

The Nuclotron-based Ion Collider Facility (NICA) Project. The Physics Programme for the Multi-Purpose Detector.

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The Nuclotron-based Ion Collider Facility (NICA) is a new accelerator complex being constructed at the Joint Institute for Nuclear Research (JINR). The general objective of the project is to provide beams for the experimental study of hot and dense strongly interacting QCD matter. The heavy ion programme includes two planned detectors: BM@N (Baryonic Matter at Nuclotron) – a fixed target experiment with extracted Nuclotron beams; and MPD (MultiPurpose Detector) – a collider mode experiment at NICA. The accelerated particles can range from protons and light nuclei to gold ions. Beam energies will span $\sqrt{s} = 12 - 27$ GeV with luminosity $L \geq 1 \times 10^{30} \text{ cm}^{-2} \text{ s}^{-1}$ and $\sqrt{s_{NN}} = 4 - 11$ GeV and average luminosity $L = 1 \times 10^{27} \text{ cm}^{-2} \text{ s}^{-1}$ (for $^{197}\text{Au}^{79+}$), respectively. A third experiment for spin physics is planned with the SPD (Spin Physics Detector) at the NICA collider in polarized beams mode. A brief overview of the MPD is presented along with several observables in the MPD physics programme.

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