

Nanophotonic Devices

National Research Tomsk State University

Degree or qualification is awarded: **Master's degree**

Language of study: **Russian**

Mode of study: **full-time**

Duration: **2 years**

Availability of free education: **no**

Price: **201 500 RUB per year**

Programme webpage at the university website: http://tsu.ru/education/magistratura/magisterskie_programmy.php

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Fundamental grounding in the physics of interaction of electromagnetic radiation in the range from ultraviolet to radio waves with different substances gives deep insight into operating principles of devices and facilities of Nano-photonics that generate, amplify, modulate and detect optical signals and allows one to develop new fabrication techniques and constructions of wide range of optical devices.

Programme contents

Nano-photonics is the branch of photonics that examine physical processes taking place during interaction of photons with the Nano-metric objects. These objects are Nano-dimensional inclusions such as quantum wells, wires and dots. These structures with the reduced dimension are widely used in designing of new devices of photo-electronics (photosensitive elements of photo-detectors), photo-voltaics (solar cells) and emitting devices (light emission diodes and lasers).

Program includes aspects of technology, issues of fundamental investigations of nanoheterostructures properties, as well as their diagnostics and device application. Using of nanoheterostructures dramatically changes characteristics of existing devices, making base for the current photonics. Recombination time and quantum efficiency of photo-detectors alter significantly along with the widening of spectral range of absorption and emission. It also makes possible localization of recombining charge carriers and of radiation from emitting structures and increase in internal and external quantum efficiency. All these allow researchers to find breakthrough technologies of creation of new elements for nano-photonics and to considerably change characteristics of modern devices of photonics, optoelectronics and photo-voltaics.

Graduates also acquire knowledge in development of computational systems ensuring informational support and automation of diagnostic complexes for different purposes using methods of programming with high-level languages.

Career.

Area of graduate's professional interests:

- Development of nanotechnologies and design of elements of nano-photonics.
- Investigation of characteristics of nano-materials, device-oriented nanostructures and equipment.
- Computational modeling of physical processes in nanostructures.
- Application of developed technologies in producing of effective devices of nano-photonics.
- Graduates of this Master's program will be called-for by telecommunications agencies, educational, research and scientific production organizations, as well as by enterprises dealing with innovative activities.

Admission.

The admission to the program is carried out on the competitive program on the basis of the entrance examinations: an examination in the direction of preparation and an interview.

Specializations within this programme