

03.06.01 Physics and Astronomy

Chemical Physics, Combustion and Explosion, Physics of Extreme States of Matter

Graduation department: Chemical Physics Department (№4).

The Department was found in 1951. Nikolay N. Semenov, the Nobel Prize laureate, became its founder and first Head. The department has more than 50 years of experience in educational and research activities with the participation of employees of leading research organizations.

Program objectives

- training professionals with deep physical and mathematical training and fundamental knowledge in the field of chemical physics, combustion and explosion, physics of extreme states of matter, industrial safety and ecology;
- developing the ability to solve a wide range of problems in the physics of fast-flowing processes, extreme states of matter at high pressures and temperatures, monitoring the safety of industrial facilities and the environment
- developing methods for computer modeling and forecasting the consequences of man-made accidents and catastrophes.

Research areas

- risk analysis and predictive modelling of consequences of man-made accidents and natural disasters
- combustion, shock waves, detonation
- theoretical and experimental research on physical and chemical reactions in fluid, gas and solid
- theoretical research on wide-range equations of state for fluid mixtures, condensed and nanodispersed matter and materials, products of combustion and detonation of chemical energetic
- supercomputer modelling, Monte Carlo and molecular dynamics simulation for thermodynamic properties of matter at extreme temperature and pressure.

Career opportunities

leading Russian and foreign research centers and companies specializing in research software.