



Project Proposal for Ph.D.

Project Details

Project Title	Wrinkling in two-dimensional materials
Project Summary (Minimum 500 and maximum 2000 characters)	Two-dimensional (2D) materials, such as graphene, transition metal dichalcogenides, MXenes and even few layer thick metallic films have attracted a lot of interest owing to their tunable electronic and optical properties. Formation of wrinkles and folds is very common during the fabrication process, and interestingly these have the potential to induce excellent properties, which are of great importance for their practical applications in a host of areas including field effect transistors, hydrophobic surfaces and sensors for flexible electronics. In this project, we aim to work on creating wrinkled 2D structures and understand the induced mechanical, electrical, thermal and optical properties using experimental studies and multiphysics modeling.

Ph.D. Supervisors

Role	Faculty	Academic Unit in IITD/Institute/University	Email ID (Official)
Supervisor 1	Prof. Sushma Santapuri	Applied Mechanics	ssantapuri@am.iitd.ac.in
Supervisor 2	Prof. Nirat Ray	Materials Science and Engineering	nirat@iitd.ac.in

Project requirements (Student qualifications, experience required, etc)

- B. Tech/BS/M.Tech./MS(R) in Mechanical Engineering, Applied mechanics, Materials Science and Engineering, Chemical engineering/Physics OR M. Sc. in Physics/Materials Science
- Strong analytical skills
- Willing to handle computational as well as experimental aspects

Source of fellowship/funding

(CSIR/UGC/DBT/ICMR/ICAR/NEET-PG/DST-INSPIRE/IRD/FITT Project details, if any)

Candidate with his/her own fellowship/IRD Project (RP04356G)

Role of Faculty Members involved:

Prof. Santapuri will be involved with the multiscale and multiphysics modeling of wrinkles in thin structures. Prof. Ray will be involved with the experimental fabrication and investigations of the material.