



Indian Institute of Technology Delhi
School of Interdisciplinary Research (SIRe)



SIRe Project Number

2023-01-17

(will be assigned by SIRe)

Project Proposal for Ph.D.

Project Details

Project Title	Mechanically stable and compact laser systems with precision alignment and focus control for the applications in quantum and laser based technologies
Project Summary (Minimum 500 and maximum 2000 characters)	Stable and compact laser systems are required for various applications ranging from quantum technologies, study of single molecules, precision spectroscopy, laser communications etc. In this project, we would like to develop a compact and robust laser system by designing mechanically stable laser housing and opto-mechanics to reach ultra-stable single mode operation. As frequency and power stability directly depend on mechanical stability of the laser, the successful completion of the project should provide the prototype of an ultra-stable compact laser for various applications including the above mentioned ones.

Ph.D. Supervisors

Role	Faculty	Academic Unit in IITD/Institute/University	Email ID (Official)
Supervisor 1	Prof. Bodhaditya Santra	Physics	bsantra@physics.iitd.ac.in
Supervisor 2	Prof. Prithviraj Mukhopadhyay	ME	prithvirajm@mech.iitd.ac.in

Project requirements (Student qualifications, experience required, etc)

- MSc/MTech in Physics/Electronics/Mechanical engineering or BTech in Electronics/Mechanical engineering or related disciplines
- Fundamental knowledge on Physics, Mechanical design, Optics, Electronics
- Valid CSIR-NET or GATE score
- Good communication skill
- Willing to work in interdisciplinary research team involved in cutting edge design, manufacturing and characterizing

Source of fellowship/funding

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

Funding through project number: RP04121G

Role of Faculty Members involved:

Asst. Prof. Bodhaditya Santra (Physics): Design, assembling and characterizing the opto-mechanical high quality laser cavity setup for large mode-hop free frequency tuning range

Asst. Prof. Prithviraj Mukhopadhyay (ME): Mechanical aspects of manufacturing hermetically sealed package containing optomechanical subcomponents required for the laser