



National Research Nuclear University MEPhI
(Moscow Engineering Physics Institute)

Institute of Nuclear Physics and Engineering

Nuclear and particle physics

Direction: **03.06.01 Physics and Astronomy**

Scientific specialty: **01.04.16 Nuclear and particle physics**

Program: **Nuclear and particle physics**

Certificate, degree or qualification: **Researcher, Lecturer-researcher**

Language of instruction: **English**

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

Program curator: **Konstantin Belotsky**

Graduation department: Department of Experimental Nuclear Physics and Cosmophysics (#7); Department of Experimental Methods of Nuclear Physics (#11); Department of Elementary Particle Physics (#40); Scientific and educational center NEVOD (607)

The purpose of the program is the training of highly qualified specialists familiar with the experimental nuclear and particles physics, capable of carrying out scientific research for exploration of fundamental properties of matter, nuclear interactions, interactions of particles beams with nuclei at low, middle and high energies, neutrino physics, understanding of nuclear processes in astrophysics and high energy cosmic ray physics, including its preparation for specific scientific task and carrying out it, interpretation their results (data analysis)

Area of professional activity: the training of PhD-students is focused on their research work in the field of neutron physics, processes in nuclear physics, neutrino physics, astrophysics, origin of elemental abundances in Universe and cosmic ray physics. PhD-students can participate in the preparation and carrying out of various experiments in nuclear and neutrino physics and cosmic rays, including physical analysis. Also they can develop new methods and design new experimental devices to study nuclear phenomena, neutrino and cosmic ray physics.

Objects of professional activity: Fundamental experimental and theoretical research in the field of structure and properties of atomic nuclei and subatomic objects and phenomena, neutron physics, weak and electromagnetic processes in nuclear physics, neutrino physics, nuclear astrophysics and cosmic ray physics, nuclear methods of solar-terrestrial physics, developing nuclear physics instrumentation, particle accelerators. The main feature of the professional activity of the PhD students and graduates is to study the fundamentals of the matter structure and the development of practical applications of nuclear physics.

Features of the curriculum

The curriculum, in addition to the mandatory humanities, contains special courses:

- "Cosmology and Nuclear Cosmophysics" which introduces to the modern state of the knowledge about the evolution and structure of the Universe, the physics of stars and their evolution, cosmic ray physics;
- "Nuclear and Particle Physics" which introduces to the current state of research in the nuclear and elementary particles physics, neutrino physics;
- "Experimental methods" which introduces to modern methods and tools of more important experimental research in the field of nuclear physics and cosmic rays.

PhD-students have the opportunity to choose the direction of training, focused on experimental or theoretical research, data analysis.

List of enterprises for practical training: Moscow Engineering Physics Institute, the Russian Academy of Sciences (Lebedev Physical Institute, Space Research Institute, and Institute for Nuclear Research), Research Center "Kurchatov Institute", an international laboratory of Gran-Sasso (Italy), National institute of nuclear physics (Italy), the International Centre for Particle Physics CERN (Switzerland), JINR (Dubna), LPI, Alikhanov Institute for Theoretical and Experimental Physics, Research and Production Corporation "Space Monitoring Systems, Information & Control and Electromechanical Complexes" named after A.G. Iosifian and others