

Prospective laser and plasma systems and radio photonics

National Research Nuclear University MEPhI (Moscow Engineering Physics Institute)

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

Language of study: **Russian**

Mode of study: **full-time, part-time**

Duration: **4 years**

Availability of free education: **yes**

Price: **316 290 rubles per semester**

Programme webpage at the university website:

http://eis.mephi.ru/AccGateway/index.aspx?report_url=/Accreditation/program_annotation&report_param_pid=61

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Field of study: "Nuclear Physics and Technologies".

Duration of training: 4 years, 240 credits.

Course delivery language: russian & english.

Basic department: Plasma Physics (No. 21).

The program of continuous training: Bachelor's Degree – Master of Science – Post Graduate.

Aim of the program: training in the fields of plasma physics; gas discharge physics; engineering of devices for plasma production, confinement, and diagnostics; plasma technologies; and mathematical simulation of plasma phenomena.

Program manager: V. A. Kurnaev, the Head of the Plasma Physics Department of MEPhI, Doctor of Science (Physics and Mathematics), Professor, Russian Federation Government Prize Laureate (2010).

The Bachelor's Program includes profound study of physics and mathematics and gives knowledge and experience necessary for work both at research centers and industrial enterprises (of Rosatom, the Ministry of Defense, the Russian Academy of Sciences, etc.) and at small high-tech firms associated with designing, development, and adjustment of equipment that utilize plasma. The Bachelor's Program curriculum is formed in such a way that students, in addition to theoretical knowledge, gain experience in operation of modern facilities and equipment, as well as skills in designing devices and systems. This is achieved by combination of various disciplines. The program includes designing of an instrument or a new installation using modern computer packages SOLID WORK, INVENTOR, AUTOCAD, KATIA, and KOMPAS-3D. The program also includes lectures and seminars on modern vacuum plasma system technology and plasma installations, with give knowledge and experience in operation and development of various vacuum and plasma systems. Lectures on plasma chemistry and the spectral methods for studying plasmas add knowledge on processes in plasma and plasma diagnostics. Laboratory works on "Physics of Low Temperature Plasma" and "Hot Plasma and Fusion" give practice in operation of vacuum and plasma facilities, as well as experience in plasma physics experiments. The course "Safety of Works on Electric Installations" helps to learn measures necessary for protection of human health when working with electricity and a high voltage. Particular attention is paid to computer simulation of plasma processes and the basics of automation of experimental facilities. Additional English training is also included in the educational process; it comprises technical translation and seminars in English.

Research work can be performed in various branches of physics ranging from astrophysics to plasma nanotechnology. Experiments, theoretical studies, computer simulation, and technology development are performed by students. There is also a broad academic and scientific cooperation with leading national institutions, including State Atomic Energy Corporation "Rosatom" and the Russian Academy of Sciences, as well as with foreign institutions in Germany, Italy, Kazakhstan, China, Poland, the United States, France, Sweden, and Japan.

The professional activity sphere of graduates after their completion of the "Plasma Physics" program is related to

research works, designing, development of technologies, and production in the fields related to plasma science and technology, as well as to organizational and managerial activities at institutions of the State Atomic Energy Corporation "Rosatom" (e.g., Dukhov All-Russia Research Institute of Automatics, Moscow; Russian Federal Nuclear Center – All-Russia Research Institute of Experimental Physics, Sarov) and the Russian Academy of Sciences (Prokhorov Institute of General Physics, Lebedev Physical Institute, Joint Institute for High Temperatures, Space Research Institute, Institute for Problems in Mechanics, etc.).

Specializations within this programme

Nuclear Physics and Technologies

Objects of professional activity: Charged particles and plasma, fusion reactors, nuclear reactor materials, development of plasma physics facilities, devices and facilities for registration of plasma-emitted radiation, plasma technologies in medicine, nanomaterials and nanotechnologies; mathematical models for theoretical, experimental and applied studies of phenomena and patterns in the field of plasma and fusion reactors.