

# Condensed matter physics

National Research Nuclear University MEPhI (Moscow Engineering Physics Institute)

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

Language of study: **Russian, English**

Mode of study: **full-time**

Duration: **4 years**

Availability of free education: **yes**

Price: **155 000 rubles per semester**

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Place of education:

- **Obninsk Institute for Nuclear Power Engineering**

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## **Goals of the Program:**

Research and teaching activities in condensed matter physics, laser and ion-plasma methods of modification of ceramics and composite materials, nano-materials.

## **Characteristics of the scope and objects of professional activity of future graduates:**

Structural studies: X-ray and neutron diffractometry, vibrational spectroscopy, laser and beam technologies in material science: nonequilibrium metastable states in solids, induced by ion and laser beams; radiation damage of dielectrics, including ceramics and nano-structured materials; physical principles of sensors for radiation, thermal and electromagnetic fields.

## **Objects of the professional activity:**

- New composite materials: production, processing, application;
- High-temperature ceramic and polymer composite materials, products made of polymer composites;
- Technologies for obtaining high-strength heat-resistant glasses for aviation and space technology;
- Photonics materials: nonlinear optical phenomena in fiber systems, energy conversion processes in optical materials

## **Brief description of the curriculum:**

The main attention is paid to the structural studies, the interaction of ionizing radiation with condensed matter, the radiation methods of modification of metal alloys, amorphous and ceramic materials, nanomaterials, radiation photonics problems. The PhD theses have fundamental and applied orientations and free innovative modern approaches in materials science.

## **Modules:**

Modules in the curriculum are in preparation for the Ph.D. examinations in foreign language, history and philosophy of science and specialty (professional module). The professional module consists of research work, teaching practice and disciplines on solid state physics, beam and plasma methods of material modification.

## **Specializations within this programme**