

# Energy efficient, additive fabrication and hybrid laser technology

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: **155 610 rubles per semester**

Programme curator: **Sergey V. Kireev**

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**Basic department:** Laser Physics (No. 37), Sergey V. Kireyev , Professor, Ph.D., Professor of the Department of Laser Physics, e-mail: [svkireyev@mephi.ru](mailto:svkireyev@mephi.ru)

**The program aim** is to obtain the highest-depth vocational training allows graduates to work successfully in the field of activities related to laser technique, research and development of lasers, laser applications for technical and diagnostic problems, in information processing systems. Graduates will have universal competences, contributes to their social mobility and demand in the labor market.

**Area of professional activity:** research aimed at the development of the theory, the designing and application of lasers and laser systems, both for distance and high-precision measurements and diagnostics, as well as for the development and use of new efficient laser technology, including additive fabrication and hybrid technologies.

**Objects of professional activity:** lasers, laser processing tasks and arrangements , the use of lasers in the field of medical physics, biophysics, condensed matter physics, physics of fast processes, information and diffractive optics, remote and high-precision measurements and diagnostics, mathematical models of theoretical and experimental studies of phenomena and laws in the field of laser physics and technology, propagation and interaction of laser light with matter and biological objects, environmental monitoring.

## **Educational plan:**

The main feature of the educational process of preparation is the fundamental physical and mathematical and engineering training in the main basic and special disciplines related to lasers and interaction of laser light with matter, optics, laser technique and laser technology. The research work of students is carried out in close connection with work carried out at the department and research organizations NTO "IRE-Polus", "Laser Center" MEPhI, institutes of the Russian Academy of Sciences and industry organizations .

Graduates of the department are trained for a wide range of problems in the first place, such as the development and construction of:

- Lasers and laser processing arrangements;
- High-precision laser measurement and diagnostic systems;
- Programs for data processing and storage, as well as to simulate physics-cal processes and the various devices;
- Automated control systems;
- Systems of optical information processing.

Part of the curriculum is also implemented in English.

**The list of enterprises for practice and employment of graduates:** Russian research centers, NTO "IRE-Polus", Institute of the Academy of Sciences.

## **Specializations within this programme**

### **Laser technique and laser technology**

Objects of professional activity: lasers, laser processing tasks, the use of lasers in the field of medical physics, biophysics, condensed matter physics, physics of fast processes, information and diffractive optics, remote and high-precision measurements and diagnostics, mathematical models of theoretical and experimental studies of phenomena and laws in the field of laser physics, propagation and interaction of laser light with objects animate and inanimate nature, environmental monitoring.