17 junho 2021 16.00

Alberica Toia, IKF JW Goethe University, Frankfurt and GSI

https://us02web.zoom.us/j/84981605548

The Compressed Baryonic Matter experiment at FAIR

The study of QCD matter in extreme conditions of temperature and density such as those existing shortly after the Big Bang or in the core of neutron stars brings many insights into the innermost structure of the matter and the forces between its building blocks. While gravitational wave events revealed a glimpse of QCD matter at extreme conditions, the future Facility for Antiproton and Ion Research (FAIR) will directly create and investigate its properties in the laboratory. Nucleus-nucleus collisions at SIS100 beam energies produce very high net-baryon densities, where phenomena such as a first order phase transition between hadronic and partonic matter or even exotic phases, are expected. The Compressed Baryonic Matter (CBM) is a dedicated heavy-ion experiment designed to explicitly access rare observables sensitive to the medium. For high-statistics measurements of rare probes, event rates of up to 10 MHz are needed. To meet these demands, the CBM experiment uses fast and radiation hard detectors, self-triggered detector front-ends and a free-streaming readout architecture. Several of the CBM detector systems, the data read-out chain and event reconstruction are commissioned and already used in experiments during the FAIR phase 0, and also within a full-system setup at GSI SIS18. In this presentation the physics program of CBM will be reviewed and the current status of the experiment will be reported.