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NICA project at JINR

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The project NICA (Nuclotron-based Ion Collider fAcility) is aimed to study a hot and dense baryonic matter in heavy-ion collisions in the energy range up to $\sqrt{s_{NN}} = 11.0$ GeV. The NICA accelerators complex includes an upgrade of the existing superconducting synchrotron "Nuclotron" and construction of the new injection sources, superconducting booster, and superconducting collider rings with two interaction points (IP). The heavy-ion collision program will be performed with the fixed target experiment Baryonic Matter at Nuclotron (BM@N) at the beam extracted from the Nuclotron, and with Multi-Purpose Detector (MPD) at the first IP of NICA Collider. Investigation of nucleon spin structure and polarization phenomena is foreseen with the Spin Physics Detector (SPD) at the second IP of the Collider.

The BM@N experiment will work with light nuclei to study particle production at kinetic energy up to 4 GeV. The Multi-Purpose Detector (MPD) will investigate heavy ion collisions at the NICA collider in the energy range $\sqrt{s_{NN}} = 4 - 11$ GeV. The MPD physics purpose is to get a better understanding of the QCD matter under extreme conditions of high baryonic density by studying collective phenomena like Λ polarization, dilepton yields, multi-strange hyperons and hypernuclei production. The MPD construction is progressing in accordance with the schedule. The Spin Physics Detector will explore polarized protons and neutrons to study of spin and polarization dependent effects in hadron-hadron collisions.

Primary author: Dr ROGACHEVSKIY, Oleg (JINR)

Presenter: Dr ROGACHEVSKIY, Oleg (JINR)

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