O 29: Invited Talk Rotenberg

Time: Tuesday 14:45–15:30 Location: H36

Invited Talk O 29.1 Tue 14:45 H36

Many-body interactions in clean and alkali-adsorbed graphene — •E. Rotenberg[1], A. Bostwick[1], T. Ohta[1,2], J. McChesney[1], Th. Seyller[3], and K. Horn[2] — [1]E. O. Lawrence Berkeley Natl. Lab. 6-2100, Berkeley, CA 94720 USA — [2]Fritz-Haber-Institut der MPG, Faradayweg 4-6, 14195 Berlin, Germany — [3]Lehrstuhl für Techn. Physik, U. Erlangen-Nürnberg, Erwin-Rommel-Straße 1, D-91058 Erlangen, Germany

Graphene, a single layer of carbon atoms arranged in a simple honeycomb lattice, is the building block of graphite, fullerenes, and carbon nanotubes and has fascinating electronic properties deriving from the effectively massless, relativistic behavior of its charge carriers. The study of many-body interactions among these carriers is of interest owing to their contribution to superconductivity in these systems.

I will report the characterization of graphene thin films grown on SiC using angle-resolved photoemission spectroscopy (ARPES). We determined the spectral function for monolayer graphene, which encodes the many-body interactions in the system–namely the charge and vibrational excitations. The bands around the Dirac crossing point E_D are heavily renormalized by electron-electron, electron-plasmon, and electron-phonon couplings, which must be considered on an equal footing to understand the quasiparticle dynamics in graphene and related systems. At alkali coverages comparable to graphite intercalation compounds (GICs), renormalization of the carrier mass near E_F becomes significant, supporting the importance of electron-phonon coupling in superconductivity in GICs.