

## The MPD Detector, a facility to explore the QCD phase diagram: status and physics capabilities

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### Abstract

The Multi-Purpose Detector (MPD) is the main experiment of the NICA complex, which is currently under construction at JINR. With collisions of heavy ions in the collider and the fixed-target modes, the MPD detector will cover the energy range  $\sqrt{s_{NN}} = 2.4-11$  GeV to scan the high baryon density region of the QCD phase diagram. The main physics objectives of the MPD experiment are to look for the critical endpoint and study the first-order phase transition predicted to occur in that region.

The commissioning of the MPD detector with Xe beams is expected to start in 2025. A rich physics program, that includes the study of light hadron and (hyper)nuclei production, measurements of flow, correlations and fluctuations will be studied with the first collected data sets. In this talk, we review the status of the MPD experiment and discuss its physics capabilities with the first beams.

**Keywords:** MPD, NICA, heavy-ion collisions, phase transition, critical point