

Fritz-Haber-Institut der Max-Planck-Gesellschaft

Physikalische Chemie — Direktor: Prof. Dr. Martin Wolf



MAX-PLANCK-GESELLSCHAFT

Informal Seminar:

Tuesday, April 17, 2018, at 10:00 a.m.

Julian Maklar

Claessen Group, Experimental Physics 4,
Fakultät für Physik und Astronomie,
Julius-Maximilians-Universität Würzburg.

Potassium Doping of a Correlated Triangular Adatom Lattice

PC Seminar Room **G2.06**, Building G, Faradayweg 4.

L. Rettig

Abstract:

Triangular lattices of localized electrons exhibit a rich phase diagram including spin liquids and exotic superconductivity due to geometric frustration and electronic correlations. A simple and tunable experimental realization are submonolayer triangular lattices of group IV adatoms on semiconductor substrates, which can serve as a model system to study electronic correlations and frustration.

I will discuss electron doping by K deposition of a triangular Sn atom lattice on Si(111) investigated by ARPES and STM. At low temperatures Sn/Si represents a Mott-insulator with row-wise antiferromagnetic order, evident from backfolding of the Sn surface band. Upon K deposition, surprisingly a metal-insulator transition does not emerge. Instead we detect a band sharpening and deformation resulting in a completely filled Sn band. Furthermore, signatures of antiferromagnetic order are destroyed. STM measurements reveal a K honeycomb reconstruction at 1/6 monolayer coverage. This setup opens the door to search for exotic states of matter, specifically topological superconductivity.