

Plasma Physics

National Research Nuclear University MEPhI (Moscow Engineering Physics Institute)

Degree or qualification is awarded: **Researcher. Lecturer-researcher**

Language of study: **Russian, English**

Mode of study: **full-time**

Duration: **4 years**

Availability of free education: **yes**

Price: **325 000 rubles per year**

Programme curator: **Valeriy A. Kurnaev**

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Basic department: Plasma physics (№ 21)

Goals of the Program

Training in the field of controlled fusion, gas discharge, plasma diagnostics, plasma technologies and mathematical simulation of plasma phenomena, plasma-surface interaction and physics of fast plasma processes.

The program is aimed at solving the tasks of fundamental and applied science, such as:

- highest qualification staff training for domestic fusion program and international project ITER;
- highest qualification staff training for academic institutes and centers engaged in studies of plasma and plasma-like media in extreme states, in space and in laboratory conditions;
- highest qualification staff training for innovative technological applications of plasma in manufacturing, ecology and medicine

Characteristics of the scope and objects of professional activity of future graduates

Hot plasma and controlled fusion with magnetic confinement including participation in ITER project; inertial fusion; interaction of ions and plasma with matter; gas discharge plasma and its application in lasers, ecology and medicine; development of the newest ion-plasma technologies; astrophysical plasma; studies of plasma effects in atmosphere and condensed media; computer simulations of complex physical phenomena; methods of plasma diagnostics and processing of high-density data flows.

Objects of the professional activity

Hot plasma and controlled fusion with magnetic confinement; inertial fusion (as a part of research groups of the leading centers and institutes of Russian Federation in this field; studies and development of gas discharge plasma and its application in lasers, ecology and medicine; development of ion-plasma technologies for modification of materials and items; participation in research of plasma phenomena in space, atmosphere and condensed media; computer simulation of complex physical phenomena; development and application of various methods of plasma diagnostics.

Brief description of the curriculum

The curriculum allows to train modern specialists in the field of nuclear physics. The program stimulates PhD students for independent scientific research work at high professional level with self-appraisal of results. Practical application of obtained results is the focus of the program. Special attention is given to research work. This allows students to practice in compiling the literature overview in the research field, modeling of physical phenomena with standard software suits, experimental work, analysis of obtained results, preparing scientific publications, patent research. The curriculum includes:

- specialized programs for PhD students, individual studying plans, academical mobility.
- participation in research and teaching together with leading specialists in the field, practical work of PhD

- students in scientific groups of various organizations;
- competitive selection of PhD students and help in their employment in Russian scientific centers, State Atomic Energy Corporation “Rosatom”, and others;
- broad academic and scientific collaboration with both domestic (Rosatom, Russian Academy of Sciences) and foreign (Belgium, Germany, Kazakhstan, USA, France, Sweden, Japan, etc) institutes.

The base of industrial and/or scientific practice and employment

NRC “Kurchatov Institute”, State Atomic Energy Corporation ‘Rosatom’: Russian Federal Nuclear Center, TRINITY, ITER, Federal Agency of Scientific Organizations: General Physics Institute of Russian Academy of Sciences, Physical Institute of Russian Academy of Sciences, Joint Institute for High Temperatures of Russian Academy of Sciences, Space Research Institute of Russian Academy of Sciences, Institute of Applied Mathematics of Russian Academy of Sciences.

Programme manager: V.A. Kurnaev – The head of the Plasma Physics Department of MEPhI, Doctor of Science in physics and mathematics, Professor, Russian Federation Government Prize Laureate (2010).

Specializations within this programme