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Experiments at the CRYRING@ESR Low-Energy Heavy-Ion Storage Ring

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As a first completed facility of the FAIR project, the heavy ion storage ring CRYRING@ESR is in operation since 2020 and is serving as experiment platform for the SPARC collaboration. The ring is optimized for low-energy storage and beam cooling, and with access to all ion species available from the GSI accelerator chain or from a local RFQ injector. This offers a unique access to study the dynamics of slow collisions and for precision spectroscopy in highly charged ions. To realize these experiments, CRYRING@ESR has four straight sections where experimental setups can be installed: for merged-beams electron-ion collisions spectroscopy at the electron cooler, in a collinear laser spectroscopy setup, in a 'free' experimental section for various setups provided from the collaboration, and an extracted beam for single pass experiments, such as surface modifications. Thus, in the recent years, researchers from atomic physics, nuclear reactions and materials science have been able to commence their experiment program. While the data analysis from these first experiments is largely still ongoing, we are finding that the very high expectations on achievable resolution have been fulfilled.
With this poster, we will be giving an overview of the CRYRING@ESR facility, discuss our presently available experimental installations, their performance, and the boundary conditions for beam operation. We present selected results from first experiments, preview our program for the next few years, and invite for a discussion of novel ideas.

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