

## **Students' Annual Webinar**

### **Development of Atomic TMD Based Valley Engineered 2D crystals for Opto-Spintronics**

#### **Dipak Maity**

Understanding the role of defects is highly important in studying the light-matter interactions in semiconductors. In this perspective, studying the role of defects in atomically thin layered two dimensional (2D) semiconducting transition metal dichalcogenides (TMDs) is highly important. TMDs grown via CVD processes are prone for several defects particularly in the form of chalcogen vacancies. Further tuning of the defects can be carried out by post processes and other chalcogen or metal doping. Such additional energy levels formed in the crystal can play a seminal role in the excitation and emission properties of TMDs. Here I have studied the role of dopants, particularly vanadium and selenium, in MoS<sub>2</sub> monolayers and studied the transport and chirality dependent optical excitations. The results obtained here are correlated with a possible band structure and possibilities of such structures in applications such as valleytronics.

***Friday, Feb 24<sup>th</sup> 2023***

***11:00 AM (Tea / Coffee 10.45 AM)***

***Seminar Hall, TIFR-H***