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## **Seminar**

### **Structure-Function Correlations: Polymer Nanocomposites to Bioinspired Programmable Nanomaterials**

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Self-assembly offers a promising method to organize functional nanoscale objects with unique properties in bulk as well as in reduced dimensions. I will present few case examples of structure-function correlations in hybrids of soft matter and inorganic nanoparticle assemblies under confinement, created through manipulation of colloidal interactions and biomolecular recognitions at nanoscale. In case of polymer nanocomposites the morphological transformation at nanoscale can be achieved by varying polymer-polymer and polymer-particle interactions, which results in composites with tunable thermo-mechanical and dynamical properties. Incorporation of biomolecules such as DNA into a nano-object design provides a unique opportunity to establish highly selective and reversible interactions during self-assembly process. The molecular design of the nanoscale components can be programmed to yield tunable nanoparticle superlattices with pre-defined macroscopic compressibility, rheological phase behavior and creation of stimuli-responsive nanoscale objects.

***Tuesday, Apr 14<sup>th</sup> 2015***

***11:30 AM (Tea/Coffee at 11:15 AM)***

***Seminar Hall, TCIS***