UniSysCat Colloquium

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Helmholtz Zentrum Berlin & University of Illinois Urbana-Champaign, USA

Start Time: Wednesday, November 17, 2021 05:00 pm

End Time: Wednesday, November 17, 2021 07:00 pm

Online

Fast electrons and hard X-rays for unraveling light-induced dynamics in energy materials

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The visualization and tracking of light-induced carrier and atomic dynamics on their inherent ultrafast time scales is of uttermost importance in a large range of fields, including photocatalysis, photovoltaics, optoelectronics, and plasma physics. Conventional characterization techniques either lack the spatial resolution necessary to resolve individual atoms, or they lack the temporal resolution required to capture the dynamics as they evolve. Our group develops complementary X-ray and electron-based tools to visualize light-induced processes in molecules and nanostructured materials on atomic length and time scales (i.e. Ångstroms and femtoseconds). In this talk I will shortly present the ultrafast electron microscope we developed at the University of Illinois at Urbana-Champaign, as well as recent results on using transient X-ray linear dichroism to study carrier screening in heterostructured nanomaterials. I will conclude with an outlook of how these ultrafast structural tools could be used for other molecular and nanoscale systems relevant to photocatalysis.

Dr. Bartholomäus Pieber

Organizer