

# Advanced semiconductor lasers and technology

## National Research Nuclear University MEPhI (Moscow Engineering Physics Institute)

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

Language of study: **Russian, English**

Mode of study: **full-time**

Duration: **2 years**

Availability of free education: **yes**

Price: **178 750 rubles per semester**

Programme webpage at the university website:

[http://eis.mephi.ru/AccGateway/index.aspx?report\\_url=/Accreditation/program\\_annotation&report\\_param\\_pid=273](http://eis.mephi.ru/AccGateway/index.aspx?report_url=/Accreditation/program_annotation&report_param_pid=273)

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**Basic department:** "Department of Semiconducting Quantum Electronics and Biophotonics" (No. 88)

**The aim of the program:** The goal of the program is to train highly qualified personnel capable of working in both research laboratories and the industrial sector, solving various problems in the field of quantum electronics, photonics, and the interaction of radiation with matter, semiconductor laser components and devices.

**The area of professional activity:** laser physics, semiconductor physics, optics, interaction of radiation with matter, plasma physics, laser fusion, physics of condensed matter, physics of fast processes, and control systems so on.

**The objects of professional activity:** The curriculum is organized so that the graduates obtain a wide spectrum of competences allowing them to perform the basic research and solve applied problems in the fields of laser physics, physics of semiconductors, solid state, plasma, fast processes, interaction of radiation with matter, and applications of laser and semiconductor devices in electronics, biomedicine, and other areas.

**Features of the curriculum:** A feature of the educational process on the program is a logical and mutually complemented combination of theoretical and experimental courses with practical exercises on the production technology. An individual approach in masters teaching, taking into account student level of training, characteristics and propensity to research activity widely used. Students can perform research in the laboratories of MEPhI, LPI RAS, and other institutes of the Russian Academy of Sciences, State Corporation "Rosatom" and State Corporation "Rostec". Short-term training are practiced. Students have the opportunity of learning in university-partner: joint educational programs, research and graduation work.

**Graduates of the department** "Semiconductor quantum electronics and biophotonics" have the opportunity to work in the leading scientific centers of the Russian Federation and abroad, graduates are demanded at the leading enterprises of high-tech sectors of Russian industry.

**The list of enterprises for practice and employment of graduates:** Basic organizations - P.N. Lebedev Physical Institute of the Russian Academy of Sciences (LPI RAS), RPE "Inject" (Saratov, Russia), and other institutions and laboratories of RAS performing research in the same field in collaboration with European and American universities and scientific companies.

This program has been certified by FEANI (Federation of professional engineers that unites national engineering associations from 33 European Higher Education Area (EHEA) countries).

## **Specializations within this programme**

### **Nuclear Physics and Technologies**

The objects of professional activity of the graduates include the high-power diode lasers and arrays, for pumping of solid state and gas lasers; direct material processing by action of semiconductor laser radiation, diode lasers for wide range of fiber optic systems, laser medicine, navigation, ranging, and other applications. Technological foundation to create the laser pumping system of solid state active elements of high-power laser system of laser thermonuclear synthesis, as well as solid state lasers with diode pumping.