



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



SIRe Project Number

2023-01-16

(will be assigned by SIRe)

Project Proposal for Ph.D.

Project Details

Project Title	Laser beam stabilization for various field applications in vibrating environments for the applications in quantum sensing and communications
Project Summary (Minimum 500 and maximum 2000 characters)	Stable laser beams over long distances are at the heart of various real life applications ranging from range-finder, laser communication, quantum communication, satellite communication etc. One of the main requirement for building such systems to have a frequency and power stabilized collimated laser beam. The second main requirement is a robust vibration isolation system to achieve high quality beam pointing stability. In this project we would like to develop a compact and robust laser system with vibration isolation for the above mentioned applications. Once the setup is ready, we would like test and characterize the stability of the collimated laser beam over distances longer than one kilometer or more.

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. Jayanta Kumar Dutt	ME	jkdudd@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): Opto-mechanical setup and analysis
Prof. Jayanta Kumar Dutt (ME): Vibration isolation setup and analysis