Tata Institute of Fundamental Research
Survey No. 36/P, Gopanpally Village, Serilingampally, 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) has emerged as a transformative 2D material, bridging the gap between graphene's exceptional properties and practical applications in catalysis, optoelectronics, and beyond. Its tuneable electronic and mechanical properties, governed by a diverse landscape of defects, make GO a versatile platform for material design. The central theme of this talk is to develop robust methodologies for quantifying, characterising, and leveraging defects in GO to tune its mechanical and electronic properties. I will first present strategies for generating realistic GO models and demonstrate how conventional defect quantification approaches can lead to misleading interpretations. Then, I will explore how targeted defect engineering can modulate GO's mechanical response, such as Young's modulus. Finally, I will delve into our efforts in understanding the vibrational and electronic behaviour of GO through Raman spectral simulations and tracking localised charge states, paving the way for future studies in charge transport in defective carbon materials. Together, these findings provide a roadmap for leveraging defects to unlock GO's full potential in next-generation technologies.

Wednesday, Jun 25th 2025

16:30 Hrs (Tea / Coffee 16:15 Hrs)

Auditorium, TIFRH