Reuben Shibu Mathew

Masters Student,
Advanced Optical Technologies

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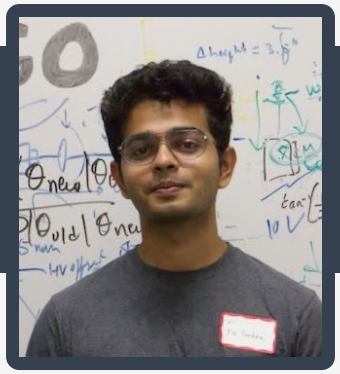

Education

Friedrich-Alexander-Universität, Erlangen-Nürnberg
2024 - Present

- Masters in **Advanced Optical Technologies**
  - Grade 1.4
  - Scholarship from Max **Planck School of Photonics**.
  - Majors: Optical Materials and Systems & Physics of Light.

National Institute of Technology, Calicut
2020 - 2024

- Bachelor of Technology in **Engineering Physics**
  - CGPA 8.5/10
  - Graduated **First Class with Distinction**.

Project Experience

Masters project at Max Planck Institute for the Science of Light, Erlangen
November 2025 - Present

- **Quantum correlation in modulation instability in twisted photonic crystal fibers.**
  - Supervisors: Dr. Vishal Choudhary & Prof. Nicolas Joly; *Joly Group @ MPL*.
- Working with mode locked lasers, fibre free space coupling, polarisation and quantum correlation measurements.

Internship at Max Planck Institute for the Science of Light, Erlangen
2025 April - 2025 November

- **Relative intensity noise analysis of MOPA lasers.**
  - Supervisors: Dr. Vishal Choudhary & Prof. Nicolas Joly; *Joly Group @ MPL*.
- Gained experience with MOPA lasers, fibre splicing and nonlinear optical phenomena in photonic crystal fibers.

Undergraduate project at National Institute of Technology (NIT), Calicut
August 2023 - May 2024

- **Analysis of microplastics using incoherent broadband cavity enhanced absorption spectroscopy.**
  - Supervisors: Salma Jose and & Prof. M. K, Ravi Varma; Department of Physics @ NIT Calicut.
- Gained experience with aethalometers, lasers, broadband sources and building and aligning broadband cavities.

Summer internship at California Institute of Technology, Pasadena
May 2023 - July 2023

- **Improving frequency stabilisation at the 40m detector with digital controllers.**
  - Supervisors: Radhika Bhatt and & Prof. Rana Adhikari; The Division of Physics, Mathematics and Astronomy @ Caltech LIGO 40m lab.
- Gained hands-on experience in control theory, laser locking and digital controllers (Moku platform) and related programming.

Summer internship at Indian Institute of Space Science and Technology (IIST), Trivandrum
May 2022 - June 2022

- **Design and realisation of a rotation stage for characterisation of optical gyroscopes**

- Supervisors: Dr. Dinesh Naik; Applied and Adaptive Optics Lab & Small Spacecraft Systems and Payload Centre (SSPACE) @ IIST.

– Experience gained in working with laser, optical fibers, interferometers and related components and in the design and machining of related parts.
– Presented a poster on the above project at quantum optics symposium, COPaQ'22 @ IIT Roorkee.

— **Design and realisation of a simple quadruped robot**
August 2021

– A robot with four legs, capable of moving forward and backwards under static stability, made with 3D printed parts powered by servo motors and controlled with micro controllers.
– 3D modelling – Autodesk Inventor; Movement and gait simulation – MATLAB and Simulink; Hardware and code – Raspberry Pi Pico running MicroPython.

Achievements

– Scholarship under Max Planck School of Photonics.
– LIGO Caltech Summer Undergraduate Research Fellowship (SURF), 2023.
– Head of Bhauthiki, the physics association at NIT Calicut.
– GATE Physics 2022, All India Rank 514.
– GRE general score – Quantitative 168/170, Verbal 158/170, Analytical Writing 4.0/6.0

Skills

– Laboratory experience
  – Fibre lasers, mode locked lasers, high power lasers.
  – Fibre cleaving, splicing, free space coupling, characterisation.
  – Oscilloscopes, optical and electronic spectrum analysers, FPGA based controllers, and SCPI interfacing with python.
– Software and coding
  – Advanced Python coding and basic coding in Java, C, HTML and MATLAB scripting. Capable of picking up on object-oriented languages easily.
  – Experience in working with CAD, MATLAB & Simulink, Blender and Linux based systems/servers.
  – Design of hardware and coding for micro controllers and peripherals on Raspberry Pi, Arduino and ESP32 platforms.
– Mechanical design and problem solving related to physics and robotics.
– Handling power tools like drills, cutters, grinders, circular saws and angle grinders.

Main courses taken

— **Masters:**

– Quantum Optics	– Nonlinear Optics	– Nonlinear fibre optics
– Quantum Communication	– Optics in Communication	– Machine Learning
– Advanced Laser	– Waveguides and photonic crystal fibres	

— **Bachelors:**

– Quantum Mechanics	– Thermodynamics	– Critical Phenomena
– General theory of Relativity	– Digital/Analogue electronics	– Condensed Matter Physics
– Physics of Climate	– Nuclear Physics	– Electromagnetics
– Statistical Physics	– Computational Physics	– Classical Mechanics