

O 17: Invited Talk Sergey Borisenko

Time: Monday 17:45–18:30

Location: HE 101

Invited Talk O 17.1 Mon 17:45 HE 101
Charge-Density Waves and Superconductivity in Two Dimensions: The ARPES View — ●SERGEY BORISENKO — Institute for Solid State Research, IFW-Dresden

An interaction between electrons and phonons results in two fundamental quantum phenomena in solids: in three dimensions it can turn a metal into a superconductor whereas in one dimension it can turn a metal into an insulator. In two dimensions (2D) both superconductivity and charge-density waves (CDW) are anomalous. In superconducting cuprates, critical transition temperatures are unusually high and the energy gap may stay unclosed even above these temperatures (pseudogap). In CDW-bearing dichalcogenides the resistivity below

the transition can decrease with temperature even faster than in the normal phase and a basic prerequisite for the CDW, the favorable nesting conditions seems to be absent. We demonstrate that the normal-state pseudogap also exists in two of the most studied 2D examples, dichalcogenides $2H - TaSe_2$ and $2H - NbSe_2$, and the formation of CDW is driven by a conventional nesting instability, which is masked by the pseudogap. On the other hand, we find a very unusual behavior of the pseudogap in underdoped Dy-BSCCO and Tb-BSCCO as a function of temperature overlooked in previous ARPES studies. The magnitude, character, anisotropy and temperature evolution of the 2D-CDW pseudogap are intriguingly similar to those seen in superconducting cuprates.