Nanoscale Substance Structure

Information

The Center for Collective Usage (CCU) 'Nanoscale Substance Structure' was founded in 2010 on the basis of the laboratories of the Smart Materials Research Center.

Director: Candidate of Physical and Mathematical Sciences, Research engineer Podkovyrina Julia Sergeevna
CCU Address: lab. 008, 5 Zorge street, Rostov-on-Don, Russia, 34400

Basic institution

Federal State Autonomous Institution of Higher Education "Southern Federal University"
Link to the SFedU website

Information

The Center for Collective Usage 'Nanoscale Substance Structure' conducts the scientific research in the field of nanoscale substance structure, quantitative and qualitative X-ray spectral analysis of the material chemical composition, defining the parameters of the local atomic and electronic structure of the substance, computer simulation and synthesis of nanostructured materials.
The innovative activities of the CCU are aimed at the research on nano-bio-medical developments, ecology and environmental protection, and related to development and implementation of the new knowledge-intensive analytical equipment.
The CCU methods of defining the parameters of the nanoscale atomic substance structure based on the X-ray absorption spectroscopy and supercomputer technologies go beyond all available similar methods and were rewarded with the International Community of the X-ray spectroscopy prize in 2009.

Aims:

The main aim of the research is to define the tridimensional atomic local nanoscale geometry and electronic structure in the different types of new advanced materials with a spatial resolution at the subatomic level (including the calculating of the interatomic spacing to within 0.02 angstrom and the bonds angles to within few degrees).
The method under development is based on the new analysis method of high-resolution experimental spectrums fine structure: X-ray absorption (the international term is XANES) and the electron energy loss (the international term is EELS).
The most important research subjects are nanomaterials: nanoclusters, nanotubes, etc., as well as imperfections and impurities in the solids, active centers of proteins, metallic complexes, catalysts.

The CCU page on the 'Modern Science and Research Infrastructure of the Russian Federation' website
The CCU page on the 'Smart Material Research Center' website