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

Seminar

Role of defects in determining the mechanical and electronic response of graphene oxide

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Graphene oxide (GO) is a versatile two-dimensional material whose electronic and mechanical behaviour can be tuned by changing the distribution of defects. In this thesis seminar, I will present methods to quantify and characterise defects in GO and show how to use them as design parameters to tailor material properties. I will begin by outlining strategies to build realistic atomistic models of GO, and then I will show how commonly used defect metrics can produce misleading conclusions when applied without careful validation. I will then demonstrate how controlled defect modification can influence mechanical performance, including changes in Young's modulus. Finally, I will discuss our analysis of the vibrational (Raman) and electronic properties of GO and identification of localised charge states, providing a foundation for future work on charge transport in these defective carbon systems. Overall, this work provides practical guidelines for defect-aware modelling and property tuning in graphene oxide for emerging technological applications.

Friday, Mar 6th 2026

11:30 Hrs (Tea / Coffee 11:15 Hrs)

Auditorium, TIFRH