

03.06.01 Physics and Astronomy

Laser Physics

In recent years, with the development of plasma-chemical and other technologies, it has become possible to synthesize either known forms of carbon, for example, diamond, with superior or new properties and at a lower cost, or to create previously unknown optical carbon materials. They are usually called new carbon materials and include, first of all, synthetic poly and single-crystal CVD diamond films and plates, single-wall carbon nanotubes, graphene and nanodiamond.

Such research has been booming in recent years, with hundreds of scientific publications every year, while industrial production and applications are just expanding. New carbon materials have the most promising prospects for practical use as elements and devices in electronics, photonics, mechanical engineering, and medical technology. It was demonstrated that laser radiation is a unique tool for micro and nanostructuring, modification of the properties of such materials.

All this leads to the need for training highly qualified personnel capable of synthesizing various carbon materials and structures by various methods, processing them with laser radiation, as well as subsequent diagnostics by optical and electron microscopic methods.

Key research areas: Synthesis, laser diagnostics and processing of new carbon materials (poly- and single-crystal CVD diamond films and plates, single-wall carbon nanotubes and graphene) and structures based on them.

Practical training and job opportunities

- Prokhorov General Physics Institute, Lebedev Institute of Physics and other institutes of the Russian Academy of Sciences
- leading research universities and medical centers