

Plenary Talk PV II Mon 10:00 H-Aula/HS I/HS X
Superheavy Element Research at GSI — ●MICHAEL BOCK
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The investigation of superheavy elements (SHE) that do not occur naturally on earth was one motivation for the foundation of the GSI Helmholtzzentrum in Darmstadt fifty years ago. Around that time, SHE were predicted to exist in the region $Z \approx 114$, $N \approx 184$ and to form a region of long-lived nuclei: the island of stability. In the following decades the six elements with $Z=107-112$ were discovered at GSI. Today, 118 elements are known, but there are still many open ques-

tions: what is the heaviest element that may exist? How do relativistic effects change the structure of the periodic table? Are SHE produced in stellar nucleosynthesis? At the GSI in Darmstadt we perform a comprehensive research program trying to answer these questions and to address all aspects of this multifaceted science field. Within the FAIR phase-0 program several experiments are performed in this context. Recent highlights comprise nuclear spectroscopy of Mc isotopes, laser spectroscopy of No isotopes and high-precision mass measurements up to Rf. These experiments shed light on the strength and extension of nuclear shell effects, the occurrence of low-lying isomeric states, and provide access to the shape and size of the heaviest nuclei. In my contribution, I will present select results from the FAIR phase-0 campaigns in 2018-2019 and discuss the plans for 2020.