



ΑΡΙΣΤΟΤΕΛΕΙΟ
ΠΑΝΕΠΙΣΤΗΜΙΟ
ΘΕΣΣΑΛΟΝΙΚΗΣ

ΣΕΜΙΝΑΡΙΟ ΤΜΗΜΑ ΦΥΣΙΚΗΣ

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Αίθουσα Α₃₁

Κύκλος σεμιναρίων

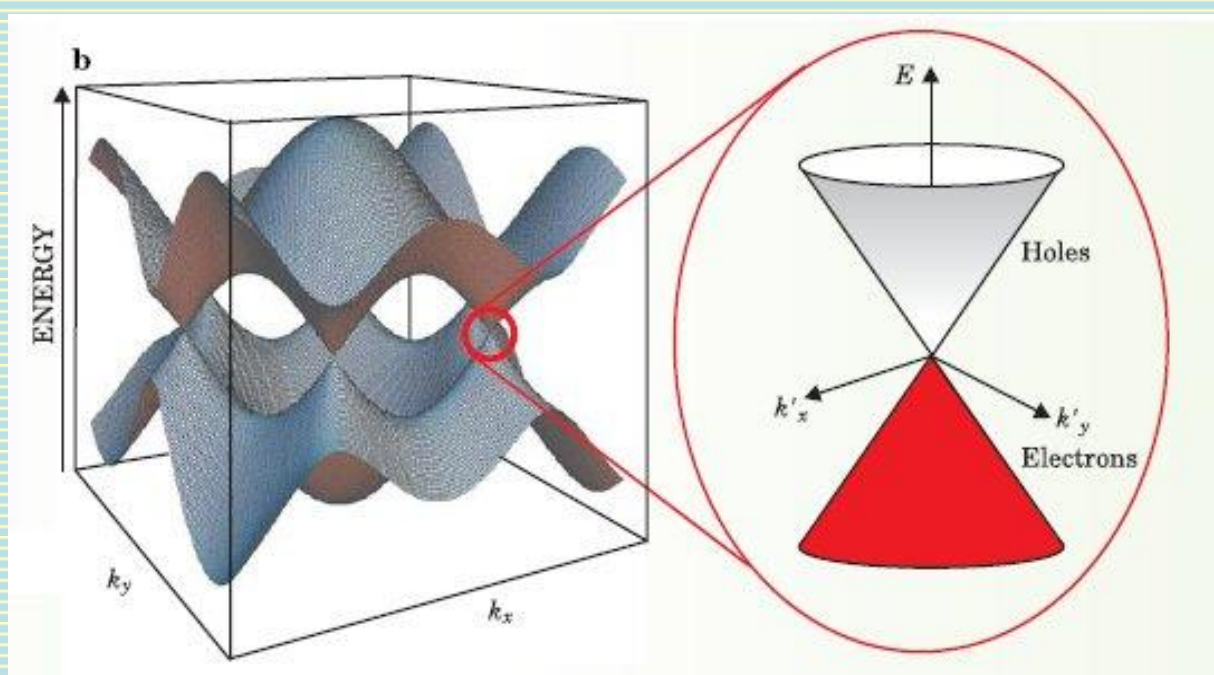


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The Relativistic World of Graphene



Prof. Gordon Semenoff
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Graphene is a two-dimensional semi-metal where the electron obeys an emergent relativistic Dirac equation. The resulting electronic properties of this substance make it both a fascinating case study in condensed matter physics and a promising new material for electronics technology. It also offers a novel testing ground for fundamental issues associated with the quantization of the relativistic particle, such as Zetterbewegung and the Schwinger and Klein effects which have proven difficult to test in the particle physics world, but are visible in and have profound effects on the physics of graphene. As well, graphene electrons are putatively strongly coupled and some effects of strong interactions, such as dynamical symmetry breaking and the fractional quantum Hall effect have been observed. This provides a simple example of the symmetry breaking phenomenon as well as posing a puzzle as to why, if interactions are strong, so much of the physics of graphene is described by weakly interacting, or even non-interacting electrons. Some ideas about how strong interactions are manifest in graphene will be presented.

Το προφίλ του ομιλητή



Gordon Walter Semenoff is a Professor at the University of British Columbia since 1990; His research examines the nature at its most fundamental level, in particular superstring theory and duality of string theories with strongly coupled gauge field theories and quantum gravity. Before joining the faculty at UBC, he has held a number of visiting and postdoctoral positions at Niels Bohr Institute, the Institute for Advanced Study, Princeton, and Massachusetts Institute of Technology among others. He is an Officer of the Order of Canada since 2012, and was awarded the Queen Elizabeth II Diamond Jubilee Medal, 2012, a Lifetime Achievement Award from the Canadian Association of Physicists, 2012, a D.Sc. Honoris Causa, University of Lethbridge, 2011, the CAP Brockhouse Medal, 2010, Fellowship of the Royal Society of Canada since 2000, the CAP/CRM Medal for Mathematical Physics 2000, the MacDowell Medal 1990 and the Killam Research Prize 1989.