**Abstract** оf the program “Nanoelectronics, spintronics and photonics”

**Direction:** 11.04.04 Electronics and nanoelectronics

**Required duration:** 2 years

**Eligibility requirements** Bachelor degree

**Qualification awarded upon graduation:** Master

**Graduating Institution**: Institute of nanotechnologies in nanoelectronics, spintronics and photonics (INTEL), the department of condensed matter physics

**Purpose of the program:** Getting higher education, which allows to work successfully in the field of activity aimed at theoretical and experimental research, mathematical and computer modeling, design, construction, technology of production of materials, components, electronic devices, solid, microwave, optical, micro - and nanoelectronics of various functional purposes, have the general cultural and professional competencies promoting his/her social mobility and firmness in the labor market.

**The area of professional activity: M**ethods and tools, aimed at theoretical and experimental research, mathematical and computer modeling, design and production technology for micro- and nano-electronic devices of various functional purposes; application of information technologies, computer-aided design systems, software systems for engineering analysis and computer engineering, technologies for developing digital prototypes based on virtual, digital three-dimensional models of the product and all its components, allowing to model any characteristics of the object in any conditions operation; project management, entrepreneurship in the field of high technologies; the organization of work of scientific, design and production units engaged in the development and design of new equipment and technologies, the introduction and application of science-intensive technologies.

**Objects of professional activity:** materials, components, electronic devices, installations, methods for their research, design and construction, technological production processes, diagnostic and technological equipment, mathematical models, algorithms for solving typical problems, modern software and information support for modeling and design of electronics and nanoelectronics products; information technology, nanotechnology.

**Competitive advantages of the program:** the relevance of disciplines under study and the high technological level of the experimental basis, the possibility of postgraduate work in areas that are extensively demanded at the present time: physics and technology of semiconductor electronic and optoelectronic devices (light-emitting diodes, photovoltaic cells, thin-film field-effect transistors, memory elements, etc.). Research practices taught by successful acting scientists.

**The academic plan** is based on the knowledge gained in the bachelor's degree. Profile disciplines: Physics of Nanosystems, Physics and Technology of Micro and Nanoelectronics Devices, Quantum Informatics, Experimental Methods of Condensed State Physics, Molecular beam epitaxy physics and technology, and Information Security, Computer Technologies, ets.

**Organizations for the practice and employment of graduates**: The Institution of Functional Nuclear Electronics NRNU MEPhI, scientific centers and industrial companies, Institutions of the Academy of Sciences.