



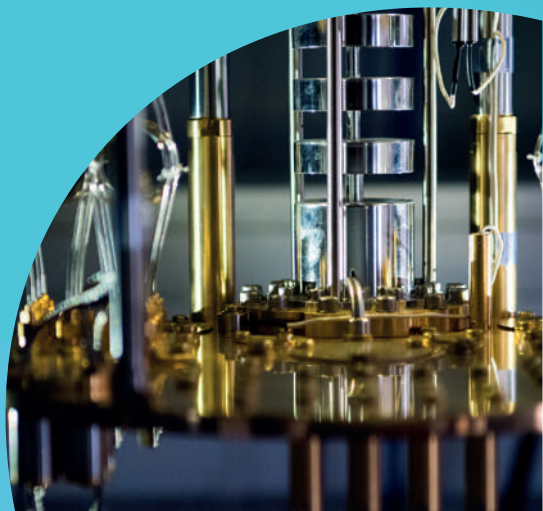
STRENGTHS OF THE INTERNATIONAL MASTER'S PROGRAM

Superconducting qubits,
circuits for quantum computing

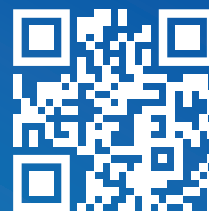
Advanced materials manufacturing
and characterization

Forecasting properties
of emerging materials

Single-electron devices – physics
and applications



CONTACT INFORMATION



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QUANTUM PHYSICS FOR ADVANCED MATERIALS ENGINEERING



PROFESSIONAL NAVIGATION AND ADMISSION DEPARTMENT



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2024

PROGRAM



Inspired by the works of Professor A.A. Abrikosov, the Nobel Prize winner, who held the Chair of the Department of Theoretical Physics from 1975 to 1990, we provide a training program, in modern Condensed Matter Physics and Materials Science which includes:

- ELECTRON THEORY OF METALS
- MODERN QUANTUM PHYSICS OF SOLIDS
- SPECTROSCOPIC METHODS FOR MATERIALS CHARACTERIZATION
- TECHNOLOGY AND MATERIALS OF QUANTUM ELECTRONICS
- PHYSICS OF LOW-DIMENSIONAL SYSTEMS
- QUANTUM CONFINED SEMICONDUCTOR HETEROSTRUCTURES
- PATH INTEGRAL METHODS IN CONDENSED MATTER PHYSICS
- QUANTUM ELECTRONIC PROPERTIES OF NANOSYSTEMS
- PHYSICS OF LIQUID CRYSTAL MEMBRANES

The new physical phenomena studied in our courses includes the effects of size quantization in low-dimensional structures, in particular, the quantum Hall effect, quantum charge fluctuations, the Coulomb blockade, the Landauer quantum conductance of the contacts of atomic size, the Wigner-Dyson statistics of electronic energy levels in nanoclusters, the Rabi oscillations in two-level systems, the spectra of quantum dots, wells and wires in an external magnetic field, and phonons in structurally complex solids.

SKILLS AND CAREER OPPORTUNITIES

Our graduates pursue challenging career opportunities in Solid State Physics and Materials Science, Soft Condensed Matter Physics, Biophysics and Nanometrology in Russia, European countries, USA and Canada.

FACULTY



Professor Sergey I. Mukhin PhD & DSc in Physics and Mathematics

Consultant at Los Alamos National Laboratory, USA. Guest professor at the Lorenz Institute for Theoretical Physics of Leiden University, Netherlands. Invited research scholar in NASA Projects in Basic Research, University of Maryland at College Park, USA. Former appointments: postdoctoral fellow at Kamerlingh Onnes Laboratory, Netherlands.



Professor Alexey A. Basharin Assoc. professor, PhD in Physics and Mathematics

Researcher at The Laboratory of Superconducting Metamaterials. Visiting Professor at Politecnico di Torino, Italy. Former Researcher at Institute Langevin, École supérieure de physique et de chimie industrielles (ESPCI), Paris, France. Postdoctoral fellow at Institute of Electronic Structure and Laser of FORTH (IESL-FORTH), Crete, Greece.



Professor Maksim P. Telenkov PhD in Physics and Mathematics

Senior researcher of P.N. Lebedev Physical Institute of the Russian Academy of Sciences, Member of methodological committee and jury of International Olympiad on Physics «Open Doors».



Professor Alexander V. Karpov DSc in Physics and Mathematics

Professor at NUST MISIS, Moscow, Visiting professor at Karlsruhe Institute of Technology. Former appointments: Senior Scientist at Caltech received NASA awards for developing and sending superconductive Terahertz detectors in space. PhD and DSc graduate of Sorbonne university group.

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