

# Graphene: a physicist's view of the “wonder material”

Eva Y. Andrei

Department of Physics and Astronomy, Rutgers University, Piscataway NJ

Since its first scotch-tape extraction from graphite in 2004, Graphene – a one atom-thick crystal of carbon - has metamorphosed from the poor relative of diamond into a “wonder material”. By now it has amassed an impressive string of superlatives –lightest, thinnest, strongest material, best electrical and thermal conductor - as well as the 2010 Nobel Prize for its discoverers. Due to its remarkable properties graphene is rapidly moving from research laboratories into industrial, medical and electronics applications. For physicists much of the continuing excitement about Graphene stems from its exotic charge carriers - Dirac fermions - which resemble two dimensional massless neutrinos. I will review the story and physics of graphene with emphasis on its unusual electronic properties and will describe the experiments and techniques which provided access to the two-dimensional world of Dirac fermions, their interactions with each other and with the environment.

