MM 1: HV Meyer

Time: Monday 10:15–10:45 Location: IFW A

Invited Talk MM 1.1 Mon 10:15 IFW A

The physics of nano-carbons explored by atomic resolution transmission electron microscopy — •Jannik Meyer[1,2], Simon Kurasch[2], Ute Kaiser[2], Andrey Chuvilin[2], Gerardo Algara-Siller[2], Hye-Jin Park[3], Viera Skakalova[3], Siegmar Roth[3], Cristina Gomez-Navarro[3], Ravi Sundaram[3], Marko Burghard[3], Klaus Kern[3], Jurgen Smet[3], Takayuki Iwasaki[3], Ulrich Starke[3], Jani Kotakoski[4], and Arkady Krasheninnikov[4] — [1]University of Vienna, Department of Physics, Vienna, Austria — [2]University of Ulm, Germany — [3]Max Planck Institute for solid state physics, Stuttgart, Germany — [4]University of Helsinki, Finland

Graphene is an outstanding new material that promises a wide range of new applications and scientific insights, and it is closely related to carbon nanotubes, fullerenes or graphite. Hence, the graphene structure and its defects are of outstanding interest for the science and applications of these new materials. Static deformations, topological defects, various vacancy configurations or the two-dimensional equivalent of dislocations were studied by aberration-corrected transmission electron microscopy (TEM). Existing defects in as-synthesized CVD graphene and reduced graphene oxide were analyzed. The formation and evolution of defects under electron irradiation is observed in real time with atomic resolution. High-energy electron irradiation provides a "randomization" of some atoms, which then allows new insights into the complicated bonding behaviour in carbon materials. Further, we show that the charge distribution in graphene defects or other 2-D materials can be analyzed on the basis of high-resolution TEM images.