

## **Brief Description of the Program**

### **Career**

Physics is the most fundamental branch of the science of nature. The achievements of modern physics are so significant that they cannot but arouse admiration. Microelectronics and personal computers, lasers, controlled thermonuclear fusion, holography, high-temperature superconductivity - this is far from exhaustive list of applications of the achievements of physics of recent decades.

A physicist studies the nature around us, namely physical bodies and physical phenomena. The essence of the work is the verification of logical conclusions by experiment.

Within the framework of the profession of a physicist there are many specializations, which are distinguished by the objects of study, for example, space physics, microworld physics, mechanics and thermodynamics, optics and electronics, and others. Experimental and theoretical physics are distinguished by the used research methods.

Experimental physicists not only observe real phenomena occurring in nature, but also model them themselves, they conduct special experiments to prove some scientific facts or some aspects of a physical phenomenon.

Theoretical physicists use mathematical methods to formulate general physical principles and concepts. They conduct their work in three main areas: obtaining quantitative relationships between the observed values, discussion and theoretical calculation of physical experiments and creation of adequate methods for mathematical description of nature.

### **Educational process**

In the first year of study, students are intensively immersed in the profession, they receive excellent knowledge in the field of condensed matter physics, quantum theory, and physics of semiconductors and dielectrics. TSU students have a unique opportunity to undergo educational, research and production and pre-diploma practical trainings at the Research Institute "Nanotechnologies and Nanomaterials" of the TSU named after G.R. Derzhavin. Training sessions are conducted by highly qualified professors who have a doctoral degree. Multimedia equipment is widely used in the educational process. Laboratory work is performed on modern automated installations. Students are actively involved in conferences at various levels.

### **Disciplines**

- ✓ Physics of Dielectrics and Semiconductors
- ✓ Condensed Matter Physics
- ✓ Physics of Metals and Alloys
- ✓ Physical Materials Science
- ✓ Radiation Physics
- ✓ Optoelectronics
- ✓ Physics of Strength and Plasticity
- ✓ Nanostructures and Nanotechnologies
- ✓ Physics and Methods for Studying Surface Phenomena
- ✓ Power Nanotesting

### **Practical training**

Each year, students undergo practical trainings in schools, industrial enterprises, factories, research institutes, where they develop their analytical skills, rational thinking, and logic, and acquire necessary experience operating high-tech equipment.

### **Career**

After completing the educational program, graduates will be able to work as research scientists at research and production enterprises and at research institutes in the areas of condensed matter physics and medical physics; they will also be able to work as teachers in higher and secondary special educational institutions.