V O R T R A G S E I N L A D U N G

im Rahmen des gemeinsamen Berufungsverfahrens
der Freien Universität Berlin und des Helmholtz-Zentrums Berlin
W1-Professur „EPR-Spektroskopie in der Photokatalyse oder Photovoltaik (BeJEL)“

am Mittwoch**,** 25. September 2013, 9.00Uhr
FU Berlin, Fachbereich Physik, Arnimallee 14,Hörsaal B

Magnetic resonance spectroscopy for materials science

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Electron-Paramagnetic Resonance (EPR) and Dynamic-Nuclear Polarization (DNP) are highly versatile spectroscopic techniques to study electronic states and atomic structure of functional materials. In order to study the structure-function relationship, a toolbox of techniques was developed and applied ranging from time-domain EPR and Electrically-detected magnetic resonance to study efficiency-degrading defect states in thin-film silicon solar cells to Ferromagnetic Resonance applied to complex oxide heterostructures. As a future outlook I will present recent results on how solid-state DNP spectroscopy at high magnetic fields (7 T) can be optimized and applied to study materials for renewable energy production. As a specific case, I will focus on NafionTM, a fluorinated polymer applied as proton exchange membranes in fuel cells. The ability of NafionTM to simultaneously transport protons and block electron transfer relies on its unique morphology. I will present static 19F DNP results where nitroxide spin probes of varying degree of hydrophobicity were applied to obtain valuable information about the morphology of NafionTM membranes.
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