

Division: *Institute of Natural Sciences and Mathematics, Department of Physics of Nanoscale Systems*

Academic programme: *11.04.04 Electronics and Nanoelectronics, Nanoelectronics: Quantum Technologies and Materials*

Mode of study: *full-time*

Programme length: *2 years*

Programme level: *Master's degree*

Language of instruction: *Russian*

Programme description: *Nanotechnologies are the core of a new technological system and the material base for the development of digital technologies and artificial intelligence. The transition to the nanolevel in electronics means that ideas about the structure and principles of operation of electronic systems, based on the principles of classical physics, must be supplemented or replaced by the laws of quantum mechanics. In this academic programme, such transition is ensured by the fact that, along with modern courses on micro- and nanoelectronics, much attention is paid to electronic devices as quantum objects, their description by analytical and numerical methods, the use of achievements in condensed matter physics, quantum informatics and physics of nanoscale systems. Mastering this programme will create the basis for the demand for its graduates over the next decades.*

Main programme-specific classes:

- *Materials for Functional Electronics*
- *Solid-state Smart Sensors*
- *Digital Electronics Components*
- *Microprocessor-based Systems*
- *Quantum Static Methods of Nanoelectronics*
- *Non-conventional Materials for Solid-state Electronics*
- *Atomistic Modelling of Nanoelectronics Materials*
- *Quasi-classical Models of Electronic Devices*
- *Nanoelectronics in Biology and Medicine*
- *Quantum Information and Quantum Computing*
- *Radiation Technologies in Electronics*
- *Methods of Quantum Materials Science*
- *Low-dimensional Structure Electronics*
- *Physics of Nanoscale Systems*
- *Relevant Problems of Modern Electronics and Nanoelectronics*

- *Mathematical Modelling of Devices and Systems*
- *CAD in Electronics*
- *Introduction to Quantum Computing*

Programme manager: *Aleksandr A. Mirzoev, Doctor of Sciences (Physics and Mathematics), Professor, Professor at the Department of Physics of Nanoscale Systems*