

CatLab Lecture Series hosted by FHI and HZB

Friday, December 8th 2023, 10:30-12:00

BESSY II, Seminar Room at the Entrance, Albert-Einstein-Straße 15, Berlin Adlershof

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Fast electrons and hard X-rays for unravelling atomic-scale dynamics in homogeneous and heterogeneous catalysis

The increasing demand for renewable and low-cost energy motivates intensive research aimed at developing, characterizing and optimizing materials that can efficiently convert (sun) light into usable energy in the form of electricity or chemical fuels. Conventional characterization techniques either lack the spatial resolution necessary to resolve individual atoms, or they lack the temporal resolution required to capture structural rearrangements as they evolve. Our group develops complementary X-ray and electron-based tools to visualize light-induced processes in materials on atomic length and time scales. In this lecture I will give an introduction to the experimental methods of ultrafast X-ray spectroscopy and ultrafast electron microscopy and talk about a couple of examples of how these methods are used to reveal carrier and structural dynamics in heterostructured nanomaterials and molecular photocatalysts.