

## Graphene Seminar

# **Growth of Graphene by Carbon Source Molecular Beam Epitaxy**

**Dr. William C. Mitchel  
AFRL, Wright Patterson AFB, OH**

**10:30 a.m., Tue. July 12, 2011  
Room 312, Building D3  
Cullen College of Engineering  
University of Houston**

Please contact Steven Pei, [spei@uh.edu](mailto:spei@uh.edu), if you need more information

## Graphene Seminar

### “Growth of Graphene by Carbon Source Molecular Beam Epitaxy”

Dr. William C. Mitchel, AFRL, Wright-Patterson AFB

Graphene, a single to a few atomic layers of graphite, has only recently been isolated. However, its unique electronic properties have already led to the demonstration of quantum effects such as Dirac electrons, Klein tunneling and fractional quantum Hall effect. It is also being pursued for advanced electronics and as a possible substitute for Si to maintain Moore's Law.

In this talk, I will review existing methods for producing graphene and then discuss our research at the Air Force Research Laboratory on growth by direct deposition of carbon from solid sources. We use both thermally evaporated C<sub>60</sub> and a heated graphite filament to generate carbon. Both result in graphene but with significant differences. Preliminary results on the formation of bandgaps in bilayer graphene doping heterostructures fabricated by using different carbon sources will be presented.

Please contact Steven Pei, [spei@uh.edu](mailto:spei@uh.edu), if you need more information