BenzoThiophene
Polyakov, Roman A.	P28	Novel Luminescent Polymers for 3 th Generation OLED Materials
Popova, Vlada V.	P29	Study of Influence of Terminal Groups in 2,1,3 Benzothiadiazole-Based Thiophene Phenylene Derivatives
Sorokina, Ekaterina A.	P30	Synthesis of Organosilicon Copolymers with Grafted Biotin-Containing BTBT Segments
Stakanova, Daria E.	P31	Novel Luminophores Based on 2,1,3-Benzothiadiazole Containing Phenyl, Thiophene and Various Terminal Substituents
Tolkachev, Egor D.	P32	Synthesis and Optoelectronic Properties of Thiophene-Containing Derivatives of Tris(2,4,6-Trichlorophenyl)Methyl Radical
Trofimova, Kristina E.	P33	Experimental and Calculated Electronic Structure of Organic Semiconductors Based on Benzothienoacene
Trukhanov, Vasiliy A.	P34	Modeling the Charge Traps Influence on Organic Phototransistor Performance with Spatially Localized Photoelectric Effect
Zaborin, Evgeniy A.	P35	Synthesis and Properties of Novel Polysiloxanes Grafted with Dialkyl BTBT Derivatives
Balakirev, Dmitry O.	P36	Triphenylamine-based Push-pull Small Molecules as a Platform for Elaborating Organic Semiconductor Materials with Wide Applications Range

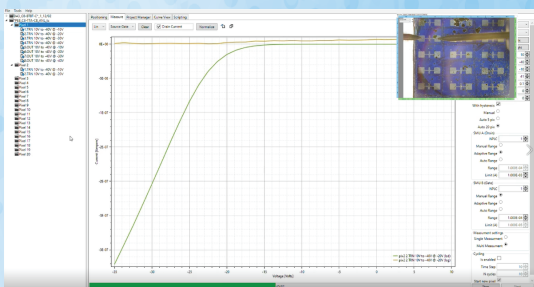
ProbeStation 100

Fully-automated low-cost probe-station designed for laboratory use and perfectly suited for semiconductors studies



Key features

- Compact design for glove-box installation
- Fully automated sample holder for fast characterization
- High accuracy current measurements with fully triaxial connectors
- Multiple-sample testing in continuous mode
- One-click measurements with user-defined scripts of the devices array
- Up to 4 semi-automated probes
- Digital microscope with LED lighting
- External LCD for probes positioning
- Keithley compatible software
- 2D sample positioning with trackball
- Software for measurement automatization
- Automatic FET parameter extraction (mobility, threshold voltage, etc.)



Additional options

- Extra probes (4-wire sense)
- Custom sample holders
- Glove-box installation
- Keithley semiconductor analyzer
- Software extension for other semiconductor analyzers

ProbeStation software

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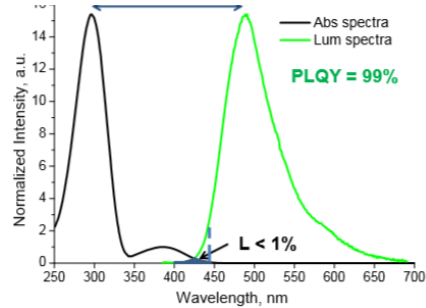
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The main goal of LumInnoTech is research, development and commercialization of Nanostructured Organosilicon Luminophores (NOLs) with unique optical properties combining those of organic luminophores and inorganic quantum dots.

Key advantages of NOLs:

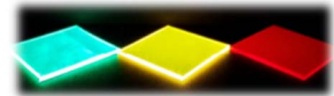
- High luminescence quantum yield: up to 99%
- High molar extinction coefficient: up to 300 000
- Large pseudo Stokes shift: up to 250 – 300 nm
- The possibility of controlling a wavelength of the light emission in a wide range
- Good solution processability
- High stability



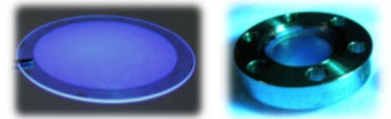
➤ **A library of NOLs, emitting at the desired wavelengths in the range from 390 to 650 nm.**



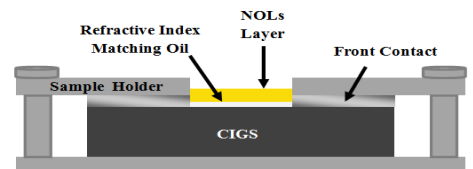
➤ **Wavelength shifting plates for pure CsI crystals**



➤ **VUV wavelength shifters for improving photon detection efficiency of noble gas detectors**



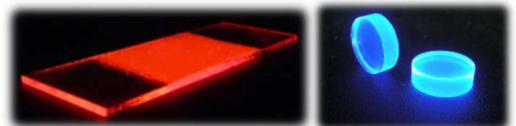
➤ **Luminescent Down Shifting Materials for CIGS Photovoltaics**



➤ **Effective Spectral Shifters for Silicon Photomultipliers**



➤ **New generation of highly efficient and fast plastic and organosilicon scintillators**



➤ **Various NOLs are available from 100 mg to 100 g quantity**

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