

Particle Physics and Cosmology

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**

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=69

Programme curator: **Mikhail D. Skorokhvatov**

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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: Elementary Particle Physics (No. 40).

The purpose of the program is the training of bachelors possessing knowledge in the foundations of nuclear physics, particle physics and cosmology, being able to take part in research work on (I) improvement of the experimental techniques in the field of nuclear and particle physics, preparation and carrying out of experiments in this field, analysis and interpretation of its results; and (II) solution of fundamental problems of astrophysics, cosmology and particle physics, connected with description of the early Universe, dark matter, dark energy, etc.

Program manager: M. D. Skorokhvatov, Professor, Doctor of Science (Phys.– Math.), Head of Department No. 40.

Brief characteristics of the curriculum, features of the educational process, basic fundamental and special disciplines. The curriculum includes more than 60 courses, including elective ones, which provide fundamental training in physics and mathematics, as well as basic theoretical and practical grounding in nuclear and particle physics. A student can choose the direction of training focused on accelerator experiments (e.g., at the Large Hadron Collider) or cosmology. In the context of the first direction, students study experimental techniques, particle detectors, electronics, and methods of measurements, as well as methods for computer-aided processing and analysis of experimental data. In the context of the second direction, basics of the relativistic quantum mechanics, astrophysics, and cosmology are studied.

Characteristics of the field and objects of the professional activity of expected graduates: Training of bachelors is focused on their research work in the field of basic particle physics and cosmology. Graduates may participate in preparation and carrying out of particle physics experiments, in particular, in creation and use of particle and radiation detectors, as well as in analysis of experimental data. They also can take part in theoretical predictions and interpretation of experiments in high-energy physics (experiments at accelerators and in astrophysics). Graduates may work at the MEPhI, Research Center "Kurchatov Institute", Joint Institute for Nuclear Research (Dubna), Institute for High Energy Physics (Protvino), Alikhanov Institute for Theoretical and Experimental Physics, Lebedev Physical Institute of the Russian Academy of Sciences, the European Organization for Nuclear Research CERN (Switzerland), DESY (Germany), etc. In addition, graduates can enter the master's school.

Specializations within this programme