TIFR Centre for Interdisciplinary Sciences
21 Brundavan Colony, Narsingi, Hyderabad 500075

Students' Annual Seminar

Studies on the Controlled Assembly of Atomic Layers for Energy Devices

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Emergence of graphene has revolutionized both fundamental and applied research with new trends and unprecedented approaches. The concepts such as straintronics, valleytronics, quantum Hall effect, atomic layer thin corrosion coatings, flexible and ultrafast electronics, metal free catalysis etc. are the fields few to mention those emerged and flourished after the discovery of graphene.

Pristine and engineered (bandgap engineered) graphene are interesting electronic materials, and finding uses in making efficient energy storage and harvesting devices. But the controlled assembly of graphene still needs laborious multistep transfer processes and patterning techniques. This limits large area and industry scale production of graphene based devices.

Studies on the stability and formation of graphene surged the development of other layered materials, and this resulted the discovery of various atomic layers with a range of opto-electronic and physico-chemical properties. Present 2-dimensional (2D) atomic layers spectrum encompasses many members which include both conventional (metal dichalcogenides, h-boron nitride etc.) and unconventional (silicene, germanane etc.) layered materials. Apart from their large scale defect free synthesis, controlled assembly of atomic layers and formation of predefined junctions among them are still elusive, and these are bottlenecks in their advancement.

In this talk, large scale synthesis and assembly of atomic layers are taken for pursuit both theoretically and experimentally.

Thursday, Dec 3rd 2015

4:00 PM (Tea/Coffee at 3:45 PM)

Seminar Hall, TCIS