

## René Heller

*Helmholtz-Zentrum Dresden-Rossendorf  
Dresden, Germany*



**Tuesday, 13<sup>th</sup> March 2018, 16:00 s.t.**

TU Wien, Institut für Angewandte Physik, E134  
1040 Wien, Wiedner Hauptstraße 8-10  
Yellow Tower „B“, 5th floor, SEM.R. DB gelb 05 B



## In-situ Chemical Analysis of Solid-Liquid Interfaces by means of Rutherford Backscattering Spectrometry

### An Approach to Direct Measurements of the Electric Double Layer Formation Dynamics

Rutherford Backscattering Spectrometry (RBS) represents a well-established and widely used analysis technique for the non-destructive and quantitative determination of elemental compositions as well as depth profiling at solid surfaces. However, since this technique utilizes a charged particle beam (typically 1-2MeV H/He ions) measurements have to be performed in vacuum which just allows investigation of solid samples. Liquids, gases or the interface of one of both with a solid surface are not accessible for measurements in this setup. Therefore, we recently commissioned a new experimental setup that overcomes this hurdle. By utilizing a thin (500nm) SiN-window we are able to perform online chemical analysis by means of RBS at the solid-liquid (and solid-gaseous) interface. In this talk we will give an overview of this new experiment, point out its strengths and limitations and give some ideas on possible applications. The results of first investigations on the growth dynamics of the electric double layer (EDL) will be presented revealing the impressive sensitivity of the setup down to a fraction of an atomic monolayer.

**René Heller** studied physics at TU Dresden, where he graduated in 2005. He did his PhD at the Helmholtz-Zentrum Dresden-Rossendorf (HZDR) and received the doctoral degree with *summa cum laude*. In 2010 he received the PhD award of the HZDR and became a Scientific Staff Member in the Ion Beam Analysis group at HZDR. He left the HZDR from 2011-2012 to work at the R&D department of Dreebit GmbH. He rejoined HZDR and became the head of the Ion Beam Analysis group in 2012. He received the HZDR Research Award in 2015.

All interested colleagues are welcome to this seminar lecture (45 min. presentation followed by discussion)

Friedrich Aumayr  
(LVA-Leiter)

Richard Wilhelm  
(Seminar Chair)