

# Claudia Merola

*TU Wien, Institut für Angewandte Physik*

**Tuesday, 11<sup>th</sup> December 2018, 16:00 s.t.**

TU Wien, Institut für Angewandte Physik, E134

1040 Wien, Wiedner Hauptstraße 8-10

Yellow Tower „B“, 5<sup>th</sup> floor, SEM.R. DB gelb 05 B



## **Unrevealing the corrosion mechanism in nanometer confined gaps using white light interferometry in reflection and transmission mode**

Nickel and nickel alloys, because of their versatility and corrosion resistance, are used in a broad-range of applications, however they still undergo the corrosion process under aggressive environments. It is our interest to have a deeper understanding of the starting mechanism of crevice corrosion. Herein we have developed an electrochemical surface forces apparatus (1) extended to function in reflection mode (EC-rSFA), hence, we successfully extend the interferometry technique from transparent thin film materials to polished bulk materials within the SFA. Post experiment analysis was performed to characterize the corroded area with atomic force microscopy, optical microscopy, x-ray Laue nanodiffraction, and XPS. To get a complete overview of the corrosion phenomenon, oxygen saturated/depleted conditions were reproduced in a flow cell for use with downstream ICP-MS detection of corrosion products in solution. The combined approach of EC-rSFA and ICP-MS provides both visual and elemental interpretation of the corrosion at the surface of bulk metal samples of alloys (2) and, hence, a better understanding of the role of alloying elements in the corrosion process.

(1) C. Merola et al., PNAS (2017), 9541-9546

(2) V. Shkirskiy et al., Journal of (2016) The Electrochemical Society pp. C37-C44

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

Friedrich Aumayr  
(LVA-Leiter)

Markus Valtiner  
(Seminar Chair)