

# 25<sup>th</sup> INTERNATIONAL SYMPOSIUM NANOSTRUCTURES: PHYSICS AND TECHNOLOGY

Saint Petersburg • Russia

June 26–30 • 2017

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The annual International Symposium on Nanostructures is chaired by two Nobel Prize laureates — Professor **Zh. Alferov** and Professor **L. Esaki**, and organized together with the St Petersburg Academic University, Submicron Heterostructures for Microelectronics Research and Engineering Center of the RAS, Foundation for Support of Education and Science (Alferov's Foundation), Ioffe Institute and ITMO University which are pioneering in many directions of this impetuously developing area.

The aim of the 25th Symposium is to focus on the newest achievements in physics, technology and applications of solid state and life nanostructures and bring together various scientific groups actively working in these very important directions. The Symposium scientific program will cover a wide spectrum of physical phenomena, studied by the participants from both basic and applied point of view. The technological aspects related to nanostructures are also presented.

## Main Topics

The symposium program will cover different aspects of semiconductor nanostructure research. We are seeking for contributions in the following list of topics:

- Technology of Nanostructures: Growth, Self-Organization and Nanopatterning
- Atomic-scale Characterization of Nanostructures
- Electrical, Magnetic and Optical Properties of Nanostructures (including Spin-Related Phenomena, Graphene, Many Particle Effects, Infrared and THz Phenomena)
- Nanostructure Device Applications in Electronics, Spintronics and Computing
- Nanophotonics, Microcavity and Photonic Crystals: Properties, Characterization and Applications
- Emerging Materials in Nanostructures (including Semiconductors, Oxides, Metals, Ferromagnetics, Carbon-based, Polymer and Biomaterials)
- Nanostructures and Life Sciences
- Metamaterials

## Language

All contributions should be presented in English that is the official language of the Symposium. No simultaneous translation services will be provided.

## Symposium Format

The Symposium program will comprise invited talks and contributed papers. The latter should be earlier unpublished works that either have been completed or are at their final stages. All contributions will be reviewed for technical merit and content by the International Program Committee on the basis of the extended abstracts submitted by the authors. Main criteria for paper acceptance are originality, significance of presented results, quality and completeness of the abstracts. The accepted papers will be assigned to either oral or poster presentation at the discretion of the International Program Committee.

Plenary, invited and contributed talks will be presented in a single-session format at opening, closing and regular oral sessions. There will be a few poster sessions.

Oral presentations will conform to a 30-minute and 20-minute format (including 5 minutes for discussions) for invited and contributed oral talks, respectively.

Each poster presenter will be provided with a 1x1 m<sup>2</sup> board.

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• **Symposium Archive**

## Invited Speakers

A number of distinguished scientists from all over the world have been invited to present talks on recent progress in various key areas of nanostructure physics and technology. While the invitation process is still in progress, a list of speakers who have accepted the invitation will be timely updated.

### Sven Höfling

University of Würzburg, Germany

Quantum dot single photon emitters in semiconductor GaAs-based micropillars and in monolayered WSe<sub>2</sub>

### Dieter Weiss

University of Regensburg, Germany

Electrical spin injection and detection in two-dimensional electron systems

### Peter Michler

University of Stuttgart, Germany

Entanglement enhanced interferometry with deterministic singlephoton sources

### Pawel Hawrylak

University of Ottawa, Canada

Carbononics: electronics, photonics and spintronics with graphene quantum dots

### Alexander Efros

Naval Research Laboratory, Center for Computational Material Science, USA

Electronic and optical properties of lead halide Perovskite nanocrystals

### Vladimir Agranovich

Institute of Spectroscopy RAS, Moscow, Russia

Hybrid resonant organic/inorganic nanostructures for optoelectronics

### Mikhail Glazov

Ioffe Institute, St Petersburg, Russia

Fine structure and scaling of Rydberg excitons in cuprous oxide

### Vladislav Timofeev

Institute of Solid State Physics RAS, Chernogolovka, Moscow District, Russia

Long-lived magnetoexcitons and two-dimensional magnetofermionic condensate in GaAs/AlGaAs heterostructure

### Gillaume Cassabois

University of Montpellier, France

Hexagonal boron nitride: an indirect bandgap semiconductor with unique optoelectronic properties

### Maurice Skolnick

University of Sheffield, UK

On-chip quantum optics with III-V quantum dots in circuit geometries

### Elyahou Kapon

Laboratory of Physics of Nanostructures, École Polytechnique Fédérale de Lausanne, Switzerland

Integrated quantum photonics with ordered quantum dot and quantum wire systems

### Bernard Gil

CNRS Laboratoire Charles Coulomb, Université Montpellier, France

Internal quantum efficiency in InGaN-GaN heterostructures emitting from blue to red

### Thierry Amand

Institut National des Sciences Appliquées de Toulouse-CNRS, France

Valley coherence in transition metal dichalcogenide monolayers

### Stefan Breuer

Technische Universität Darmstadt, Germany

Timing stability control of quantum dot based semiconductor lasers

### Benedikt Schwarz

Technische Universität Wien, Austria

QCL technology for future applications: From on-chip detection to frequency comb generation

### Sukhdeep Dhillon

Laboratoire Pierre Aigrain, Ecole Normale Supérieure, Paris, France

Generating THz pulses from modelocked quantum cascade lasers

### Michel Dyakonov

Laboratoire Charles Coulomb, Université Montpellier, France

Microwave-induced resistance oscillations as a classical memory effect

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## Friday, June 30

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### Nanostructure Technology

10:00–11:30

- NT.01i *V.L. Alperovich*, D.M. Kazantsev, I.O. Akhundov, A.S. Kozhukhov and A.V. Latyshev  
Thermal smoothing and roughening of semiconductor surfaces: experiment on GaAs and Monte Carlo simulation
- NT.02o *S. Battiato*, D. Ercolani, U.P. Gomes, V. Zannier, E. Ubyivovk, V. Mikhailovskii, Y. Murata, S. Heun, F. Beltram and L. Sorba  
Heterogenous nucleation of catalyst-free InAs nanowires on silicon
- NT.03o *I.A. Tarasov*, M.A. Visotin, L.A. Solovyov, M.N. Volochaev, M.V. Rautskii, V.S. Zhandun, I.V. Nemtsev, I.A. Yakovlev, S.N. Varnakov and S.G. Ovchinnikov  
Tuning the preferable orientation of self-assembled  $\alpha$ -FeSi<sub>2</sub> nanocrystals on Si(100): orientation relationship analysis and their physical properties
- NT.04o *A.V. Vasev*, M.A. Putyato, V.V. Preobrazhenskii, A.K. Bakarov and A.I. Toropov  
Kinetics of structural changes on GaSb(001) singular and vicinal surfaces during the UHV annealing

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### Lasers and Optoelectronic Devices II

11:50–13:20

- LOED.05i *B. Schwarz*  
QCL technology for future applications: from on-chip detection to frequency comb generation
- LOED.06o *F.I. Zubov*, A.V. Ikonnikov, K.V. Maremyanin, S.V. Morozov, V.I. Gavrilenko, A.Yu. Pavlov, N.V. Shchavruk, R.A. Khabibulin, R.R. Reznik, G.E. Cirlin, N.V. Kryzhanovskaya, A.E. Zhukov and Zh.I. Alferov  
Development and study of terahertz quantum-cascade lasers with metallic waveguide
- LOED.07o *M.A. Royz*, A.N. Imenkov, A.N. Baranov, D.S. Burenina, A.A. Pivovarova, A.M. Monakhov, E.A. Grebenshchikova and Yu.P. Yakovlev  
Collective modes in coupled semiconductor disk lasers on whispering gallery modes