



Southern Federal University

You're about to discover a very special place!

A leading Educational and Research Center is waiting for new, prospective and creative students.

We offer a world-class education on competitive terms.

The Smart Materials Research Institute at SFedU
178/24 Sladkova str., Rostov-on-Don

To a prospective student

Nanoscale Structure of Materials

Contemporary development of nanoscience and nanotechnology is characterized by the increasingly growing demand for highly qualified specialists in the cutting-edge research into nanoscale structure of materials. The Smart Materials Research Institute at Southern Federal University offers an interdisciplinary Master's Degree Programme "Nanoscale Structure of Materials" at the interface between physics, chemistry and computer science.

To know more about the Programme:
<https://youtu.be/a49RiDqDaNs>



Why our program?

- The Program unites the educational traditions of the world-recognized scientific school of Southern Federal University in the field of novel materials and X-ray spectroscopic characterization techniques with the opportunities of international and Russian academic mobility.

- The teachers use advanced educational technologies, including the "learning-by-doing" principle that involves acquiring knowledge through practice.

- The interactive laboratory classes enable students to use "gaming" technologies as well as provide a remote access to unique research equipment.

- The students have access to world-level research equipment and facilities, including Europe's only laboratory spectrometer Rigaku R-XAS.

- The students have an opportunity to undertake an internship at the Mega-Science facilities such as Kurchatov Synchrotron (Moscow, Russia), European Synchrotron Radiation Facility (France), etc.

- A number of educational modules are delivered by the leading foreign specialists in the state-of-the-art nanodiagnostics research methods.

- The students can opt to participate in the Student Exchange Program through the European Program MaMaSELF (<https://www.mamaself.eu/>).



Scientific opportunities

The Smart Materials Research Institute is a place for young and creative researchers, who are motivated to reach their scientific goals. Research work is a core part of the program. The students can choose the class of materials to investigate in accordance with their interests.

Possible research areas are as follows:

- ✓ Picometer diagnostics of the local 3D structure of materials without a long range order in the atomic arrangement in nanoparticles, molecules, catalysts, nanoparticles for biomedical applications, etc.
- ✓ Multiscale computer simulation of the atomic structure and electronic properties of smart materials.
- ✓ Metal-organic framework structures: synthesis and diagnostics.
- ✓ Development and operando diagnostics of platinum-based nanocatalysts.
- ✓ Magnetic nanoparticles for biomedical applications: synthesis and characterization.
- ✓ Cathode materials for lithium-ion batteries.

Among the Basic and Special Courses we offer:

- Foreign Language for Professional Purposes
- Project Management
- Computer Modeling
- Condensed Matter Physics
- Methods of Materials Diagnostics
- Methods of Nanomaterials design
- Modern Supercomputer Technology and Data Analysis
- Synthesis of Nanostructured Materials
- Mega-class Research Facilities
- Research Seminars
- Teaching Internship
- Pre-graduation practical training



Admission requirements

A candidate should:

- have at least Bachelor's degree
- get through an entrance exam in physics.

The Portfolio (CV) competition to be announced.

Admission requirements for the Russian applicants:

https://sfedu.ru/www/stat_pages22.show?p=ABT/N8207

Admission requirements for the international applicants:

https://sfedu.ru/www/stat_pages22.show?p=STE/N12362/P



Alexander V. Soldatov, Doctor in Physics, Professor, Director of the Program

The program is suitable for those applicants who would like to obtain the fundamental knowledge and practical skills in experimental and theoretical methods of nanomaterials diagnostics and become the highly qualified specialists in nanoscale structure of materials cutting-edge research.

Although an undergraduate degree in physics is not a pre-requisite, applicants should possess good knowledge in general physics.

Do you need to know more?

[Request free information form](#)

Work paths and future careers

- You will be an expert in experimental and theoretical diagnostics and computer modeling of nanoscale atomic and electronic structures of different classes of nanosized materials.
- Our graduates work in the academia, research institutes and departments of the high-tech sector of the economy.
- The graduates are trained to be competitive to continue their research at the international mega-class research centers.

Discover the value of the program

It is important to understand the whole picture of the cost of your education (inquiry needed):

- Tuition,
- Room and board,
- Other Fees.

Contacts

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