



National Research Nuclear University MEPhI
(Moscow Engineering Physics Institute)

Institute of Nuclear Physics and Engineering

Particle Physics and Cosmology

Direction: **14.03.02 Nuclear Physics and Technologies**

Certificate, degree or qualification: **Bachelor degree**

Language of instruction: **English**

Duration and mode of study: **4 years, full-time**

Program curator: **Mikhail D. Skorokhvatov**

Graduation department: Department of Elementary Particle Physics (# 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. Graduates from the program work, first of all, at enterprises and institutions of the nuclear industry and related fields, including principal institutes of the Russian Academy of Sciences, organizations of applied researches and design.

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.