INDIAN ASSOCIATION FOR THE CULTIVATION OF SCIENCE

2A & 2B, Raja S.C. Mullick Road, Jadavpur, Kolkata-700032, India

Seminar Notice

Title:	Surface-anchored thin films: Liquid-phase epitaxy approach for interface and surface design of functional organic/metal-organic materials
Speaker:	Dr. Ritesh Haldar, Karlsruhe Institute of Technology (KIT), Germany
Date:	January 06, 2020
Time:	**15:00 Hours**
Venue:	**C.V. Raman Hall, 2nd Floor, Main Building, IACS**

All are cordially invited

Kind regards
-Praveen

Abstract: Crystalline organic or metal-organic materials (in particular: semiconductors, porous materials etc) are obtained as nanometer to micron sized particles with heterogeneous morphology. The intrinsic nanoscale periodicity of these materials is not retained when assembled in centimeter scale. Hence assembling these materials in large length scale (as a thin film) imposes severe challenge and the scope of material positioning and real-world applications such as in optical, electronic and separation technologies are severely constrained. To overcome this technology gap and introduce new functionalities, development of 3D ordering and material positioning methods is necessary. This presentation will highlight a methodology to realize 3D assembly of crystalline metal-organic/organic thin films at the solid-liquid interface and their interfacial properties. Using a layer-by-layer (lbl) liquid-phase epitaxy technique, crystalline and oriented thin films of metal-organic structures can be realized.1 Multi-heteroepitaxy method provides the scope of vertically designed material with high quality of organic-organic interface structure with low defect density. In my presentation, I'll briefly discuss the methodology (including surface functionalization, oriented growth, quartz crystal microbalance) and the major findings of my research work (mesoscale crystalline assembly, exciton diffusion at metal-organic interface). 2 I'll also propose the scope of the methodology towards new material design for optoelectronics and filtration technology, with particular emphasis on surface structure modification.

References:

1) Chem. Soc. Rev. 2017, 46, 5730
2) Nat. Commun. 2018, 9, 4332; Angew. Chem. Int. Ed. 2018, 57, 13662; Nat. Commun. 2019, 10, 2048