

# NGC2017 Program Draft

**September 18, Monday**

## **Summer school: Tutorials I and II:**

Francis Balestra, Grenoble Institute of Technology, Grenoble, France,  
NanoCMOS and Tunnel FETs for the end of the Roadmap (online  
presentation)

Victor Bykov, NT-MDT, Zelenograd, Russia, Scanning Probe Technology  
for Surface Structures Characterizations: High resolution in Microscopy  
and Spectroscopy

David Gilmer, Nantero, Austin, Texas, USA, Fundamentals of Oxide  
Resistive Random Access Memories (RRAM)

Stephen Goodnick, Arizona State University, Tempe, Arizona, USA  
Nanotechnology Pathways to Next-Generation Photovoltaics

Roman Kezerashvili, The City University of New York, New York, USA,  
Superfluidity and Bose-Einstein Condensation in Two-dimensional  
Nanomaterials

Vladimir Yakubov, National Research Tomsk State University, Tomsk,  
Russia, Theory and Technology of Wave Vision

Stephen Johnston, Arizona State University, Tempe, Arizona, USA,  
Innovations in Medicine: A Simple Plan to Eradicate Cancer by  
Preventative Vaccine and Early Detection

Yoshiro Hirayama, Tohoku University, Sendai, Japan  
Nuclear Spin Related Measurements for Semiconductor Quantum  
Systems

## **September 19, Tuesday**

### **Summer school: Tutorials III and IV:**

Marco Buongiorno Nardelli, University of North Texas, Denton, Texas, USA, High-throughput Materials Discovery and Development: Breakthroughs and Challenges in the Mapping of the Materials Genome (online presentation)

Dominic Gervasio, University of Arizona, Tucson, Arizona, USA, Science and Technology Challenges in Solar Energy Generation and Energy Storage

Denis Mamaluy, Sandia National Laboratories, Albuquerque, New Mexico, USA, Quantum Transport Simulations

Vladimiro Mujica, Arizona State University, Tempe, Arizona, USA Quantum Confinement Effects in Nanoelectronic Materials

Tina Ng, University of California San Diego, San Diego, California, USA, Additively printed Electronics for Sensing

Björn Lüssem, Kent State University, Kent, Ohio, USA Minority and Majority Currents in Organic Field-Effect Transistors

Fred Roozeboom, Technische Universiteit Eindhoven, Eindhoven, Netherlands, Atomic Layer Processing: Basics, Materials, Processes and Applications (online presentation)

Mikhail Baklanov, North China University of Technology, Beijing, China, Interconnect Challenges of ULSI Devices Beyond 10 nm Technology Nodes

### **Nanotechnology in Space:**

Pavel Ananyev, GUN, Ltd, Moscow, Russia, Electro-Magnetic Cold Drilling for Lunar Mining

Victor Bykov, NT-MDT, Zelenograd, Russia, Space Technologies and Analytical Systems

Roman Kezerashvili, The City University of New York, New York, USA, Solar Sail Acceleration by Thermal Desorption and Temperature Restriction on Heliocentric Orbits

Mikhail Mikhailov, Tomsk State University of Control Systems and Radioelectronics, Tomsk, Russia, Nanotechnology Application for Spacecraft Smart Coatings

Alexander Shalumov, Research Institute ASONIKA, Moscow, Russia, Computational Modeling of External Impact on Electronic Devices

Oleg Tolbanov, National Research Tomsk State University, Tomsk, Russia, Gamma Ray Detectors for Terrestrial and Space Applications

## **September 20, Wednesday, Morning**

### **Optoelectronics, Photonics, and Plasmonics I (5)**

Ken-Ichi Ueda, Osaka University, Osaka, Japan, Thermal-Lens-Free Heat Capacitive Active Mirror

Elena Semouchkina, Michigan Tech, Houghton, Michigan, USA  
From Microwaves to Optics: AllDielectric Solutions for Coordinate Transformation-Based Devices

Kodo Kawase, Nagoya University, Nagoya, Japan  
THz Spectroscopic Imaging Using Optical Parametric Generator

Vladimir Pavelyev, Samara University, Samara, Russia  
Silicon Diffractive Optics for THz Laser Radiation

Valery Filippov, Peter the Great St. Petersburg Polytechnic University, St Petersburg, Russia, Fiber Optic Amplifiers and Lasers with Active Double Clad Tapered Fibers

## **Magnetic Materials and Devices (6)**

Flavio Abreu Araujo, University Paris-Sud, Orsay Cedex, France  
Dynamical Neuromorphic Computing with Nanoscale Magnetic Oscillators

Joerg Debus, Technical University of Dortmund, Dortmund, Germany  
Magneto-optical Effects of Nitrogen-vacancy Centers in Diamond Crystals

Victor Tugushev, National Research Center "Kurchatov Institute",  
Moscow, Russia, Anomalous Hall Conductivity in 3D Magnetic Topological Insulator Based Nanostructures

Patrick Lenahan, Pennsylvania State University, University Park,  
Pennsylvania, USA Spin Dependent Variable Range Hopping and Spin Dependent Charge Pumping in Metal- Insulator- Semiconductor Systems

Geliia Karlova, Tomsk State University of Control Systems and Radioelectronics (TUSUR), Tomsk, Russia, Development of Phased Array Antenna Element for Active Magnetic Positioning System Based on Semiconductor Hall-Effect Sensors

Igor Shvets, Tomsk State University, Tomsk, Russia, Intrinsic Spin Hall Response in Three-Dimensional Topological Insulator/Normal Insulator Heterostructures

**September 20, Wednesday, Afternoon**

## **Optoelectronics, Photonics, and Plasmonics II (8)**

Yuriy Gladush, Skolkovo Institute of Science and Technology, Moscow, Russia, Polymer-free Films of Single-walled Carbon Nanotubes as a Saturable Absorbers for Fiber Lasers

Petr Kuznetsov, Kotel'nikov Institute of Radio-Engineering and Electronics of RAS, Moscow, Russia  
Saturable Absorbers based on Thin Film Bismuth-Chalcogenides

Alexei Popov, Pushkov Institute of Terrestrial Magnetism, Ionosphere and Radio Wave Propagation, Troitsk, Russia, Parametric resonance and theory of Bragg waveguides

Pavle Radovanovic, University of Waterloo, Waterloo, Ontario, Canada  
Tuning Plasmon Resonance of In<sub>2</sub>O<sub>3</sub> Nanocrystals Throughout Mid-Infrared: Dopant, Phase, and Electronic Structure Dependence

Dzmitry Bychanok, Belarusian State University, Minsk, Belarus, Design of Carbon Nanotube-based Broadband Radar Absorber for Ka-band Frequency Range

Alexander Plekhanov, Institute of Automation and Electrometry of the Siberian Branch of the Russian Academy of Sciences, Novosibirsk, Russia, Compact Planar Electro-optical Modulators based on Poled Chromophore-doped Polyimides

Olga Sedelnikova, Nikolaev Institute of Inorganic Chemistry SB RAS, Novosibirsk, Russia, Effect of Interlayer Coupling on Plasmonic Properties of Twisted Bilayer Graphene

Steponas Asmontas, Center for Physical Sciences and Technology, Vilnius, Lithuania, Peculiarities of Photovoltage Formation Across SI and GAAS p-n Junction under Illumination of Laser Radiation

## **Modeling and simulation (6)**

Denis Mamaluy, Sandia National Laboratories, Albuquerque, New Mexico, USA Beyond Moore's Law: Fundamental Downscaling Limit of Field-effect Transistors and New Possibilities for Continued Increase of Computing Power

Sergey Beznosyuk, Altai State University, Barnaul, Russia  
Quantum Mechanical Approaches to Computer Simulation Graphene-Metal Nanosystems

Giacomo Giorgi, University of Perugia, Perugia, Italy  
Hybrid Organic-Inorganic Halide Perovskites: Dimensionality vs. Applicability. A Theoretical Standpoint

Alexander Kvashnin, Skolkovo Institute of Science and Technology, Moscow, Russia  
Computational materials discovery in various dimensionalities

Vladimiro Mujica, Arizona State University, Tempe, Arizona, USA  
Chirality Effects in Molecular Electronics

Olga Maslova, Altai State University, Barnaul, Russia, Computer Simulation of Graphene-Molybdenum Nanosized Sensor of Carbon Monoxide Molecules.

## **September 21, Thursday, Morning**

### **Energy Transformation and Storage (7)**

Stephen Goodnick, Arizona State University, Tempe, Arizona, USA  
Nonequilibrium Electron and Phonon Dynamics in Advanced Concept Solar Cells

Koichi Yamashita, University of Tokyo, Tokyo, Japan  
Theoretical Study on Energy Conversion Processes of Perovskite Solar Cells

Dominic Gervasio, University of Arizona, Tucson, Arizona, USA,  
Chemical Processing in Molten Salts

Artem Kabanov, Samara University, Samara, Russia, Methods for prediction of new perspective materials for the electrochemical systems of energy storage

Alex Laikhtman, Holon Institute of Technology, Holon, Israel, Tungsten Disulfide Nanoparticles as a Medium for Hydrogen Storage: Comparison of Hydrogenation Methods and Determination of Chemical Configuration

Lyubov Bulusheva, Nikolaev Institute of Inorganic Chemistry SB RAS, Novosibirsk, Russia, Li-ion Capacity of Coupled Graphene and Molybdenum Sulfide Materials

Sergii Sergiienko, National University of Science and Technology (MISi, Moscow, Russia, Structure and Transport Properties of the Spark Plasma Sintered Barium Cerate Based Proton Conductor

### **Non-volatile Memory Devices (5)**

Luca Larcher, University of Modena, Modena, Italy  
Multiscale Modeling of Memristor Devices for Novel Memory and Logic System Architectures

David Gilmer, Nantero, Austin, Texas, USA, NRAM: A Disruptive Carbon-Nanotube Resistance-Change Memory

Vladimir Gritsenko, Rzanov Institute of Semiconductor Physics, Novosibirsk, Russia The Charge Transport Mechanism and the Nature of Traps in Charge Trap Flash, ReRAM and FeRAM Devices

Sergei Koveshnikov, Institute of Microelectronics Technology Russian Academy of Sciences, Chernogolovka, Russia  
Fundamental Properties of Cross-bar Non-volatile RRAM Elements and their Integration for Low Energy System-on-chip Applications

Yakov Roizin, TowerJazz, Migdal Haemek, Israel  
Nonvolatile memories for IoT applications

**September 21, Thursday, Afternoon**

**Carbon Based Materials in Electronics and Photonics (8)**

Sergey Maksimenko, Belarusian State University, Minsk, Belarus  
Propagation and Generation of Electromagnetic Waves in Carbon  
Nanotubes and Graphene

Albert Nasibulin, Skolkovo Institute of Science and Technology, Moscow,  
Russia Single-walled Carbon Nanotubes: from Synthesis to Applications

Robert Nemanich, Arizona State University, Phoenix, Arizona, USA  
Defect Control in Diamond Epitaxy for High Temperature Electronics

Georgy Fedorov, Moscow Institute of Physics and Technology, Moscow,  
Russia Graphene Based Nanostructures for Detecting Terahertz  
Radiation

Elena Obraztsova, A.M. Prokhorov General Physics Institute of RAS,  
Moscow, Russia, New Materials Based on Filled Single-Wall Carbon  
Nanotubes

Yutaka Ohno, Nagoya University, Nagoya, Japan  
Flexible Bio-electronics Based on Carbon Nanotube Thin Films

Vladimir Popov, Rzhanov Institute of Semiconductor Physics,  
Novosibirsk, Russia, Diamond-Graphite-Diamond Heterostructures  
Produced by Implantation and HPHT Annealing for Lift-off Transfer and  
New Devices

Sergey Makarov, Altai State University, Barnaul, Russia, Diamond-like  
Carbon Films

**Electronics Structure and Charge Transport I (8)**

Hiroaki Benten, Nara Institute of Science and Technology, Nara, Japan

Nanoscale Mapping of Charge Transport Properties of Conjugated Polymer Films by Conducting Atomic Force Microscopy

Vladimir Burtman, University of Utah, Salt Lake City, Utah, USA  
Generalized Charge Transfer (GCT) Model for Analysis of Transport Phenomena in Molecular and DNA stacks

Oana Jurchescu, Wake Forest University, Winston-Salem, North Carolina, USA  
Charge Transport in Hybrid Perovskite Field-effect Transistors (online presentation)

Satoshi Kera, Institute for Molecular Science, Okazaki, Japan  
Tracking Charge Transport of Organic Semiconductor Material by Electronic Structure Measurement

Oleg Tolbanov, National Research Tomsk State University, Tomsk, Russia,  
Electronics Properties of GaAs Crystals containing deep Nanoclusters

Steffen Duhm, Soochow University, Suzhou, China  
Vertical Adsorption Distances Impact Energetics at Organic-Metal Interfaces

Axel Fischer, Technical University Dresden, Dresden, Germany  
A Vertical Organic Transistor with Areal Current Densities in the kA/cm<sup>2</sup> Regime

Alexander Voitsekhovskii, Tomsk State University, Tomsk, Russia,  
Electrical Properties of MIS Structures Based on n(p)-HgCdTe with Quantum Wells.

**September 22, Friday, Morning**

**Fabrication of Nanostructured Materials and Devices I (5)**

Alexey Kovalgin, University of Twente, Enschede, Netherlands

Hotwire-assisted Atomic Layer Deposition of Pure Metals and Metal Nitrides

Konstantin Golant, Kotel'nikov Institute of Radio-Engineering and Electronics of RAS, Moscow, Russia  
Recent Advances in Laser-Induced Backside Wet Etching

Seunghyup Yoo, Korea Advanced Institute of Science and Technology, Daejeon, Korea  
Polymer Gate Dielectrics Prepared by Initiated Chemical Vapor Deposition for Flexible Electronics on Various Soft Platforms

Alexander Okotrub, Nikolaev Institute of Inorganic Chemistry, Novosibirsk, Russia,  
Multiwall Carbon Nanotube Forest: Synthesis, Structure and Applications

Tatiana Kopylova, Tomsk State University, Tomsk, Russia, Molecular Layer Epitaxy Method for Molecular Nanoelectronics

**Technology Innovations I (4):**

Konstantin Belyakov, Tomsk State University, Tomsk, Russia, Ecosystem of Innovations at the Tomsk State University

Evgeni Gousev, Qualcomm, San Jose, California, USA, Overcoming the High Power and High Cost of Computer Vision

William Petuskey, Arizona State University, Tempe, Arizona, USA, Accelerating Materials Innovation and Implementation: What Strategies can be

Yuri Tkachenko, IP-Management, Nizhny Novgorod, Russia, Development, Management and Licensing Intellectual Property: There are more Money than Good Proposals (online presentation)

**September 22, Friday, Afternoon**

## **Fabrication of Nanostructured Materials and Devices II (8)**

Damir Isamov, Institute of Semiconductor Physics, Novosibirsk, Russia, Influence of ALD Synthesis Conditions on the Trap Density in Thin Films of Hafnium Oxide

Konstantin Egorov, Moscow Institute of Physics and Technology, Moscow, Russia, Plasma-Enhanced Atomic Layer Deposition of Oxygen Deficient TaOx Thin Films for Resistive Switching Memory Applications

Alexander Gilinsky, Institute of Semiconductor Physics, Novosibirsk, Russia, High Quality Molecular-beam Epitaxy InAlAs for UHF Photodiodes

Vyacheslav Timofeev, Rzhanov Institute of Semiconductor Physics, Novosibirsk, Russia, Morphology, Structure and Optical Properties of Semiconductor Films with GeSiSn Nanoislands and Strained Layers

Kirill Lozovoy, Tomsk State University, Tomsk, Russia, Comparative Analysis of Germanium Quantum Dots Growth on Si(100), Si(111) and Sn/Si(100) Surfaces

Emine Guneri, Erciyes University, Kayseri, Turkey The Structural, Optical and Electrical Properties of SnO<sub>2</sub> Nano thin Films Deposited By Spin Coating

Felipe Perez Rodriguez, Benemerita Universidad Autonoma de Puebla, Puebla, Mexico, Magnetic Response of Fe and Ni Nanoparticles Embedded in Artificial SiO<sub>2</sub> Opals

Arturo Rodríguez-Gómez, Universidad Nacional Autonoma de Mexico, Mexico, The auto-formation of silicon quantum dots embedded in a silicon nitride matrix on the surface of different substrates

## **Technology Innovations II (6):**

Nikolay Evseev, Tomsk State University, Tomsk, Russia, Technology of High-purity Aluminum Nitride Production by Self-propagating High-temperature Synthesis

Ruslan Gadirov, Tomsk State University, Tomsk, Russia, Inkjet Printing of Organic Materials and Devices

Grigoriy Kuleshov, Tomsk State University, Tomsk, Russia, Broadband Protective Coating to Reduce the Level of Electromagnetic Radiation of the Gigahertz Range Supplementary materials

Roman Malakhov, ZOOM, Tomsk, Russia, Distributed Road Traffic Monitoring Network

Rail Satarov, Tomsk State University, Tomsk, Russia, Positioning for People Behind Barriers in Real Time with System «DOZOR-400»

Vladimir Yurin, Tomsk State University, Tomsk, Russia, Multiwave Laser Cutting of Thin Glasses