

HL 62: Invited Talk Rolf Haug

Time: Thursday 9:30–10:00

Location: ER 270

Invited Talk

HL 62.1 Thu 9:30 ER 270

Folded Graphene - Solid State Physics in a Nutshell — ●ROLF J. HAUG¹, JOHANNES C. RODE¹, HENNRİK SCHMIDT^{1,2}, and DMITRI SMIRNOV¹ — ¹Institut für Festkörperphysik, Leibniz Universität Hannover, 30167 Hannover, Germany — ²Centre for Advanced 2D Materials and Graphene Research Centre, National University of Singapore, Singapore

The folding of a monolayer of graphene results in a stack made up from two single layers of graphene. The atomic lattices are arranged one on top of the other with a certain twist angle between the crystallographic directions of the two layers. Depending on this twist angle the electronic properties of the produced system can be quite different leading to a variety of well known effects of solid state physics. For

large twist angles the two layers are actually electronically decoupled [1]. For such twist angles screening effects and variations in Fermi velocities can be observed [2]. For small twist angles much more interesting electronic structures appear. Depending on the twist angle the two atomic lattices give origin to a moiré superstructure resulting in a new electronic band structure of the system [3]. In addition the coupling between the two layers is modulated leading to even more complex electronic effects. In the talk the expected physics of such systems and some recent experimental results will be reviewed. [1] H. Schmidt et al., Appl. Phys. Lett. 93, 172108 (2008) [2] H. Schmidt, T. Lüdtkke, P. Barthold, R.J. Haug, Phys. Rev. B 81 121403 (2010) [3] H. Schmidt, J. C. Rode, D. Smirnov, R.J. Haug, Nature Comm. 5, 5742 (2014)