

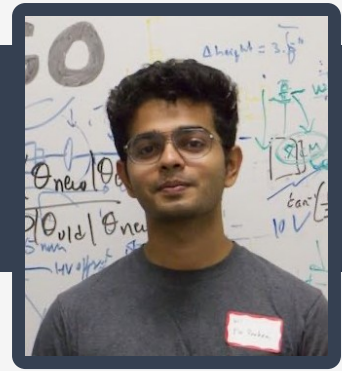
Reuben Shibu Mathew

Masters Student,
Advanced Optical Technologies

rbnsmathew@gmail.com

+49 176 35111 604

rbnsmathew.github.io



■ 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 8.57/10
 - 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:

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|-------------------------|--|--------------------------|
| – 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 | – Electromagnetic Theory |
| – Statistical Physics | – Computational Physics | – Classical Mechanics |
| – Lithography Techniques | | |