

General information

The International Conference "Micro- and nanoelectronics – 2009" (ICMNE-2009) including extended Session "Quantum Informatics" (QI-2009) will be held **in October 5-9, 2009 at the holiday hotel "Lipki", Zvenigorod, Moscow region, Russia.**

Conference ICMNE is biannual event covering majority of area of micro- and nanoelectronic technologies, physics and devices. ICMNE-2009 is focused on recent progress in that area. The Conference will include the exhibition on equipment for micro- and nanoelectronics.

Scope:

Micro-, nanoelectronic materials and films:

- SOI, strained Si, SiGe, GaAs, GaN
- Thin films, high-k dielectrics, low-k dielectrics
- Metal gates, systems for contacts and metallization in nanoscale devices
- Magnetic materials. Nanomagnetism
- Nanotubes
- Materials for optoelectronics and photovoltaic, metamaterials

Micro- and nanoelectronic technologies and equipment:

- Sub-100 nm lithographies: DUV, EUV, Electron and Ion lithography, Nanoimprint.
- Plasma processing for micro- and nanoelectronics.
- Beam line and Plasma immersion Ion Implantation
- CVD, MBE.

Metrology:

- Processes monitoring, end-point detection
- Metrology and characterization of micro- and nanostructures

Physics and technologies of micro- and nanodevices:

- Nanotransistors: MOSFET, SET. Quantum dot memory and logic circuits.
- Magnetic micro- and nanostructures
- Spintronics
- Superconducting micro- and nanodevices and systems
- Molecular nanoelectronics
- Devices of optoelectronics, photonics
- Micro and nano-electromechanical systems (MEMS, NEMS).

Simulation and modeling:

- Simulation of technological processes
- Simulation and modeling of micro- and nanoelectronic devices
- IC's modeling

Quantum informatics:

- Quantum computer and complex quantum systems modeling (quantum computer problems, computer simulation of quantum systems, decoherence, entanglement)
- Quantum information processing (quantum information, applications of quantum methods)
- Quantum cryptography (quantum channels, nonlocality, security, error correction)

Organizers and Sponsors:

- Russian Academy of Sciences (RAS). Division of Nano- and Information Technologies
- Ministry of Education and Science of Russian Federation
- Russian Foundation for Basic Research
- Scientific Council "Fundamental Problems of the Device Development for Informational, Computational and Controlling Systems" (Russia)

- Scientific Council on Physical and Chemical Fundamental of Semiconductor Material Science (Russia)
- Institute of Physics & Technology of RAS (FTIAN), Moscow, Russia
- Educational-scientific centre "MSU-FTIAN"
- SPIE, Cooperating Organization
- Institute of Semiconductor Physics (ISP) of RAS, Siberian Branch, Novosibirsk, Russia
- Lomonosov's Moscow State University (MSU), Russia
- Yaroslavl State University, Russia
- Moscow Institute of Electronic Engineering (TU) (MIEE), Zelenograd, Russia
- Micron Corp., Russia
- INTEL, Inc.
- Fraunhofer Institute of Integrated Systems and Device Technology (FhG IIS-B), Germany
- Carl Zeiss AG, Germany
- TechoInfo Ltd., UK
- NT-MDT Co., Russia
- [NIX company](#), Russia

Language:

The official language is English

Abstracts Submission:

You can download a single page abstract template and requirements for full manuscript publication in the [Downloads](#) section of Conference website. Please, submit the files with Abstracts to ICMNE-2009 Local Organizing Committee by address icmne2009@ftian.ru.

Deadline for abstracts submission is August 10, 2009

Proceedings:

SPIE (<http://www.spie.org>) will publish the full text of papers in the separate volume of Proceedings of SPIE dedicated to ICMNE-2009 after Conference termination.

The authors should prepare full manuscripts of papers according the rules of SPIE Proceedings (see [Download](#) section) and submit it **by service MySPIE** (link http://myspie.org/submission/index.cfm?fuseaction=act_AbstractInit&EventId=898506). Dear Authors: On the manuscript submission page, please ignore the text that reads, 'SUBMIT AN ABSTRACT OVERVIEW.' This is indeed the correct place to submit your full manuscript.

Text of full manuscripts should be sent to SPIE by **November 9, 2009**. Please post the attached manuscript specifications and SPIE transfer of copyright form to the ICMNE-2009 Local Committee.

Papers not presented at the ICMNE will not be published in the Proceedings.

Contributions on the topics of the Conference are welcome from the academic community, universities as well as from the industry. About 80 contributions will be selected as oral presentations; all of others will be presented in form of poster. Program Committee will give preference to the papers which are containing results of recent original works consistent with Conference scope. Abstracts and full manuscripts should be written in clear and concise English.

The Conference program will be comprised of invited and contributed papers. Contributed papers will be reviewed by the members of the Program Committee on the basis of submitted abstracts for their being in theme with the Conference, and for their scientific quality. The Program Committee will determine the session (oral or poster) on which the paper will be presented. Author's preferences are taken into consideration.

Monday, October 5th, 2009

9.00 - ...Registration & Accommodation
13.00 - 14.00 Lunch

Conference hall

Special Session. Presentations of Hi-Tech Companies

14.30 S-00/1 Milestones of analytical FE-SEM technology - Zeiss Merlin System. Uwe Anton Schubert, Carl Zeiss NTS GmbH, Germany.
 15.00 S-00/2 Electron beam lithography tools for nanoelectronic devices. Leonid Litvin, Raith GmbH, Germany
 15.30 S-00/3 Applications of Electron Beam Lithography. Martin Kirchner, Raith GmbH, Germany
 16.00 S-01 JEOL Industrial Electron Beam Lithography Systems. Mr. Kamide, General Manager of JEOL Semiconductors Equipment Department
 16.30 S-02 Nanoimprint Lithography: Principles, Possibilities, and High Volume Manufacturing. Marc Beck, Eurotek, Inc., Germany
 17.00 S-03 TechnoInfo products overview. A. Kuznetsov, TechnoInfo Ltd., London, UK
 17.30 S-04 Technological complexes for MEMS and NEMS research and development. Victor Bykov, NT-MDT Co., Zelenograd, Russia

18.00 - Welcome Party
 19.00 - Dinner

Tuesday, October 6th, 2009

8.15 - Breakfast

Conference hall

8.50 - WELCOME REMARKS

E.P. Velikhov, Conference Chair, RSC "Kurchatov Institute", Moscow
 K.A. Valiev, Program Chair, IPT RAS, Moscow

Plenary Session I

Session Chairman: Alexander Orlikovsky, Institute of Physics & Technology RAS, Russia

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| 9.00 | L1-01 | KEYNOTE: Nanoelectronic devices and materials for the end of the roadmap. G. Ghibaudo and F. Balestra. IMEP-LAHC, Minatex (CNRS-Grenoble INP, UJF, US), Grenoble, France |
| 9.40 | L1-02 | KEYNOTE: Challenges of Advanced Interconnects: from Cu/low-k to Wireless. T. Kikkawa. Research Institute for Nanodevice and Bio Systems, Hiroshima University, Japan. |
| 10.20 | L1-03 | INVITED: Electromigration theory and its applications to integrated circuit metallization. T. Makhviladze, M. Sarychev. Institute of Physics and Technology, Russian Academy of Sciences, Moscow, Russia |
| 11.00 | L1-04 | INVITED: IMEC: from aggressive CMOS scaling to Nanomaterials. Mikhail Baklanov and Patric Verbist. Interuniversitair Microelectronica Centrum (IMEC), Leuven, Belgium. |

11.40-12.00 Coffee break. Winter garden

Conference Hall

Session 1. Advanced Lithography

Session Chairman: Vladimir Lukichev, Institute of Physics & Technology RAS, Russia

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| 12.00 | L1-05 | INVITED: Immersion Lithography and Double Patterning in Advanced Microelectronics. T. Vandeweyer, J. Bekaert, M. Ercken, R. Gronheid, A. Miller, V. Truffert, J. Versluijs, V. Wiaux, P. Wong, G. Vandenberghe, M. Maenhoudt. IMEC vzw, Leuven, Belgium |
| 12.30 | O1-01 | Projection photolithography modeling using the finite-difference time-domain approach. T. Makhviladze, M. Sarychev. Institute of Physics and Technology, Russian Academy of Sciences, Moscow, Russia. |
| 12.50 | O1-02 | Influence of thermal annealing on the structural and optical properties of thin multilayer EUV filters containing Zr, Mo and silicides of these metals. N.I. Chkhalo ¹ , S.A. Gusev ¹ , M.N. Drozdov ¹ , E. B. Kluekov ¹ , A.Ya. Lopatin ¹ , V.I. Luchin ¹ , A.E. Pestov ¹ , N.N. Salashchenko ¹ , L.A. Shmaenok ² , N.N. Tsybin ¹ . 1. Institute for Physics of Microstructures, Russian Academy of Sciences, Nizhny Novgorod, Russia 2. PhysTeX, Vaals, Netherlands Institute of Semiconductor. |
| 13.10 | O1-03 | Manufacturing of diffraction quality optical elements for high resolution optical systems. N.I. Chkhalo, A.E. Pestov, N.N. Salashchenko, M.N. Toropov. Institute for Physics of Microstructures, Russian Academy of Sciences, Nizhny Novgorod, Russia |

Auditorium A

Session 2. Simulation and Modeling I

Session Chairman: Vladimir Vyurkov, Institute of Physics & Technology RAS, Russia

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| 12.00 | O1-04 | Nanoelectronic device simulation software system NANODEV: New opportunities. I.I. Abramov, A.L. Baranoff, I.A. Goncharenko, N.V. Kolomejtseva, Y.L. Bely. Belarusian State University of Informatics and Radioelectronics, Minsk, Belarus. |
| 12.20 | O1-05 | The charge sharing inside the layers of nano- CMOS integrated structures under controllable substrate biasing. T. Krupkina, D. Rodionov, A. Shvets, I. Titova. Moscow Institute of Electronic Engineering, Moscow, Russia |

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| 12.40 | 01-06 | Analysis of lateral thermal SOA for smart power IC's. <i>Yu. Chaplygin, A. Krasukov, E. Artamonova.</i> Moscow Institute of Electronic Technology (Technical University) |
| 13.00 | 01-07 | Advanced atomic-scale simulation of silicon nitride CVD from dichlorosilane and ammonia. <i>T. Makhviladze, A. Minushev.</i> Institute of Physics and Technology, Russian Academy of Sciences, Moscow, Russia |

Auditorium B

Session 3. Photonics and Optoelectronics I

Session Chairman: **Sergey Nikitov**, *Institute of Radioengineering and Electronics RAS, Russia*

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| 12.00 | 01-08 | One-dimensional Photonic Crystals on Silicon as Optical Elements for Integrated Microphotonics. <i>V. Tolmachev1, E. Astrova1, T. Perova2.</i> 1. Ioffe Physical Technical Institute, Russian Academy of Sciences, St. Petersburg, Russia, 2. Department of Electronic and Electrical Engineering, University of Dublin, Trinity College, Dublin 2, Ireland |
| 12.20 | 01-09 | Reduction of noise in atomic system driven by squeezed coherent field. <i>A. Gelman, V. Mironov.</i> Institute of Applied Physics of Russian Academy of Sciences, Nizhny Novgorod, Russia |
| 12.40 | 01-10 | Enhancement of Optical Properties by Surface Nanostructuring. <i>V.V. Nanumov1, V.A. Paporkov2, N.A. Rud2, E.I. Vaganova1, A.V. Prokaznikov1.</i> 1. Yaroslavl Branch of Institute of Physics and Technology RAS, Yaroslavl, Russia 2. Yaroslavl State University named after Demidov P.G., Yaroslavl, Russia |
| 13.00 | 01-11 | Excitation dependence of infrared emission at 1.5-1.6 μm from defect-rich Si layers. <i>A.A. Shklyayev1,2, A.B. Latyshev1,2, M. Ichikawa3.</i> 1. Institute of Semiconductor Physics, SB RAS, Novosibirsk, Russia, 2. Novosibirsk State University, Novosibirsk, Russia 3. Quantum-Phase Electronics Center, Department of Applied Physics, Graduate School of Engineering, The University of Tokyo, Tokyo, Japan |

13.30-14.30 Lunch

Conference Hall

Session 4. Nanodevices and Nanostructures I

Session Chairman: **Vitaly Aristov**, *Institute of Microelectronics Technology, RAS, Russia*

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| 14.30 | 01-12 | Electronic transport in heterogeneous nanometer FET channels. <i>V. P. Popov.</i> Institute of Semiconductor Physics, Novosibirsk, Russia |
| 14.50 | 01-13 | Ballistic and Pseudo-Relativistic Carrier Transport in Graphene. <i>G. I. Zebrev.</i> Micro- and Nanoelectronics Department, National Research Nuclear University "MEPHI", Moscow, Russia |
| 15.10 | 01-14 | Comparative studies of single- and double-nanocrystal layer NVM structures: charge accumulation and retention. <i>V. Turchanikov1, V. Ievtukh1, A. Nazarov1, V. Lysenko1, M. Theodoropoulou2, A.G. Nassiopoulou2.</i> 1. Lashkaryov Institute of Semiconductor Physics NASU, Kyiv, Ukraine, 2. IMEL/NCSS Demokritos, Athens-Greece |
| 15.30 | 01-15 | Silicon nanoballs recharging in plasma-chemical oxide of nanometric thickness. <i>M.D. Efremov1,2, S.A. Arzhannikova1,2, V.A. Volodin1,2, G.N. Kamaev1,2, S.A. Kochubei1, I.G. Neizvestny1.</i> 1. Institute of Semiconductor Physics, Russian Academy of Sciences, Novosibirsk, Russia, 2. Novosibirsk State University, Novosibirsk, Russia |
| 15.50 | 01-16 | Charges and states in nitrided buried dielectrics of SOI structures. <i>V. P. Popov, I.E. Tyschenko.</i> Institute of Semiconductor Physics, Novosibirsk, Russia. |

Auditorium A

Session 5. Superconducting Structures and Devices I

Session Chairman: **Vladimir Lukichev**, *Institute of Physics & Technology RAS, Russia*

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| 14.30 | L1-06 | INVITED: Thermo-Electric Charge-to-Voltage Converter with an SIN Tunnel Junction for Bolometer Applications. <i>L. Kuzmin.</i> Chalmers University of Technology, Goteborg, Sweden. |
| 15.00 | 01-17 | DC SQUID modulation electronics for operation with HTS DC SQUID magnetometers in the unshielded environment. <i>E.V. Burmistrov, V.Yu. Slobodchikov, V.V. Khanin, Yu.V. Maslennikov.</i> Kotelnikov Institute of Radio Engineering and Electronics of RAS, Moscow, Russia |
| 15.20 | 01-18 | Properties of planar Nb/?-Si/Nb Josephson junctions with various doped degree of ?-Si interlayers. <i>A.L. Gudkov, A.A. Gogin, A.I. Kozlov, A.N. Samys.</i> CJSC "Compelst", FSUE "SRIPP n. F.V. Lykin", Moscow, Zelenograd, Russia |
| 15.40 | 01-19 | The theoretical analysis of the new microwave detector based on a Josephson heterostructure. <i>I.A. Devyatov1, M.Yu. Kupriyanov2.</i> 1. Lomonosov Moscow State University, Russia 2. Skobeltsyn Institute of Nuclear Physics, Moscow, Russia |
| 16.00 | 01-20 | «Conventional» SQUIDs and quantum interferometers on matter waves in superfluid helium. <i>A. Golovashkin1, G. Izmailov2, G. Kuleshova3, A. Tshovrebov1, L. Zherikhina1.</i> 1. Lebedev Physical Institute, Russian Academy of Science, Moscow, Russia; 2. Moscow Aviation Institute (State Technical University), Moscow, Russia 3. Moscow Engineering Physics Institute (State University), Moscow, Russia |

Auditorium B

Session 6. Thin Films

Session Chairman: Andrey Vasiliev, FSU Enterprise "Pulsar", Russia

- 14.30 01-21 The thermodynamic theory of interfacial adhesion between materials containing point defects. **R. Goldstein¹, T. Makhviladze², M. Sarychev²**. 1. Institute for Problems in Mechanics, Russian Academy of Sciences, Russia, 2. Institute of Physics and Technology, Russian Academy of Sciences, Russia.
- 14.50 01-22 The thickness-dependence of the polariton effect in the single quantum well. **Yu.V. Moskaev¹, S.B. Moskovski²**. 1. Yaroslavl State Pedagogical University, Yaroslavl, Russia, 2. Yaroslavl State University, Yaroslavl, Russia
- 15.10 01-23 CoSi₂/TiO₂/SiO₂/Si gate structure formation. **A.E. Rogozhin¹, I.A. Khorin^{1,2}, V.V. Naumov¹, A.A. Orlikovsky¹, V.V. Ovcharov¹, V.I. Rudakov¹, A.G. Vasiliev^{1,3}**. 1. Institute of Physics and Technology, Russian Academy of Sciences, Moscow, Russia, 2. Moscow State Institute of Radio-engineering, Electronics and Automation, Moscow, Russia, 3. Federal State Unitary Enterprise "Scientific & Product Enterprise "Pulsar", Moscow, Russia
- 15.30 01-24 Local performances of PZT films with a thickness less than 100 nanometers. **V.M. Roshchin, M.V. Silibin**. Moscow Institute of Electronic Technologies (Technical University), Zelenograd, Russia
- 15.50 01-25 Polysilicon Inductive Elements for IC's. **A.M. Pashayev, F.D. Kasimov., R.A. Ibragimov**. National Academy of Aviation, Baku, Azerbaijan

16.30-17.00 Coffee break. Winter garden.

Conference Hall

Session 7. Devices and ICs

Session Chairman: **Boris Konoplev,**

Taganrog Institute of Technology - Southern Federal University, Russia

- 17.00 01-26 SiGe and GaN heterostructure microwave devices. **A.G. Vasiliev, Y.V. Kolkovsky, S.V. Korneev, A.A. Dorofeev, V.M. Minnebaev**. FSUE "Science and Production Enterprise "Pulsar" Moscow, Russia
- 17.20 01-27 Methods of cache memory optimization for multimedia applications. **A. Kravtsov**. JSC Mikron, Moscow, Zelenograd, Russia
- 17.40 01-28 Integrated Injection Laser with Amplitude Modulation in Terahertz Band. **B. Konoplev^{1,2}, E. Ryndin², M. Denisenko¹**. 1. Taganrog Institute of Technology - Southern Federal University, Taganrog, Russia, 2. Southern Scientific Center of Russian Academy of Sciences, Rostov-on-Don, Russia
- 18.00 01-29 Gas medium influence on characteristics stability of electroformed structures Si-SiO₂-W and reliability of switching processes of memory elements on the basis of these structures. **V.M. Mordvintsev, S.E. Kudryavtsev, V.L. Levin, L.A. Tsvetkova**. Yaroslavl Branch of the Institute of Physics and Technology, Russian Academy of Sciences, Russia
- 18.20 01-30 Low-resistance Ge/Au/Ni/Ti/Au based ohmic contact to n-GaAs. **E. Erofeev¹, V. Kagadei²**. 1. Scientific Research Institute of Electrical Communication Systems, Tomsk, Russia, 2. Research and production company "Micran", Tomsk, Russia

Auditorium A

Session 8. Superconducting Structures and Devices II

Session Chairman: Mikhail Kupriyanov, Institute of Nuclear Physics, Moscow State University, Russia.

- 17.00 01-31 Manipulating superconductivity with magnetism: from unconventional physical effects to cryogenic spintronics. **L.R. Tagirov**. Solid State Physics Department, Kazan State University, Kazan, Russia
- 17.20 01-32 Magnetic field-tuned superconductor-insulator transition in PbTe/PbS heterostructures with superconducting interface. **O. Yuzepovich^{1,2}, S. Bengus^{1,2}, M. Mikhailov¹, A. Sipatov³, E. Buchstab⁴, N. Fogel⁴**. 1. Institute for Low Temperature Physics and Engineering, Kharkov, Ukraine, 2. International Laboratory of High Magnetic Fields and Low Temperatures, Wroclaw, Poland 3. National Technical University "Kharkov Polytechnical Institute" Kharkov, Ukraine 4. Solid State Institute, Technion, Haifa, Israel
- 17.40 01-33 Could equilibrium noise be detected with help of series-connected asymmetric superconducting rings? **V.L. Gurtovoi, A.I. Ilin, A.V. Nikulov, V.A. Tulin**. Institute of Microelectronics Technology, Russian Academy of Sciences, Chernogolovka, Russia
- 18.00 01-34 Superconductivity of polymers with charge injection doping. **A.N. Ionov¹, R. Rentzsch²**. 1. A.F. Ioffe Physico-Technical Institute, St. Petersburg, Russia, 2. Institut für Experimentalphysik, Freie Universität Berlin, Berlin, Germany

Auditorium B

Session 9. Photonics and Optoelectronics II

Session Chairman: Sergey Nikitov, Institute of Radioengineering and Electronics RAS, Russia

- 17.00 01-35 CMOS color image sensors. Current state and aspects. **V.A. Gergel¹, I.V. Vanyushin²**. 1. Institute of Radio Engineering and Electronics, Russian Academy of Sciences, Moscow, Russia. 2. LLC "SensorIC", Moscow, Russia
- 17.20 01-36 Monolithic photodetector 32x32. **A.V. Sorochkin, M.V. Yakushev, S.A. Dvoretzky, A.I. Kozlov, I.V. Sabinina, Y.G. Sidorov, B.I. Fomin, A.L. Aseev**. Institute of Semiconductor Physics, Russian Academy of Sciences, Novosibirsk, Russia

- 17.40 01-37 **Improvement of Radiation Resistance of Multijunction Solar Cells by Application of Bragg Reflectors.** V. Emelyanov, N. Kaluzhnyi, S. Mintairov, M. Shvarts, V. Lantratov. *Ioffe Physico-Technical Institute of RAS, St.-Petersburg, Russia*
- 18.00 01-38 **Polycrystalline Silicon Short Wave Photodetectors.** F.D. Kasimov., N.G. Javadov. *National Academy of Aviation, Baku, Azerbaijan*

19.00 Dinner

Wednesday, October 7th 2009

8.15 Breakfast

Conference hall

Plenary Session II. Quantum Informatics

Session Chairman: K.A.Valiev, *Institute of Physics and Technology, RAS, Russia*

- 8.50 **Introductory Remarks: Quantum informatics and complex systems.** Yu.I. Ozhigov. *M.V. Lomonosov Moscow State University, Russia*
- 9.00 qL-01 **INVITED: Quantum Mechanics as Emergent Phenomenon.** A. Khrennikov. *International center for mathematical modeling in physics, engineering and cognitive science, University of Vaxjo, Sweden*
- 9.30 qL-02 **INVITED: Dynamical Decoupling Pushed to the Extreme.** V.M. Akulin. *Laboratoire Aime Cotton CNRS ,Orsay, France*
- 10.00 qL-03 **INVITED: Tunneling without tunneling: wavefunction reduction in a mesoscopic qubit.** J.A. Nesteroff and D. V. Averin. *Department of Physics and Astronomy, Stony Brook University, Stony Brook, NY, USA*
- 10.30 qL-04 **INVITED: Superconducting Qubits.** E. Il'ichev. *Institute of Photonic Technology, Jena, Germany*

11.00 Coffee break

Conference Hall

Session 10. Carbon Nanostructures

Session Chairman: Anatoly Vyatkin, *Institute of Microelectronics Technologies, RAS, Russia*

- 11.20 L2-01 **INVITED: Carbon nanostructures as new material for emission electronics.** Yu. V. Gulyaev. *Institute of Radio Engineering and Electronics, Russian Academy of Sciences, Moscow, Russia*
- 12.00 02-01 **Linear-chain carbon films for micro- and nanoelectronics.** N.D. Novikov, A.F. Alexandrov, M.B. Guseva, V.V. Khvostov, N.F. Savchenko, Yu.V. Korneeva. *Physics Department, M.V. Lomonosov Moscow State University, Moscow, Russia*
- 12.20 02-02 **Fabrication of device structures from single-walled carbon nanotubes selectively grown on patterned catalytic layers.** O.V. Kononenko 1 , V.N. Matveev 1 , Yu.A. Kasumov1, I.I. Khodos1, D.V. Matveev2, V.T. Volkov1, A.I. Il'in1, M.A. Knyazev1 1. *Institute of Microelectronics Technology, Russian Academy of Sciences, Chernogolovka, Russia*. 2. *Institute of Solid State Physics Russian Academy of Sciences, Chernogolovka, Russia*
- 12.40 02-03 **CNS catalyst growth from carbonaceous substrate.** E. Ilyichev, V. Inkin, D. Migunov, G. Petruhin, E. Poltoratskii, G. Rychkov, D. Shkodin. *FSUE "Res. Inst. of Phys. Problems named after F.V. Lukin", Zelenograd*

Auditorium A

Session 11. Quantum Informatics II

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

- 11.20 q2-01 **Simulation of entangled nuclei in two-atom association.** B. Aksenov, Yu. Ozhigov. *Lomonosov Moscow State University, Russia*
- 11.40 q2-02 **Could the Schrodinger's Cat be used as Quantum Bit?** V.V. Aristov, A.V. Nikulov. *Institute of Microelectronics Technology, Russian Academy of Sciences, Chernogolovka, Russia*
- 12.00 q2-03 **Unified Statistical Method for Tomography of Quantum States by Purification.** Yu.I. Bogdanov. *Institute of Physics and Technology, Russian Academy of Sciences, Moscow, Russia*
- 12.20 q2-04 **Information aspects of «which way» experiments with microparticles.** Yu.I. Bogdanov1, K.A. Valiev1, S.A. Nuyanzin2, A.K. Gavrichenko1. 1. *Institute of Physics and Technology, Russian Academy of Sciences, Moscow, Russia*. 2. *Moscow Institute of Electronic Technology (Technical University), Zelenograd, Russia*
- 12.40 q2-05 **Simulation of electron jumps in the collision of two hydrogen atoms.** K. Burtniy1, Yu. Ozhigov1,2. 1. *Institute of Physics and Technology, RAS, Moscow, Russia* 2. *M.V. Lomonosov Moscow State University, Russia*

13.00 Lunch

Conference hall

Session 12. Ion and Plasma Processing

Session Chairman: Alexander Efremov, Ivanovo State University of Chemistry & Technology, Russia.

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| 14.00 | L2-02 | INVITED: Evolution of Ion Implantation Technology Towards sub-45 nm Device Fabrication. S. I. Kondratenko, R. N. Reece, M. S. Ameen, M. A. Harris, and L. M. Rubin. Axcelis Technologies, 108 Cherry Hill Drive, Beverly, MA 01915 USA |
| 14.30 | L2-03 | INVITED: Challenges and future prospects in plasma etching processes. O. Joubert1, E. Pargon1, T. Chevolleau1, G. Cunge1, L. Vallier1, T. David2, S. Barnola2, T. Lill3. 1. LTM (CNRS-UJF-INPG), France 2. CEA-LETI, France. 3. Applied Materials Inc., Santa Clara, USA |
| 15.00 | O2-04 | The metal hard-mask approach for contact patterning. J.-F. de Marneffe, D. Goossens, D. Shamiryan, F. Lazzarino, Th. Conard, I. Hoflijk, H. Struyf and W. Boullart. IMEC v.z.w., Leuven, Belgium. |
| 15.20 | O2-05 | Impact of plasma exposure on organic low-k materials. E. Smirnov1,2, A. K. Ferchichi1, C. Huffman1, M. R. Baklanov1. 1. IMEC vzw, Heverlee, Belgium, 2. Moscow Institute of Electronic Technology, Moscow, Russia |
| 15.40 | O2-06 | Application of Langmuir probe technique in depositing plasmas for monitoring of etch process robustness and for end-point detection. A.V. Miakonkikh, K.V. Rudenko. Institute of Physics and Technology of RAS ,Moscow, Russia. |

Auditorium A

Session 13. Quantum Informatics III

Session Chairman: A. Tsukanov, Institute of Physics and Technology, RAS, Russia

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| 14.00 | qL-05 | INVITED: Quantum Measurement of Open Systems. L. Fedichkin. Michigan State University, East Lansing, USA |
| 14.30 | q2-06 | Quantum Entanglement and its Observation at Measurement of Magnetic Susceptibility and in Multiple Quantum NMR Experiments. E.B. Fel'dman. Institute of Problems of Chemical Physics of Russian Academy of Sciences, Chernogolovka, Moscow Region |
| 14.50 | q2-07 | The qubit states decoherence in antiferromagnet-based nuclear spin model of quantum register. A.A. Kokin1, V.A. Kokin2. 1. Institute of Physics and Technology of RAS , Moscow, Russia 2. Institute of Radioengineering and Electronics of RAS, Moscow Russia |
| 15.10 | q2-08 | Quantum Double Helix. A.Yu. Okulov. General Physics Institute of Russian Academy of Sciences, Moscow, Russia |
| 15.30 | q2-09 | Time-optimal control of quantum dynamics of a quadrupole nucleus by NMR techniques. V.P. Shauro, V.E. Zobov. L.V. Kirensky Institute of Physics, Siberian Branch, Russian Academy of Sciences, Krasnoyarsk, Russia |
| 15.50 | q2-10 | Resonant dipole-dipole interaction of a few cold Rydberg atoms in a magneto-optical trap. D.B. Tretyakov1, I.I. Beterov1, V.M. Entin1, I.I. Ryabtsev1, P.L. Chapovsky2 1. Institute of Semiconductor Physics SB RAS, Novosibirsk, Russia, 2. Institute of Automation and Electrometry SB RAS, Novosibirsk, Russia |

Auditorium B

Session 14. Simulation and Modeling II

Session Chairman: Tariel Makhviladze, Institute of Physics & Technology RAS, Russia

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| 14.00 | O2-07 | Mathematical modeling of a fast neutrals beam source neutralization channel. A.V. Degtyarev, V.P. Kudrya, Yu.P. Maishev. Institute of Physics and Technology, Russian Academy of Sciences, Moscow, Russia |
| 14.20 | O2-08 | TCAD technique to simulate total dose effects in SOI MOSFETs. K. Petrosjanc, I. Kharitonov, E. Orekhov. Moscow State Institute of Electronics and Mathematics (Technical University), Moscow, Russia |
| 14.40 | O2-09 | Optimization of near-surficial annealing for decreasing of depth of p-n-junction in semiconductor heterostructure. E.L. Pankratov. The Mathematical Department, Nizhny Novgorod State University of Architecture and Civil Engineering,, Nizhny Novgorod, Russia |
| 15.00 | O2-10 | Research of current injection process in the substrate during digital gate switching. T. Krupkina, D. Rodionov. Moscow Institute of Electronic Technology (Technical University), Moscow, Russia |
| 15.20 | O2-11 | Extrinsic Compact MOSFET Model with Correct Account of Positive Differential Conductivity after Saturation. V.O. Turin1, A.V. Sedov1, G.I. Zebrev2, B. Iniguez3, M.S. Shur4 1. Orel State Technical University, Orel, Russia, 2. National Research Nuclear University "MEPHI", Moscow, Russia, 3. Rovira i Virgili University, Tarragona, Spain, 4. Rensselaer Polytechnic Institute, Troy, NY, USA |
| 15.40 | O2-12 | Informational charge readout dynamics and non-linearity of photosignal characteristics of active pixels in CMOS image sensors. A.V. Verhovtseva, V.A. Gergel', V.A. Zimogiyad. LLC RPC «SensorIS», Moscow, Russia |

16.10 Coffee break

16.30 Entresol. POSTER SESSION I

16.30. Bottom hall. EXHIBITION

17.00. Conference Hall. Presentations of Hi-Tech Companies

17.00 S-05 Surface Metrology measurements; from nanometer to millimeter scale. P. Markus. Veeco Instruments Inc., USA
17.30 S-06 Advances in Cryofree Ultra-Low-Temperatures and integrated high magnetic fields. S. Mitchinson. Oxford Instruments Nanosciences Ltd., UK

19.00 Dinner

Thursday, October 8th 2009

08.15 Breakfast

Conference hall

Session 15. Nanostructures Fabrication Techniques

Session Chairman: Anatoly Vyatkin, Institute of Microelectronics Technologies, RAS, Russia

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|-------|-------|--|
| 09.00 | 03-01 | Nucleation and growth of Ge nanoislands on pit-patterned Si substrates. J.V. Smagina ¹ , P.L. Novikov ¹ , A.S. Deryabin ¹ , E.E. Rodyakina, D.A. Nasimov ¹ , B.I. Fomin ¹ , V.A. Zinov'yev ¹ , A.V. Dvurechenskii ^{1,2} . 1. Institute of Semiconductor Physics SB RA, Novosibirsk, Russia, 2. Novosibirsk State University, Novosibirsk, Russia. |
| 09.20 | 03-02 | Nanoscale Si/SiO ₂ superlattices produced by plasma-chemical technology. S.A. Arzhannikova ^{1,2} , M.D. Efremov ^{1,2} , A.Kh. Antonenko ^{1,2} , V.A. Volodin ^{1,2} , G.N. Kamaev ^{1,2} , D.V. Marin ^{1,2} , S.A. Kochubei ¹ , A.A. Voschenkov ¹ . 1. Institute of Semiconductor Physics, Russian Academy of Sciences, Novosibirsk, Russia, 2. Novosibirsk State University, Novosibirsk, Russia |
| 09.40 | 03-03 | Impurity activation and nanocrystals formation using excimer lasers. M.D. Efremov ^{1,2} , S.A. Arzhannikova ^{1,2} , V.A. Volodin ^{1,2} , G.N. Kamaev ^{1,2} , S.A. Kochubei ¹ , I.G. Neizvestny ¹ . 1. Institute of Semiconductor Physics, Russian Academy of Sciences, Novosibirsk, Russia, 2. Novosibirsk State University, Novosibirsk, Russia |
| 10.00 | 03-04 | Femtosecond and nanosecond laser assistant formation of Si nanoclusters in silicon-rich nitride films. V.A. Volodin ^{1,2} , T.T. Korchagina ¹ , G.N. Kamaev ¹ , A.H. Antonenko ¹ , J. Koch ³ , B.N. Chichkov ³ . 1. Institute of Semiconductor Physics, Russian Academy of Sciences, Novosibirsk, Russia, 2. Novosibirsk State University, Novosibirsk, Russia, 3. Laser Zentrum Hannover, Hannover, Germany |
| 10.20 | 03-05 | Optical diagnostics of GaAs nanoheterostructures growth processes. I.P. Kazakov, E.V. Glazyrin, V.I. Tsekhosh. P.N. Lebedev Physical Institute of Russian Academy of Sciences, Moscow, Russia |
| 10.40 | 03-06 | Low voltage micro lens ion beam column for nano-patterning with resolution of 1.5?2 nm. Numerical simulation and prospects. V.A. Zhukov ¹ , S. Kalbitzer ² , A. I. Titov ³ . 1. Institute for Informatics and Automation, Russian Academy of Sciences, St. Petersburg, Russia, 2. Ion Beam Technology, D-69121 Heidelberg, Germany, 3. St. Petersburg State Technical University, St. Petersburg, Russia |

Auditorium A

Session 16. Quantum Informatics IV

Session Chairman: Yu.I. Bogdanov, Institute of Physics and Technology, RAS, Russia

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| 09.00 | q3-01 | Quantum computer without uncontrollable Coulomb interaction among space-based qubits. S. Filippov, V. Vyurkov. Institute of Physics and Technology, RAS, Moscow, Russia |
| 09.20 | q3-02 | Quantum information transfer protocol via optimized single-electron transport in semiconductor nanostructure. A.V. Tsukanov. Institute of Physics and Technology, RAS, Moscow, Russia |
| 09.40 | q3-03 | Outlook for the application of Ge/Si quantum dots in quantum calculations. A. Zinov'eva ¹ , A. Nenashev ¹ , A. Dvurechenskii ¹ , A.I. Nikiforov ¹ , A. Lyubin ¹ , L. Kulik ² . 1. Institute of Semiconductor Physics, Russian Academy of Sciences, Novosibirsk, Russia, 2. Institute of Chemical Kinetics and Combustion, Novosibirsk, Russian Academy of Sciences, Russia |
| 10.00 | q3-04 | The quantum dynamics of two coupled large spins. V.E. Zobov. L.V. Kirensky Institute of Physics, SB Russian Academy of Sciences, Krasnoyarsk, Russia |
| 10.20 | q3-05 | Can entanglement fluctuate? M. A. Yurishchev. Institute of Problems of Chemical Physics, Russian Academy of Sciences, Chernogolovka, Russia |

Auditorium B

Session 17. Simulation and Modeling III

Session Chairman: Igor Abramov, Belarusian State University of Informatics & Radioelectronics, Belarus

9.00	03-07	The influence of the suboxide layer structure on equivalent oxide thickness in nanoscale MIS-structure. N.A. Zaitsev, G.Ya Krasnikov, Matyushkin I.V. Micron Corp., Moscow, Zelenograd, Russia
9.20	03-08	Semi-analytical model of a field-effect transistor with an ultra-thin channel. A. Khomyakov, V. Vyurkov. Institute of Physics and Technology, Russian Academy of Sciences, Moscow, Russia
9.40	03-09	Impact of channel inhomogeneities on characteristics of a quantum field-effect transistor. V. Vyurkov, I. Semenikhin, V. Lukichev, A. Orlikovsky. Institute of Physics and Technology, Russian Academy of Sciences, Moscow, Russia
10.00	03-10	Bulk and Nanoribbon Graphene Field-Effect Transistor Modeling. G.I. Zebrev1, E.A. Zotkin1, A.A. Tselykovskiy1, E.V. Melnik1, V.O. Turin2 .1. Micro- and Nanoelectronics Department, National Research Nuclear University "MEPHI", Moscow, Russia, 2. Orel State Technical University, Orel, Russia
10.20	03-11	Electron optical spin polarization in broken-gap heterostructures. A. Zakharova1, K. A. Chao2, I. Semenikhin1. 1. Institute of Physics and Technology of the Russian Academy of Sciences, Moscow, Russia, 2. Department of Physics, Lund University, Lund, Sweden, and Department of Physics, Chemistry and Biology, Linköping University, Linköping, Sweden

11.00 Coffee break

Conference hall

Session 18. Magnetic Micro- and Nanostructures

Session Chairman: **Mikhail Chuev**, *Institute of Physics & Technology RAS, Russia*

11.30	03-12	High-temperature magnetization and Mossbauer spectra of nanoparticles in a weak magnetic field. M. A. Chuev. Institute of Physics and Technology, Russian Academy of Sciences, Moscow, Russia.
11.50	03-13	Mossbauer study of nanomagnetics. V.I. Bachurin1, I.N. Zakharova1, M.A. Shipilin2, A.M. Shipilin3 . 1. Yaroslavl State Technical University, Yaroslavl, Russia, 2. P.G.Demidov Yaroslavl State University, Yaroslavl, Russia, 3. M.V. Lomonosov Moscow State University, Moscow, Russia
12.10	03-14	Ferromagnetic resonance and magnetoelastic demodulation in giant magnetostriction TbCo ₂ /FeCo nanostructured thin film. A. Klimov1,2, Yu. Ignatov2, S. Nikitov2, N. Tiercelin1, V. Preobrazhensky1,3, P. Pernod1. 1. LEMAC-IEMN CNRS, Ecole Centrale de Lille, France 2. Kotelnikov Institute of Radioengineering and Electronics (IRE RAS), Moscow, Russia 3. Wave Research Center, A.M. Prokhorov General Physics Institute RAS, Moscow, Russia
12.30	03-15	Odd-even effects in magnetic nanostructures. V.V. Kostyuchenko. Institute of Physics and Technology RAS, Yaroslavl Branch, Yaroslavl, Russia
12.50	03-16	Magnetoresistance of multilayer ferromagnetic nanoparticles. S.N. Vdovichev, A.A. Fraerman, B.A. Gribkov, S.A. Gusev, A.Yu. Klimov, V.L. Mironov, V.V. Rogov. Institute for Physics of Microstructures, Russian Academy of Science, Nizhny Novgorod, Russia

Auditorium A

Session 19. Quantum Informatics V

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

11.30	q3-06	Quantum cryptography system using phase-time coding and resistant to PNS attack. D.A. Kronberg1, S.N. Molotkov1,2,3 1. Faculty of Computational Mathematics and Cybernetics, Moscow State University, Moscow, Russia 2. Institute of Solid State Physics, Russian Academy of Sciences, Chernogolovka, Moscow region, Russia. 3. Academy of Cryptography of the Russian Federation, Moscow, Russia
11.50	q3-07	Entanglement measure for multipartite pure states and its numerical calculation. A. Yu. Chernyavskiy. Institute of Physics & Technology of RAS (FTIAN), Moscow, Russia
12.10	q3-08	Quantum Computing with Collective Ensembles of Multilevel Systems. E. Brion, K. Molmer, and M. Saffman. Laboratoire Aime Cotton (CNRS), Orsay, France
12.30	q3-09	Spin-1/2 systems with simple two- and three-dimensional geometrical configurations: state transfer and entanglement between different nodes. S.I. Doronin, E.B. Fel'dman and A.I. Zenchuk. Institute of Problems of Chemical Physics, Russian Academy of Sciences, Chernogolovka, Moscow reg., Russia
12.50	q3-10	Flux-qubit and the law of angular momentum conservation. A.V. Nikulov. Institute of Microelectronics Technology, Russian Academy of Sciences, Chernogolovka, Moscow District, Russia.

Auditorium B

Session 20. Micro- and Nanostructures Characterization I

Session Chairman: **Eduard Rau**, *Moscow State University, Moscow, Russia*

11.30	03-17	SEM Probe Defocusing Method of Measurement of Linear Sizes of Nanorelief Elements. M.N. Filippov1, Yu.A. Novikov2, A.V. Rakov3, P.A. Todua3. 1. N.S. Kurnakov General and Inorganic Chemistry Institute of the Russian Academy of Sciences, Moscow, Russia, 2. A.M. Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia. 3. Center for Surface and Vacuum Research, Moscow, Russia
11.50	03-18	SEM Relief Structure Images with Trapezoid Profile and Big Inclination Angle of Side Walls in Back Scattered

- Electrons. M.N. Filippov1, Yu.A. Novikov2, A.V. Rakov3, P.A. Todua3.** 1. N.S. Kurnakov General and Inorganic Chemistry Institute of the Russian Academy of Sciences, Moscow, Russia, 2. A.M. Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia. 3. Center for Surface and Vacuum Research, Moscow, Russia
- 12.10 03-19 Combined electron-beam method of the diagnostic of microelectronic structures in scanning electron microscopy. F.A. Lukyanov1, N.A. Orlikovsky2, E.I. Rau3, R.A. Sennov3.** 1. Moscow State University, Moscow, Russia 2. Institute of Physics and Technology RAS, Moscow, Russia. 3. Institute of Microelectronics Technology RAS, Chernogolovka, Moscow Region, Russia
- 12.30 03-20 Problems of AFM-investigations of open sandwich MIM-structures. E.S. Gorlachev, V.M. Mordvintsev, V.L. Levin.** Yaroslavl Branch of the Institute of Physics and Technology RAS, Yaroslavl, Russia
- 12.50 03-21 Correct measurements of capacity using atomic force microscope. A.A. Chouprik, A.S. Baturin.** Moscow Institute of Physics and Technology, Dolgoprudny, Russia

13.20 Lunch

Conference hall

Session 21. Plasma Physics and Technologies

Session Chairman: Konstantin Rudenko, Institute of Physics & Technology RAS, Russia

- 14.20 L3-01 INVITED: Problems of nano-sized and high aspect ratio features plasma etching. V. Lukichev1, K. Rudenko1, A. Orlikovsky1, V. Yunkin2.1. Institute of Physics & Technology (FTIAN) 2. Institute of Microelectronics Technology, Russian Academy of Sciences, Russia**
- 14.50 03-22 Modeling of plasma reactive ion etching of ultra high aspect ratio Si trenches. I.I. Amirov1, A.S. Shumilov1, A.N. Kupriyov1, V.F. Lukichev2.** 1. Institute RAS Yaroslavl branch of the Institute of Physics & Technology RAS, Yaroslavl, Russia, 2. Institute of Physics & Technology (FTIAN), Russian Academy of Sciences, Moscow, Russia
- 15.10 03-23 Plasma parameters and active particles kinetics in HBr dc glow discharges. A. Smirnov1,2, A. Efremov1, V. Svetsov1, A. Islyaykin2.1. Ivanovo State University of Chemistry & Technology, Ivanovo, Russia, 2. Mikron JSC, Zelenograd, Moscow, Russia**
- 15.30 03-24 Mechanisms of film deposition from BCl3-based plasma during dry etching. D. Shamiryan1, A.M. Efremov2, V. Serlenga3, M.R. Baklanov1, W. Boullart1.** 1. IMEC, Leuven, Belgium 2. Ivanovo State University of Chemistry and Technology, Ivanovo, Russia 3. Instituto Universitario di Studi Superiori, Pavia, Italy
- 15.50 03-25 Excitation Mechanism of the B+ Emission Line at 345.1 nm in Low-Temperature Plasma. V.P. Kudrya.** Institute of Physics and Technology, Russian Academy of Sciences, Moscow, Russia

Auditorium A

Session 22. Quantum Informatics VI

Session Chairman: Yuri Ozhigov, M.V. Lomonosov Moscow State University, Russia

- 14.20 q3-11 Implementation of the quantum order-finding algorithm by adiabatic evolution of two qubits. A.S. Ermilov, V.E. Zobov.** L. V. Kirensky Institute of Physics, Russian Academy of Sciences, Siberian Branch, 660036, Krasnoyarsk, Russia
- 14.40 q3-12 NMR Saturation and Entanglement in Solids. M. Kutcherov.** Siberian Federal University, Krasnoyarsk, Russia
- 15.00 q3-13 Quantum Scattering on Dypole Potential in Adiabatic Approximation. K.S. Arakelov.** M.V. Lomonosov Moscow State University, Russia
- 15.20 16.20 Round Table Discussion: Quantum Systems in Computer Simulation**

Auditorium B

Session 23. Micro- and Nanostructures Characterization II

Session Chairman: Mikhail Chuev, Institute of Physics & Technology RAS, Russia

- 14.20 03-26 De-processing technologies for modern VLSI based on grazing incident ion beams. A.F. Vyatkin.** Institute of Microelectronics Technologies, Russian Academy of Sciences, Chernogolovka, Russia
- 14.40 03-27 Development of computer methods for multi nano-layer parameters measurements by X-Ray reflectometry. N.N. Gerasimenko1, D.A. Kartashov2, A.G. Turyansky3.** 1. Moscow Institute of Electronic Technology, Moscow, Zelenograd, Russia, 2. JSC Mikron, Moscow, Zelenograd, Russia, 3. LPI, Moscow, Russia
- 15.00 03-28 Experimental scheme for observation of anomalous Kossel effect in semiconductor structures. P.G. Medvedev, M.A. Chuev.** Institute of Physics and Technology, Russian Academy of Sciences, Moscow, Russia
- 15.20 03-29 Structural Investigation of Magnetic Digital Alloys. I.A. Subbotin1, M.A. Chuev2, V.V. Kvardakov1, I.A. Likhachev1, E.M. Pashaev1.** 1. Russian Research Center "Kurchatov Institute", Moscow, Russia. 2. Institute of Physics and Technology, Russian Academy of Sciences, Moscow, Russia
- 15.40 03-30 Spectroscopic and scanning ellipsometry for investigation of surfaces, thin films and nanolayers. V. Tolmachev1, T. Zvonareva1, L. Portzel1, V. Kudoyarova1, T. Perova2, V. Shvets3, S. Rykhliitskii3.** 1. Ioffe Physical Technical Institute, Russian Academy of Sciences, St. Petersburg, Russia 2. Department of Electronic and Electrical Engineering, University of Dublin, Trinity College, Dublin 2, Ireland, 3. Semiconductor Physics Institute SB RAS, Novosibirsk, Russia
- 16.00 03-31 Temperature of one-side polished silicon wafer at different position relatively incoherent radiance source. V.I. Rudakov, V.V. Ovcharov, V.P. Prigara.** Yaroslavl Branch of Institute of Physics and Technology RAS

16.30 Coffee break

16.45 Entresol. POSTER SESSION II

Bottom hall. EXHIBITION

18.45. Conference Hall. CLOSING CONFERENCE REMARKS
A.A. Orlikovsky, Chair of Organizing Committee ICMNE-2009,
Institute of Physics and Technology, Russian Academy of Sciences, Moscow, Russia

19.30 BANQUET

Friday, October 9th, 2009

09.00 Breakfast

10.00 DEPARTURE