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***Synthesis and Properties of Graphene
Nanostructures***

Graphene is a two-dimensional material, consisting of sp^2 carbon atoms packed in a honeycomb lattice, that attracts enormous attention due to its unique physical properties. Arguably, the most promising applications of graphene are related to electronics, as the charge carriers in graphene exhibit unusually high mobilities (up to 200,000 $cm^2/V \cdot s$ reported for suspended graphene devices). However, the absence of a semiconductor bandgap (ΔE) in graphene is the major problem for the logic applications. One of the possible approaches for bandgap engineering in graphene is the synthesis of narrow graphene nanoribbons (GNRs), where ΔE has been theoretically and experimentally shown to be inversely proportional to the ribbon's width. The GNRs could be either (1) patterned from graphene by a combination of electron-beam lithography and dry etching or (2) prepared by a nanowire lithography using narrow inorganic nanowires as the etch masks or (3) patterned from graphene using self-assembled monolayers of monodisperse colloidal microspheres or (4) synthesized by a chemical unzipping of carbon nanotubes (CNTs). I will compare preparation techniques for GNRs and discuss properties of GNRs and related graphene nanostructures.

**Wednesday, November 16, 2011
3:30 pm - Room 151, Jorgensen Hall
*Refreshments served***

**Host:
Dr. David Sellmyer
Department of
Physics & Astronomy**

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