



Seminar des  
Zentrums für Materialforschung (ZfM/LaMa)

## Analyzing Batteries and Fuel Cells by the Distribution of Relaxation Times (DRT)

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**Freitag, 8. September 2017, 13:30 – 14:30 Uhr**  
**Hörsaal C 2, neues Chemie-Hörsaalgebäude, Heinrich-Buff-Ring 19**

### **Abstract:**

The ongoing transformations of the transportation and the energy sectors demand an evolution of the state of the art batteries and fuel cells. This evolution is driven by a knowledge-based optimization of today's materials using sophisticated analytical techniques. For electrochemical research one of these techniques is the electrochemical impedance spectroscopy (EIS). By EIS physico-chemical processes can be unraveled and subsequently quantified by fitting the data with equivalent circuit models (ECM). In batteries, examples for such processes are the formation of a solid–electrolyte interphase layer (SEI), charge-transfer processes in the electrode's active material or solid-state diffusion. While the ECM fitting procedure is straightforward owing to the availability of standard software packages, it suffers from ambiguity since it requires detailed a priori knowledge of the system to obtain physically meaningful results. This problem can be mitigated by a distribution of relaxation times (DRT) analysis which directly provides a distribution of physical processes giving rise to the impedance response of a system without requiring a priori knowledge. In this presentation, the DRT analysis will be discussed in detail and its application to Li-ion batteries, fuel cells and solid electrolytes will be shown.

**Gäste sind herzlich willkommen!**

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### **Kontakt**

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