

MAR11-2010-020207

Abstract for an Invited Paper
for the MAR11 Meeting of
the American Physical Society

Graphene: Deep physics from the all-surface material

MICHAEL S. FUHRER, University of Maryland, College Park

The 2010 Nobel Prize in Physics was awarded to Andre Geim and Kostya Novoselov for their experiments on graphene, a single-atom plane of graphite. I will discuss why graphene has generated such excitement in condensed matter physics. Graphene is different: graphene's electrons mimic massless Dirac Fermions. But graphene is also amazingly tunable: Bandgaps can be generated by nanostructuring. Interactions can be tuned by the surrounding dielectric. Strain generates effective "pseudomagnetic" fields up to 300 Tesla. The work function can be tuned over a large range. Such tunability promises that graphene will remain interesting as a laboratory for condensed matter physics.