



NANO-2019 SPINTECH + Humboldt Kolleg Conference



Academy of Sciences
of Moldova



D. Ghitu Institute of Electronic
Engineering and Nanotechnologies



Scientific Library (Institute) "A. Lupan"



Ministry of Education, Culture
and Research of Moldova

The event is dedicated to the 250th Birthday of Alexander von Humboldt,
10 year Anniversary of the Eastern European partnership,
and 5 years of The Moldova–European Union Association Agreement

NANO-2019: Limits of Nanoscience and Nanotechnologies

24-27 September 2019, Chisinau, Moldova
and

SPINTECH Summer school "S/F Hybrid Structures for Spintronics",
27-30 September 2019

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Organizing Committee

Prof. **Anatolie Sidorenko**, D. GHITU IEEN Chisinau, Moldova

Prof. **Alexander Golubov**, University of Twente, The Netherlands

Prof. **Vladimir Krasnov**, University of Stockholm, Sweden

Prof. **Marian Jaskula**, Jagiellonian University of Krakow, Poland

Prof. **Matthias Eschrig**, Institute of Physics, University of Greifswald,
Germany

Prof. **Eugen Sava**, National Museum of Moldova History, Chisinau,
Moldova

Dr. **Irina Obukhova**, Moscow Institute of Physics and Technology
(Fiztech), Russia

Dr. **Yurii Savva**, I.S. Turgenev Orel State University, Russia

Dr. **Oleg Bujor**, Scientific Library (Institute) "A. Lupan", Chisinau, Moldova

PROGRAM

Day 1, 23.09.2019

12:00-24:00 Arrival of participants, accommodation in the Hotel "KLASSIK" ("Hotel Club Service", str. Kogalniceanu nr. 6, MD-2001, Chisinau) and Hotel "Vila Verde" (str. Grenoble nr. 110, MD-2028, Chisinau)

12:00-19:00 Registration of participants in lobby of hotel "KLASSIK" and hotel "Vila Verde"

17:00-18:00 Working meeting of Presidents of National Humboldt-Clubs and Humboldt Ambassadors – goals and new forms of networking (conference hall of hotel KLASSIK).

19:00-21:00 Opening Reception (foyer of hotel KLASSIK).

Day 2, 24.09.2019

8:00-12:00 Registration of participants (foyer of library "A. Lupan")

9:00-12:30 Session 1: (library "A. Lupan"): Opening of the Conference, greeting talks:

- Anatolie Sidorenko, director of the Conference,
- Liliana Nicolaescu-Onofrei, Minister of education, culture and research of RM,
- Ion Tiginyanu, President of Academy of Sciences of Moldova,
- representatives of EU-commission and Embassies in Moldova.

9:30 Schulte Ortwin, Referatsleiter Gesundheit, Ständige Vertretung der Bundesrepublik Deutschland bei der Europäischen Union. **Erfahrungen aus der deutsch-moldauischen Zusammenarbeit im Gesundheitswesen** (Experience of German-Moldavian collaboration in area of medicine).

9:50 Prof. Keimer Bernhard, director of Max-Planck Institute-Stuttgart, Germany. **Spin and charge correlations in metal-oxide heterostructures.**

10:10 Prof. Bogusław Buszewski, Nicolaus Copernicus University Toruń, Poland. **Bioanalytics – from Micro to Nano dimension.**

10:30 Prof. Nikitov Sergei, director of Kotelnikov Institute of Radioelectronics, Moscow. **Magnonics – from Gigahertz to Terahertz.**

10:50 Prof. Levchenko Sergei, A.V. Luikov Heat and Mass Transfer Institute, National Academy of Sciences of Belarus, Minsk. **On the way to Smart Energy World.**

11:30-13:00 Lunch-break (foyer of library "A. Lupan")

14:00-17:00 External Session-2 and Round table discussion: **"Quo vadis, Nanotechnologies?"** Moderators Prof. Sergei Nikitov, Prof. Mikhail Zveryakov, Prof. Boguslaw Buszewski (in historical Complex "Cricovo" – underground vine-city).

17:00 Return to the hotels "KLASSIK" and "Vila Verde"

18:00 **Working meeting of the group "Functional Nanostructures Program"** (foyer of hotel "KLASSIK").

Day 3, 25.09.2019

9:00-13:00 Session 3 (library "A. Lupan"): Nano-bio-medicine and environment problems. Chair – Prof. Marian Jaskula, Prof. Vladimir Tishkov.

9:00 Prof. Tishkov Vladimir, Moscow State University. **Enzymes as Nanobiocatalysts: Structural Studies and Engineering.**

9:20 Prof. Wessel Niels, Humboldt-Universität zu Berlin. Cardiorespiratory interactions: **From the pulse respiration quotient via the respiratory sinus arrhythmia to the coordigram.**

9:40 Dr. Sidorenko Ludmila, Nicolae Testemitanu State University of Medicine and Pharmacy, Moldova. **Methods for Identification of Artificial Networks in the Central Nervous System based on Advanced Cardiorhythmogram Analysis.**

9:50 Dr. Amit Livneh, Technion, Haifa, Israel. **Assessing the Severity of Arterial Stenosis Towards Better Surveillance of Patients with Peripheral Arterial Disease by Noninvasive Means.**

10:00 Dr. Braniste Tudor, National Center for Materials Study and Testing, Technical University of Moldova. **The interaction between Endothelial Cells and Gallium Nitride nanoparticles.**

10:10 Dr. Pometun Anastasia, Bach Institute of Biochemistry, RAS, Moscow. **New artificial enzyme systems with cofactor regeneration step.**

10:20 Coffee break (foyer of library "A. Lupan")

10:50 Prof. Jaskula Marian, Jagiellonian University of Krakow, Poland. **Fabrication of nanostructured materials by anodic oxidation of metals.**

11:10 Dr. Alhumidi Adnan. Bundeswähr Krankenhaus Koblenz, Germany. **Electrosurgery in the hands of cardiac surgeons: a retrospective analysis of almost 4000 Patients over 16 years.**

11:20 Dr. Chepliaka Alexei, Vinnitsa Medical University, Ukraine. **Hydrophilic/hydrophobic nanocomposition for wound care and method of it manufacturing and use.**

11:30 Dr. Chornopyshchuk Roman, Vinnitsa Medical University, Ukraine. **Use of computer morphometry in the complex diagnostic program of patients with burn injuries.**

11:40 Prof. Abramov Vladimir, Institute of General and Inorganic Chemistry, Moscow. **Sol-Gel Method for Applying Nanosized Antibacterial Particles to the Surface of Textile Materials in Ultrasonic Field.**

12:00-13:30 **Poster session-1**, reports of young researchers (foyer of library "A. Lupan"). Chairs: Prof. Oleg Vlasenko, Prof. Niels Wessel, Prof. Marian Jaskula, selection of three best poster presentations.

13:30-14:30 Lunch-break (foyer of library "A. Lupan")

14:30-16:00 Session 4 (library "A. Lupan"): Qubits and Terahertz applications of Nanoscience. Chair Prof. Sergei Nikitov, Prof. Mihai Macovei.

14:30 Prof. Vakhrushev Alexandr, Head of Department "Modeling and Synthesis of Technological Structures" of Udmurt Federal Research Center of UD RAS, and Department "Nanotechnology and Microsystems", Kalashnikov State Technical University, Izhevsk, Russia. **Formation of Nanoelements in the Surface of Solids: Modeling, Experiment, Application.**

14:50 Prof. Macovei Mihai, director of Institute of Applied Physics, Moldova. **Quantum dynamics in optomechanical systems via collectively interacting artificial qubits.**

15:10 Prof. Sirkeli Vadim, Moldova State University. **Quantum Nanostructures For Terahertz Devices And Applications.**

15:30 Prof. Tronciu Vasile, Technical University of Moldova. **Theoretical studies of the dynamics of two section blue-violet semiconductor lasers.**

15:50 Coffee break (foyer of library "A. Lupan")

15:10 Prof. Arutyunov Konstantin, National Research University Higher School of Economics, Moscow. **Quantum Confinement Phenomena in Low Dimensional Superconductors.**

15:30 Dr. Reisinger Thomas, Institute of Nanotechnology KIT, Germany. **Magnetic properties of nanocomposite thin films prepared with size-selective cluster-ion beam deposition.**

15:45 Prof. Shevchenko Igor, Kiev State University, Ukraine. **Influence of solar energy on self-organization of water molecules.**

16:00-18:00 **Poster session-2**, reports of young researchers (foyer of library "A. Lupan"). Chairs: Prof. Sergei Levchenko, Prof. Vadim Sirkeli, Prof. Mihai Makovei – selection of three best poster presentations.

19:30 **Conference Gala-Dinner** (restaurant of hotel Vila Verde), Award of the best poster presentations.

Day 4, 26.09.2019

9:00-13:00 Session 5 (conference hall of hotel Vila Verde): Limits of nanoelectronics – towards Superconducting Spintronics. Chairs: Prof. Anatolie Sidorenko, Prof. Valery Vinokur

9:00 Prof. Lukyanchuk Igor, Université de Picardie Jules Verne – Pôle Scientifique, Amiens Cedex, France. **Domains and topologic defects in ferroelectrics and related functional materials.**

9:30 Prof. Vasenko Andrei, National Research University Higher School of Economics, Moscow. **Competitive "0" and " π " states in S/F/S trilayers: multimode approach.**

- 10:00 Dr. Fominov Yakov, L.D. Landau Institute for Theoretical Physics RAS, Chernogolovka, Russia. **Cooper pair splitting in magnetic SQUIDs.**
- 10:30 Prof. Miu Lucica, National Institute of Materials Physics, Magurele, Romania. **AC magnetic response of superconducting films and superlattices.**
- 11:00 Coffee break (foyer of hotel Vila Verde).
- 11:30 Prof. Sidorenco Anatolie, director of Institute of Electronic Engineering and Nanotechnologies, Moldova. **Superconductor/Ferromagnet Layered Nanostructures for Superconducting Spintronics.**
- 11:50 Dr. Beckmann Detlef, Institute of Nanotechnology KIT, Germany. **Spin-dependent thermoelectric effects in superconductor/ferromagnet hybrid structures.**
- 12:10 Dr. Bakursky Sergei, Moscow State University, Russia. **Quasiparticle imbalance effect on asymmetric Josephson stack.**
- 12:30 Prof. Nika Denis, State University of Moldova. **Phonons in twisted graphene.**
- 13:00-14:00 Lunch (hotel Vila Verde)
- 14:30-18:00 Session 5 (continuation, conference hall of hotel Vila Verde): Limits of nanoelectronics – towards superconducting spintronics. Chairs: Prof. Lucica Miu, Prof. Alexander Golubov.
- 14:30 Prof. Vinokur Valery, Argonne Distinguished Fellow, Argonne National Laboratory, USA. **Physics of Superconductor-Insulator Transition.**
- 15:00 Prof. Belzig Wolfgang, University of Konstanz, Germany. **Quantum geometry of topological Josephson matter.**
- 15:30 Dr. Khaydukov Yuri, Max-Planck Institute, Garching, Germany. **Polarized Neutron Reflectometry on superconducting/ferromagnetic superlattices.**
- 15:50 Dr. Golovchanskii Igor, Moscow Institute of Physics and Technology (Fiztech), Dolgoprudny, Russia. **Interplay of spin waves with the Meissner currents in ferromagnet/superconductor hybrids.**
- 16:10 Prof. Lupan Oleg. **Nanosensors on a single semiconducting oxide nanowire.**
- 16:30 Prof. Golubov Alexander, University of Twente, Enschede, Netherlands, and Moscow Institute of Physics and Technology (Fiztech), Dolgoprudny, Russia. **Introduction to the Physics of Superconductor/Ferromagnet hybrid structures.**
- 16:50 Coffee break (foyer of hotel Vila Verde).
- 17:00 Feed-back Session (conference hall of hotel Vila Verde) : summing-up of the main ideas presented in Sections 1-5. Chairs: Prof. Sergei Nikitov and Prof. Anatolie Sidorenko.
- 18:00 **Culture program.**

Day 5, 27.09.2019

- 9:00-11:00 Session 6 (conference hall of hotel Vila Verde): Nanoscience and society. Chairs: Prof. Tatiana Nikitina, Prof. Mikahil Zveryakov.
- 9:00 Prof. Zveryakov Mikhail, rector of Odessa university of economic. **Technological innovations and economic growth in the context of “digital capitalism”.**
- 9:30 Prof. Nikitina Tatyana, Staatliche Universität Ökonomie und Finanzen St. Petersburg, Russia. **Global financial architecture – problems of international monitoring.**
- 10:00 Prof. Petliutschenko Natalia, National University “Odessa Law Academy”, Odessa, Ukraine. **Servant of the people as a collective avatar of Zelensky’s charisma: phenomena of Ukraine’s 2019 electoral discourse.**
- 10:30 Closing remarks and summary of the Conference, Prof. Sidorenko Anatolie, Prof. Jaskula Marian.
- 11:30 Departure of the conference participants.

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**SPINTECH Summer school "S/F Hybrid Structures for Spintronics"
27-30 September 2019**

THE SCHOOL PROGRAM

Day 1, 27.09.2019

15:00-18:00 Opening of the school (conference hall of hotel KLASSIK). Moderator Prof. Sidorenko Anatolie.

- 1) Prof. Arutyunov Konstantin. **Fundamental Limitations and Future of Nanoelectronics.**
- 2) Prof. Klenov Nikolai. **Macroscopic quantum effects and their application in electronic devices.**
- 3) Prof. Krasnov Vladimir. **Superconducting supercomputer: challenges and solutions.**
- 4) Prof. Vasenko Andrei. **Andreev Reflection and Subgap Conductance in S/N and S/F proximity structures.**

Day 2, 28.09.2019

9:00-13:00 Morning session (conference hall of hotel KLASSIK). Moderator Prof. Golubov Alexander.

- 1) Prof. Belzig Wolfgang. **Quantum geometry of topological Josephson matter.**
- 2) Prof. Vinokur Valery. **Exotic Phases at Superconductor-Insulator Transition.**
- 3) Prof. Lukyanchuk Igor. **Ferroelectrics at the nanoscale.**
- 4) Dr. Fominov Yakov. **Superconducting spin valves and odd-frequency superconductivity.**

13:00 Lunch (hotel KLASSIK)

14:00-20:00 Excursion in Castle "Mimi" with wine tasting.

Day 3, 29.09.2019

9:00-11:00 Morning session (conference hall of hotel KLASSIK). Moderator Prof. Krasnov Vladimir.

- 1) Prof. Matthias Eschrig. **Triplet pairing in Superconductor/Ferromagnet layered hybrids.**
- 2) Prof. Vakhrushev Alexandr. **Modeling of formation processes of multilayer nanostructures for spintronics.**
- 3) Prof. Tagirov Lenar. **Superconducting spin-valves.**

11:00 Closing remarks, departure of the school participants.