

Speaker:

Inna Vishik, Assistant Professor, University of California, Davis

Title:

Shear displacement driven by surface electron doping in WTe_2

Abstract:

WTe_2 is a multifunctional quantum material exhibiting numerous emergent phases in which tuning of the carrier density plays an important role. I will show our recent ARPES studies which demonstrate how that a small amount of surface electron doping in WTe_2 can induce a shear displacement in the top layer, producing a crystal structure locally similar to a polytype typically not encountered in ambient conditions. This phase transition is evidenced by pronounced changes in low-energy surface electronic structures with support from first-principles calculations. A second phase transition at higher doping levels affects higher-energy band structures, and is associated both with hybridization with dopant bands and the surface Stark effect. These results highlight the variety of electronic structure changes associated with electron doping in WTe_2 , with implications for heterostructures and devices.