

COMMITTEES

International Advisory Committee

Chair: E. Velikhov, National Research Centre "Kurchatov Institute", Moscow, Russia

Co-chair: A. Orlikovsky, Institute of Physics and Technology, Moscow, Russia

Co-chair: G. Krasnikov, JCS Mikron, Zelenograd, Russia

Members:

A. Aseev, Institute of Semiconductor Physics, Novosibirsk, Russia

D. Averin, Stony Brook University, New York, USA

M. Baklanov, International Microelectronic Center (IMEC), Leuven, Belgium

V. Benine, ASML, Veldhoven, Netherlands

R. Chabicovsky, Technical University, Vienna, Austria

Yu. Gulyaev, Kotelnikov Institute of Radioengineering and Electronics, Moscow, Russia

H.-L. Hwang, National Tsing Hua University, Hsinchu, Taiwan

V. Labunov, Belarusian State University of Informatics and Radioelectronics, Minsk, Belarus

K. Likharev, Stony Brook University, New York, USA

V. Litovchenko, Institute of Semiconductor Physics of National Ukrainian Academy of Sciences, Kiev, Ukraine

J. Nishizawa, Semiconductor Research Institute, Sendai, Japan

K. Novoselov, University of Manchester, Manchester, UK

Yu. Pozhela, Institute of Semiconductor Physics, Vilnius, Lithuania

I. Rangelow, University of Ilmenau, Ilmenau, Germany

H. Ryssel, Fraunhofer Institute of Integrated Systems and Devices Technology, Erlangen, Germany

Th. Skotnicki, ST Microelectronics, Crolles, France

R. Suris, Ioffe Physical Technical Institute, RAS, St. Peterburg, Russia

D. Toma, Tokyo Electron Corporation, U.S. Technology Development Center, Albany, USA

A. Toriumi, University of Tokyo, Tokyo, Japan

Program Committee

Chair: A. Orlikovsky, Institute of Physics and Technology, Moscow, Russia

Co-chair: I. Neizvestnyi, Institute of Semiconductor Physics, Novosibirsk, Russia

Co-chair: V. Lukichev, Institute of Physics and Technology, Moscow, Russia

Members:

A. Alexandrov, Lomonosov Moscow State University, Moscow, Russia

V. Aristov, Institute of Microelectronics Technology and High-Pure Materials, Chernogolovka, Russia

V. Betelin, Scientific Research Institute of System Analysis, Moscow, Russia

Yu. Bogdanov, Institute of Physics and Technology, Moscow, Russia

Yu. Chaplygin, National Research University of Electronic Technology, Zelenograd, Russia

B. Gribov, State Scientific Institute of Ultra-Pure Materials, Zelenograd, Russia

F. Komarov, Belorussian State University, Minsk, Belorussia

P. Kop'ev, Ioffe Physical Technical Institute, St. Peterburg, Russia

P. Maltsev, UHF Semiconductor Microelectronics Institute, Moscow, Russia

A. Nazarov, Institute of Semiconductor Physics of National Ukrainian Academy of Sciences, Kiev, Ukraine

Yu. Ozhigov, Lomonosov Moscow State University, Moscow, Russia

V. Panchenko, Institute of Laser and Informatics Technologies Problems, Shatura, Russia

A. Rudy, Yaroslavl Demidov State University, Yaroslavl, Russia

N. Salaschenko, Institute of Microstructures Physics, Nizhnii Novgorod, Russia
K. Salikhov, Kazan Zavoiskiy Physical-Technical Institute, Kasan, Russia
A. Sigov, Moscow State Institute of Radioengineering, Electronics, and Automation (TU),
Moscow, Russia
P. Todua, Moscow Institute of Physics and Technology (SU), Moscow, Russia
V. Vyurkov, Institute of Physics and Technology, Moscow, Russia

Organizing Committee

Chair: V. Lukichev, Institute of Physics and Technology, Moscow, Russia

Co-chair: K. Rudenko, Institute of Physics and Technology, Moscow, Russia

Members:

I. Abramov, Belarusian State University of Informatics and Radioelectronics, Minsk, Belarus
I. Amirov, Institute of Physics and Technology (Yaroslavl Branch), Yaroslavl, Russia
Yu. Bogdanov, Institute of Physics and Technology, Moscow, Russia
A. Buharaev, Kazan, Zavoiskiy Physical-Technical Institute, Kasan, Russia
M. Chuev, Institute of Physics and Technology, Moscow, Russia
A. Gorbazevitch, P.N. Lebedev Physical Institute, Moscow, Russia
Eu. Gornev, JCS Mikron, Zelenograd, Russia
M. Korolev, National Research University of Electronic Technology, Zelenograd, Russia
S. Nikitov, Kotel'nikov Institute of Radioengineering and Electronics, Moscow, Russia
O. Pchelyakov, Institute of Semiconductor Physics, Novosibirsk, Russia
V. Rubaev, NIX Company, Moscow, Russia

Local Organizing Committee

Vladimir Lukichev – Chair of the ICMNE-2014 Organizing Committee

Yuri Bogdanov - Chair of the Extended Session QI-2014

Vladimir Kudrya - Scientific Secretary of ICMNE-2014

Sergey Skalkin – Financial Administrator of ICMNE-2014

Alexander Astakhov - Administrator of ICMNE-2014

Alexey Dianov - PR-support of ICMNE-2014

Andrey Chernyavskiy

Andrey Miakonkikh

Alexander Rogozhin

Igor Semenikhin

Alexander Tsukanov

Vladimir Vyurkov

Lidiya Besschastnova

Irina Lukianova

Irina Novojilova

SESSIONS LOCATION

Monday, October 6th, 2014

TIME	CONFERENCE HALL	AUDITORIUM A	AUDITORIUM B
15.00 – 16.20	Hi-Tech Companies Presentations I	-----	-----
16.40 – 17.40	Hi-Tech Companies Presentations II	-----	-----

Tuesday, October 7th, 2014

8.50. Conference Hall. WELCOME REMARKS

TIME	CONFERENCE HALL	AUDITORIUM A	AUDITORIUM B
9.00 – 10.50	Plenary Session I	-----	-----
11.20 – 14.00	Plenary Session II. Quantum Informatics I	-----	-----
14.40 – 16.30	Session 1. Materials and Films I	Session 2. Physics and Technology of Micro- and Nanodevices I	Session 3. Quantum Informatics II
16.50 – 18.50	Session 4. Materials and Films II	Session 5. Physics and Technology of Micro- and Nanodevices II	Session 6. SOI and Low-Dimensional Structures

Wednesday, October 8th 2014

TIME	CONFERENCE HALL	AUDITORIUM A	AUDITORIUM B
9.00 – 11.30	Plenary Session III	-----	-----
11.50 – 13.30	Session 7. Materials and Films III	Session 8. Physics and Technology of Micro- and Nanodevices III	Session 9. Quantum Informatics III
14.20 – 15.40	Session 10. Materials and Films IV	Session 11. Meeting of the IAAS	Session 12. Quantum Informatics IV

TIME	HALL	HALL
16.00 – 18.30	POSTER SESSION I	EXHIBITION

Thursday, October 9th 2014

TIME	CONFERENCE HALL	AUDITORIUM A	AUDITORIUM B
9.00 – 11.00	Session 13. Simulation and Modeling I	Session 14. Micro- and Nanoelectronics Technologies and Equipments	Session 15. Quantum Informatics V
11.20 - 13.00	Session 16. Simulation and Modeling II	Session 17. Metrology and Characterization	Session 18. Quantum Informatics VI
14.00 – 15.00	Session 19. Simulation and Modeling III	-----	-----

TIME	HALL
15.30 – 18.30	POSTER SESSION II

18.30. Conference Hall. CLOSING CONFERENCE REMARKS

ICMNE-2014 SCIENTIFIC PROGRAM

Oral Sessions

Monday, October 6th, 2014

9.00 Registration & Accommodation

13.00-14.00 Lunch

Conference Hall

Special Session. Presentations of Hi-Tech Companies I

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

- 15.00 S1-01 Oxford Instruments Plasma Technology equipment for the micro- and nano-engineering of materials for semiconductor, optoelectronics, MEMS and other applications. A. Krynin. Technoinfo Limited, Moscow, Russia.**
- 15.20 S1-02 Application of ION-TOF equipment for microelectronics development and process control. V. Sudin. Technoinfo Limited, Moscow, Russia.**
- 15.40 S1-03 Measurements of permittivity and permeability at radio frequencies. Matching active devices during radio modules design. E. Suchkov. Rohde&Schwarz Russia.**
- 16.00 S1-04 Hitachi HD-2700 STEM with automated Cs-corrector. E. Kremer^{1,2}. 1. Interlab JSC, Moscow, Russia. 2. Hitachi High Technologies, Tokyo, Japan.**

16.20-16.40 Coffee break

Special Session. Presentations of Hi-Tech Companies II

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

- 16.40 S1-05 SemiTEq technological equipment set for micro- and nanoelectronics. S.I. Petrov¹, A.N. Alexeev¹, D.M. Krasovitsky², V.P. Chaly², V.V. Mamaev^{1,3}. 1. SemiTEq JSC, Saint-Petersburg, Russia. 2. Svetlana-Rost JSC, Saint-Petersburg, Russia. 3. State Polytechnical University, Saint-Petersburg, Russia.**
- 17.00 S1-06 New possibilities of scanning probe microscopy for studying the local properties of the samples. V.A. Bykov¹, S.M. Magonov², S.Y. Krasnoborodko¹. 1. NT-MDT Co, Zelenograd, Russia. 2. NT-MDT Development Inc., Tempe AZ USA.**
- 17.20 S1-07 CAMECA magnetic sector SIMS instruments for semiconductor applications and Materials Sciences. E. Norman, P. Peres, A. Merkulov. Cameca, Gennevilliers Cedex, France.**

18.00

Welcome Party

19.00

Dinner

8.15 Breakfast

Conference Hall

8.50

WELCOME REMARKS

A.A. Orlikovsky, Program Committee Chair, Institute of Physics and Technology, Moscow

Plenary Session I

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

- 9.00 L1-01 **KEYNOTE: Alternative metals for advanced interconnects.** *C. Adelman¹, L.G. Wen¹, A. Premkumar Peter¹, Y. K. Siew¹, S. Dutta^{1,2}, K. Croes¹, J. Swerts¹, M. Popovici¹, K. Sankaran¹, G. Pourtois^{1,3}, Sven Van Elshocht¹, Bömmels¹, Zsolt Tőkei¹.* 1. Imec, Leuven, Belgium. 2. Department of Physics and Astronomy, KU Leuven, Leuven, Belgium. 3. PLASMANT, Department of Chemistry, University of Antwerp, Antwerpen, Belgium.
- 9.40 L1-02 **KEYNOTE: Ultra low-k integration into sub 100 nm technologies: Challenges of plasma processing.** *S. Zimmermann¹, N. Lang², N. Köhler³, M. Haase³, M. Hübner², J. Röpcke, S.E. Schulz.* 1. Fraunhofer ENAS, Department Back-end of Line, Chemnitz, Germany. 2. Leibnitz Institute for Plasma Science and Technologie, Greifswald, Germany. 3. Technische Universität Chemnitz, Center for Microtechnologies, Chemnitz, Germany.
- 10.20 L1-03 **INVITED: NEMS/MEMS generators, thermoelectric devices, and pumps.** *L. Montes.* Grenoble INP/PHELMA/IMEP-LAHC, Minatec, Grenoble, France.

11.00-11.20 Coffee break

Conference Hall

Plenary Session II. Quantum Informatics I

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

- 11.20 qL-01 **KEYNOTE: Ultimate communication rates of phase-insensitive quantum channels.** *A. S. Holevo.* Steklov Mathematical Institute, Moscow, Russia.
- 12.00 qL-02 **INVITED: Conception of quantum hashing and its possible applications.** *F. Ablayev, M. Ablayev.* Kazan Federal University, Kazan, Russia.
- 12.40 qL-03 **INVITED: Multi-qubit quantum random access memory.** *E.S. Moiseev¹, S.A. Moiseev^{2,3}.* 1. Institute for Quantum Science and Technology, University of Calgary, Canada. 2. Quantum Center, Kazan National Research Technical University, Kazan, Russia. 3. Kazan E.K. Zavoisky Physical-Technical Institute, Kazan, Russia.
- 13.20 qL-04 **INVITED: Experimental adaptive Bayesian tomography: From qubits towards ququarts.** *K.S. Kravtsov^{1,2}, I.V. Radchenko^{1,2}, S.S. Straupe², G.I. Struchalin², S.P. Kulik².* 1. A.M. Prokhorov General Physics Institute, Moscow, Russia. 2. Faculty of Physics, M.V. Lomonosov Moscow State University, Moscow, Russia.

14.00-14.40 Lunch

Conference Hall
Session 1. Materials and Films I

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

- 14.40 O1-01 DC magnetron sputtered silicon thin films on dielectric substrates. D. Mitin, A. Markin, A. Serdobintsev, S. Venig. Chernyshevsky Saratov State University, Saratov, Russia.
- 15.00 O1-02 Reversible and non-reversible changes in nanostructured Si in humid atmosphere. V. Zhigalov, O. Pyatilova, S. Timoshenkov, S. Gavrilov. National Research University of Electronic Technology (MIET), Zelenograd, Russia.
- 15.20 O1-03 High-temperature surface morphologies of Ge layers on Si. A.A. Shklyayev. Rzhanov Institute of Semiconductor Physics, Novosibirsk, Russia.
- 15.40 O1-04 Investigation of the two-dimensional electron gas optic excitation in nanoheterostructures InAlAs/InGaAs/InAlAs. D.V. Lavrukhin, S.S. Pushkarev, V.S. Lopotov, A.N. Aleshin, G.B. Galiev. Institute of Ultrahigh Frequency Semiconductor Electronics, Moscow, Russia.
- 16.00 O1-05 Low dislocation density and high mobility GaN based HEMT heterostructures grown by plasma-assisted and high temperature ammonia MBE. S.I. Petrov¹, A.N. Alexeev¹, D.M. Krasovitsky², V.P. Chaly², V.V. Mamaev^{1,3}. 1. SemiTEq JSC, Saint-Petersburg, Russia. 2. Svetlana-Rost JSC, Saint-Petersburg, Russia. 3. State Polytechnical University, Saint-Petersburg, Russia.

Auditorium A

Session 2. Physics and Technology of Micro- and Nanodevices I

Session Chairman: Evgeny Danilkin, *Crocus Nanoelectronics, Moscow, Russia*

- 14.40 O1-06 Electron transport and magnetic properties of ferromagnetic-antiferromagnetic planar junctions. A. Chernikh, L. Fomin, I. Malikov, V. Vinnichenko, G. Mikhailov. Institute of Microelectronics Technology and High Purity Materials, Chernogolovka, Russia.
- 15.00 O1-07 Evaluation of a new MgO barrier based on CoFeB/MgO/CoFeB structure for advanced MRAM applications. E. Smirnov¹, M. Genkin¹, C. Portemont², C. Ducruet², J. Alvarez-Hérault², E. Danilkin¹, D. Choutov¹, K. Mackay². 1. Crocus Nanoelectronics, Moscow, Russia. 2. Crocus Technology, Grenoble Cedex, France.
- 15.20 O1-08 Prospective sensors of ultra weak magnetic fields for medical applications. L.P. Ichkitidze¹, R.Y. Preobrazhensky¹, M.L. Gavrushina². 1. National Research University of Electronic Technology (MIET), Moscow, Russia. 2. JSC Bazovye Technologii, Moscow, Russia.
- 15.40 O1-09 Study the interface through “isolated 3D silicon tensoframe on silicon” heterostructure of MEMS-SOIMT pressure sensor. L. Sokolov. Institute of Aircraft Equipment, Zhukovsky, Russia.

- 16.00 O1-10 Development of driving setup for micromechanical friction vacuum gauge. *A. Boyko, A. Shalimov, S. Timoshenkov, P. Kovyarkin, D. Kuznetsov. National Research University of Electronic Technology (MIET), Zelenograd, Russia.*

Auditorium B Session 3. Quantum Informatics II

Session Chairman: S.P Kulik, *Lomonosov Moscow State University, Moscow, Russia*

- 14.40 q1-01 INVITED: Quantum and classical correlations in a system of interacting spins in an external magnetic field. *E.B. Fel'dman. Institute of Problems of Chemical Physics, Chernogolovka, Russia.*
- 15.10 q1-02 Antiferromagnetic anisotropic XXZ chain of spins $S = \frac{1}{2}$ in the presence of an inhomogeneous transverse magnetic field as a basis for the multiqubit quantum register simulation. *A.A. Kokin¹, V.A. Kokin². 1. Institute of Physics and Technology, Moscow, Russia. 2. Institute of Radioengineering and Electronics, Moscow, Russia.*
- 15.30 q1-03 Using radio-frequency electric field to enhance Rydberg atom interaction. *D.B. Tretyakov¹, V.M. Entin¹, E.A. Yakshina^{1,2,3}, I.I. Beterov^{1,2}, C. Andreeva^{4,5}, I.I. Ryabtsev^{1,2,3}. 1. Institute of Semiconductor Physics, Novosibirsk, Russia. 2. Novosibirsk State University, Novosibirsk, Russia. 3. Russian Quantum Center, Skolkovo, Moscow Region, Russia. 4. University of Latvia, Riga, Latvia. 5. Institute of Electronics, Sofia, Bulgaria.*
- 15.50 q1-04 Quantum diamond chip under network optical control. *A.V. Tsukanov, I.Yu. Kateev, N.A. Orlikovsky, A.A. Orlikovsky. Institute of Physics and Technology, Moscow, Russia.*
- 16.10 q1-05 Quantum register in a field-effect transistor channel. *M. Rudenko¹, V. Vyurkov^{1,2}, S. Filippov^{1,2}, A. Orlikovsky^{1,2}. 1. Institute of Physics and Technology, Moscow, Russia. 2. Moscow Institute of Physics and Technology (State University), Moscow, Russia.*

16.30-16.50 Coffee break

Conference Hall Session 4. Materials and Films II

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

- 16.50 O1-11 The chemistry screening for ultra low-k dielectrics plasma etching. *A. Zotovich^{1,2}, M. Krishtab¹, F. Lazzarino¹, M.R. Baklanov¹. 1. IMEC, Leuven, Belgium. 2. Lomonosov Moscow State University, Moscow, Russia.*
- 17.10 O1-12 Comparative analysis of the factors leading to low-k degradation during the integration process. *A. Zotovich^{1,2}, M. Krishtab¹, F. Lazzarino¹, M.R. Baklanov¹. 1. IMEC, Leuven, Belgium. 2. Lomonosov Moscow State University, Moscow, Russia.*
- 17.30 O1-13 Impact of structural changes in e-beam negative resist hydrogen silsesquioxane (HSQ) to etch-resistance at different doses of exposure. *I.P. Ivanenko, V.A. Kalnov, A.V. Miakonkikh, N.A. Orlikovsky, A.A. Tatarintsev. Institute of Physics and Technology, Moscow, Russia.*

- 17.50 O1-14 **Properties of HfO₂/Si interface layer formed by H₂ and NH₃ plasma pretreatments in PEALD reactor.** *A. Rogozhin, A. Miakonkikh, K. Rudenko. Institute of Physics and Technology, Moscow, Russia.*
- 18.10 O1-15 **Conformal Deposition of HfO₂ by Plasma Enhanced ALD Process on Silicon Fin and Trench Structure.** *A. Miakonkikh, K. Rudenko, A. Orlikovsky. Institute of Physics and Technology, Moscow, Russia.*

Auditorium A

Session 5. Physics and Technology of Micro- and Nanodevices II

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

- 16.50 O1-16 **Superconductor – ferromagnetic control unit for superconducting memory compatible with RSFQ logic circuits.** *M.Yu. Kupriyanov^{1,4}, C.B. Bakurskiy^{2,4}, A.A. Golubov^{3,4}, T.Yu. Karminskaya¹, N.V. Klenov², I.I. Soloviev¹, N.G. Pugach¹, S.L. Prischepa⁵.* 1. Skobeltsyn Institute of Nuclear Physics, Lomonosov Moscow State University, Moscow, Russia. 2. Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia. 3. Faculty of Science and Technology and MESA+ Institute for Nanotechnology, University of Twente, The Netherlands. 4. Moscow Institute of Physics and Technology (State University), Dolgoprudniy, Russia. 5. Belarusian State University of Informatics and RadioElectronics, Minsk, Belarus.
- 17.10 O1-17 **Soliton scattering in Josephson vortex interferometer as a basis of low level measurements.** *I.I. Soloviev^{1,2}, N.V. Klenov^{3,2}, S.V. Bakurskiy^{3,4,5}, A.L. Pankratov^{6,7}, E. Il'ichev⁸, L.S. Kuzmin^{9,6,1}.* 1. Skobeltsyn Institute of Nuclear Physics, Lomonosov Moscow State University, Moscow, Russia. 2. Lukin Scientific Research Institute of Physical Problems, Zelenograd, Russia. 3. Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia. 4. Moscow Institute of Physics and Technology (State University), Dolgoprudniy, Russia. 5. Faculty of Science and Technology and MESA+, Institute for Nanotechnology, University of Twente, Enschede, The Netherlands. 6. Laboratory of Cryogenic Nanoelectronics, Nizhny Novgorod State Technical University, Nizhny Novgorod, Russia. 7. Institute for Physics of Microstructures, Nizhny Novgorod, Russia. 8. Leibniz Institute of Photonic Technology, Jena, Germany. 9. Chalmers University of Technology, Goteborg, Sweden.
- 17.30 O1-18 **Josephson magnetic rotary valve.** *I.I. Soloviev^{1,5}, N.V. Klenov^{2,5}, S.V. Bakurskiy^{2,3}, M.Yu. Kupriyanov^{1,3}, A.A. Golubov^{3,4}.* 1. Skobeltsyn Institute of Nuclear Physics, Lomonosov Moscow State University, Moscow, Russia. 2. Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia. 3. Moscow Institute of Physics and Technology, State University, Dolgoprudniy, Russia. 4. Faculty of Science and Technology and MESA+ Institute for Nanotechnology, University of Twente, The Netherlands. 5. Lukin Scientific Research Institute of Physical Problems, Zelenograd, Russia.
- 17.50 O1-19 **Theory of charge transport in contacts with multiband unconventional and topological superconductors.** *I.A. Devyatov¹, A.V. Burmistova².* 1. Skobeltsin Institute of Nuclear Physics, Lomonosov Moscow State University, Moscow, Russia. 2. Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia.

- 18.10 O1-20** Magnetic field oscillation phenomena in multiple asymmetric superconducting rings of 1 μm diameter. *V.L. Gurtovoi¹, M. Exarchos², R. Shaikhaidarov², V.N. Antonov², A.V. Nikulov¹, V.A. Tulin¹*. 1. Institute of Microelectronics Technology, Chernogolovka, Russia. 2. Physics Department, Royal Holloway University of London, Egham, UK.
- 18.30 O1-21** Magnetic dependencies of critical current of aluminium and tantalum ring with asymmetric link-up of current leads. *A.V. Burlakov, A.V. Chernykh, V.L. Gurtovoi, A.I. Ilin, G.M. Mikhailov, A.V. Nikulov, V.A. Tulin*. Institute of Microelectronics Technology, Chernogolovka, Russia.

Auditorium B

Session 6. Silicon-on-insulator and low-dimensional structures

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

- 16.50 O1-22** The quantum-size Si dots in Si/SiO₂ multilayers via direct wafer bonding. *A. Gismatulin¹, G. Kamaev¹, V. Volodin^{1,2}, S. Cherkova¹, A. Antonenko^{1,2}*. 1. Rzhanov Institute of Semiconductor Physics, Novosibirsk, Russia. 2. Novosibirsk State University, Novosibirsk, Russia.
- 17.10 O1-23** Noise properties of SET transistor made from highly doped SOI. *D.E. Presnov^{1,2}, S.V. Amitonov¹, V.I. Rudakov⁴, S.V. Lotkhov³, A.B. Zorin^{2,3}, V.A. Krupenin¹*. 1. Laboratory of Cryoelectronics, Moscow State University, Moscow, Russia. 2. Scobeltsin Nuclear Physics Institute, Moscow State University, Moscow, Russia. 3. Physikalisch-Technische Bundesanstalt, Braunschweig, Germany. 4. Institute of Physics and Technology (Yaroslavl Branch), Yaroslavl, Russia.
- 17.30 O1-24** Unified description of I-V characteristics in field-effect and bipolar transistors based on current density continuity equation solution. *G.I. Zebrev*. National Research Nuclear University MEPhI, Moscow, Russia.
- 17.50 O1-25** SOI VLSI layout decomposition for double patterning lithography on high-performance computer platforms. *V. Verstov, L. Zinchenko, V. Makarchuk*. Bauman Moscow State Technical University, Moscow, Russia.

19.00 Dinner

8.15 Breakfast

Conference Hall
Plenary Session III

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

- 9.00 L2-01 **INVITED: Graphene nanoelectronics for high-frequency and low-power application.** *A. Orlikovsky, V. Vuyrkov, D. Svintsov. Institute of Physics and Technology, Moscow, Russia; Moscow Institute of Physics and Technology (State University), Moscow, Russia.*
- 9.30 L2-02 **INVITED: Macroscopic system with large quantum mechanical effect based on the fully depleted SOI transistors in asymmetric mode.** *V.P. Popov^{1,2}, M.A. Ilitsky¹, O.V. Naumova¹. 1. Institute of Semiconductor Physics, Novosibirsk, Russia. 2. Tomsk State University, Tomsk, Russia.*
- 10.00 L2-03 **INVITED: Graphene terahertz electronics and optoelectronics.** *V. Ryzhi¹, T. Otsuji¹, M. Ryzhi², V. Mitin³, M.S. Shur⁴. 1. Research Institute for Electrical Communication, Tohoku University, Sendai, Japan. 2. Department of Computer Science and Engineering, University of Aizu, Aizu-Wakamatsu, Japan. 3. Department of Electrical Engineering, University at Buffalo, Buffalo, USA. 4. Department of Electrical, Electronics, and System Engineering, Rensselaer Polytechnical Institute, Troy, USA.*
- 10.30 L2-04 **INVITED: Plasmon-resonant terahertz emitters and detectors and their system applications.** *S. Boubanga Tombet¹, T. Otsuji¹, V. Popov², W. Knap³. 1. Research Institute of Electrical Communication, Tohoku University, Japan. 2. Kotelnikov Institute of Radioengineering and Electronics (Saratov Branch), Russia. 3. TERALAB and L2C Laboratories, University of Montpellier&CNRS, France.*
- 11.00 L2-05 **INVITED: Quantum-mechanical and continual models of magnetic dynamics for antiferromagnetic particles in analyzing Mössbauer spectra.** *I. Mischenko, M. Chuev. Institute of Physics and Technology, Moscow, Russia.*

11.30 - 11.50 Coffee break

Conference Hall
Session 7. Materials and Films III

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

- 11.50 O2-01 **Influence of doping on the crystallization kinetics of Ge-Sb-Te thin films for phase-change memory application.** *A. Sherchenkov¹, S. Kozyukhin², A. Babich¹, Y. Shtern¹, R. Mironov¹. 1. National Research University of Electronic Technology (MIET), Moscow, Russia. 2. Kurnakov Institute of General and Inorganic Chemistry, Moscow, Russia.*

- 12.10 O2-02 Investigation of transport mechanisms in Bi doped Ge₂Sb₂Te₅ thin films for phase change memory application. *P. Lazarenko¹, A. Sherchenkov¹, S. Kozyukhin², M. Shtern¹, S. Timoshenkov¹, D. Gromov¹, E. Redichev¹*. 1. National Research University of Electronic Technology (MIET), Zelenograd, Russia. 2. Kurnakov Institute of General and Inorganic Chemistry, Moscow, Russia.
- 12.30 O2-03 Effect of low-voltage field desorption in nanotubes. *V. Zhigalov, V. Petukhov, A. Emelyanov, S. Timoshenkov*. National Research University of Electronic Technology (MIET), Zelenograd, Russia.

Auditorium A

Session 8. Physics and Technology of Micro- and Nanodevices III

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

- 11.50 O2-04 Terahertz radiation detection by GaAs/GaAlAs high electron mobility transistors beyond the hydrodynamic approach. *O.A. Klimenko¹, Yu.A. Mityagin¹, N. Dyakonova², W. Knap²*. 1. P.N. Lebedev Physical Institute, Moscow, Russia. 2. Charles Coulomb Laboratory, CNRS-University Montpellier, Montpellier, France.
- 12.10 O2-05 Tunnel field-effect transistor with electrically induced p-n junction. *D. Svintsov, M. Rudenko, V. Vyurkov, A. Orlikovsky*. Institute of Physics and Technology, Moscow, Russia.
- 12.30 O2-06 Memristive switching and neuromorphic functionality of fully-ALD grown HfO₂-based stacks. *Yu. Matveyev, K. Egorov, A. Markeev, A. Zenkevich*. Moscow Institute of Physics and Technology (State University), Moscow, Russia.
- 12.50 O2-07 Photocurrent relaxations and gain in semiconductor nanowires. *S. Petrosyan^{1,2}, A. Yesayan¹, S. Nersesyan¹*. 1. Russian-Armenian (Slavonic) State University, Yerevan, Armenia. 2. Institute of Radiophysics and Electronics NAS RA, Ashtarak, Armenia.
- 13.10 O2-08 Oxide charge damage mechanisms in deep sub-micron CMOS-technologies. *N. Belova, D.D.J. Allman, T. Meixner, B. Greenwood*. ON Semiconductor, Phoenix, AZ, USA.

Auditorium B

Session 9. Quantum Informatics III

Session Chairmen: V.E. Zobov, *Kirensky Institute of Physics, Krasnoyarsk, Russia*

- 11.50 q2-01 Quantum discord in two-qubit systems. General X and CS states. *M.A. Yurischev*. Institute of Problems of Chemical Physics, Chernogolovka, Russia.
- 12.10 q2-02 Entanglement resonance. *S. Filippov^{1,2}, V. Vyurkov¹*. 1. Institute of Physics and Technology, Moscow, Russia. 2. Moscow Institute of Physics and Technology (State University), Moscow, Russia.
- 12.30 q2-03 Parasitic polarization in Jordan-Wigner fermion system with stationary discord. *E.B. Fel'dman, A.I. Zenchuk*. Institute of Problems of Chemical Physics, Chernogolovka, Russia.

- 12.50 q2-04 **An analytical calculation of quantum discord in a three-spin system in an external magnetic field.** *S.I. Doronin, E.B. Fel'dman, E.I. Kuznetsova. Institute of Problems of Chemical Physics, Chernogolovka, Russia.*
- 13.10 q2-05 **Long-distance entanglement with macroscopic Bose-Einstein condensates.** *A.N. Pyrkov¹, Y. Ji², T. Byrnes³. 1. Institute of Problems of Chemical Physics, Chernogolovka, Russia. 2. Australian National University, Australia. 3. National Institute of Informatics, Tokyo, Japan.*

13.30-14.20 Lunch

Conference Hall
Session 10. Materials and Films IV

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

- 14.20 O2-09 **Formation of Si nanocrystals in SiO_x, SiO_x:C:H films and Si/SiO₂ multilayer nano-heterostructures by pulse laser treatments.** *I.G. Neizvestniy¹, V.A. Volodin^{1,2}, A.A. Gismatulin^{1,2}, G.N. Kamaev^{1,2}, A.H. Antonenko^{1,2}, A.G. Cherkov^{1,2}, V.G. Litovchenko³, I.P. Lisovsky³, I.Yu. Maidanchuk³. 1. Institute of Semiconductor Physics, Novosibirsk, Russia. 2. Novosibirsk State University, Novosibirsk, Russia. 3. V.E. Lashkaryov Institute of Semiconductor Physics NAS of Ukraine, Kyiv, Ukraine.*
- 14.40 O2-10 **Investigation of opaque band stability in transmission spectra of 2D photonic crystals with positional disorder by Riccati equation method.** *M.Yu. Barabanenkov¹, Yu.N. Barabanenkov². 1. Institute of Microelectronics Technology, Chernogolovka, Russia. 2. V.A Kotelnikov Institute of Radioengineering and Electronics, Moscow, Russia.*

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

Session Chairman: Alexander Orlikovsky, *Russian Academy of Sciences*

14.20 - 15.40

Auditorium B
Session 12. Quantum Informatics IV

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

- 14.20 q2-06 **Quantum discord in the central spin model.** *V.E. Zobov. L.V. Kirensky Institute of Physics, Krasnoyarsk, Russia.*
- 14.40 q2-07 **Quantum simulation with multi-pulse sequence.** *M.M. Kucherov. Institute of Space and Information Technology, Siberian Federal University, Krasnoyarsk, Russia.*
- 15.00 q2-08 **Exact time-optimal solutions for control of spin $I = 1$ by NMR.** *V. Shauro. Kirensky Institute of Physics, Krasnoyarsk, Russia.*

- 15.20 q2-09 Preparation Brodband biphotons in the single spatial mode by means of angular dispersion. **K. Katamadze**^{1,2}, **N. Borshchevskaya**², **A. Paterova**², **I. Dyakonov**², **S. Kulik**². 1. Institute of Physics and Technology, Moscow, Russia. 2. M.V. Lomonosov Moscow State University, Moscow, Russia.

15.40-16.00 Coffee break

16.00-18.00 POSTER SESSION I

19.00 Dinner

Thursday, October 9th 2014

08.15 Breakfast

Conference Hall

Session 13. Simulation and Modeling I

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

- 9.00 O3-01 "Extrinsic" compact model of the MOSFET with the correct account of nonzero differential conductance in the saturation regime. **V. Turin**¹, **S. Matyukhin**¹, **G. Zebrev**², **S. Makarov**³, **C.-H. Kim**⁴, **B. Iñiguez**⁵, **M. Shur**⁶. 1. State University ESPC, Orel, Russia. 2. National Research Nuclear University (MEPhI), Moscow, Russia. 3. LLC "Integrated Solutions", Moscow, Russia. 4. LPICM, Ecole Polytechnique, CNRS, Palaiseau, France. 5. Rovira i Virgili University, Tarragona, Spain. 6. Rensselaer Polytechnic Institute, Troy, New York, USA.
- 9.20 O3-02 Mesoscopic electromechanical transducer simulation: transfer-matrix approach. **I. Lysenko**, **L. Molchanova**, **N. Pristupchik**. Southern Federal University, Taganrog, Russia.
- 9.40 O3-03 Configuration transition and electron density redistribution in molecular switches based on trans-polyacetylene. **M.N. Zhuravlev**¹, **A.A. Gorbatshevich**^{1,2}, **T.S. Kataeva**¹. 1. National Research University of Electronic Technology (MIET), Moscow, Russia. 2. P.N. Lebedev Physical Institute, Moscow, Russia.

Auditorium A

Session 14. Micro- and Nanoelectronics Technologies and Equipment

Session Chairman: Alexander Rogozhin, Institute of Physics and Technology, Moscow, Russia

- 9.00 O3-04 Image formation in a layer of tungsten with resolution of 32 nm by electron beam lithography. **O. Borzenkova**¹, **O. Gushin**², **S. Zaytsev**¹. 1. Moscow Institute of Physics and Technology (State University), Moscow, Russia. 2. Research Institute of Molecular Electronics, Zelenograd, Russia.
- 9.20 O3-05 Small-scale vacuum system for deposition of multilayer metal films – "MVU TM – Magna 3M". **V. Odinokov**, **G. Pavlov**, **V. Panin**, **V. Raschinsky**, **A. Shpakov**, **A. Shubnikov**. JSC "Research Institute of Precision Machine Manufacturing" (JSC NIITM), Zelenograd, Russia.

- 9.40 O3-06 **Arc plasma jet treatment of the silicon surface at gate oxidation and contact formation.** *G. Pavlov. JSC "Research Institute of Precision Machine Manufacturing" (JSC NIITM), Zelenograd, Russia.*
- 10.00 O3-07 **Formation of fast neutral particle beams and their using for selective etching.** *V. Kudrya, Yu. Maishev, S. Shevchuk. Institute of Physics and Technology, Moscow, Russia.*
- 10.20 O3-08 **Carbon and fluorine co-implantation for boron diffusion suppression in extremely ultra shallow junctions.** *A. Miakonkikh¹, A. Rogozhin¹, V. Rudakov², K. Rudenko¹, V.F. Lukichev¹. 1. Institute of Physics and Technology, Moscow, Russia. 2. Institute of Physics and Technology (Yaroslavl Branch), Yaroslavl, Russia.*

Auditorium B

Session 15. Quantum Informatics V

Session Chairman: *E.B. Fel'dman, Institute of Problems of Chemical Physics, Chernogolovka, Russia*

- 9.00 q3-01 **The impact of quantum noises on Grover's search algorithm and Quantum Fourier Transform.** *Yu.I. Bogdanov^{1,2,3}, B.I. Bantysh^{1,2}, V.F. Lukichev¹, A.A. Orlikovsky¹, I.A. Semehin¹, A.S. Holevo⁴, A.Yu. Chernyavskiy^{1,5}. 1. Institute of Physics and Technology, Moscow, Russia. 2. National Research University of Electronic Technology (MIET), Moscow, Russia. 3. National Research Nuclear University (MEPhI), Moscow, Russia. 4. Steklov Mathematical Institute, Moscow, Russia. 5. Faculty of Computational Mathematics and Cybernetics, Moscow State University, Moscow, Russia.*
- 9.20 q3-02 **A study of amplitude and phase relaxation impact on the quality of quantum information technologies.** *Yu.I. Bogdanov^{1,2,3}, B.I. Bantysh^{1,2}, V.F. Lukichev¹, A.A. Orlikovsky¹, A.Yu. Chernyavskiy^{1,4}. 1. Institute of Physics and Technology, Moscow, Russia. 2. National Research University of Electronic Technology (MIET), Moscow, Russia. 3. National Research Nuclear University (MEPhI), Moscow, Russia. 4. Faculty of Computational Mathematics and Cybernetics, Moscow State University, Moscow, Russia.*
- 9.40 q3-03 **The study of classical dynamical systems using quantum theory.** *Yu.I. Bogdanov^{1,2,3}, N.A. Bogdanova². 1. Institute of Physics and Technology, Moscow, Russia. 2. National Research University of Electronic Technology (MIET), Moscow, Russia. 3. National Research Nuclear University (MEPhI), Moscow, Russia.*
- 10.00 q3-04 **Mutually Unbiased Bases and SIC-POVM as special cases in the family of solutions to the Fekete packing problem in complex space.** *Yu.I. Bogdanov^{1,2,3}, L.V. Belinsky^{1,2}. 1. Institute of Physics and Technology, Moscow, Russia. 2. National Research University of Electronic Technology (MIET), Moscow, Russia. 3. National Research Nuclear University (MEPhI), Moscow, Russia.*
- 10.20 q3-05 **Root approach for estimation of statistical distributions and quantum states.** *Yu.I. Bogdanov^{1,2,3}, N.A. Bogdanova², F.Yu. Ignatiev³, D.Yu. Kulko³, M.A. Podtserkovsky³. 1. Institute of Physics and Technology, Moscow, Russia. 2. National Research University of Electronic Technology (MIET), Moscow, Russia. 3. National Research Nuclear University (MEPhI), Moscow, Russia.*

11.00-11.20 Coffee break

Conference Hall

Session 16. Simulation and Modeling II

Session Chairman: Boris Konoplev, *Institute of Nanotechnology, Electronics and Electronic Equipment Engineering of Southern Federal University, Taganrog, Russia*

- 11.20 O3-09 **Simulation of devices based on carbon nanotubes and graphene.** *I.I. Abramov, V.A. Labunov, N.V. Kolomejtseva, I.A. Romanova. Belarusian State University of Informatics and Radioelectronics, Minsk, Belarus.*
- 11.40 O3-10 **Numerical modeling of functionally integrated injection lasers-modulators.** *B. Konoplev, E. Ryndin, M. Denisenko. Institute of Nanotechnology, Electronics and Electronic Equipment Engineering of Southern Federal University, Taganrog, Russia.*
- 12.00 O3-11 **Carrier dynamics and stimulated radiative terahertz transitions between Landau levels in cascade GaAs/AlGaAs quantum well structures.** *M.P. Telenkov^{1,2}, A.A. Kutsevol², Yu.A. Mityagin^{1,3}, V.V. Agafonov¹. 1. P.N. Lebedev Physical Institute, Moscow, Russia. 2. National University of Science and Technology (MISIS), Moscow, Russia. 3. National Research Nuclear University (MEPhI), Moscow, Russia.*
- 12.20 O3-12 **Application of the iterative approach to Eigenmode Expansion method for the solution of Maxwell's equations.** *I. Semenikhin¹, M. Zanucoli². 1. Institute of Physics and Technology, Moscow, Russia. 2. ARCES-DEIS University of Bologna and IUNET, Cesena (FC), Italy.*

Auditorium A

Session 17. Metrology

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

- 11.20 O3-13 **Approaches to a dies decoupling during failure analysis of the 3D package integrated circuits.** *G. Molodtsova, R. Milovanov, D. Zubov, E. Kelm. Institute of Nanotechnology of Microelectronics, Moscow, Russia.*
- 11.40 O3-14 **Electrochemical recovery of damaged bonding area during failure analysis of the modern integrated circuits.** *D. Zubov, E. Kelm, R. Milovanov, G. Molodtsova. Institute of Nanotechnology of Microelectronics, Moscow, Russia.*
- 12.00 O3-15 **Non-destructive electromigration testing method development for metallization of integrated circuits based on the rate of resistance change.** *S.O. Safonov. National Research University of Electronic Technology (MIET), Moscow, Russia.*

Auditorium B

Session 18. Quantum Informatics VI

Session Chairman: F.M. Ablayev, *Kazan Federal University, Kazan, Russia*

- 11.20 q3-06 **Qubit modification of JCH model for two molecules.** *Yu.I. Ozhigov^{1,2}, N.A. Skovoroda². 1. Institute of Physics and Technology, Moscow, Russia. 2. Lomonosov Moscow State University, Moscow, Russia.*
- 11.40 q3-07 **Why energy of magnetic dipole moment in magnetic field is not taken into account in the theory of flux qubit?** *V.L. Gurtovoi, A.V. Nikulov. Institute of Microelectronics Technology, Chernogolovka, Russia.*

- 12.00 q3-08 **Biology inspired path towards a quantum computer.** *V. Ogryzko¹, Yu. Ozhigov². 1. INSERM, Institute Gustave Roussy, Paris, France. 2. Lomonosov Moscow State University, Moscow, Russia.*
- 12.20 q3-09 **Quantum computation and the problem of free will in quantum mechanics.** *V.V. Aristov, A.V. Nikulov. Institute of Microelectronics Technology, Chernogolovka, Russia.*
- 12.40 q3-10 **Quantum key distribution over 300 km.** *R. Ozhegov^{1,2}, M. Elezov¹, Y. Kurochkin³, V. Kurochkin⁴, A. Divochiy², V. Kovalyuk^{1,2}, Y. Vachtomin², K. Smirnov^{1,2,5}, and G. Goltsman^{1,2,5}. 1. Moscow State Pedagogical University, Moscow, Russia. 2. CJSC "Superconducting Nanotechnology", Moscow, Russia. 3. Russian Quantum Center, Skolkovo, Russia. 4. Institute of Semiconductor Physics, Novosibirsk, Russia. 5. Moscow Institute of Electronics and Mathematics, National Research University Higher School of Economics, Moscow, Russia.*

13.00-14.00 Lunch

Conference Hall

Session 19. Simulation and Modeling III

Session Chairman: Mikhail Chuev, Institute of Physics and Technology, Moscow, Russia

- 14.00 O3-16 **Atomic mechanisms of misfit dislocation nucleation in heteroepitaxial system Ge/Si(001).** *O.S. Trushin¹, S.-C. Ying², E. Granato³, T. Ala-Nissila⁴. 1. Institute of Physics and Technology (Yaroslavl Branch), Yaroslavl, Russia. 2. Department of Physics, Brown University, Providence, USA. 3. Laboratorio Associado de Sensores e Materiais, Instituto Nacional de Pesquisas Espaciais, Sao Jose dos Campos, SP, Brasil. 4. Department of Engineering Physics, Aalto University, Espoo, Finland.*
- 14.20 O3-17 **Modeling of processes of phase formation in binary metal systems under ion bombardment.** *S. Krivelevich. Institute of Physics and Technology (Yaroslavl Branch), Yaroslavl, Russia.*

15.00-15.20 Coffee break

15.30-18.30 POSTER SESSION II

18.30. Conference Hall. CLOSING CONFERENCE REMARKS

A.A. Orlikovsky, Program Committee Chair,
Institute of Physics and Technology, Moscow, Russia

19.30 CONFERENCE DINNER

Friday, October 10th, 2014

09.00 Breakfast

10.00 DEPARTURE

ICMNE-2014 SCIENTIFIC PROGRAM

POSTER SESSIONS

Wednesday, October 8th 2014

17.00 – 18.30

Poster session I

Materials and Films

- P1-01** Formation of nanovoids arrays in silicon substrate using non-isothermal annealing. *V. Rudakov, E. Bogoyavlenskaya, Yu. Denisenko*. Institute of Physics and Technology (Yaroslavl Branch), Yaroslavl, Russia.
- P1-02** Production and electrical properties of W/HfO₂/Si gate structures. *V. Rudakov, E. Bogoyavlenskaya, Yu. Denisenko*. Institute of Physics and Technology (Yaroslavl Branch), Yaroslavl, Russia.
- P1-03** Optically transparent fluoro-containing polyimides films with low dielectric permeability. *V. Kravtsova¹, M. Umersakova¹, R. Iskakov², O. Prikhodko³, N. Korobova⁴*. 1. A.B. Bekturov Institute of Chemical Science, Almaty, Republic of Kazakhstan. 2. Kazakh-British Technical University, Almaty, Republic of Kazakhstan. 3. al-Farabi Kazakh National University, Almaty, Republic of Kazakhstan. 4. National Research University of Electronic Technology (MIET), Zelenograd, Russia.
- P1-04** Formation of gold and silver cluster arrays using vacuum-thermal evaporation on a non-heated substrate. *D.G. Gromov¹, A.I. Savitskiy¹, L.M. Pavlova¹, N.I. Borgardt¹, Y.S. Grishina¹, A.Y. Trifonov²*. 1. National Research University of Electronic Technology (MIET), Zelenograd, Russia. 2. Lukin Research Institute of Physical Problems, Zelenograd, Russia.
- P1-05** Electrical properties of ALD HfO₂ (EOT 0.47 nm). *A. Molchanova^{1,2}, A. Rogozhin¹*. 1. Institute of Physics and Technology, Moscow, Russia. 2. Moscow Institute of Physics and Technology (State University), Moscow, Russia.
- P1-06** Electrochemical formation of Ag-Sn layers on copper plates. *V.M. Roschin, M.S. Mikhailova, I.N. Petukhov, V.R. Kukhtyaeva, M.S. Vagin*. National Research University of Electronic Technology (MIET), Zelenograd, Russia.
- P1-07** Heat release efficiency improving in multilayered aluminum-copper nitride composite thermite materials. *D.G. Gromov¹, E.A. Lebedev¹, A.S. Shuliatyev¹, Yu.I. Shilyaeva¹, Y.P. Shaman², D.I. Smirnov³, A.A. Dudin⁴, E.P. Kirilenko⁵*. 1. National Research University of Electronic Technology (MIET), Zelenograd, Russia. 2. Science Manufacturing Complex "Technological Center", Zelenograd, Russia. 3. Lebedev Physical Institute, Moscow, Russia. 4. Institute of Nanotechnology of Microelectronics, Moscow, Russia. 5. Science-Technological Center "Nano- and Microsystems Technics", Moscow, Russia.
- P1-08** TaN_x and Ta/graded Ta(N)/TaN multilayer diffusion barriers. *V. Kalnov¹, I. Khorin^{1,2}, N. Orlikovsky¹, A. Rogozhin¹*. 1. Institute of Physics and Technology, Moscow, Russia. 2. Moscow State Technical University of Radioengineering, Electronics and Automation (MSTU MIREA), Moscow, Russia.

- P1-09** Surface treatment of polyimide film for metal magnetron deposition in vacuum. *V. Petrov, D. Vertyanov, S. Timoshenkov*. National Research University of Electronic Technology (MIET), Zelenograd, Russia.
- P1-10** FMR evidence of high- T_c ferromagnetism in $Mn_{52}Si_{48}$ thin film. *S. Kapelnitsky^{1,2}, A. Drovosekov³, N. Kreines³, V. Rylkov², V. Tugushev², S. Zhou⁴*. 1. Institute of Physics and Technology, Moscow, Russia. 2. NRC "Kurchatov Institute", Moscow, Russia. 3. P.L.Kapitza Institute for Physical Problems, Moscow, Russia. 4. Helmholtz-Zentrum Dresden-Rossendorf, Institute of Ion Beam Physics and Materials Research, Dresden, Germany.
- P1-11** Study of growth kinetics of amorphous carbon nanopillars formed by PECVD. *D. Gromov¹, V. Borgardt¹, Y. Grishina¹, A. Dedkova², E. Kirilenko², S. Dubkov¹*. 1. National Research University of Electronic Technology (MIET), Moscow, Russia. 2. Science-Technological Center "Nano- and Microsystems Technics", Russia, Moscow.
- P1-12** The increase in the conductivity of the layers of composite nanomaterials with carbon nanotubes. *A.Y. Gerasimenko¹, L.P. Ichkitidze¹, S.V. Selishchev¹, E.V. Blagov², A.A. Pavlov², E.P. Kitsuk³, Yu.P. Shaman³*. 1. National Research University of Electronic Technology (MIET), Zelenograd, Russia. 2. Institute of Nanotechnology of Microelectronics, Moscow, Russia. 3. Scientific-Manufacturing Complex "Technological Centre", MIET, Zelenograd, Russia.
- P1-13** Study of hydrogen states in a-Si:H films, dehydrogenization treatments and influence of hydrogen on nanosecond pulse laser crystallization of a-Si:H. *V.A. Volodin^{1,2}, M.S. Galkov^{1,2}, N.A. Safronova^{1,3}, G.N. Kamaev^{1,2}, A.H. Antonenko^{1,2}, S.A. Kochubey¹*. 1. Rzhanov Institute of Semiconductor Physics, Novosibirsk, Russia. 2. Novosibirsk State University, Novosibirsk, Russia. 3. Novosibirsk State Technical University, Novosibirsk, Russia.
- P1-14** Mechanism of formation of nanoscale silicon phase in oxide matrix by light beams treatments. *V.G. Litovchenko¹, I.P. Lisovskyy¹, I.Yu. Maidanchuk¹, S.A. Zlobin¹, I.G. Neizvestniy², V.A. Volodin^{2,3}, G.N. Kamaev²*. 1. V.E. Lashkaryov Institute of Semiconductor Physics, Kyiv, Ukraine. 2. Institute of Semiconductor Physics, Novosibirsk, Russia. 3. Novosibirsk State University, Novosibirsk, Russia.
- P1-15** New generation photoelectric converter structure optimization using nano-structured materials. *A. Dronov, I. Gavrilin, A. Zheleznyakova*. National Research University of Electronic Technology (MIET), Moscow, Russia.
- P1-16** Research of band structure features of hexagonal planar photonic crystals. *A. Friman, P.N. Lebedev* Physical Institute, Moscow, Russia.
- P1-17** Different methods of forming multicomponent metal sulfide by SILAR-techniques. *S. Gavrilov, A. Zheleznyakova, A. Dronov, A. Presnukhina, E. Popova*. National Research University of Electronic Technology (MIET), Moscow, Russia.
- P1-18** Correlative compositional analysis of fiber-optic nanoparticles. *E. Norman¹, H. Francois-Saint-Cyr², I. Martin², W. Blanc³, P. LeCoustumer⁴, C. Hombourger¹, D. Neuville⁵, D.J. Larson², T.J. Prosa², C. Guillermier⁶*. 1. CAMECA SAS, Gennevilliers Cedex, France. 2. CAMECA Instruments Inc., Madison, WI, USA. 3. Université Nice Sophia Antipolis, CNRS, LPMC, UMR7336, Nice, France. 4. Université Bordeaux 3, Géorressources et Environnement, Pessac, France. 5. Institut de Physique du Globe de Paris, Paris, France. 6. National Resource for Imaging Mass Spectroscopy, Cambridge, MA, USA.

- P1-19** Thermodynamic analysis and physical properties of $(\text{TlInSe}_2)_{1-x}(\text{TlGaTe}_2)_x$ solid solutions. M. Asadov¹, S. Mustafaeva², A. Mammadov¹. 1. Institute of Catalysis and Inorganic Chemistry named after M.F. Nagiyev, Azerbaijan National Academy of Sciences, Baku, Azerbaijan. 2. Institute of Physics, Azerbaijan National Academy of Sciences, Baku, Azerbaijan.
- P1-20** Phase equilibria and dielectric materials of $\text{Li}_2\text{O}-\text{B}_2\text{O}_3-\text{Yb}_2\text{O}_3$ system. M. Asadov, N. Akhmedova. Institute of Catalysis and Inorganic Chemistry named after M.F. Nagiyev, Azerbaijan National Academy of Sciences, Baku, Azerbaijan.
- P1-21** Local electronic properties of thin NiNb oxidized films. A.S. Trifonov^{1,2}, S.V. Ketov³, A. Shluger^{3,4}, D.V. Louzguine-Luzgin³. 1. Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia. 2. Skobeltsyn Institute of Nuclear Physics, Lomonosov Moscow State University, Moscow, Russia. 3. WPI-AIMR, Tohoku University, Sendai, Japan. 4. Department of Physics and Astronomy, University College London, London, United Kingdom.
- P1-22** Phase separation and electronic properties in $(\text{K}_{0.7}\text{Na}_{0.3})_x\text{Fe}_{2-y}\text{Se}_2$ single crystal. A.S. Trifonov^{1,2}, Y.A. Ovchenkov¹, D.E. Presnov^{1,2}, A.I. Boltalin³, M. Liu³, I.V. Morozov³, A.N. Vasiliev^{1,4,5}. 1. Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia. 2. Skobeltsyn Institute of Nuclear Physics, Lomonosov Moscow State University, Moscow, Russia. 3. Faculty of Chemistry, Lomonosov Moscow State University, Moscow, Russia. 4. Theoretical Physics and Applied Mathematics Department, Institute of Physics and Technology, Ural Federal University, Ekaterinburg, Russia. 5. National University of Science and Technology (MISiS), Moscow, Russia.
- P1-23** Strain induced properties of the strong spin-orbit semimetal SrIrO_3 thin films. Yu.V. Kislinskiĭ^{1,4}, K.I. Constantinian¹, G.A. Ovsyannikov^{1,2}, Yu. Khaydukov³, A.M. Petrzhik¹, A.V. Shadrin¹, A.E. Sheyerman¹. 1. Kotel'nikov Institute of Radioengineering and Electronics, Moscow, Russia. 2. Chalmers University of Technology, Gothenburg, Sweden. 3. Max-Planck Institute for Solid State Research, Stuttgart, Germany. 4. Shubnikov Institute of Crystallography, Moscow, Russia.
- P1-24** Modeling approach to aluminum anodization process. A.N. Belov, S.A. Gavrilov, V.I. Shevyakov, M.I. Vorobiev. National Research University of Electronic Technology (MIET), Moscow, Russia.
- P1-25** Nanostructured chalcogenide materials for memory switching devices. O. Pyatlova, R. Rozanov, S. Gavrilov, A. Zheleznyakova, A. Belov, V. Shevyakov, A.V. Shcherbakova. National Research University of Electronic Technology (MIET), Moscow, Russia.

Technology and Equipment

- P1-26** Some peculiarities of the new dry method of mask (relief) formation by direct electron-beam etching of resist. *M.A. Bruk¹, E.N. Zhikharev², D.R. Streltsov¹, V.A. Kalnov², A.V. Spirin¹, A.E. Rogozhin²*. 1. Karpov Institute of Physical Chemistry, Moscow, Russia. 2. Institute of Physics and Technology, Moscow, Russia.
- P1-27** Inductively coupled plasma parameters and etching mechanisms in ternary mixtures of CF₄, C₄F₈, O₂, and Ar. *A. Efremov¹, J. Lee², K.-H. Kwon²*. 1. Ivanovo State University of Chemistry & Technology, Ivanovo, Russia. 2. Korea University, Sejong, South Korea.
- P1-28** Monte Carlo simulation of Boron doping profile of fin and trench structures by plasma immersion ion implantation. *I. Shahsenov¹, A. Miakonkikh², K. Rudenko²*. 1. Moscow Institute of Physics and Technology (State University), Moscow, Russia. 2. Institute of Physics and Technology, Moscow, Russia.

Metrology

- P1-29** Melting behaviour of electrochemically grown Ag-Sn structures in the temperature range 25-500 °C. *Yu.I. Shilyaeva, M.S. Mikhailova, N.V. Rakhmanova, A.I. Merkulova*. National Research University of Electronic Technology (MIET), Zelenograd, Russia.
- P1-30** Experimental and computational thickness determination of ultra-thin surface films using backscattered electrons spectra in SEM. *S. Kupreenko¹, N. Orlikovsky², E. Rau¹, A. Tagachenkov³, A. Tatarintsev²*. 1. Moscow State University, Moscow, Russia. 2. Institute of Physics and Technology, Moscow, Russia. 3. Institute of Nanotechnology and Microelectronics, Moscow, Russia.
- P1-31** X-ray reflectometry measurements of Si-surface modified layers produced by high dose He⁺ plasma immersion implantation. *A. Lomov, A. Miakonkikh*. Institute of Physics and Technology, Moscow, Russia.
- P1-32** Modification of cantilevers for atomic force microscopy using the method of exposure defocused ion beam. *Yu.A. Chaplygin¹, V.I. Shevyakov¹, S.Y. Krasnoborodko²*. 1. National Research University of Electronic Technology (MIET), Moscow, Russia. 2. NT-MDT Co, Zelenograd, Russia.

SOI

- P1-33** Non-uniformly doped SOI based FETransistor with nanowire channel. *D. Presnov^{1,2}, A. Miakonkikh³, I. Bozhjev², V. Rudakov⁴, A. Trifonov^{1,2}, V. Krupenin²*. 1. Skobeltsyn Institute of Nuclear Physics, Moscow State University, Moscow, Russia. 2. Laboratory of Cryoelectronics, Moscow State University, Moscow, Russia. 3. Institute of Physics and Technology, Moscow, Russia. 4. Institute of Physics and Technology (Yaroslavl Branch), Yaroslavl, Russia.
- P1-34** Noise characteristics of silicon FET with nanowire channel. *D.E. Presnov^{1,2}, I.V. Sapkov¹, I.V. Bojiev¹, A.V. Rjevskiy¹, V.A. Krupenin¹*. 1. Laboratory of Cryoelectronics, Moscow State University, Moscow, Russia. 2. Skobeltsyns Institute of Nuclear Physic, Moscow State University, Moscow, Russia.

Modeling and Simulation I

- P1-35 Self-organization phenomena during electrochemical formation of nanoclusters in silicon.** *N. Arzhanova¹, M. Prokaznikov¹, A. Prokaznikov². 1. Yaroslavl Demidov State University, Yaroslavl, Russia. 2. Institute of Physics and Technology (Yaroslavl Branch), Yaroslavl, Russia.*
- P1-36 A systematic modeling study of chemical mechanical polishing for copper interconnects.** *T.M. Makhviladze, M.E. Sarychev. Institute of Physics and Technology, Moscow, Russia.*
- P1-37 Modeling Griffith crack propagation at interfaces between materials containing point defects.** *R.V. Goldstein¹, T.M. Makhviladze², M.E. Sarychev². 1. Institute for Problems in Mechanics, Moscow, Russia. 2. Institute of Physics and Technology, Moscow, Russia.*
- P1-38 The optical properties of ZnO nanowire array.** *M.Yu. Nazarkin, I.V. Melnikov, D.G. Gromov, S.A. Gavrilo, A.A. Machnev, A.S. Shuliatyev. Department of Electronic Materials, National Research University for Electronic Technology (MIET), Zelenograd, Russia.*

Physics and Technology of Devices

- P2-01 High-temperature single-electron transistor based on a gold nanoparticle.** S.A. Dagesyan¹, A.S. Stepanov², E.S. Soldatov¹, G. Zharik¹. 1. Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia. 2. Scobeltsyn Institute of Nuclear Physics, Lomonosov Moscow State University, Moscow, Russia.
- P2-02 Arsenic dopant single-atom single-electron transistor.** D.E. Presnov¹, V.V. Shorokhov², S.V. Amitonov², V.A. Krupenin², S.A. Dagesyan². 1. Skobeltsyn Institute of Nuclear Physics, Lomonosov Moscow State University, Moscow, Russia. 2. Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia.
- P2-03 Single-electron transistor with suspended electrodes based on single gold nanoparticle.** I.V. Sapkov, E.S. Soldatov. Faculty of Physics, Moscow State University, Moscow, Russia.
- P2-04 A simplified analytical model of merged MOS.** V. Rakitin¹, A. Rakitin². 1. F.V. Lukin Research Institute of Physical Problems, Moscow, Russia. 2. Lomonosov Moscow State University, Moscow, Russia.
- P2-05 Nanowire field effect transistor for biosensor applications.** D. Presnov^{1,2}, G. Presnova³, M. Rubtsova³, I. Bozhjev², V. Krupenin². 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.
- P2-06 I-V features of MIS memristors in conductive state.** A.E. Berdnikov, A.A. Popov, A.A. Mironenko, V.D. Chernomordick, V.N. Gusev. Institute of Physics and Technology (Yaroslavl Branch), Yaroslavl, Russia.
- P2-07 Quality control at different stages of MTJ fabrication.** O.S. Trushin, V.V. Naumov, A.A. Mironenko, N.M. Timina, O.M. Koroleva. Institute of Physics and Technology (Yaroslavl Branch), Yaroslavl, Russia.
- P2-08 Switching of magnetic nanoring by a circular field.** O. Trushin¹, N. Barabanova². 1. Institute of Physics and Technology (Yaroslavl Branch), Yaroslavl, Russia. 2. Faculty of Physics, Yaroslavl Demidov State University, Yaroslavl, Russia.
- P2-09 Coherent control of magnetic cluster dynamics by short electromagnetic pulses.** A.V. Kuznetsov¹, N.V. Klenov^{1,2}, I.I. Soloviev^{1,2}, O.V. Tikhonova¹. 1. Lomonosov Moscow State University, Moscow, Russia. 2. Lukin Scientific Research Institute of Physical Problems, Zelenograd, Russia.
- P2-10 Unusual critical current in a long quasi-one-dimensional superconducting wire with a narrowing.** V.I. Kuznetsov. Institute of Microelectronics Technology and High Purity Materials, Chernogolovka, Russia.
- P2-11 Geometry precise correction of receiving parabolic antenna by means of Josephson elements phased array.** A. Karuzskii, A. Perestoronin, A. Tskhovrebov, L. Zherikhina. P.N. Lebedev Physical Institute, Moscow, Russia.

- P2-12** Photoresponse beyond the red border of the internal photoeffect. *M. Dresvyannikov, A. Karuzskii, A. Perestoronin, A. Tskhovrebov, L. Zherikhina.* P.N. Lebedev Physical Institute, Moscow, Russia.
- P2-13** Large Scale (~25 m²) metal diffraction grating of submicron period as possible optoelectronic detector for short scalar gravitational waves. *V.A. Zhukov.* St. Petersburg Institute of Information Science and Automation, St. Petersburg, Russia.
- P2-14** Digital holography in 3D integral circuits and neo cortical columns. *V.A. Zhukov.* St. Petersburg Institute of Information Science and Automation, St. Petersburg, Russia.
- P2-15** The sensor of surface defects based on electrical impedance tomography technique. *E. Ryndin, A. Isaeva.* Institute of Nanotechnology, Electronics and Electronic Equipment Engineering of Southern Federal University, Taganrog, Russia.
- P2-16** Electrostatically actuated MEMS switch with resistive contact. *I.V. Uvarov, V.V. Naumov, R.V. Selyukov.* Institute of Physics and Technology (Yaroslavl Branch), Yaroslavl, Russia.
- P2-17** How to increase reliability of frameless PCB based on the organic substrates. *Yu. Dolgovykh, A. Pogalov, G. Blinov, S. Timoshenkov, N. Korobova.* National Research University of Electronic Technology (MIET), Zelenograd, Russia.
- P2-18** Work-function lowered upon field emission from nanotubes and graphene. *G. Alymov^{1,2}, D. Svintsov^{1,2}, V. Vyurkov^{1,2}.* 1. Institute of Physics and Technology, Moscow, Russia. 2. Moscow Institute of Physics and Technology (State University) Moscow, Russia.

Modeling and Simulation II

- P2-19** Monte Carlo simulation of hot carrier transport in deep submicron SOI MOSFET. *A.V. Borzdo¹, V.M. Borzdo¹, V.V. V'yurkov².* 1. Belarusian State University, Minsk, Belarus. 2. Institute of Physics and Technology, Moscow, Russia.
- P2-20** Radiation-induced mismatch enhancement in 65 nm CMOS SRAM for space applications. *M. Gorbunov^{1,2}, P. Dolotov¹, A. Shnaider¹, G. Zebrev², A. Antonov¹, A. Lebedev².* 1. Scientific Research Institute of System Analysis, Moscow, Russia. 2. National Research Nuclear Institute (MEPhI), Moscow, Russia.
- P2-21** TCAD calibration of nanoscale SOI MOSFETs. *E. Artamonova¹, A. Klyuchnikov², A. Krasnyukov¹, T. Krupkina¹.* 1. National Research University of Electronic Technology (MIET) Moscow, Russia. 2. JSC Molecular Electronics Research Institute, Zelenograd, Russia.
- P2-22** Modeling of single event gate rupture in power MOSFETs under heavy ion irradiation. *R.G. Useinov^{1,2}, G.I. Zebrev¹, V.V. Emel'yanov², A.S. Vatuiev².* 1. National Research Nuclear University (MEPhI), Moscow, Russia. 2. Research Institute of Scientific Instruments, Lytkarino, Russia.
- P2-23** TCAD models for ETSOI FET with undoped body. *Y. Chaplygin, A. Krasnyukov, T. Krupkina, D. Rodionov.* National Research University of Electronic Technology (MIET), Moscow, Russia.

- P2-24 Modeling of mobility degradation in electron-irradiated SiGe p-type MOSFETs with different Ge concentration.** *E.V. Orekhov¹, L.M. Sambursky^{1,2}, R.A. Torgovnikov¹, A.A. Pugachev¹.* 1. Institute for Design Problems in Microelectronics, Moscow, Russia. 2. National Research University "Higher School of Economics," Moscow, Russia.
- P2-25 Modeling and simulation of dose effects in bipolar analog integrated circuits.** *G.I. Zebrev¹, M.G. Drosdetsky¹, A.M. Galimov¹, A.A. Lebedev¹, I.A. Danilov², V.O. Turin³.* 1. National Research Nuclear University (MEPhI), Moscow, Russia. 2. Scientific Research Institute of System Analysis, Moscow, Russia. 3. State University ESPC, Orel, Russia.
- P2-26 Estimation technique for SET-tolerance of combinational ICs.** *A. Balbekov, M. Gorbunov.* Scientific Research Institute of System Analysis, Moscow, Russia.
- P2-27 Simulation of nanoelectronics devices in cognitive nanoinformatics.** *V. Shakhnov, L. Zinchenko, E. Rezhikova.* Bauman Moscow State Technical University, Moscow, Russia.
- P2-28 Optimization of the I-V characteristics of the multi-barrier heterostructures by band engineering method.** *V. Gergel, A. Verhovtseva, N. Gorshkova, V. Minkin.* Kotelnikov Institute of Radioengineering and Electronics, Moscow, Russia.
- P2-29 Effect of emitter spacer layer on high frequency response of resonant tunneling diode taking into account electro-electron interaction.** *M. Remnev.* All-Russia Research Institute of Automatics (VNIIA), Moscow, Russia.
- P2-30 Resonant tunneling multiple quantum well structures in p-i-n photovoltaic element.** *M.P. Telenkov^{1,2}, Yu.A. Mityagin^{1,3}, G.N. Zhuchkov².* 1. P.N. Lebedev Physical Institute, Moscow, Russia. 2. National University of Science and Technology (MISiS), Moscow, Russia. 3. National Research Nuclear University (MEPhI), Moscow, Russia.
- P2-31 Peculiarities of sub-THz wave rectification by resonant tunneling semiconductor nanostructures at zero bias voltage.** *V. Kapaev^{1,2}, V. Murzin¹, S. Savinov¹, V. Egorkin².* 1. P.N. Lebedev Physical Institute, Moscow, Russia. 2. National Research University of Electronic Technology (MIET), Zelenograd, Russia.
- P2-32 Conducting media with spatial dispersion in a microwave field: eigenvalue problem for permittivity operator.** *M.A. Dresvyannikov¹, A.P. Chernyaev², A.L. Karuzskii¹, Yu.A. Mityagin¹, A.V. Perestoronin¹, N.A. Volchkov¹.* 1. P. N. Lebedev Physical Institute, Moscow, Russia. 2. Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russia.
- P2-33 Molecular dynamic simulations of free vibrations of metallic nanocantilever.** *A.N. Kupriyanov, O.S. Trushin, I.I. Amirov.* Institute of Physics and Technology (Yaroslavl Branch), Yaroslavl, Russia.
- P2-34 Simulation of eigen frequencies and MEMS switches voltage in response to changes in their geometric dimensions and parameters of the material.** *K.V. Lebedev, V.F. Lukichev.* Institute of Physics and Technology, Moscow, Russia.
- P2-35 An estimation of the thermal distribution in silicon field emitter.** *A. Levitskiy.* Siberian Federal University, Krasnoyarsk, Russia.

Quantum Informatics

- P2-36** Software package for the modeling of quantum circuits in terms of quantum operations. **Yu.I. Bogdanov^{1,2,3}, A.Yu. Chernyavskiy^{1,4}, D.V. Fastovets^{1,2}**. 1. Institute of Physics and Technology, Moscow, Russia. 2. National Research University of Electronic Technology (MIET), Moscow, Russia. 3. National Nuclear Research University (MEPhI), Moscow, Russia. 4. Lomonosov Moscow State University, Moscow, Russia.
- P2-37** The analysis of the accuracy of quantum tomography protocols. **Yu.I. Bogdanov^{1,2,3}, A.Yu. Chernyavskiy^{1,4}, A.K. Gavrichenko¹, M.I. Somova⁴**. 1. Institute of Physics and Technology, Moscow, Russia. 2. National Research University of Electronic Technology (MIET), Moscow, Russia. 3. National Nuclear Research University (MEPhI), Moscow, Russia. 4. Lomonosov Moscow State University, Moscow, Russia.
- P2-38** Comparison of different methods of quantum tomography based on photon registration. **Yu. I. Bogdanov^{1,2,3}, G.V. Avosopyants², T.V. Shepitko³**. 1. Institute of Physics and Technology, Moscow, Russia. 2. National Research University of Electronic Technology (MIET), Moscow, Russia. 3. National Research Nuclear University (MEPhI), Moscow, Russia.
- P2-39** Continuous-time fermionic quantum walks. **A. Melnikov¹, L. Fedichkin^{1,2,3}**. 1. Institute of Physics and Technology, Moscow, Russia. 2. Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russia. 3. NIX, Moscow, Russia.