TECHNISCHE UNIVERSITÄT DRESDEN

Bereich Mathematik und Naturwissenschaften Fakultät Physik

PHYSIKALISCHES KOLLOQUIUM

Vortrag: **Dr. Oliver Forstner**
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Thema: **Astrophysics in the laboratory at CRYRING@ESR**

Zeit und Ort: Dienstag, 1.2.2022, 16:40 Uhr / Online-Kolloquium in Zoom

Zoom-Meeting: Meeting-ID: 867 7847 4568 / Kenncode: PK-21!-OF
https://tu-dresden.zoom.us/j/86778474568?pwd=SHBhN3RBMnF0VmV6aXRKVXdzYy9qdz09

Leitung: Prof. Dr. Kai Zuber

Kurzfassung: CRYRING@ESR is the first operational heavy ion storage ring of the FAIR project (Facility for Antiproton and Ion Research) [1]. It has a long history of successful research in atomic and molecular physics during its two-decade operation as a central research facility of the Manne Siegbahn Laboratory in Stockholm, Sweden. After its shutdown it was decided to transfer CRYRING to FAIR/GSI as a Swedish in-kind contribution to the FAIR project. Starting in 2015 it was modernized, adapted to FAIR standards and connected to the existing experimental storage ring ESR under the project name CRYRING@ESR [2]. In the target section of CRYRING an internal gas-jet target will be installed. This will enable to perform proton and alpha capture reactions at the Gamow energy for important astrophysical reactions. One example is the reaction ^{44}Ti(α,p)^{47}V, which happens during a core collapse supernova. Other reactions studied at CRYRING are important for the element creation during the big bang. Besides that, atomic physics studies at highly charged ions relevant for astrophysical observations will be studied at CRYRING. All together CRYRING will be an important tool to study laboratory astrophysics at FAIR.
In this seminar I will present the status of CRYRING@ESR and give an overview of the foreseen physics program together with results from the first successful experiments.

[1] GSI press release 08.06.2020,
https://www.gsi.de/start/aktuelles/detailseite/2020/06/08/cryring_einsatzbereit.htm
[2] Physics book: CRYRING@ESR, Eur. Phys. J. Spec. Top. (2016) 225:797,
http://dx.doi.org/10.1140/epjst/e2016-02643-6.

Biographie: Oliver Forstner studied Physics at the Technical University of Vienna and received his PhD 2001 for his work at the REXTRAP Penning Trap facility at CERN / ISOLDE. He continued his work at CERN as a research fellow in the study group for a possible future linear electron positron collider CLIC. From 2004 to 2014 he was post-doc at the accelerator mass spectrometry (AMS) laboratory VERA at the University of Vienna. His main field of research was the application of laser interaction with negative ions to increase the sensitivity of AMS and to extend it to new isotopes. In 2014 he started working at the Friedrich-Schiller University Jena and the Helmholtz Institute Jena, where he is part of the CRYRING@ESR group at GSI Darmstadt. Since 2019 he is also leader of a BMBF funded project to establish laser suppression of isobars at the DREAMS facility at HZDR.