IFSOE
2015

2nd International Fall School on Organic Electronics

Book of abstracts

September 20-25, 2015
Moscow region, Russia
Soyuz Hotel
www.ispm.ru/ifsoe-2015

2nd INTERNATIONAL FALL SCHOOL ON ORGANIC ELECTRONICS – 2015 (IFSOE-2015)

Organizers

Division of Chemistry and Material Science of Russian Academy of Sciences

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

Lomonosov Moscow State University (MSU)

Russian Science Foundation (RSF)

Russian Foundation for Basic Research (RFBR)

Federal Agency of Scientific Organizations

Scientific program

1) ***Fundamentals of organic electronics:*** charge transport, modeling, photophysics, etc.

2) ***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 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. Vladimir Agranovich (Institute for Spectroscopy RAS, Russia)

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

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Prof. Maxim Pshenichnikov (University of Groningen, the Netherlands)

Dr. Abderrahim Yassar (Ecole polytechnique, France)

Local Organizing Committee

Alexey Sizov – *workshop secretary*

Dr. Elena Agina

Askold Trul

Technical Partner

Professional Congress Organizer – UniFest Congress
Project Coordinator – Tatiana Volkova

11:00 – 11:30	**Coffee-break**
	Chair: Paul Berger
11:30 – 12:00	**I-1**. *Pavel Troshin.* Towards understanding photochemical degradation of electron donor and acceptor components of organic bulk heterojunction solar cells
12:00 – 12:30	**I-2**. *Artem Bakulin.* Optical vibrational control of charge transport in organic semiconductors
12:30 – 13:00	**I-3**. *Dmitry Godovsky.* Resistive switch Red-Ox behavior as mechanism behind the operation of polyaniline memristors and neural network elements
13:00 – 13:30	**I-4**. *Albert Nasibulin.* Carbon nanomaterials for flexible and transparent electronics
13:30 – 15:00	**Lunch**
15:00 – 19:00	**Trip to New Jerusalem Monastery (optional)**
19:00 – 20:00	**Dinner**
20:00 – 22:30	**Sport activities**

Friday, September 25th

8:00 – 9:00	**Breakfast**
	Chair: Dmitry Paraschuk
9:00 – 9:30	**I-5**. *Alexey Komolov.* Electronic properties of conjugated organic films and of their interfaces with solid surfaces studied by electron spectroscopy techniques
9:30 – 10:00	**I-6** *Mikhail Vener.* Toward a unified description of different intermolecular interactions in organic crystals. Combined X-ray Crystallographic, Infrared/Raman Spectroscopic and solid-state DFT study
10:00 – 10:30	**I-7**. *Viktor Ivanov.* Computer simulation of microscopic ordering and charge transport in thiophene-based conjugated polymer PBTTT-C14
10:30 – 11:00	**I-8**. *Sergey Novikov.* Charge transport in amorphous organic materials: effect of spatial correlation of the random energy landscape
11:00 – 12:00	**I-9**. *Dmitry Paraschuk.* Organic electronics in Russia: current state and perspectives. **Closing ceremony.**
13:30 – 15:00	**Lunch**
15:00 – 15:15	**Departure to Moscow**

Electronic properties of conjugated organic films and of their interfaces with solid surfaces studied by electron spectroscopy techniques.

A.S. Komolov

St. Petersburg state University

Electronic properties of the surfaces of the conjugated organic materials have attracted scientific interest because of possible applications in organic electronics devices as well as in single-molecule devices. The electron spectroscopy techniques were used successfully to characterize the energy level alignment and the density of the electronic states at organic film interfaces with metal and semiconductor surfaces. Selected results on the interfacial vacuum level shift and on the formation of a 5-7 nm extended interface layer obtained by core-level and ultraviolet photoelectron spectroscopy will be reviewed. The electronic properties of the surface organic layers can be tuned by means of the influence of the substrate material and by introducing polar substituents into the molecules. That may have a pronounced effect on the density of valence states and on the density of the unoccupied electronic states (DOS and DOUS, respectively). Particularly, the substitution by electron-withdrawing groups would typically provide a stabilization of the energy positions of the edges of the forbidden energy gap and to narrowing of the bandgap. The changes of the DOS peak structure can be monitored by means of ultraviolet photoelectron spectroscopy, the DOUS changes can be monitored by means of inverse photoemission spectroscopy (IPES), by means of near edge X-ray absorption spectroscopy (NEXAFS) and using the total current spectroscopy (TCS). The experimental results are supported by the results of the first-principle electron structure calculations. The recent results on the interface formation and on the DOUS of the ultrathin films of substituted fullerene and phthalocyanine films on solid surfaces are presented.