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Facilities for High Energy Density Experiments at FAIR

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The Facility for Antiproton and Ion Research (FAIR) will offer unique research opportunities in the field of plasma physics. This research will focus on the study of high energy density matter generated with heavy ion beams. The properties (equation of state, transport properties) of the matter states that can be created (eV temperatures, near solid density) are important for modelling planetary interiors and many other applications.

At FAIR, the SIS-100 synchrotron will provide heavy ion beams with up to $5 \cdot 10^{10}$ $U-28^+$ ions (energy 2 AGeV) in a 50 ns bunch for plasma physics experiments. In addition, high energy proton beams with energies of up to 10 GeV and up to $2.5 \cdot 10^{13}$ particles per bunch will be available for proton microscopy.

Recently a new schedule for the construction and commissioning of the facility has been approved by the FAIR council. During the construction of FAIR, beam times using the upgraded GSI facilities will be available for experiments (FAIR Phase 0). Civil construction is planned to be completed by 2022 and the Day-1 experiments of all FAIR scientific collaborations are expected to be running by 2025.

In my presentation I will give an overview of the experimental facilities that will be available and the timeline for the construction and commissioning of FAIR.

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