

## **Seminar**

### **Interfacial nanoengineering for sustainable energy and healthcare applications**

**Manish K Tiwari**

**UCL, London**

The engineering challenges of sustainability, energy-efficiency, robustness etc. are particularly acute at interfaces; nearly any failure starts at or creates new interfaces. Therefore, innovative engineering of surfaces and interface-integrated sensors elicits interest from a broad ranging of scientific community. I would like to present a few examples of how nanoengineering offers a strong promise to address these challenges. To start with, materials considerations for self-powered, nanogenerator-based catalysts and sensors will be presented. Next, I would discuss the need for precision and scalability in surface manufacture, with an emphasis on surfaces for anti-icing and other phase change control applications as well as in controlling (bio) fouling which impairs a large number of energy and propulsion systems. The biofouling issue is also linked with antimicrobial resistance (AMR), a major healthcare challenge. Lastly, I will share some perspective on how interfacial nanoengineering may need to evolve to meet future human healthcare and net zero considerations in infrastructure resilience, built environment and transport applications. Examples showing progress towards replacing poly- and perfluoroalkyl substances (PFAS) and introducing sustainably sourced materials for interfacial engineering will be discussed.

***Thursday, Jan 18<sup>th</sup> 2024***

***16:00 Hrs (Tea / Coffee 15:45 Hrs)***

***Auditorium, TIFR-H***