**Abhay Pasupathy**

Columbia University

**Title:** *Hidden Kekule Order of Ghost Atoms on Monolayer Graphene*

**Abstract:** Various charge and spin ordered phases have been predicted to exist in graphene when the lattice symmetry is broken on the atomic scale.  One such phase is Kekule order, which breaks the C-C bond symmetry and triples the graphene unit cell. It has been proposed that when certain adatoms are placed on monolayer graphene, strong interactions can exist between them mediated by the graphene lattice. The graphene-adatom interaction can induce Kekule order in the graphene itself, and move the adatoms to produce a hidden Kekule ordering.  In this talk I will discuss evidence from scanning tunneling microscopy, electron diffraction and angle resolved photoemission spectroscopy that shows the existence of this unique ordering in epitaxial graphene on copper. Interestingly, we find in this case that the Kekule order is induced by a dilute number of vacancies ("ghost atoms") in the otherwise perfect copper lattice underneath the monolayer graphene.