

# COMMITTEES

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M. Korolev, National Research University of Electronic Technology, Zelenograd, Russia

O. Pchelyakov, Rzhanov Institute of Semiconductor Physics, Novosibirsk, Russia

V. Popov, Rzhanov Institute of Semiconductor Physics, Novosibirsk, Russia

V. Rubaev, NIX Company, Moscow, Russia

## **Local Organizing Committee**

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Konstantin Rudenko - Co-chair of the Local Organizing Committee

Yuri Bogdanov - Chair of the Extended Session "Quantum Informatics"

Vladimir Kudrya - Scientific Secretary

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Andrey Chernyavskiy - WEB design

Andrey Miakonkikh - Technical support

Alexander Rogozhin - Technical support

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Vladimir Vyurkov - Contacts to the invited speakers

Lidiya Besschastnova - Registration and accommodation

Irina Lukianova - Registration and accommodation

Inna Nikitushkina - Conference fee manager

Irina Novojilova - Conference fee manager

## SESSIONS LOCATION

**Monday, October 3<sup>rd</sup>, 2016**

TIME	CONFERENCE HALL	AUDITORIUM A	AUDITORIUM B
15.00 – 16.20	Hi-Tech Companies Presentations	-----	-----

**Tuesday, October 4<sup>th</sup>, 2016**

### 8.50. Conference Hall. WELCOME REMARKS

TIME	CONFERENCE HALL	AUDITORIUM A	AUDITORIUM B
9.00 – 11.20	<b>Plenary Session I</b>	-----	-----
11.40 – 13.40	<b>Plenary Session II.</b> Quantum Informatics I	-----	-----
14.40 – 16.20	Session 1. Physics of Nanotransistors	Session 2. Materials and Films I	Session 3. Quantum Informatics II
16.40 – 18.20	Session 4. Advanced Lithography	Session 5. Physics of Memory Devices	Session 6. Quantum Informatics III

**Wednesday, October 5<sup>th</sup> 2016**

TIME	CONFERENCE HALL	AUDITORIUM A	AUDITORIUM B
9.00 – 11.10	<b>Plenary Session III</b>	-----	-----
11.30 – 13.20	Session 7. Materials and Films II	Session 8. Superconducting Devices	Session 9. Quantum Informatics IV
14.20 – 16.00	Session 10. Superconducting and Spintronics Devices	Session 11. Meeting of the IAAS	Session 12. Quantum Informatics V

TIME	HALL	HALL
16.20 – 18.30	POSTER SESSION I	EXHIBITION

**Thursday, October 6<sup>th</sup> 2016**

<b>TIME</b>	<b>CONFERENCE HALL</b>	<b>AUDITORIUM A</b>	<b>AUDITORIUM B</b>
9.00 – 10.40	Session 13. Plasma-Based Technologies	Session 14. Semiconductor Devices of Photonics	Session 15. Quantum Informatics VI
11.00 - 13.00	Session 16. Modeling and Simulation of Semiconductor Devices	Session 17. Metrology and Characterization	Session 18. Quantum Informatics VII
14.00 – 15.40	Session 19. MEMS and NEMS	Session 20. Meeting of the IAAS	-----

<b>TIME</b>	<b>HALL</b>
16.00 – 18.30	POSTER SESSION II

**18.30. Conference Hall. CLOSING CONFERENCE REMARKS**

# ICMNE-2016 SCIENTIFIC PROGRAM

## Oral Sessions

Monday, October 3<sup>rd</sup>, 2016

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**9.00 Registration & Accommodation**

**13.00-14.00 Lunch**

### Conference Hall

#### Special Session. Presentations of Hi-Tech Companies

**Session Chairman: Konstantin Rudenko, Institute of Physics and Technology, Moscow, Russia**

- 15.00 S1-01 III-Nitride advanced technologies and equipment for microelectronics. A.N. Alexeev<sup>1</sup>, S.I. Petrov<sup>1</sup>, V.V. Mamaev<sup>1,3</sup>, D.M. Krasovitsky<sup>2</sup>, V.P. Chaly<sup>2</sup>. 1. SemiTEq, JSC, Saint Petersburg, Russia. 2. Svetlana-Rost, JSC, Saint Petersburg, Russia. 3. State Polytechnical University, Saint Petersburg, Russia.**
- 15.20 S1-02 New generation of Oxford Instruments Plasma Technology equipment for the micro- and nano- engineering of materials for semiconductors, optoelectronics, MEMS and other applications. A. Krynin. Technoinfo Limited, Moscow, Russia.**
- 15.40 S1-03 New opportunities of scanning probe microscopy and spectroscopy for micro and nanoelectronic structures investigations. V. Bykov, A. Shelaev, A. Kalinin. NT-MDT LLC, Zelenograd, Russia.**
- 16.00 S1-04 New opportunities in semiconductor manufacturing by maskless multiple e-beam lithography. H. Kersting<sup>1</sup>, M. van Kervinck<sup>1</sup>, D. Shamiryan<sup>2</sup>. 1. Mapper Lithography BV, Delft, Netherlands. 2. Mapper LLC, Moscow, Russia.**

**16.20-16.40 Coffee break**

**18.00**

**Welcome Party**

**19.00**

**Dinner**

**8.15 Breakfast**

**Conference Hall**

**8.50**

**WELCOME REMARKS**

**Yu.V. Gulyaev, Program Committee Chair, Kotel'nikov Institute of Radio Engineering and Electronics, Moscow, Russia.**

**V.F. Lukichev, Program Committee Co-Chair, Institute of Physics and Technology, Moscow, Russia.**

**Plenary Session I**

**Session Chairman: Vladimir Lukichev, Institute of Physics and Technology, Moscow, Russia**

- 9.00 L1-01 KEYNOTE: Carbon nanotubes – a new material for vacuum electronics.** *Yu.V. Gulyaev. Kotel'nikov Institute of Radio Engineering and Electronics, Moscow, Russia.*
- 10.00 L1-02 INVITED: High frequency carbon nanotube FETs for mobile communications.** *S.E. Schulz. Fraunhofer Institute for Electronic Nano Systems (Fraunhofer ENAS), Chemnitz, Germany.*
- 10.40 L1-03 INVITED: Tunnel field-effect transistors for digital electronics.** *D. Svintsov<sup>1,2</sup>, V. Vyurkov<sup>1,2</sup>, A. Orlikovsky<sup>1,2</sup>. 1. Institute of Physics and Technology, Moscow, Russia. 2. Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russia.*

**11.20-11.40 Coffee break**

**Conference Hall**

**Plenary Session II. Quantum Informatics I**

**Session Chairman: Yuri Bogdanov, Institute of Physics and Technology, Moscow, Russia**

- 11.40 qL1-01 INVITED: Experimental and theoretical investigations of quantum state transfer and decoherence processes in quasi-one-dimensional systems in multiple-quantum NMR experiments.** *G.A. Bochkin, S.I. Doronin, S.G. Vasil'ev, A.V. Fedorova, E.B. Fel'dman. Institute of Problems of Chemical Physics, Chernogolovka, Russia.*
- 12.10 qL1-02 INVITED: Post-selection free spatial Bell state generation.** *E.V. Kovlakov, I.B. Bobrov, S.S. Straupe, S.P. Kulik. Lomonosov Moscow State University, Moscow, Russia.*
- 12.40 qL1-03 INVITED: Broadband quantum memory in a nanofiber-coupled ring-cavity array.** *S.A. Moiseev<sup>1</sup>, E.S. Moiseev<sup>1</sup>, A.M. Zheltikov<sup>2,3,4</sup>. 1. Kazan Quantum Center, Kazan Scientific Research Technical University, Kazan, Russia. 2. Texas University, College Station, USA. 3. International Laser Center, Lomonosov Moscow State University, Moscow, Russia. 4. Russian Quantum Center, Skolkovo, Russia.*

- 13.10 qL1-04 INVITED: Quantum Cryptographic Hashing.** F. Ablayev<sup>1</sup>, M. Ablayev<sup>2</sup>.  
1. Department of Theoretical Cybernetics, Kazan Federal University, Kazan, Russia.  
2. Laboratory of Quantum Informatics, Kazan Federal University, Kazan, Russia.

**13.40-14.40 Lunch**

## **Conference Hall**

### **Session 1. Materials and Films I**

**Session Chairman: Andrey Miakonkikh, Institute of Physics and Technology, Moscow, Russia**

- 14.40 O1-01 Characterization of InSb nanocrystals ion-beam synthesized in SiO<sub>2</sub> films.** I.E. Tyschenko<sup>1</sup>, V.A. Volodin<sup>1,2</sup>, A.G. Cherkov<sup>1,2</sup>, M. Stoffel<sup>3</sup>, H. Rinnert<sup>3</sup>, M. Vergnat<sup>3</sup>. 1. Rzhanov Institute of Semiconductor Physics, Novosibirsk, Russia. 2. Novosibirsk State University, Novosibirsk, Russia. 3. Université de Lorraine, Institut Jean Lamour UMR CNRS 7198, Vandœuvre-lès-Nancy Cedex, France.
- 15.00 O1-02 HfO<sub>2</sub>/Pr<sub>2</sub>O<sub>3</sub> gate dielectric stacks.** F. Sidorov<sup>1,2</sup>, A. Molchanova<sup>1,2</sup>, A. Rogozhin<sup>1,2</sup>. 1. Institute of Physics and Technology, Moscow, Russia. 2. Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russia.
- 15.20 O1-03 Quantum-mechanical relaxation model for characterization of fine particles magnetic dynamics in an external magnetic field.** I. Mischenko, M. Chuev. Institute of Physics and Technology, Moscow, Russia.
- 15.40 O1-04 Modulation of magnetic interaction in Bismuth ferrite through strain and spin cycloid engineering.** R.S Yadav<sup>1</sup>, H.A. Reshi<sup>1</sup>, S. Pillai<sup>1</sup>, D.S. Rana<sup>2</sup>, V. Shelke<sup>1</sup>. 1. Barkatullah University, Bhopal, India. 2. Indian Institute of Science Education and Research, Bhauri, India.
- 16.00 O1-05 Optical coefficients of nanometer chromium films in 0.25–1.1 THz frequency range.** V.G. Andreev<sup>1</sup>, A.A. Angeluts<sup>1</sup>, V.F. Lukichev<sup>2</sup>, A.P. Shkurinov<sup>1</sup>, V.A. Vdovin<sup>3</sup>. 1. Lomonosov Moscow State University, Moscow, Russia. 2. Institute of Physics and Technology, Moscow, Russia. 3. Kotel'nikov Institute of Radio Engineering and Electronics, Moscow, Russia.

## **Auditorium A**

### **Session 2. Physics of Nanotransistors**

**Session Chairman: Vladimir Vuyrkov, Institute of Physics and Technology, Moscow, Russia**

- 14.40 O1-06 Quantum capacitance in thick 2G SOI transistors.** V.P. Popov<sup>1</sup>, M.A. Ilnitskii<sup>1</sup>, V.N. Mordkovich<sup>2</sup>, A.V. Leonov<sup>2</sup>. 1. Rzhanov Institute of Semiconductor Physics, Novosibirsk, Russia. 2. Institute of Microelectronics Technology and High-Purity Materials, Moscow, Russia.
- 15.00 O1-07 Simple models of Tristate transistors.** S. Krivelevich. Institute of Physics and Technology (Yaroslavl Branch), Yaroslavl, Russia.

- 15.20 O1-08 Abrupt current switching in graphene bilayer tunnel transistors enabled by van Hove singularities.** *G. Alymov<sup>1,2</sup>, V. Vyurkov<sup>1,2</sup>, V. Ryzhii<sup>3</sup>, D. Svintsov<sup>1</sup>.* 1. Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russia. 2. Institute of Physics and Technology, Moscow, Russia 3. Research Institute of Electrical Communication, Tohoku University, Sendai, Japan.
- 15.40 O1-09 Photoresponse in graphene field effect transistors under ultra-short pulsed laser irradiation.** *A.V. Emelianov<sup>1</sup>, D.M. Kireev<sup>2</sup>, I.I. Bobrinetskiy<sup>3</sup>, N. Otero<sup>3</sup>, P. Romero<sup>3</sup>.* 1. National Research University of Electronic Technology, Zelenograd, Russia. 2. Forschungszentrum Juelich GmbH, Juelich, Germany. 3. Laser Applications Centre, AIMEN, Porriño, Spain.
- 16.00 O1-10 Field effect transistor with two-dimensional gate and channel with carriers in different valleys.** *V.G. Popov.* Institute of Microelectronics Technology and High-Purity Materials, Chernogolovka, Russia.

## Auditorium B

### Session 3. Quantum Informatics II

**Session Chairman:** Sergei Kulik, *Lomonosov Moscow State University, Moscow, Russia*

- 14.40 q1-01 Magnus paradox for entanglement in multi-pulse spin locking.** *E.B. Fel'dman<sup>1</sup>, D.E. Feldman<sup>2</sup>, E.I. Kuznetsova<sup>1</sup>.* 1. Institute of Problems of Chemical Physics, Chernogolovka, Russia. 2. Brown University, Providence, USA.
- 15.00 q1-02 MQ NMR dynamics and quantum correlations in dimers in the multiple-quantum NMR experiment.** *S.A. Gerasev<sup>1,2</sup>, E.I. Kuznetsova<sup>2</sup>.* 1. Lomonosov Moscow State University, Moscow, Russia. 2. Institute of Problems of Chemical Physics, Chernogolovka, Russia.
- 15.20 q1-03 Entanglement of the sender and receiver at the quantum state transfer in a spin chain with the XY Hamiltonian.** *I.D. Lazarev<sup>1,2</sup>, E.I. Kuznetsova<sup>2</sup>.* 1. Lomonosov Moscow State University, Moscow, Russia. 2. Institute of Problems of Chemical Physics, Chernogolovka, Russia.
- 15.40 q1-04 Permanent characteristics of spin-communication line and robustness of remote two-qubit state creation.** *J. Stolze<sup>1</sup>, A.I. Zenchuk<sup>2</sup>.* 1. Technische Universität Dortmund, Fakultät Physik, Dortmund, Germany. 2. Institute of Problems of Chemical Physics, Chernogolovka, Russia.
- 16.00 q1-05 Remote creation of one-qubit mixed state and its optimization via local unitary transformations.** *G.A. Bochkin, A.I. Zenchuk.* Institute of Problems of Chemical Physics, Chernogolovka, Russia.

**16.20-16.40 Coffee break**



## Conference Hall

### Session 4. Advanced Lithography

**Session Chairman: Konstantin Rudenko**, *Institute of Physics and Technology, Moscow, Russia*

- 16.40 O1-11 Problems and prospects of maskless (B)EUV lithography.** N.I. Chkhalo, *N.N. Salashchenko, M.N. Toropov. Institute for Physics of Microstructures, Nizhny Novgorod, Russia.*
- 17.00 O1-12 Modeling the distribution of energy deposited by FIB in ion beam lithography.** Ya. Shabelnikova, *S. Zaitsev. Institute of Microelectronics Technology and High Purity Materials, Chernogolovka, Russia.*
- 17.20 O1-13 Experimental investigation of the distribution of energy deposited by FIB in ion-beam lithography.** *N. Gusseinov<sup>1</sup>, M. Gabdullin<sup>1</sup>, Ya.L. Shabelnikova<sup>2</sup>, S.I. Zaitsev<sup>2</sup>. 1. Al-Farabi Kazakh National University, Almaty, Kazakhstan. 2. Institute of Microelectronics Technology and High Purity Materials, Chernogolovka, Russia.*
- 17.40 O1-14 Resistless lithography: Selective etching of silicon with gallium doping regions.** D. Abdullaev<sup>1,2</sup>, *R. Milovanov<sup>1</sup>, D. Zubov<sup>1</sup>. 1. Institute of Nanotechnology of Microelectronics, Moscow, Russia. 2. Moscow Technological University, Moscow, Russia.*
- 18.00 O1-15 Features of local probe oxidation process.** *S.V. Lemeshko<sup>1</sup>, A.N. Belov<sup>2</sup>, Yu.A. Chaplygin<sup>2</sup>, I.V. Sagunova<sup>2</sup>, V.I. Shevyakov<sup>2</sup>. 1. Nanotechnology Instruments Europe B.V., Netherlands. 2. National Research University of Electronic Technology, Zelenograd, Russia.*

## Auditorium A

### Session 5. Physics of Memory Cells

**Session Chairman: Oleg Trushin**, *Institute of Physics and Technology (Yaroslavl Branch), Yaroslavl, Russia*

- 16.40 O1-16 Automatic optimization of resistive switching parameters in HfO<sub>2</sub>-based 1T1R devices.** E. Kondratyuk, *Y. Matveyev, I. Kiseleva, R. Kirtaev, D. Negrov, A. Zenkevich. Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russia.*
- 17.00 O1-17 Memristive devices for analog memory applications.** S. Zimmermann<sup>1,2</sup>, *N. Köhler<sup>1</sup>, A. Shah<sup>1</sup>, P. Matthes<sup>2</sup>, R. Reich<sup>2</sup>. 1. Technische Universität Chemnitz, Center for Microtechnologies, Chemnitz, Germany. 2. Fraunhofer ENAS, Department Back-end of Line, Chemnitz, Germany.*
- 17.20 O1-18 Multiple Cell Upsets in Nanoscale Memories: Characterization and Modeling.** *G.I. Zebrev, A.M. Galimov, K.S. Zemtsov, I.V. Elushov. National Research Nuclear University, Moscow, Russia.*
- 17.40 O1-19 Crossbar Nanoscale HfO<sub>2</sub>-Based Electronic Synapses.** Y. Matveyev, *R. Kirtaev, A. Fetisova, S. Zakharchenko, D. Negrov, A. Zenkevich. Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russia.*

- 18.00 O1-20 **Electronic and phonon properties of molecular switch based on Y-splitter of trans-polyacetylene molecules.** M.N. Zhuravlev<sup>1</sup>, A.A. Gorbatshevich<sup>1,2</sup>, T.S. Kataeva<sup>1</sup>. 1. National Research University of Electronic Technology, Zelenograd, Russia. 2. P.N. Lebedev Physical Institute, Moscow, Russia.

## Auditorium B Session 6. Quantum Informatics III

**Session Chairman:** Sergei Moiseev, *Quantum Center, Kazan National Research Technical University, Russia; Zavoisky Kazan Physical-Technical Institute, Russia*

- 16.40 q1-06 **Multifunctional quantum node based on a double quantum dot in laser and cavity fields.** A.V. Tsukanov<sup>1,2</sup>. 1. Institute of Physics and Technology, Moscow, Russia. 2. Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russia.
- 17.00 q1-07 **Diamond chip under single-photon driving as a high-spatial resolution quantum magnetometer and electrometer.** A.V. Tsukanov<sup>1,2</sup>, I.Yu. Kateev<sup>1,2</sup>. 1. Institute of Physics and Technology, Moscow, Russia. 2. Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russia.
- 17.20 q1-08 **Single-electron solitons in magnetic field.** M. Rudenko<sup>1</sup>, D. Svintsov<sup>1,2</sup>, S. Filippov<sup>1,2</sup>, V. Vyurkov<sup>1,2</sup>. 1. Institute of Physics and Technology, Moscow, Russia. 2. Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russia.
- 17.40 q1-09 **Two-particle fermionic quantum walks.** A. Melnikov<sup>1</sup>, L. Fedichkin<sup>1,2,3</sup>. 1. Institute of Physics and Technology, Moscow, Russia. 2. Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russia. 3. NIX, Moscow, Russia.
- 18.00 q1-10 **Quantum-classical transition in quantum walks mixing.** L. Fedichkin<sup>1,2,3</sup>, F. Meshchaninov<sup>1,2</sup>. 1. Institute of Physics and Technology, Moscow, Russia. 2. Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russia. 3. NIX, Moscow, Russia.

19.00 Dinner

Wednesday, October 5<sup>th</sup> 2016

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8.15 Breakfast

## Conference Hall Plenary Session III

**Session Chairman:** Vladimir Lukichev, *Institute of Physics and Technology, Moscow, Russia*

- 9.00 L2-01 **KEYNOTE: Current injection terahertz lasing in graphene-channel field-effect transistors under population inversion.** T. Watanabe<sup>1</sup>, G. Tamamushi<sup>1</sup>, A.A. Dubinov<sup>2</sup>, A. Satou<sup>1</sup>, M. Ryzhi<sup>3</sup>, V. Ryzhi<sup>1,4</sup>, T. Otsuji<sup>1</sup>. 1. Research Institute of Electrical Communication, Tohoku University, Sendai, Japan. 2. Institute for Physics of Microstructures, Lobachevsky State University of Nizhny Novgorod, Nizhny Novgorod, Russia. 3. University of Aizu, Aizu, Japan. 4. Institute of Ultra-High-Frequency Semiconductor Electronics, Moscow, Russia.

- 9.40 L2-02 **INVITED: Emission and Detection of Terahertz Radiation in Graphene/hBN Heterostructures.** S. Boubanga Tombet<sup>1</sup>, D. Yadav<sup>1</sup>, T. Watanabe<sup>1</sup>, V. Ryzhii<sup>1,2</sup>, T. Otsuji<sup>1</sup>. 1. Research Institute of Electrical Communication, Tohoku University, Sendai, Japan. 2. Institute of Ultra-High-Frequency Semiconductor Electronics, Moscow, Russia.
- 10.10 L2-03 **INVITED: Detectors of Infrared and Terahertz Radiation based on Graphene-van der Waals Heterostructures.** V. Ryzhii<sup>1,2,3</sup>, M. Ryzhii<sup>4</sup>, V. Leiman<sup>5</sup>, D. Svintsov<sup>5</sup>, V. Mitin<sup>1,6</sup>, M.S. Shur<sup>7</sup>, T. Otsuji<sup>1</sup>. 1. Research Institute of Electrical Communication, Tohoku University, Japan. 2. Institute of Ultra High Frequency Semiconductor Electronics, Moscow, Russia. 3. Center for Photonics and Infrared Engineering, Bauman Moscow State Technical University, Moscow, Russia. 4. University of Aizu, Japan. 5. Laboratory of Optoelectronics of 2D Materials, Moscow Institute Physics and Technology (State University), Dolgoprudny, Russia. 6. University at Buffalo, USA. 7. Rensselaer Polytechnic Institute, USA.
- 10.40 L2-04 **Low-dimensional transit-time diodes for terahertz generation.** R. Khabutdinov<sup>1,2</sup>, I. Semenikhin<sup>1</sup>, F. Davydov<sup>1</sup>, V. Vyurkov<sup>1,2</sup>, L. Fedichkin<sup>1,2</sup>, K. Rudenko<sup>1,2</sup>, A.V. Borzdov<sup>3</sup>, V.M. Borzdov<sup>3</sup>. 1. Institute of Physics and Technology, Moscow, Russia. 2. Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russia. 3. Belarusian State University, Minsk, Belarus.

11.10 - 11.30 Coffee break

## Conference Hall

### Session 7. Materials and Films II

Session Chairman: Andrey Miakonkikh, Institute of Physics and Technology, Moscow, Russia

- 11.30 O2-01 **INVITED: SOI and SOS heterostructures produced by only silicon layer transfer after plasma activation bonding.** V.P. Popov. Rzhanov Institute of Semiconductor Physics, Novosibirsk, Russia.
- 12.00 O2-02 **GeSi nanocrystals formed by high temperature annealing of GeO/SiO<sub>2</sub> multilayers: structure and optical properties.** V.A. Volodin<sup>1,2</sup>, A.G. Cherkov<sup>1,2</sup>, V.I. Vdovin<sup>1,2</sup>, M. Stoffel<sup>3</sup>, H. Rinnert<sup>3</sup>, M. Vergnat<sup>3</sup>. 1. Rzhanov Institute of Semiconductor Physics, Novosibirsk, Russia. 2. Novosibirsk State University, Novosibirsk, Russia. 3. Université de Lorraine, Institut Jean Lamour UMR CNRS 7198, Vandœuvre-lès-Nancy Cedex, France.
- 12.20 O2-03 **Epitaxy of Gallium Nitride Nanowires on Graphene.** V. Kumaresan<sup>1</sup>, L. Largeau<sup>1</sup>, A. Madouri<sup>1</sup>, F. Glas<sup>1</sup>, H. Zhang<sup>2</sup>, F. Oehler<sup>1</sup>, A. Cavanna<sup>1</sup>, A. Babichev<sup>2,3</sup>, N. Gogneau<sup>1</sup>, M. Tchernycheva<sup>2</sup>, J-C. Harmand<sup>1</sup>. 1. Laboratoire de Photonique et de Nanostructures (LPN), CNRS, Université Paris-Saclay, Marcoussis, France. 2. Institut d'Electronique Fondamentale, UMR 8622 CNRS, University Paris Sud, University Paris-Saclay, France. 3. ITMO University, St. Petersburg, Russia.
- 12.40 O2-04 **Low-threshold field emission in planar cathodes with nanocarbon materials.** V. Zhigalov<sup>1</sup>, V. Petukhov<sup>1</sup>, A. Emelianov<sup>1</sup>, V. Timoshenkov<sup>1</sup>, Yu. Chaplygin<sup>1</sup>, A. Pavlov<sup>2</sup>, A. Shamanaev<sup>3</sup>. 1. National Research University of Electronic Technology, Moscow, Russia. 2. Institute of Nanotechnologies of Microelectronics, Moscow, Russia. 3. Technology Center Research and Production Complex, Moscow Institute of Electronic Engineering, Moscow, Russia.

- 13.00 O2-05 **Chemical surface treatment of Ge<sub>2</sub>Sb<sub>2</sub>Te<sub>5</sub> for phase memory devices.** S. Nemtseva<sup>1</sup>, M. Mikhailova<sup>1</sup>, P. Lazarenko<sup>1</sup>, A. Sherchenkov<sup>1</sup>, S. Kozukhin<sup>2</sup>, A. Shulyat'ev<sup>1</sup>, V. Glukhenkaia<sup>1</sup>, S. Timoshenkov<sup>1</sup>. 1. National Research University of Electronic Technology, Zelenograd, Russia. 2. Kurnakov Institute of General and Inorganic Chemistry, Moscow, Russia.

## Auditorium A Session 8. Superconducting Devices

**Session Chairman:** Vladimir Lukichev, *Institute of Physics and Technology, Moscow, Russia*

- 11.30 O2-06 **Analytical derivation of Low-Tc DC SQUID response.** I. Soloviev<sup>1-3</sup>, N. Klenov<sup>1-6</sup>, A. Shchegolev<sup>4,5</sup>, S. Bakurskiy<sup>1,3</sup>, M. Kupriyanov<sup>1,3,7</sup>. 1. Skobeltsyn Institute of Nuclear Physics, Lomonosov Moscow State University, Moscow, Russia. 2. Lukin Scientific Research Institute of Physical Problems, Zelenograd, Russia. 3. Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russia. 4. Moscow State University, Moscow, Russia. 5. Moscow Technical University of Communications and Informatics, Moscow, Russia. 6. N.L. Dukhov All-Russian Research Institute of Automatics, Moscow, Russia. 7. Kazan Federal University, Kazan, Russia.
- 11.50 O2-07 **Sub-micron inorganic masks for fabrication of nanostructures with Josephson junctions.** S.B. Izyurov<sup>1,2</sup>, V.L. Gurtovoi<sup>1,2</sup>, I.N. Khrapach<sup>1,3</sup>, A.A. Galiullin<sup>1</sup>, O.V. Astafiev<sup>1,4</sup>. 1. Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russia. 2. Institute of Microelectronics Technology and High Purity Materials, Chernogolovka, Russia. 3. Russian Quantum Center, Skolkovo, Russia. 4. Royal Holloway University of London, Egham, UK.
- 12.10 O2-08 **Down-conversion phenomenon in quantum circuits coupled with an embedded rf-SQUID.** C.S. Kim<sup>1</sup>, V.O. Munyaev<sup>2</sup>, A.M. Satanin<sup>2</sup>. 1. Chonnam National University, South Korea. 2. Lobachevsky State University, Nizhny Novgorod, Russia.
- 12.30 O2-09 **Voltage plateaus on V(I) curves of a long quasi-one-dimensional superconducting aluminum wire.** V.I. Kuznetsov. *Institute of Microelectronics Technology and High Purity Materials, Chernogolovka, Russia.*
- 12.50 O2-10 **A new type of Superconducting Quantum Interference Device.** V.L. Gurtovoi<sup>1,2</sup>, V.N. Antonov<sup>2,3</sup>, A.V. Nikulov<sup>1</sup>, R. Shaikhaidarov<sup>3</sup>, V.A. Tulin<sup>1</sup>. 1. Institute of Microelectronics Technology and High Purity Materials, Chernogolovka, Russia. 2. Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russia. 3. Physics Department, Royal Holloway University of London, Egham, Surrey, UK.

## Auditorium B

### Session 9. Quantum Informatics IV

**Session Chairmen:** *Eduard Fel'dman, Institute of Problems of Chemical Physics, Chernogolovka, Russia*

- 11.40 q2-01 Informational approach to the tomography of quadrature quantum states.** Yu.I. Bogdanov<sup>1,2,3</sup>, *N.A. Bogdanova*<sup>1,2</sup>, *G.V. Avosopyants*<sup>1,3</sup>, *L.V. Belinsky*<sup>1,3</sup>, *K.G. Katamadze*<sup>1,4</sup>, *S.P. Kulik*<sup>4</sup>, *V.F. Lukichev*<sup>1</sup>. 1. Institute of Physics and Technology, Moscow, Russia. 2. National Research Nuclear University, Moscow, Russia. 3. National Research University of Electronic Technology, Zelenograd, Russia. 4. Lomonosov Moscow State University, Moscow, Russia.
- 12.00 q2-02 Broadband Biphotons in the Single Spatial Mode through High Pump Focusing and Walk-off Effect.** K.G. Katamadze<sup>1,2</sup>, *S.P. Kulik*<sup>1</sup>. 1. Lomonosov Moscow State University, Moscow, Russia. 2. Institute of Physics and Technology, Moscow, Russia.
- 12.20 q2-03 Quantum states tomography with noisy measurement channels.** Yu.I. Bogdanov<sup>1,2,3</sup>, B.I. Bantysh<sup>1,2</sup>, *N.A. Bogdanova*<sup>1,2</sup>, *A.B. Kvasnyy*<sup>1,3</sup>, *V.F. Lukichev*<sup>1</sup>. 1. Institute of Physics and Technology, Moscow, Russia. 2. National Research Nuclear University, Moscow, Russia. 3. National Research University of Electronic Technology, Zelenograd, Russia.
- 12.40 q2-04 Schmidt decomposition and multivariate statistical analysis.** Yu.I. Bogdanov<sup>1,2,3</sup>, *N.A. Bogdanova*<sup>1,2</sup>, D.V. Fastovets<sup>1,2</sup>, *V.F. Lukichev*<sup>1</sup>. 1. Institute of Physics and Technology, Moscow, Russia. 2. National Research University of Electronic Technology, Zelenograd, Russia. 3. National Research Nuclear University, Moscow, Russia.
- 13.00 q2-05 Statistical reconstruction of compound Poisson mixtures of Fock states from quadrature measurements.** Yu.I. Bogdanov<sup>1,2,3</sup>, K.G. Katamadze<sup>1,4</sup>, G.V. Avosopyants<sup>1,3</sup>, *L.V. Belinsky*<sup>1,3</sup>, *N.A. Bogdanova*<sup>1,3</sup>, *S.P. Kulik*<sup>4</sup>, *V.F. Lukichev*<sup>1</sup>. 1. Institute of Physics and Technology, Moscow, Russia. 2. National Research Nuclear University, Moscow, Russia. 3. National Research University of Electronic Technology, Zelenograd, Russia. 4. Lomonosov Moscow State University, Moscow, Russia.

13.20-14.20 Lunch

## Conference Hall

### Session 10. Superconducting and Spintronics Devices

**Session Chairmen:** *Valery Andreev, Lomonosov Moscow State University, Moscow, Russia*

- 14.20 O2-11 About the mechanism determining the spin-injection radiation frequencies in ferromagnetic junctions.** *Yu.V. Gulyaev*<sup>1</sup>, *E.A. Vilkov*<sup>1</sup>, G.M. Mikhailov<sup>2</sup>, *A.N. Maksimov*<sup>1</sup>, *A.I. Panas*<sup>1</sup>, *S.G. Chigarev*<sup>1</sup>, *A.V. Chernikh*<sup>2</sup>. 1. Kotelnikov Institute of Radio Engineering and Electronics, Fryazino, Russia. 2. Institute of Microelectronics Technology and High Purity Materials, Chernogolovka, Russia.
- 14.40 O2-12 Numerical simulation of thin-film microthermocouple for the research of dissipation in tunneling contact.** *V. Kravchenko*, V.A. Petukhov. National Research University of Electronic Technology, Zelenograd, Russia.

- 15.00 O2-13 **Superconducting Spin Valves Based on Noncollinear Antiferromagnets.** N. Pugach<sup>1</sup>, M. Safonchik<sup>2</sup>. 1. Skobel'syn Institute of Nuclear Physics, Lomonosov Moscow State University, Moscow, Russia. 2. Ioffe Institute, St. Petersburg, Russia.
- 15.20 O2-14 **Elastically driven magnetic excitations for acoustic spin pumping in ZnO–GGG–YIG–Pt - bulk acoustic wave resonator.** S. Alekseev, I. Pyataikin, N. Polzikova, I. Kotelyanskii, V. Luzanov, A. Raevskiy, L. Galchenkov. Kotel'nikov Institute of Radio Engineering and Electronics, Moscow, Russia.
- 15.40 O2-15 **Thin-film ruthenium microstructures for transition edge sensors.** A.S. Ilin, I.A. Cohn, A.N. Vystavkin, A.G. Kovalenko. Kotel'nikov Institute of Radio Engineering and Electronics, Moscow, Russia.

### Auditorium A

## Session 11. Meeting of the International Association of the Academies of Sciences (IAAS)

Session Chairman: Vladimir Lukichev, Russian Academy of Sciences

14.20 - 18.00

### Auditorium B

## Session 12. Quantum Informatics V

Session Chairman: Farid Ablayev, Kazan Federal University, Kazan, Russia

- 14.20 q2-06 **Numerical characteristics of quantum computer simulation.** A. Chernyavskiy<sup>1,2</sup>, K. Khamitov<sup>2</sup>, A. Teplov<sup>2</sup>, V. Voevodin<sup>2</sup>, Vi. Voevodin<sup>2</sup>. 1. Institute of Physics and Technology, Moscow, Russia. 2. Lomonosov Moscow State University, Moscow, Russia.
- 14.40 q2-07 **Effective computation of quantum discord in a multiqubit spin chain.** A. Chernyavskiy<sup>1,2</sup>. 1. Institute of Physics and Technology, Moscow, Russia. 2. Lomonosov Moscow State University, Moscow, Russia.
- 15.00 q2-08 **Spectroscopic, kinetic investigations and preparation of pure quantum state of  $^{167}\text{Er}^{3+}$  impurity ions in crystals  $^7\text{LiYF}_4$  for implementing quantum memory protocol.** K.I. Gerasimov, S.A. Moiseev, M.M. Minnegaliev, R.V. Urmancheev. Kazan Quantum Center, Kazan National Research Technical University, Kazan, Russia.
- 15.20 q2-09 **Broadband photon echo quantum memory in high quality optical cavity.** S.A. Moiseev, E.S. Moiseev. Kazan Quantum Center, Kazan Scientific Research Technical University, Kazan, Russia.
- 15.40 q2-10 **Long-lived photon echo quantum memory on quantum dots.** S.A. Moiseev, S.O. Tarasov. Kazan Quantum Center, Kazan Scientific Research Technical University, Kazan, Russia.

16.00-16.20 Coffee break

## 16.20-18.00 POSTER SESSION I

19.00 Dinner

Thursday, October 6<sup>th</sup> 2016

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08.15 Breakfast

### Conference Hall

#### Session 13. Plasma-Based Technologies

Session Chairman: Konstantin Rudenko, *Institute of Physics and Technology, Moscow, Russia*

- 9.00 O3-01 Plasma parameters and active species kinetics in CF<sub>4</sub>/O<sub>2</sub>/Ar gas mixture: Effects of CF<sub>4</sub>/O<sub>2</sub> and O<sub>2</sub>/Ar mixing ratios. J. Lee<sup>1</sup>, K.-H. Kwon<sup>1</sup>, A. Efremov<sup>2</sup>. 1. Korea University, Sejong, South Korea. 2. Ivanovo State University of Chemistry and Technology, Ivanovo, Russia.
- 9.20 O3-02 Technology for fabrication of sub-20 nm Silicon planar nanowires array. A. Miakonkikh, A. Tatarintsev, A. Rogozhin, K. Rudenko. *Institute of Physics and Technology, Moscow, Russia.*
- 9.40 O3-03 Cellular-automata model of oxygen plasma impact on porous low-K dielectric. A. Rezyanov<sup>1, 2\*</sup>, I.V. Matuyshkin<sup>2, 3</sup>, O.P. Gutshin<sup>2</sup>. 1. Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russia. 2. Molecular Electronics Research Institute, Zelenograd, Russia. 3. National Research University of Electronic Technology, Zelenograd, Russia.
- 10.00 O3-04 Low-damage plasma etching of porous low-k films in CF<sub>3</sub>Br and CF<sub>4</sub> plasmas under low-temperature conditions. A. Miakonkikh<sup>1,2</sup>, I. Clemente<sup>1,2</sup>, A. Vishnevskiy<sup>3</sup>, K. Rudenko<sup>1,2</sup>, M. Baklanov<sup>4</sup>. 1. Institute of Physics and Technology, Moscow, Russia. 2. Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russia. 3. MIREA, Moscow, Russia. 4. IMEC, Leuven, Belgium.
- 10.20 O3-05 Nanoscale patterning using redeposition on sidewall microstructure. I. Amirov, A. Shumilov, A. Kupriyanov, V. Naumov. *Yaroslavl Branch of the Institute of Physics and Technology, Yaroslavl, Russia.*

### Auditorium A

#### Session 14. Semiconductor Devices of Photonics

Session Chairman: Vladimir Vuyrkov, *Institute of Physics and Technology, Moscow, Russia*

- 9.00 O3-06 Diffraction gratings and 2D photonic crystals fabrication in a SOI waveguide by plasma and wet etching of Si. M. Barabanenkov<sup>1</sup>, A. Il'in<sup>1</sup>, V. Volkov<sup>1</sup>, A. Gruzintsev<sup>1</sup>. 1. Institute of Microelectronics Technology and High Purity Materials, Chernogolovka, Russia. 2. Molecular Electronics Research Institute, Zelenograd, Russia.
- 9.20 O3-07 Quantum well FPA's of 384×288 and 640×512 elements. M.A. Dem'yanenko, D.G. Esaev, I.V. Marchishin, A.I. Toropov, V.N. Ovsyuk, N.A. Valisheva, A.V. Latyshev. *Rzhanov Institute of Semiconductor Physics, Novosibirsk, Russia.*

- 9.40 O3-08** Terahertz bolometer based on Sn nanowires in GaAs. *I. Semenikhin<sup>1</sup>, V. Vyurkov<sup>1</sup>, A. Bugayev<sup>2</sup>, R. Khabibullin<sup>2,5</sup>, D. Ponomarev<sup>2,5</sup>, A. Yachmenev<sup>2,5</sup>, P. Maltsev<sup>2</sup>, M. Ryzhi<sup>3</sup>, T. Otsuji<sup>4</sup>, V. Ryzhi<sup>2,4,5</sup>*. 1. Institute of Physics and Technology, Moscow, Russia. 2. Institute of Ultra High Frequency Semiconductor Electronics, Moscow, Russia. 3. University of Aizu, Aizu, Japan. 4. Research Institute for Electrical Communication, Tohoku University, Sendai, Japan. 5. Center for Photonics and Infrared Technology, Bauman Moscow State Technical University, Moscow, Russia.
- 10.00 O3-09** Diffraction gratings for optoelectronics by dry e-beam etching of resist. *A. Rogozhin<sup>1,3</sup>, E. Zhikharev<sup>1</sup>, M. Bruk<sup>2</sup>, S. Averkin<sup>1</sup>*. 1. Institute of Physics and Technology, Moscow, Russia. 2. L.Ya. Karpov Institute of Physical Chemistry, Moscow, Russia. 3. Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russia.

## Auditorium B

### Session 15. Quantum Informatics VI

**Session Chairman:** Andrey Chernyavskiy, *Institute of Physics and Technology, Moscow, Russia*

- 9.00 q3-01** Effect of crosstalk on QBER in QKD in urban telecommunication fiber lines. *V.L. Kurochkin<sup>1</sup>, Y.V. Kurochkin<sup>1</sup>, A.V. Miller<sup>1</sup>, A.S. Sokolov<sup>1</sup>, A.A. Kanapin<sup>1,2</sup>*. 1. Russian Quantum Center, Skolkovo, Russia. 2. Lomonosov Moscow State University, Moscow, Russia.
- 9.20 q3-02** Single-photon detector design features. *S.V. Zaitsev<sup>1,2</sup>, V.L. Kurochkin<sup>1</sup>, Y.V. Kurochkin<sup>1</sup>*. 1. International Center for Quantum Optics & Quantum Technologies, Skolkovo, Russia. 2. Femto Vision LLC, Skolkovo, Russia.
- 9.40 q3-03** Computer simulation of quantum effects in Tavis-Cummings model and its applications. *V.Y. Ladunov<sup>1</sup>, Y.I. Ozhigov<sup>1,2</sup>, N.A. Skovoroda<sup>1</sup>*. 1. Lomonosov Moscow State University, Moscow, Russia. 2. Institute of Physics and Technology, Moscow, Russia.
- 10.00 q3-04** Structure of dark subspace in Tavis-Cummings model. *Y.I. Ozhigov<sup>1,2</sup>*. 1. Lomonosov Moscow State University, Moscow, Russia. 2. Institute of Physics and Technology, Moscow, Russia.

10.40-11.00 Coffee break

## Conference Hall

### Session 16. Modeling and Simulation of Semiconductor Devices

**Session Chairman:** Vladimir Vyurkov, *Institute of Physics and Technology, Moscow, Russia*

- 11.00 O3-10** Simulation of field-effect transistors and resonant tunneling diodes based on graphene. *I. Abramov, V. Labunov, N. Kolomejtseva, I. Romanova*. *Belarussian State University of Informatics and Radioelectronics, Minsk, Belarus.*
- 11.20 O3-11** Collapse of resonances as a manifestation of PT-symmetry breaking in resonant tunneling heterostructures. *A.A. Gorbatshevich<sup>1,2</sup>, N.M. Shubin<sup>2</sup>*. 1. P.N. Lebedev Physical Institute, Moscow, Russia. 2. National Research University of Electronic Technology, Zelenograd, Russia.



- 11.40 O3-12 **Numerical modeling of microwave switchers with subpicosecond time delay.** *B. Konoplev, E. Ryndin. Southern Federal University, Taganrog, Russia.*
- 12.00 O3-13 **Development of Drift-Diffusion Numerical Models of High-Speed On-Chip Photodetectors with Heterojunctions.** *I.V. Pisarenko, E.A. Ryndin. Southern Federal University, Institute of Nanotechnology, Electronics, and Electronic Equipment Engineering, Taganrog, Russia.*
- 12.20 O3-14 **Calculation of the high-frequency conductivity and the Hall constant of a thin semiconductor film.** *O.V. Savenko, D.N. Romanov, I.A. Kuznetsova. P.G. Demidov Yaroslavl State University, Yaroslavl, Russia.*
- 12.40 O3-15 **Comparative study of diamond FETs with contact Schottky barriers and SiC source-drain regions.** *V.P. Popov<sup>1</sup>, M.A. Ilnitskii<sup>1</sup>, A.V. Sheremetiev<sup>1</sup>, V.A. Kagadei<sup>2</sup>, E.V. Shesterikov<sup>2</sup>. 1. Rzhanov Institute of Semiconductor Physics, Novosibirsk, Russia. 2. Micran, Tomsk, Russia.*

## Auditorium A

### Session 17. Metrology and Characterization

**Session Chairman:** *Andrey Miakonkikh, Institute of Physics and Technology, Moscow, Russia*

- 11.00 O3-16 **Fundamentals of the fast neutral beams diagnostics.** *V. Kudrya, Yu. Maishev. Institute of Physics and Technology, Moscow, Russia.*
- 11.20 O3-17 **Application of spectral ellipsometry to in situ diagnostics of atomic layer deposition of dielectrics on silicon and AlGaN.** *I. Clemente<sup>1,2</sup>, A. Miakonkikh<sup>1,2</sup>. 1. Institute of Physics and Technology, Moscow, Russia. 2. Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russia.*
- 11.40 O3-18 **TDR method for determination of IC's parameters.** *V. Timoshenkov, D. Rodionov, A. Khlybov. National Research University of Electronic Technology, Zelenograd, Russia.*
- 12.00 O3-19 **Non-destructive determination of thickness of the dielectric layers using EDX.** *S. Sokolov, E. Kelm, R. Milovanov. Institute of Nanotechnology of Microelectronics, Moscow, Russia.*
- 12.20 O3-20 **The use of multi-scale imaging solutions for microelectronics.** *M. Chukalina<sup>1,2,3</sup>, S. Zaitsev<sup>2</sup>, A. Buzmakov<sup>1</sup>, D. Zolotov<sup>1</sup>, I. Shelokov<sup>2</sup>, Ya. Shabelnikova<sup>2</sup>, A. Ingacheva<sup>1</sup>, V. Asadchikov<sup>1</sup>. 1. Shubnikov Institute of Crystallography, Moscow, Russia. 2. Institute of Microelectronics Technology and High Purity Materials, Chernogolovka, Russia. 3. Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russia.*
- 12.40 O3-21 **3D X-ray topo-tomography imaging of defects in crystalline materials.** *D. Zolotov, V. Asadchikov, A. Buzmakov, F. Chukhovskii. Shubnikov Institute of Crystallography of Federal Scientific Research Centre "Crystallography and Photonics", Moscow, Russia.*

**Auditorium B**  
**Session 18. Quantum Informatics VII**

**Session Chairman:** Yuri Ozhigov, *Lomonosov Moscow State University, Moscow, Russia*

- 11.00 q3-05 **The death of local realism and the idea of quantum computation.** V.V. Aristov, A.V. Nikulov. *Institute of Microelectronics Technology and High Purity Materials, Chernogolovka, Russia.*
- 11.20 q3-06 **No-go theorems and the idea of superconducting quantum bits.** A.V. Nikulov. *Institute of Microelectronics Technology and High Purity Materials, Chernogolovka, Russia.*

**13.00-14.00 Lunch**

**Conference Hall**  
**Session 19. MEMS and NEMS**

**Session Chairman:** Il'dar Amirov, *Institute of Physics and Technology (Yaroslavl Branch), Yaroslavl, Russia*

- 14.00 O3-22 **Silicon ohmic lateral-contact MEMS switch for RF applications.** A. Rogozhin<sup>1,2</sup>, A. Miakonkikh<sup>1,2</sup>, A. Tatarintsev<sup>1</sup>, K. Lebedev<sup>1</sup>, V. Kalnov<sup>1</sup>, K. Rudenko<sup>1,2</sup>, V. Lukichev<sup>1,2</sup>. 1. *Institute of Physics and Technology, Moscow, Russia.* 2. *Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russia.*
- 14.20 O3-23 **Research of the micromechanical three-axis accelerometer.** B. Konoplev, I. Lysenko, E. Ryndin, O. Ezhova, F. Bondarev. *Southern Federal University, Taganrog, Russia.*
- 14.40 O3-24 **Highly sensitive devices for primary signal processing of the micromechanical capacitive transducers.** B. Konoplev, E. Ryndin, I. Lysenko, M. Denisenko, A. Isaeva. *Southern Federal University, Taganrog, Russia.*
- 15.00 O3-25 **Computer Simulation of Heavy Charged Particles Radiation Damage on Microsystems.** V. Shakhnov, A. Glushko, V. Makarchuk, L. Zinchenko, V. Terekhov, S. Mikhaylichenko. *Bauman Moscow State University, Moscow, Russia.*
- 15.20 O3-26 **Computer modeling of elastic tension fields of MEMS tensoconverters with micro-perforated membrane structure.** L.V. Sokolov<sup>1</sup>, N.A. Agafonova<sup>2</sup>. 1. *JSC "Scientific Research Institute of Aircraft Equipment", Zhukovsky, Russia.* 2. *LLC "Research and Engineering Company", Zhukovsky, Russia.*

**Auditorium A**  
**Session 20. Meeting of the International Association of the Academies of Sciences (IAAS)**

**Session Chairman:** Vladimir Lukichev, *Russian Academy of Sciences*

**14.00 - 18.30**

**15.40-16.00 Coffee break**

**16.00-18.30 POSTER SESSION II**

**18.30. Conference Hall. CLOSING CONFERENCE REMARKS**

**V.F. Lukichev, Program Committee Chair,**  
*Institute of Physics and Technology, Moscow, Russia*

**19.30 CONFERENCE DINNER**

Friday, October 7<sup>th</sup>, 2016

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**09.00 Breakfast**

**10.00 DEPARTURE**

# ICMNE-2016 SCIENTIFIC PROGRAM

## POSTER SESSIONS

Wednesday, October 5<sup>th</sup> 2016

16.20 – 18.30

Poster session I

### Materials and Films

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- P1-01 Metal-assisted chemical etching of silicon with different metal films and clusters: A review.** O. Pyatilova<sup>1</sup>, S. Gavrilov<sup>1</sup>, A. Sysa<sup>1</sup>, A. Savitskiy<sup>1</sup>, A. Shuliatyev<sup>1</sup>, A. Dudin<sup>2</sup>, A. Pavlov<sup>2</sup>. 1. National Research University of Electronic Technology, Zelenograd, Russia. 2. Institute of Nanotechnology of Microelectronics, Moscow, Russia.
- P1-02 Influence of treatment conditions on morphology and fractal characteristics of por-Si formed by metal-assisted chemical etching.** A. Boyko<sup>1</sup>, O. Pyatilova<sup>1</sup>, R. Kalmykov<sup>2</sup>, D. Gaev<sup>2</sup>, S. Timoshenkov<sup>1</sup>, S. Gavrilov<sup>1</sup>. 1. National Research University of Electronic Technology, Zelenograd, Russia. 2. Kabardino-Balkarian State University, Nalchik, Russia.
- P1-03 The MBE growth of indium droplets and ring-like nanostructures.** O.A. Ageev, M.S. Solodovnik, S.V. Balakirev. Southern Federal University, Institute of Nanotechnologies, Electronics, and Electronic Equipment Engineering, Taganrog, Russia.
- P1-04 Influence of the growth rate and As<sub>4</sub>/Ga flux ratio on Ga surface diffusion during MBE of GaAs.** O.A. Ageev, M.S. Solodovnik, S.V. Balakirev, M.M. Eremenko. Southern Federal University, Institute of Nanotechnologies, Electronics, and Electronic Equipment Engineering, Taganrog, Russia.
- P1-05 Critical thickness for dislocation nucleation in Ge<sub>1-x</sub>Si<sub>x</sub>/Si(100) heteroepitaxial system.** O.S. Trushin<sup>1</sup>, E. Glazkov<sup>2</sup>, E. Granato<sup>3</sup>, S.-C. Ying<sup>4</sup>. 1. Yaroslavl Branch of the Institute of Physics and Technology, Yaroslavl, Russia. 2. Yaroslavl State Demidov University, Yaroslavl, Russia. 3. National Institute for Space Research, Sao Jose dos Campos, Brazil. 4. Brown University, Providence, USA.
- P1-06 DC-and AC-Electric and Dielectric Properties of Gallium Sulphide.** S.M. Asadov<sup>1</sup>, S.N. Mustafaeva<sup>2</sup>. 1. Institute of Catalysis and Inorganic Chemistry named after M.F. Nagiyev, Baku, Azerbaijan. 2. Institute of Physics, Baku, Azerbaijan.
- P1-07 Low temperature Ta/Al based ohmic contacts to high voltage GaN transistors for energy efficient power conversion.** E. Erofeev<sup>1</sup>, I. Fedin<sup>2</sup>. 1. Tomsk State University of Control Systems and Radioelectronics, Tomsk, Russia. 2. Research and Production Company Micran, Tomsk, Russia.
- P1-08 Effect of point defects on the strength properties of interface formed by materials under the action of mechanical stresses.** T.M. Makhviladze, M.E. Sarychev. Institute of Physics and Technology, Moscow, Russia.
- P1-09 Investigation of the phase formation from nickel coated nanostructured silicon.** Yu.I. Shilyaeva<sup>1</sup>, O.V. Pyatilova<sup>1</sup>, A.Yu. Berezkina<sup>1</sup>, A.V. Sysa<sup>1</sup>, A.A. Dudin<sup>2</sup>, S.A. Gavrilov<sup>1</sup>. 1. National Research University of Electronic Technology, Zelenograd, Russia. 2. Institute of Nanotechnology of Microelectronics, Moscow, Russia.

- P1-10** Investigation of formation mechanism of Mo/Al/Mo/Au ohmic contact to AlGaIn/GaN heterostructures. M.N. Kondakov<sup>1,2</sup>, S.V. Chernykh<sup>1,2</sup>, A.V. Chernykh<sup>1,2</sup>, K.D. Shcherbachev<sup>1</sup>, N.Yu. Tabachkova<sup>1</sup>, D.A. Podgorny<sup>1</sup>, N.B. Gladysheva<sup>2</sup>, A.A. Dorofeev<sup>2</sup>, S.I. Didenko<sup>1</sup>. 1. National University of Science and Technology, Moscow, Russia. 2. JSC "Scientific & Production Enterprise "Pulsar", Moscow, Russia.
- P1-11** Low resistance Ti/Si/Ti/Al/Ni/Au ohmic contact for AlGaIn/GaN HEMT. S. Shostachenko, R. Zakharchenko, R. Ryzhuk, N. Kargin. National Research Nuclear University, Moscow, Russia.
- P1-12** Tungsten alloyed with rhenium as an advanced material for heat-resistant silicon ICs interconnects. A.N. Belov, Yu.A. Chaplygin, A.A. Golishnikov, D.A. Kostyukov, V.I. Shevyakov. National Research University of Electronic Technology, Zelenograd, Russia.
- P1-13** Mechanical properties of bimetallic one-dimensional structures. E. Smelova<sup>1</sup>, I. Sitnikov<sup>1</sup>, K. Tsysar<sup>1</sup>, V. Andreev<sup>1</sup>, V. Vdovin<sup>2</sup>. 1. Moscow State University, Moscow, Russia. 2. Kotel'nikov Institute of Radio Engineering and Electronics, Moscow, Russia.
- P1-14** Analysis of contribution from various order diffraction maxima to complex magneto-optical Kerr effect from three-dimensional structures like magnetophotonic crystals. I.S. Zarev<sup>1</sup>, N.Yu. Zvezdin<sup>1</sup>, V.A. Paporkov<sup>1</sup>, A.V. Prokaznikov<sup>2</sup>. 1. Yaroslavl State Demidov University, Yaroslavl, Russia. 2. Yaroslavl Branch of the Institute of Physics and Technology, Yaroslavl, Russia.
- P1-15** An exchange anisotropy effect in magnetic and magneto-resistive properties of epitaxial Fe/Fe<sub>50</sub>Mn<sub>50</sub> film structures. L.A. Fomin, A.V. Chernykh, S.V. Pyatkin, G.M. Mikhailov. Institute of Microelectronic Technology and High Purity Materials, Chernogolovka, Russia.
- P1-16** Infrared magnetoreflexion in cobalt ferrite spinel. Yu. Sukhorukov, A. Telegin, N. Bebenin, A. Nosov, V. Bessonov, A. Buchkevich, V. Bessonova. M.N. Mikheev Institute of Metal Physics, Ekaterinburg, Russia.
- P1-17** The features of CNT growth on catalyst-content amorphous alloy layer by CVD-method. S. Dubkov<sup>1</sup>, S. Bulyarskii<sup>2</sup>, A. Pavlov<sup>2</sup>, S. Skorik<sup>3</sup>, A. Dudin<sup>2</sup>, E. Kitsyuk<sup>3</sup>, P. Mierczynski<sup>4</sup>, T. Maniecki<sup>4</sup>, R. Ciesielski<sup>4</sup>, S. Gavrilo<sup>1</sup>, D. Gromov<sup>1</sup>. 1. National Research University of Electronic Technology, Zelenograd, Russia. 2. Institute of Nanotechnology of Microelectronics, Moscow, Russia. 3. Scientific-Manufacturing Complex "Technological Center", Zelenograd, Russia. 4. Institute of General and Ecological Chemistry, Lodz University of Technology, Lodz, Poland.
- P1-18** Using functionalized CNTs for production of piezoelectric polymer composite films. A.V. Sysa<sup>1,2</sup>, Ju.P. Shaman<sup>1,2</sup>, M.V. Silibin<sup>1</sup>, L.V. Tabulina<sup>3</sup>, A.A. Polohin<sup>1</sup>, I.M. Gavrilin<sup>1</sup>, A.A. Pavlov<sup>4</sup>. 1. National Research University of Electronic Technology, Zelenograd, Russia. 2. Scientific-Industrial Complex Technological Center MIET, Zelenograd, Russia. 3. Belarusian State University of Informatics and Radioelectronics, Minsk, Belarus. 4. Institute of Nanotechnologies of Microelectronics, Moscow, Russia.
- P1-19** Formation of nanoporous structure in silicon substrate using two-stage annealing process. Yu. Denisenko, V. Rudakov. Institute of Physics and Technology (Yaroslavl Branch), Yaroslavl, Russia.

- P1-20 Luminescence properties of porous alumina films formed via Al anodization in selenic acid solution.** Y. Nazarkina<sup>1</sup>, A. Dronov<sup>1</sup>, S. Gavrilov<sup>1</sup>, S. Oleynik<sup>1</sup>, D. Gromov<sup>1</sup>, L. Lepnev<sup>2</sup>. 1. National Research University of Electronic Technology, Zelenograd, Russia. 2. P.N. Lebedev Physical Institute, Moscow, Russia.
- P1-21 Experimental study of optical coefficients of nanometer-thick copper and gold films in microwave frequency range.** I. Khorin<sup>1,2</sup>, N. Orlikovsky<sup>1</sup>, A. Tatarintsev<sup>1</sup>, S. Pronin<sup>3</sup>, V. Andreev<sup>3</sup>, V. Vdovin<sup>4</sup>. 1. Institute of Physics and Technology, Moscow, Russia. 2. Institute of Physics and Technology of Moscow Technological University, Moscow, Russia. 3. Moscow State University, Moscow, Russia. 4. Kotel'nikov Institute of Radio Engineering and Electronics, Moscow, Russia.
- P1-22 The features of charging -Z-cut single-domain ferroelectric LiTaO<sub>3</sub>.** K.E. Markovets<sup>1</sup>, E.I. Rau<sup>1</sup>, A.A. Tatarintsev<sup>1,2</sup>. 1. Lomonosov Moscow State University, Moscow, Russia. 2. Institute of Physics and Technology, Moscow, Russia.
- P1-23 Thermodynamic and Physical Properties of the New Layered Materials Based on TlGaS<sub>2</sub>.** M.M. Asadov<sup>1</sup>, S.N. Mustafaeva<sup>2</sup>. 1. Institute of Catalysis and Inorganic Chemistry named after M.F. Nagiyev, Baku, Azerbaijan. 2. Institute of Physics, Baku, Azerbaijan.
- P1-24 Effective optical constants of silver nanofilms calculated in wide frequency range.** K. Tsysar<sup>1</sup>, V. Andreev<sup>1</sup>, V. Vdovin<sup>2</sup>. 1. Moscow State University, Moscow, Russia. 2. Kotel'nikov Institute of Radio Engineering and Electronics, Moscow, Russia.
- P1-25 The quantum-size Si dots in Si/SiO<sub>2</sub> multilayers formed by PECVD technique.** A. Gismatulin<sup>1,2</sup>, G. Kamaev<sup>1</sup>, V. Volodin<sup>1,2</sup>, I. Neizvestniy<sup>1</sup>, S. Cherkova<sup>1</sup>, A. Antonenko<sup>2</sup>, S. Arzhannikova<sup>1,2</sup>. 1. Rzhanov Institute of Semiconductor Physics, Novosibirsk, Russia. 2. Novosibirsk State University, Novosibirsk, Russia.
- P1-26 Hydrogenated amorphous silicon based p-i-n structures with Si and Ge nanocrystals in i-layers.** V.A. Volodin<sup>1,2</sup>, G.K. Krivyakin<sup>1</sup>, A.A. Shklyayev<sup>1,2</sup>, S.A. Kochubei<sup>1</sup>, G.N. Kamaev<sup>1</sup>, A.V. Dvurechenskii<sup>1,2</sup>, A. Purkr<sup>3</sup>, Z. Remes<sup>3</sup>, R. Fajgar<sup>4</sup>, T.H. Stuchliková<sup>3</sup>, J. Stuchlik<sup>3</sup>. 1. Rzhanov Institute of Semiconductor Physics, Novosibirsk, Russia. 2. Novosibirsk State University, Novosibirsk, Russia. 3. Institute of Physics ASCR, Praha, Czech Republic. 4. Institute of Chemical Process Fundamentals of the ASCR, Praha, Czech Republic.
- P1-27 Electronic properties modification of silicon heterostructures by microwave plasma.** R. Yafarov<sup>1</sup>, V. Timoshenkov<sup>2</sup>, S. Timoshenkov<sup>2</sup>, S. Orlov<sup>3</sup>. 1. Saratov Branch of the Kotel'nikov Institute of Radio Engineering and Electronics, Saratov, Russia. 2. National Research University of Electronic Technology, Zelenograd, Russia. 3. JSC Molecular Electronics Research Institute, Zelenograd, Russia.
- P1-28 Some important aspects in the glass structure of chalcogenide system.** V. Minaev, S. Timoshenkov, V. Kalugin, N. Korobova. National Research University of Electronic Technology, Zelenograd, Russia.
- P1-29 Properties of Ge-Sb-Te thin films for high read/write performance and reliability.** A. Sherchenkov, P. Lazarenko, A. Babich, S. Timoshenkov, N. Korobova, D. Terekhov, A. Yakubov. National Research University of Electronic Technology, Zelenograd, Russia.
- P1-30 Analysis of changes in the composition of lithium niobate crystals under long-term impact of high vacuum.** E. Pantelei, V. Paranin. Samara National Research University, Samara, Russia.

- P1-31 Promising design of hyperbolic metamaterial for optical spectral range. I. Gasenkova<sup>1</sup>, N. Mukhurov<sup>1</sup>, V. Lukichev<sup>2</sup>, K. Rudenko<sup>2</sup>, A. Miakonkikh<sup>2</sup>, I. Ryzhikov<sup>3</sup>, I. Bykov<sup>3</sup>.** 1. State Research and Production Association "Optic, Optoelectronic and Laser Technique". 2. Institute of Physics and Technology, Moscow, Russia. 3. Institute for Theoretical and Applied Electromagnetics, Moscow, Russia.
- P1-32 Retardance of alumina nanoporous thin films in visible and near infrared spectral region. V. Dlugunovich<sup>1</sup>, A. Zhumar<sup>1</sup>, N. Mukhurov<sup>2</sup>, I. Gasenkova<sup>2</sup>, M. Binhussain<sup>3</sup>.** 1. B.I. Stepanov Institute of Physics of National Academy of Sciences of Belarus, Minsk, Belarus. 2. State Research and Production Association "Optic, Optoelectronic and Laser Technique", Minsk, Belarus. 3. The National Center of Building Systems, KACST, Riyadh, Saudi Arabia.
- P1-33 Features of CuInS<sub>2</sub> formation process by SILAR method. A. Borisova, M. Kuzmicheva, A. Dronov, D. Dronova, A. Zheleznyakova, S. Gavrilov.** National Research University of Electronic Technology, Zelenograd, Russia.
- P1-34 Investigation of germanium nanowires arrays formation process by electrochemical deposition. I.M. Gavrilin, V.A. Smolyaninov, A.I. Savitsky, A.A. Dronov, S.A. Gavrilov.** National Research University of Electronic Technology, Zelenograd, Russia.

## **Technology and Equipment**

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- P1-35 Direct writing of micro- and nanostructures for optics with using new e-beam lithography principle. E. Zhikharev<sup>1</sup>, M. Bruk<sup>2</sup>, A. Rogozhin<sup>1</sup>.** 1. Institute of Physics and Technology, Moscow, Russia. 2. L.Ya. Karpov Institute of Physical Chemistry, Moscow, Russia.
- P1-36 A resistless electron beam lithography based on charge accumulation in dielectric films. E. Kelm, D. Zubov, S. Kazmishchev, R. Milovanov, S. Sokolov.** Institute of Nanotechnology of Microelectronics, Moscow, Russia.
- P1-37 Electro-optical converter of zero-order and second-order Bessel laser beams for the photolithography systems. V. Paranin<sup>1</sup>, S. Khonina<sup>1,2</sup>.** 1. Samara National Research University, Samara, Russia. 2. Image Processing Systems Institute, Branch of the FSRC "Crystallography and Photonics", Samara, Russia.
- P1-38 Comparative study of CF<sub>4</sub>- and CHF<sub>3</sub>-based plasmas for dry etching applications. A. Efremov<sup>1</sup>, K.-H. Kwon<sup>2</sup>, A. Morgunov<sup>1</sup>, D. Shabadarova<sup>1</sup>.** 1. Ivanovo State University of Chemistry and Technology, Ivanovo, Russia. 2. Korea University, Sejong, South Korea.
- P1-39 Investigation of the reactive ion etching of Ge<sub>2</sub>Sb<sub>2</sub>Te<sub>5</sub> thin films. A. Shulyatev, A. Sherchenkov, D. Gromov, P. Lazarenko, A. Sysa, A. Kozmin.** National Research University of Electronic Technology, Zelenograd, Russia.
- P1-40 A study of the vertical walls and the surface roughness GaAs after the operation in the combined plasma etching. O.A. Ageev, V.S. Klimin, M.S. Solodovnik, A.V. Eskov, S.Y. Krasnoborodko.** Southern Federal University, Institute of Nanotechnologies, Electronics, and Electronic Equipment Engineering, Taganrog, Russia.

- P1-41** The formation of photoresist film with thicknesses from 0.7 microns to 100 microns on surfaces with considerable relief by spray coating on the heated substrate. A.V. Romashkin, D.D. Levin, R.Yu. Rozanov, V.K. Nevolin. National Research University of Electronic Technology, Zelenograd, Russia.
- P1-42** Deposition of polymers on structures of nano-gap in carbon nanotubes on SiO<sub>2</sub> creating by focusing ion beam implantation and etching. A.V. Romashkin, A.V. Emelianov, K.A. Tsarik, I.I. Bobrinetskiy. National Research University of Electronic Technology, Zelenograd, Russia.
- P1-43** Modelling energy gaps of graphene nanoribbons (GNRs) by DFT. N. Savinski<sup>1</sup>, U. Logachev<sup>2</sup>. 1. Yaroslavl Branch of the Institute of Physics and Technology, Yaroslavl, Russia. 2. Yaroslavl State Technical University, Yaroslavl, Russia.
- P1-44** Electrochemical exfoliation for the scalable production of high-quality graphene. N. Savinski<sup>1</sup>, D. Puhov<sup>1</sup>, M. Lebedev<sup>1</sup>, S. Vasilev<sup>1</sup>, O. Trushin<sup>1</sup>, M. Soloviev<sup>2</sup>, A. Surovtsev<sup>3</sup>. 1. Yaroslavl Branch of the Institute of Physics and Technology, Yaroslavl, Russia. 2. Yaroslavl State Technical University, Yaroslavl, Russia. 3. JSC Research Institute "Yarsintez", Yaroslavl, Russia.
- P1-45** Direct laser patterning of graphene-based biosensors. I.A. Komarov<sup>1</sup>, A.V. Golovin<sup>2</sup>, E.I. Rubtsova<sup>1</sup>, T. Kholina<sup>2</sup>, N. Otero<sup>3</sup>, P. Romero<sup>3</sup>, I.I. Bobrinetskiy<sup>1</sup>. 1. National Research University of Electronic Technology, Zelenograd, Russia. 2. Lomonosov Moscow State University, Moscow, Russia. 3. Laser Applications Centre, AIMEN, Porriño, Spain.
- P1-46** Silicon wafer temperature switching waves in a lamp-based chamber. V. Ovcharov, A. Kurennya, V. Rudakov, V. Prigara. Institute of Physics and Technology (Yaroslavl Branch), Yaroslavl, Russia.
- P1-47** Critical parameters of lamp-based annealing in high-power flux of incoherent radiation. V. Prigara, V. Ovcharov, V. Rudakov, A. Kurennya. Yaroslavl Branch of the Institute of Physics and Technology, Yaroslavl, Russia.
- P1-48** Influence of reactor wall conditions on the silicon etching rate in SF<sub>6</sub> plasma processing. O.V. Morozov, A.V. Postnikov. Yaroslavl Branch of the Institute of Physics and Technology, Yaroslavl, Russia.
- P1-49** Cleaning of Si sidewall surface of high aspect ratio trenches in oxygen and hydrogen peroxide plasma. I. Amirov, M. Izuymov, L. Mazaletsky. Yaroslavl Branch of the Institute of Physics and Technology, Yaroslavl, Russia.
- P1-50** Effect of low energy ion-plasma treatment on the internal stresses in three-layer Pt/Ti/SiO<sub>2</sub> microcantilevers. I. Amirov, R. Selyukov, V. Naumov. Yaroslavl Branch of the Institute of Physics and Technology, Yaroslavl, Russia.
- P1-51** Elements for Hard X-ray Optics Produced by Cryogenic Plasma Etching of Silicon. A. Miakonkikh<sup>1</sup>, A. Rogozhin<sup>1</sup>, K. Rudenko<sup>1</sup>, V. Lukichev<sup>1</sup>, V. Yunkin<sup>2</sup>. 1. Institute of Physics and Technology, Moscow, Russia. 2. Institute of Microelectronics Technology and High Purity Materials, Chernogolovka, Russia.



- P1-52** Evolution of structural and optical properties of Si(001) multilayers containing He bubbles by low-temperature annealing. A. Lomov<sup>1</sup>, K. Shcherbachev<sup>2</sup>, Y. Chesnokov<sup>3</sup>, V. Denisov<sup>4</sup>, A. Kirichenko<sup>4</sup>, A. Miakonkikh<sup>1</sup>. 1. Institute of Physics and Technology, Moscow, Russia. 2. National University of Science and Technology, Moscow, Russia. 3. National Research Centre "Kurchatov Institute", Moscow, Russia. 4. Federal State Budgetary Institution "Technological Institute for Superhard and Novel Carbon Materials", Moscow, Russia.

## **Metrology and Characterization**

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- P1-53** Optical emission 2D-tomography of plasma: case of rectangular two-view scanning and diagonal symmetry of inhomogeneities. A.V. Fadeev, K.V. Rudenko. Institute of Physics and Technology, Moscow, Russia.
- P1-54** Two methods of improving dopant contrast for semiconductor structures under thin surface layers in scanning electron microscope. E. Rau<sup>1</sup>, A. Tatarintsev<sup>1,2</sup>, S. Kupreenko<sup>1</sup>, V. Karaulov<sup>3</sup>, S. Kolybin<sup>3</sup>. 1. Lomonosov Moscow State University, Moscow, Russia. 2. Institute of Physics and Technology, Moscow, Russia. 3. JSC "NPO Sernia", Moscow, Russia.
- P1-55** Reduction in protrusion width values under scanning in a low voltage SEM. Yu.V. Larionov<sup>1</sup>, Yu.V. Ozerin<sup>2</sup>. 1. A.M. Prokhorov Institute of General Physics, Moscow, Russia. 2. JSC Mikron, Zelenograd, Russia.
- P1-56** Determination of mechanical stress in the silicon nitride films with a scanning electron microscope. N. Dyuzhev, E. Gusev, A. Dedkova, N. Patiukov. National Research University of Electronic Technology, Zelenograd, Russia.
- P1-57** Extraction of differential inverse inelastic mean free paths in solids from electron energy loss spectra. V. Afanas'ev<sup>1,2</sup>, A. Gryazev<sup>1</sup>, D. Efremenko<sup>3</sup>, P. Kaplya<sup>1</sup>. 1. National Research University "Moscow Power Engineering Institute", Moscow, Russia. 2. Joint Institute for High Temperatures, Moscow, Russia. 3. Deutsches Zentrum für Luft- und Raumfahrt (DLR), Institut für Methodik der Fernerkundung (IMF), Oberpfaffenhofen, Germany.
- P1-58** Reflected electron spectroscopy for depth profiling. V. Afanas'ev<sup>1,2</sup>, Yu. Andriyanova<sup>1</sup>, A. Gryazev<sup>1</sup>, P. Kaplya<sup>1</sup>. 1. National Research University "Moscow Power Engineering Institute", Moscow, Russia. 2. Joint Institute for High Temperatures, Moscow, Russia.
- P1-59** Method of stress and measurement modes for research of thin dielectric films of MIS structures. V.V. Andreev<sup>1</sup>, V.M. Maslovsky<sup>2</sup>, D.V. Andreev<sup>1</sup>, A.A. Stolyarov<sup>1</sup>. 1. Bauman Moscow State Technical University (Kaluga branch), Kaluga, Russia. 2. Institute of Physical Problems, Moscow, Russia.
- P1-60** Classification Automation of Thermoplastic Particles in a Cured Epoxy Matrix According to Their Size on Microscopic Images. V.A. Sablina<sup>1</sup>, A.N. Varnavsky<sup>1</sup>, Al.N. Varnavsky<sup>2</sup>. 1. Ryazan State Radio Engineering University, Ryazan, Russia. 2. Lomonosov Moscow State University, Moscow, Russia.

**Physics of Semiconductor Devices**

- P2-01** **Ambipolar memristor-based oscillator.** V. Rakitin<sup>1</sup>, A. Rakitin<sup>2</sup>. 1. Institute of Design Problems in Microelectronics, Moscow, Russia. 2. Lomonosov Moscow State University, Moscow, Russia.
- P2-02** **Application of Triple Modular Redundancy for Soft Error Mitigation in 65-28 nm CMOS VLSI.** A.P. Skorobogatov. Scientific Research Institute for System Analysis, Moscow, Russia.
- P2-03** **Graphene Field Effect Structure Manufacturing and Characterization.** S. Shostachenko, R. Zakharchenko, G. Zebrev, V. Razumny, N. Kargin. National Research Nuclear University, Moscow, Russia.
- P2-04** **Single-electron transistor based on intramolecular single-atom charge center.** V. Gaydamachenko, E. Beloglazkina, R. Petrov, I. Sapkov, E. Soldatov, S. Dagesyan. Lomonosov Moscow State University, Moscow, Russia.
- P2-05** **Dielectrophoresis method for single electron transistors creation.** A.G. Galstyan, S.A. Dagesyan, E.S. Soldatov, O.V. Snigirev. Lomonosov Moscow State University, Moscow, Russia.
- P2-06** **Single-electron transistor based on several dopant atoms.** S. Dagesyan<sup>1</sup>, V. Shorokhov<sup>1</sup>, D. Presnov<sup>2</sup>, E. Soldatov<sup>1</sup>, A. Trifonov<sup>2</sup>, V. Krupenin<sup>1</sup>. 1. Lomonosov Moscow State University, Moscow, Russia. 2. Skobeltsyn Institute of Nuclear Physics, Lomonosov Moscow State University, Moscow, Russia.
- P2-07** **Formation of metal electrodes with a nanoscale separation using an evaporated resist.** G. Zharik, S. Dagesyan, E. Soldatov. Lomonosov Moscow State University, Moscow, Russia.
- P2-08** **Double-"striping" transistor test-structures with carbon nanotubes channels.** V.M. Efimov, D.G. Esaev. Rzhanov Institute of Semiconductor Physics, Novosibirsk, Russia.
- P2-09** **Silicon nanowire based local field probe.** I. Bozhhev<sup>1</sup>, A. Trifonov<sup>1,2</sup>, D. Presnov<sup>1,2</sup>, V. Krupenin<sup>1</sup>. 1. Lomonosov Moscow State University, Moscow, Russia. 2. Skobeltsyn Institute of Nuclear Physics, Moscow, Russia.
- P2-10** **Design and modeling of GAA FET with a monocrystalline silicon channel.** S.N. Orlov<sup>1</sup>, E.S. Gornev<sup>1</sup>, A.S. Klyuchnikov<sup>1</sup>, V.P. Timoshenkov<sup>2</sup>, O.P. Gutshin<sup>1</sup>, P.G. Bobovnikov<sup>1</sup>. 1. Molecular Electronics Research Institute, Zelenograd, Moscow, Russia. 2. National Research University of Electronic Technology, Zelenograd, Russia.
- P2-11** **Nanowire based Field Effect Transistor for the detection of different biological objects.** D. Presnov<sup>1,2</sup>, G. Presnova<sup>3</sup>, I. Bozhjev<sup>2</sup>, M. Rubtsova<sup>3</sup>, A. Trifonov<sup>1,2</sup>, V. Krupenin<sup>2</sup>. 1. Skobeltsyn Institute of Nuclear Physics, Moscow State University, Moscow, Russia. 2. Laboratory of Cryoelectronics, Moscow State University, Moscow, Russia. 3. Faculty of Chemistry, Moscow State University, Moscow, Russia.

- P2-12** Characteristics simulation of single-electron transistor based on the molecule with accentuated single-atom Rh detached charge center. A.A. Parshintsev, V.V. Shorokhov, E.S. Soldatov. Lomonosov Moscow State University, Moscow, Russia.
- P2-13** Model of Nanodiode Conductivity as Description of I-V Features of ReRAM in Conductive State. A.A. Popov, A.E. Berdnikov, A.A. Mironenko, V.N. Gusev. Yaroslavl Branch of Institute of Physics and Technology, Yaroslavl, Russia.
- P2-14** The study of crystallization kinetics of phase transformations in thin films  $\text{Ge}_2\text{Sb}_2\text{Te}_5$  by electrical measurements. P. Lazarenko<sup>1</sup>, A. Yakubov<sup>1</sup>, A. Babich<sup>1</sup>, A. Sherchenkov<sup>1</sup>, S. Kozyukhin<sup>2</sup>, A. Shuliatyev<sup>1</sup>. 1. National Research University of Electronic Technology, Zelenograd, Russia. 2. Kurnakov Institute of General and Inorganic Chemistry, Moscow, Russia.
- P2-15** Thermoelectric and electro-physical properties of the phase change memory materials on the quasi-binary line  $\text{GeTe-Sb}_2\text{Te}_3$ . A. Sherchenkov<sup>1</sup>, P. Lazarenko<sup>1</sup>, D. Terekhov<sup>1</sup>, V. Kalugin<sup>2</sup>, S. Kozyukhin<sup>3</sup>, A. Yakubov<sup>1</sup>, A. Babich<sup>1</sup>. 1. National Research University of Electronic Technology, Zelenograd, Russia. 2. Zelenograd Nanotechnology Center, Zelenograd, Russia. 3. Kurnakov Institute of General and Inorganic Chemistry, Moscow, Russia.
- P2-16** Investigation of memristor effect on the titanium nanowires fabricated by focused ion beam. O. Ageev, A. Kolomyitsev, V. Smirnov, I. Jityaev. Southern Federal University, Institute of Nanotechnologies, Electronics and Electronic Equipment Engineering, Taganrog, Russia.
- P2-17** Modeling of resistive switching mechanism in  $\text{HfO}_2$  ReRAM. S. Ivanov<sup>1,2</sup>, D. Voronov<sup>1,2</sup>, O. Orlov<sup>2</sup>. 1. Moscow Institute of Physics and Technology, Dolgoprudny, Russia. 2. Research Institute of Molecular Electronics, Zelenograd, Russia.
- P2-18** The resistive switching of vertically aligned carbon nanotubes by the action of electric field. O. Ageev, Yu. Blinov, M. Ilina, O. Ilin, V. Smirnov. Southern Federal University, Institute of Nanotechnologies, Electronics and Electronic Equipment Engineering, Taganrog, Russia.
- P2-19** Exploring energy landscape of magnetic nanostructures with Nudged Elastic Band Micromagnetics. O.S. Trushin<sup>1</sup>, N. Barabanova<sup>1</sup>, E. Granato<sup>2</sup>, S.C. Ying<sup>3</sup>. 1. Yaroslavl Branch of the Institute of Physics and Technology, Yaroslavl, Russia. 2. National Institute for Space Research, São José dos Campos, Brazil. 3. Brown University, Providence, Rhode Island.
- P2-20** Some features of magnetotransport properties of Ni/NiO thin film structures. V.A. Berezin, I.V. Malikov, G.M. Mikhailov. Institute of Microelectronic Technology and High Purity Materials, Chernogolovka, Russia.
- P2-21** Geometric effects in current-voltage characteristics of a cross-shaped MDM structure Ni/NiO/Fe. I.V. Malikov, L.A. Fomin, G.M. Mikhailov. Institute of Microelectronic Technology and High Purity Materials, Chernogolovka, Russia.

- P2-22 Basic cells for energy efficient superconducting neural networks.** A. Schegolev<sup>1,2</sup>, N. Klenov<sup>1-6</sup>, I. Soloviev<sup>3-5</sup>, M. Tereshonok<sup>2</sup>. 1. Moscow State University, Moscow, Russia. 2. Moscow Technical University of Communications and Informatics, Moscow, Russia. 3. Lomonosov Moscow State University, Skobeltsyn Institute of Nuclear Physics, Moscow, Russia. 4. Lukin Scientific Research Institute of Physical Problems, Zelenograd, Russia. 5. Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russia. 6. N.L. Dukhov All-Russia Research Institute of Automatics, Moscow, Russia.
- P2-23 Capture into resonance a quantum particle moving in a double-well potential.** C.S. Kim<sup>1</sup>, D.S. Pashin<sup>2</sup>, A.M. Satanin<sup>2</sup>. 1. Chonnam National University, South Korea. 2. Lobachevsky State University, Nizhny Novgorod, Russia.
- P2-24 Efficiency of the detection signal by means of GaAs tunnel diodes in MHz and quasi THz ranges.** M.A. Dresvyannikov<sup>1</sup>, A.L. Karuzskii<sup>1</sup>, A.V. Perestoronin<sup>1</sup>, V.V. Priimochenko<sup>2</sup>, A.M. Tskhovrebov<sup>2</sup>, L.N. Zherikhina<sup>2</sup>. 1. P.N. Lebedev Physical Institute, Moscow, Russia. 2. National Research Nuclear University, Moscow, Russia.
- P2-25 Electrically stimulated high-frequency replicas of a resonant current in GaAs/AlAs resonant-tunneling double-barrier THz nanostructures.** A.A. Aleksanyan, A.L. Karuzskii, I.P. Kazakov, Yu.A. Mityagin, V.N. Murzin, A.V. Perestoronin, S.S. Shmelev, A.M. Tshovrebov. P.N. Lebedev Physical Institute, Moscow, Russia.
- P2-26 The spatially dispersive eigenvalues of permittivity operator and frequency-dependent surface impedance for conductors without the dc dissipation.** M.A. Dresvyannikov<sup>1</sup>, A.P. Chernyaev<sup>2</sup>, A.L. Karuzskii<sup>1</sup>, Yu.A. Mityagin<sup>1</sup>, A.V. Perestoronin<sup>1</sup>, N.A. Volchkov<sup>1</sup>. 1. P.N. Lebedev Physical Institute, Moscow, Russia. 2. Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russia.
- P2-27 Diamond photocell for vacuum-ultra-violet matrix detector.** E. Il'ichev, A. Kuleshov, R. Nabiev, G. Petrukhin, E. Teverovskaya, G. Rychkov. National Research University of Electronic Technology, Zelenograd, Russia.
- P2-28 3D-simulation of silicon micro-ring resonator with Comsol.** S.A. Degtyarev<sup>1</sup>, S.N. Khonina<sup>1,2</sup>, V.S. Solovyev<sup>2</sup>. 1. Samara National Research University, Samara, Russia. 2. Image Processing Systems Institute, Branch of the FSRC "Crystallography and Photonics", Samara, Russia.
- P2-29 Zero bias THz detection using GaAs/AlAs double-quantum-well resonant tunneling diodes.** S. Savinov<sup>1</sup>, V. Egorkin<sup>2</sup>, V. Kapaev<sup>1,2</sup>, I. Kazakov<sup>1</sup>, N. Maleev<sup>3</sup>, V. Murzin<sup>1</sup>. 1. P.N. Lebedev Physical Institute, Moscow, Russia. 2. National Research University of Electronic Technology, Zelenograd, Russia. 3. Ioffe Institute, St. Petersburg, Russia.

## **MEMS and NEMS**

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- P2-30 A low actuation voltage bistable MEMS switch: Design, fabrication and preliminary testing.** I.V. Uvarov, V.V. Naumov, O.M. Koroleva, E.I. Vaganova, I.I. Amirov. Yaroslavl Branch of the Institute of Physics and Technology, Yaroslavl, Russia.
- P2-31 Anchored Multi-DOF MEMS Gyroscope having Robust Drive Mode.** P. Verma, S.N. Khonina, V.S. Pavelyev. Samara National Research University, Samara, Russia.

- P2-32 Design and technological features of creating and successfully tested linear acceleration.** N. Parfenov<sup>1</sup>, S. Timochenkov<sup>2</sup>, A. Timochenkov<sup>2</sup>. 1. Moscow Aviation Institute (National Research University), Moscow, Russia. 2. National Research University of Electronic Technology, Moscow, Russia.
- P2-33 Biosensor platform based on carbon nanotubes covalently modified with aptamers.** I.A. Komarov<sup>1</sup>, E.I. Rubtsova<sup>1</sup>, A.V. Golovin<sup>2</sup>, T. Kholina<sup>2</sup>, I.I. Bobrinetskiy<sup>1</sup>. 1. National Research University of Electronic Technology, Zelenograd, Russia. 2. Lomonosov Moscow State University, Moscow, Russia.
- P2-34 A wireless micromechanical gauge for remote measurement of pressure in vacuum range.** A. Boyko, P. Kovyркиn, A. Shalimov, S. Timoshenkov. National Research University of Electronic Technology, Zelenograd, Russia.
- P2-35 Angular electrochemical sensor for precise azimuth determination.** D.L. Zaitsev<sup>1</sup>, A.N. Antonov<sup>1</sup>, V.G. Krishtop<sup>2</sup>. 1. Moscow Institute of Physics and Technology (State University), Moscow, Russia. 2. Institute of Microelectronics Technology and High Purity Materials, Chernogolovka, Russia.
- P2-36 The simulation model of planar electrochemical transducer.** D.A. Zhevnenko<sup>1,2</sup>, S.S. Vergeles<sup>3,2</sup>, T.V. Krishtop<sup>4,5</sup>, D.V. Tereshonok<sup>6</sup>, V.G. Krishtop<sup>1,7</sup>. 1. Institute of Microelectronics Technology and High Purity Materials, Chernogolovka, Russia. 2. Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russia. 3. Landau Institute for Theoretical Physics, Chernogolovka, Russia. 4. Kotel'nikov Institute of Radio-Engineering and Electronics, Moscow, Russia. 5. Amadeus IT Group, Sophia Antipolis, France. 6. Joint Institute for High Temperatures, Moscow, Russia. 7. Seysmotronika LLC, Moscow, Russia.
- P2-37 The planar silicon-based microelectronic technology for electrochemical transducers.** A.V. Novikov<sup>4</sup>, A.E. Egorchikov<sup>4</sup>, A.N. Dolgov<sup>4</sup>, E.S. Gornev<sup>4</sup>, V.G. Popov<sup>1,2</sup>, I.V. Egorov<sup>1,3</sup>, V.G. Krishtop<sup>1,3</sup>. 1. Institute of Microelectronics Technology and High Purity Materials, Chernogolovka, Russia. 2. Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russia. 3. "Seysmotroniks" LLC, Moscow, Russia. 4. JSC Mikron, Zelenograd, Russia.
- P2-38 The precision seismometer based on planar electrochemical transducer.** A.S. Khabalina<sup>1</sup>, V.G. Krishtop<sup>2</sup>. 1. Moscow Institute of Physics and Technology (State University), Moscow, Russia. 2. Institute of Microelectronics Technology and High Purity Materials, Chernogolovka, Russia.
- P2-39 Integral planar supercapacitor with CNT-based composite electrodes for heat-sensitive MEMS and NEMS.** E.A. Lebedev<sup>1</sup>, A.V. Alekseyev<sup>1</sup>, I.M. Gavrilin<sup>1</sup>, A.V. Sysa<sup>1</sup>, E.P. Kitsyuk<sup>2</sup>, R.M. Ryazanov<sup>2</sup>, D.G. Gromov<sup>1</sup>. 1. National Research University of Electronic Technology, Zelenograd, Russia. 2. Scientific Manufacturing Complex "Technological Centre", Zelenograd, Russia.

## **Modeling and Simulation**

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- P2-40 Monte Carlo simulation of electron transport in GaAs/AlAs quantum wire transistor structure under the effect of terahertz electric field.** A.V. Borzdov<sup>1</sup>, V.M. Borzdov<sup>1</sup>, V.V. V'yurkov<sup>2</sup>. 1. Belarusian State University, Minsk, Belarus. 2. Institute of Physics and Technology, Moscow, Russia.

- P2-41** TCAD model of tunnel field effect transistor, integrated in basic SOI CMOS technology. *Y. Chaplygin, A. Krasukov, T. Krupkina, A. Mukhammedov, D. Rodionov. National Research University of Electronic Technology, Zelenograd, Russia.*
- P2-42** Compact modeling of radiation-induced drain leakage current. *M.G. Drosdetsky, V.V. Orlov, G.I. Zebrev. National Research Nuclear University, Moscow, Russia.*
- P2-43** Total ionizing dose effects modeling in common-gate tri-gate FinFETs using Verilog-A. *M. Gorbunov<sup>1,2</sup>, G. Zebrev<sup>2,1</sup>. 1. Scientific Research Institute of System Analysis, Moscow, Russia. 2. National Research Nuclear Institute, Moscow, Russia.*
- P2-44** I-V Characteristics simulation of silicon carbide Ti/4H-SiC Schottky diode. *P. Panchenko, S. Rybalka, A. Malakhanov, E. Krayushkina, A. Radkov. Bryansk State Technical University, Bryansk, Russia.*
- P2-45** Layout-aware simulation of soft errors in sub-100 nm integrated circuits. *A. Balbekov<sup>1</sup>, M. Gorbunov<sup>2</sup>, S. Bobkov<sup>1,2</sup>. 1. Scientific Research Institute of System Analysis, Moscow, Russia. 2. National Research Nuclear University, Moscow, Russia.*
- P2-46** Spatial distribution of gate tunnel current in flash-memory cells: Monte Carlo simulation. *O.G. Zhevnyak. Belarus State University, Minsk, Belarus.*
- P2-47** Synthesis of the quasi-static current-voltage characteristics of the multi-barrier heterostructures for generation of terahertz electromagnetic radiation. *V.A. Gergel, A.V. Verhovtseva, N.M. Gorshkova, V.S. Minkin, V.V. Pavlovskij. Kotel'nikov Institute of Radio Engineering and Electronics, Moscow, Russia.*
- P2-48** Terahertz pulse generator on the basis of a heterostructure  $\text{Al}_x\text{Ga}_{1-x}\text{As}/\text{GaAs}$ . *S.A. Nikitov<sup>1</sup>, P.P. Maltsev<sup>2</sup>, V.A. Gergel<sup>1</sup>, A.V. Verhovtseva<sup>1</sup>, N.M. Gorshkova<sup>1</sup>, V.V. Pavlovskij<sup>1</sup>, V.S. Minkin<sup>1</sup>, R.A. Khabibullin<sup>2</sup>. 1. Kotel'nikov Institute of Radio Engineering and Electronics, Moscow, Russia. 2. Institute of UHF Semiconductor Electronics, Moscow, Russia.*

## Quantum Informatics

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- P2-49** Stark-shift based quantum dot-cavity electrometer. *A.V. Tsukanov<sup>1,2</sup>, V.G. Chekmachev<sup>1,2</sup>. 1. Institute of Physics and Technology, Moscow, Russia. 2. Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russia.*
- P2-50** Single-photon transmission and spectroscopy of diamond microring isomers. *A.V. Tsukanov<sup>1,2</sup>, I.Yu. Kateev<sup>1,2</sup>, M.S. Rogachev<sup>1,2</sup>. 1. Institute of Physics and Technology, Moscow, Russia. 2. Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russia.*
- P2-51** Hamiltonian matrix elements for Josephson silent qubits. *A.V. Kuznetsov<sup>1</sup>, N.V. Klenov<sup>1-4</sup>, S.V. Bakurskiy<sup>3</sup>. 1. Lomonosov Moscow State University, Moscow, Russia. 2. Moscow Technical University of Communications and Informatics, Moscow, Russia. 3. Lukin Scientific Research Institute of Physical Problems, Zelenograd, Russia. 4. Skobeltsyn Institute of Nuclear Physics, Lomonosov Moscow State University, Moscow, Russia.*
- P2-52** Selective measurement of qubit states by using of Josephson bifurcation oscillator. *M.V. Denisenko, A.M. Satanin. Lobachevsky State University, Nizhni Novgorod, Russia.*

- P2-53 Quantum approach to the simulation of logistics model and nonlinear oscillations.** *Yu.I. Bogdanov<sup>1,2,3</sup>, N.A. Bogdanova<sup>1,2</sup>, D.Yu. Kulko<sup>1,3</sup>, V.F. Lukichev<sup>1</sup>.* 1. Institute of Physics and Technology, Moscow, Russia. 2. National Research University of Electronic Technology, Zelenograd, Russia. 3. National Research Nuclear University, Moscow, Russia.
- P2-54 Analysis of triphoton polarization state tomography accuracy.** *Yu.I. Bogdanov<sup>1,2,3</sup>, G.V. Avosopyants<sup>1,3</sup>, K.G. Katamadze<sup>1,4</sup>, L.V. Belinsky<sup>1,3</sup>, Yu.A. Kuznetsov<sup>3</sup>.* 1. Institute of Physics and Technology, Moscow, Russia. 2. National Research Nuclear University, Moscow, Russia. 3. National Research University of Electronic Technology, Zelenograd, Russia. 4. Lomonosov Moscow State University, Moscow, Russia.
- P2-55 Quadrature state tomography adjustment by means of coherent states reconstruction.** *Yu.I. Bogdanov<sup>1,2,3</sup>, K.G. Katamadze<sup>1,4</sup>, G.V. Avosopyants<sup>1,3</sup>, S.P. Kulik<sup>4</sup>.* 1. Institute of Physics and Technology, Moscow, Russia. 2. National Research Nuclear University, Moscow, Russia. 3. National Research University of Electronic Technology, Zelenograd, Russia. 4. Lomonosov Moscow State University, Moscow, Russia.
- P2-56 Fast polarization QKD scheme based on LiNbO<sub>3</sub> phase modulators.** *A. Duplinskiy<sup>1,2</sup>, V. Ustimchik<sup>1,2</sup>, A. Kanapin<sup>1,3</sup>, Y. Kurochkin<sup>1</sup>.* 1. Russian Quantum Center, Skolkovo, Russia. 2. Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russia. 3. Lomonosov Moscow State University, Moscow, Russia.
- P2-57 1D models in analysis of solid state NMR absorption lines.** *M.M. Kucherov<sup>1</sup>, O.V. Falaleev<sup>2</sup>.* 1. Siberian Federal University, Institute of Space and Information Technology, Krasnoyarsk, Russia. 2. Krasnoyarsk Research Center, Krasnoyarsk, Russia.