

# Storage Rings for Nuclear Physics and Astrophysics

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Storage rings are powerful and versatile tools for high-precision experiments with highly charged stable and radioactive ions, enabling unique studies at the interface of atomic and nuclear physics. At the GSI Helmholtz Centre for Heavy Ion Research in Darmstadt, Germany, the Experimental Storage Ring (ESR) provides exceptional opportunities for the efficient use of rare and short-lived ion species. Advanced beam-manipulation techniques, such as accumulation, bunching, and deceleration, allow ions to be stored at sufficient intensities and at energies relevant for astrophysical processes.

This talk will present recent highlight results from the FAIR Phase-0 research programme at the ESR, with an emphasis on their relevance to nuclear physics and astrophysics. An outlook on planned future measurements and upcoming facilities will also be discussed.