Laser photonics, electronics and engineering of nanosystems

National Research Nuclear University MEPhI (Moscow Engineering Physics Institute)

Degree or qualification is awarded: **Master degree**

Language of study: **Russian**
Mode of study: **full-time**
Duration: **2 years**
Availability of free education: **yes**
Price: **196 820 rubles per semester**

Programme curator: **Alexander A. Chistyakov**
Tel.: **Contact name: Olga N. Petukhova, Phone number. +74957885699, ext. 8045.**
E-mail: ONPetukhova@mephi.ru

Goals of the program "Laser photonics, electronics and engineering of nanosystems": Training of masters, able to work successfully in the field of scientific research, design, production technology and expert activities related to the fundamental and applied aspects of physics of nanostuctures and nanophotonics, organic electronics and sensor nano-hybrid systems, and nuclear physics in relation to the problems of security of the State, a highly and selective detection in the field of ecology, biology and medicine.

Characteristics of the scope and objects of professional activity of future graduates: Research, development and technology in the field of condensed matter, the study of non-equilibrium physical processes of distribution and interaction of radiation with objects of animate and inanimate nature, processes initiated in nanostructures, the creation and use devices and systems for the study of micro- and nano-structured materials, including photoprocesses at nanoscale, the development of advanced methods and tools for highly sensitive analysis of air and surface phase with use and creation of semiconducting organic and hybrid nanomaterials.

Objects of the professional activity: Semiconductor, organic and hybrid nanomaterials, semiconductor nanoparticles, organic solar cells and LEDs, photonic crystals, thin films, nanopowders, sensors and sensor elements microcavities; development and application of systems based on them and their application to solving problems in the field of medicine, biology, safety and ecology.

Brief description of the curriculum

Curriculum Masters, along with the mandatory basic training includes courses on choice - the unique author's courses "Organic nanoelectronics", "Nanophotonics", "Biophotonics", "Physics and sensor technology", "Modern problems of micro- and nanosystems" "Modern methods of analysis", "Physical methods of special instrumentation". Part of the curriculum is also implemented in English.

Modules

1. Basic Module (basic training in the humanities, natural sciences, and general professional disciplines for all-round development of the personality).
2. Professional Module (special courses for mastering the basics of the profession).

The base of industrial and/or scientific practice and employment: Research Institute of special equipment, the State Research Center 'Institute of High Energy Physics "(Protvino), Institute of General Physics, Russian Academy of Sciences, Research Institute" Polyus ", Federal State Unitary Enterprise" Research Institute of Biological Instrument ", Microtechnology and diagnostics Center of the St. Petersburg State Technical University" LETI", Research Center "Kurchatov Institute". The Department is the base for the interdepartmental Laboratories of nano bioengineering MEPhI, works closely with the Technology Center MIET, Technical Institute of non-destructive testing MIREA. For undergraduates there is a direct opportunity to pass practice at the Universities of Nantes, Reims, Strasbourg, Dublin, San Sebastian. Graduates of the department of "Physics of micro- and nanosystems" work in leading research centers in the country and abroad (USA, Germany, France, UK and so on).

Specializations within this programme

Objects of the professional activity

Semiconductor, organic and hybrid nanomaterials, semiconductor nanoparticles, organic solar cells and LEDs, photonic crystals, thin films, nanopowders, sensors and sensor elements microcavities; development and application of systems based on them and their application to solving problems in the field of medicine, biology, safety and ecology.