

SPbPU became an official participant in unique experiments at the NICA hadron collider

Peter the Great St. Petersburg Polytechnic University has become a member of the international MPD and SPD colliders of the NICA complex of the Joint Institute for Nuclear Research (Dubna). The Nuclotron-based Ion Collider fAcility (NICA) is a new acceleration complex being built at the Joint Institute for Nuclear Research to study the properties of dense baryonic matter. Scientists from more than 20 countries are participating in this project. In fact, after the NICA collider is launched, JINR scientists will be able to recreate under laboratory conditions the special state of matter in which our Universe was in the first moments after the Big Bang — the quark-gluon plasma.



Scientists from SPbPU are taking part in experiments at the collider's two main facilities, the MPD (Multi-Purpose Detector) and the SPD (Spin Physics Detector). The MPD is designed for experiments in nuclear physics related to the study of particle production in proton-proton, proton-nucleus, and nucleus-nucleus collisions. SPD (Spin Physics Detector) is intended for experiments in spin physics.

SPbPU, having extensive experience in particle physics, high-energy physics, detector technologies, as well as in the development of systems for the collection,

processing and analysis of large data, will perform the following activities as part of the SPD and MPD experiments:

- Development of specialized software for specific tasks. In particular, Montecarian modeling for research and optimization of physical signals and background events
- Physics of 3D parton distributions of protons and nuclei and particle correlations
- Machine learning for solving SPD and MPD plant problems
- Development of electronic modules for the SPD data acquisition system and interface with NICA.



Currently, the research team consists of 17 people, including seven students. The team is headed by Professor of the Higher School of Fundamental Physical Research at the Institute of Physics and Mechanics of SPbPU Yaroslav Berdnikov, Doctor of Physics and Mathematics. It is assumed that in the future the number of participants in the group may be increased.

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