

12.04.03 Photonics and Optical Informatics

Photonics and Solid State Physics

Program objectives

training specialists in condensed matter physics, including solid state physics, physics of superconductivity, physics of semiconducting devices, physics of nanostructures, laser physics, spintronics, photonics.

Key subject and disciplines

- Condensed matter experimental physics
- Experimental methods in superconductivity physics
- Phase changes in condensed matter physics
- Topical challenges of solid state physics
- workshops on radiation-matter interaction, superconductivity physics, low temperature engineering, and computer science.

All of them provide an overview of the latest situation in different experimental research methods, such as neutron, synchrotron, x-ray ones and others.

Practical training, external expertise and future employment opportunities

- leading Russian companies and research centers
- State Corporation ROSATOM
- National Research Centre “Kurchatov Institute”
- Laser and Plasma Institute of the Russian Academy of Sciences
- General Physics Institute of the Russian Academy of Sciences
- Federal Research Centre “Crystallography and Photonics” of the Russian Academy of Sciences
- Joint Institute for High Temperatures of the Russian Academy of Sciences
- Institute of Solid State Physics of the Russian Academy of Sciences
- Institute of Radioengineering and Electronics of the Russian Academy of Sciences
- Ioffe Institute.

Research areas and expertise:

- Application and development of synchrotron methods for solving current problems of physics and technologies of condensed media;
- Laser fusion of functional materials and multilayer structures;
- Theoretical basis for non-linear optics of metamaterials and low dimensional systems;
- Quantum modeling of condensed media;
- Energy-saving technologies of energetics with applying high-temperature superconductors;
- Shape-memory alloys: functional materials and micromechanical devices.