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Experimental perspectives for the study of QCD matter at high net-baryon densities

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While the current heavy-ion programmes at RHIC and LHC address QCD matter at the highest achievable energies, but vanishing net-baryon densities, nuclear collisions at lower energies give access to matter at large baryo-chemical potential. This region of the QCD phase diagram is hardly accessible by first-principle QCD calculations, but QCD-inspired models suggest it to have a rich structure. Among the key questions here are: is there a first-order phase transition from confined to deconfined matter, and if yes, at which collisions energy is it first reached? Do the confinement and chiral phase transitions coincide, and if not, do new phases like Quarkyonic matter exist? Is there a critical point, and if yes, where?

Several experimental programmes will address these questions in the near future, both at existing accelerators (RHIC, SPS) and at upcoming, new facilities such as FAIR and NICA. In this talk, we will discuss the relevant observables and the prospects for their measurement in the years to come.

Summary

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