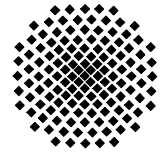


Stuttgarter Physikalisches **ONLINE Kolloquium**

Max-Planck-Institut für Festkörperforschung
Max-Planck-Institut für Intelligente Systeme
Fachbereich Physik, Universität Stuttgart

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Login data will be announced by e-mail.

Dienstag, 21. April 2020

16.15 Uhr

Stuttgarter Max-Planck-Institute, Heisenbergstraße 1, 70569 Stuttgart-Büsnau

Ultrafast Surface Dynamics and Local Spectroscopy at the Nanoscale

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Abstract

In a Born-Oppenheimer description, atomic motions evolve across a potential energy surface determined by the occupation of electronic states as a function of atom positions. Ultrafast photo-induced phase transitions provide a test case for how the forces and resulting nuclear motion along the reaction co-ordinate originate from a non-equilibrium population of excited electronic states. Here I discuss recent advances in time-resolved photoemission spectroscopy allowing for direct probing of the underlying fundamental steps and the transiently evolving band structure in the ultrafast phase transition in indium nanowires on Si(111) [1]. Furthermore, I will discuss some recent attempts to access the space-time limit in surface dynamics using local optical excitation of controlled plasmonic nano-junctions and tip-enhanced Raman scattering (TERS) [2,3].

References:

- [1] C.W. Nicholson *et al.*, Science **362**, 821 (2018) & PRB **99**, 155107 (2019)
- [2] S. Liu *et al.*, PRL **121**, 226802 (2018) & Nano Lett. **19**, 5725 (2019)
- [3] H. Böckmann *et al.*, J. Phys. Chem. Lett. **10**, 2068 (2019).