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Cosmic matter in the laboratory- The Compressed Baryonic Matter experiment at FAIR

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The Compressed Baryonic Matter (CBM) experiment is of the major scientific pillars of the future Facility for Antiproton and Ion Research (FAIR) in Darmstadt. In collisions between heavy nuclei at FAIR energies, it is expected that the matter in the reaction zone is compressed to more than five times saturation density, corresponding to the density in the core of a massive neutron star. This offers the unique opportunity, to study in the laboratory the high-density equation-of-state (EOS) of nuclear matter, and to search for new phases of QCD matter at large baryon chemical potentials. Promising experimental observables sensitive to the EOS and to possible phase transitions will be discussed, together with the expected performance of the CBM experiment, and the status of the FAIR project.

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