**Tata Institute of Fundamental Research**
Survey No. 36/P, Gopanpally Village, Serilingampally, Ranga Reddy Dist., Hyderabad – 500 046

# Webinar

## Investigation of metal-molecule interface interactions at monolayer scale using novel experimental techniques

## Saurabh Chaudhary

### TCIS, Hyderabad

Bringing the molecule in close vicinity to the ferromagnetic surface causes the broadening of molecular energy levels and often leads to p-d hybridization creating hybrid molecule-metal interface electronic states. These interface states have different electronic and magnetic properties than the respective molecule and the metal surface, whose electronic and magnetic properties can be desirably tuned by altering the chemistry of organic molecules. In my thesis, I present my work that is majorly divided into two sections. In section-I, the instrumentation facility which includes the world's first integration of cryogen-free STM and cryogen-free superconducting magnet with the vacuum cluster line assembly is discussed. Commissioning of this unique and challenging experimental setup was achieved through rigorous effort in decoupling the STM system from unwanted resonant noise signals. In section-II, I report an unconventional exchange-bias response in a Fe/CoPc bilayer structure. Here, the exchange bias is shown to arise due to surface magnetic hardening effects promoted by interface hybridization. This work opens new avenues to explore and understand the complex interactions that appear at these interfaces.

***Friday, Oct 1st 2021***

***4:00 PM***