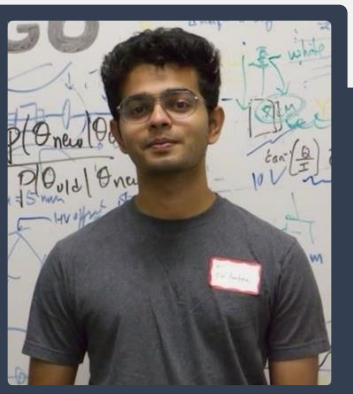
REUBEN S MATHEW

MASTERS STUDENT,

ADVANCED OPTICAL TECHNOLOGIES



rbnsmathew@gmail.com

rbnsmathew.github.io

Erlangen, Germany

EDUCATION

- **Friedrich-Alexander University, Erlangen**
- 2024-Present
  - Masters in Advanced Optical Technologies.
  - Max Planck School of Photonics.
- **NATIONAL INSTITUTE OF TECHNOLOGY, CALICUT, INDIA**
- 2020-2024
  - Bachelor of Technology in Engineering Physics.
  - CGPA – 8.53/10.

PROJECT EXPERIENCE

- **FINAL YEAR PROJECT AT NATIONAL INSTITUTE OF TECHNOLOGY, CALICUT (NIT, Calicut)** (Link)
- AUGUST 2023-May 2024
  - ***Analysis of microplastics using incoherent broadband cavity enhanced absorption spectroscopy***
    - Under guidance of Dr. MK Ravi Varma, Professor and Head, Dept. of Physics, NIT Calicut.
  - Literature survey completed, and initiated experimental phase at the Applied Optics and Instrumentation laboratory at the Dept. of Physics, NIT Calicut.
- **SUMMER INTERNSHIP AT CALIFORNIA INSTITUE OF TECHNOLOGY** (Link)
- MAY 2023-JULY 2023
  - ***Improvement of laser locking stabilization with digital controllers***
    - Mentored by Dr. Rana Adhikari, Professor of Physics, Caltech and Radhika Bhatt, graduate student, Caltech.
  - Worked at the LIGO 40m laboratory.
  - Gained hands-on experience in control theory, laser locking and digital controllers (on the Moku platform) and related Python programming, collaborated with grad students, scientists and postdocs.
- **SUMMER INTERNSHIP AT INDIAN INSTITUTE OF SPACE SCIENCE AND TECHNOLOGY (IIST)** (Link)
- MAY 2022-JUNE 2022
  - ***Design and realization of a rotation stage for characterization of optical gyroscopes***
    - Under guidance of Dr. Dinesh Naik, Assistant Professor, IIST.
  - Worked at the Applied and Adaptive Optics Lab and Small Spacecraft Systems and Payload Centre (SSPACE) at IIST.
  - Experience gained in working with laser, optical fibers, interferometers and related components and in the design and machining of related parts.
  - Presented a paper on the above project at optics symposium, COPaQ'22 at IIT Roorkee.
- **MINI PROJECT: DESIGN AND REALISATION OF QUADRUPED ROBOT** (LINK)
- 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 Python.

Courses Taken

Quantum Mechanics	Classical Mechanics	General Theory of Relativity
Optics	Condensed Matter Physics	Physics of Climate
Digital/Analogue Electronics	Computational Physics	Nuclear Physics
Statistical Physics	Complex Analysis	Laser Physics
Thermodynamics	Critical Phenomena	Solid State Physics
Electromagnetics	Waveguides	Machine Learning

Achievements and Attributes

- Scholarship from Max Planck School of Photonics.
- Recipient of the **Caltech Summer Undergraduate Research Fellowship (SURF)**, 2023.
- **Secretary of Bhauthiki**, the physics association at NIT Calicut, awarded the best performing club for the year 2022-2023.
- **Internal Affairs Secretary**, Audio-Visual Club 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.
- IELTS Academic score 8.5/9.
- **Head boy** and **Vice-Captain** in high school.
- Plays **guitar**, participated and won prizes in Western Solo, Group Songs.
- Represented school at inter school **basketball** tournaments.

Skills

- Laboratory experience
  - **Lasers, interferometers, nonlinear crystals, fiber optics** and related optical components.
  - Waveguides, measuring instruments and related electromagnetic components.
  - Precision measurement equipment like oscilloscopes, multimeters, frequency response analyzers and VSWR meters and FPGA based controllers.
- 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 Inventor, MATLAB, Simulink, Mathematica, Blender and Linux systems.
  - Design of hardware and coding for micro controllers and peripherals on **Raspberry Pi** and **Arduino.**
- Mechanical design and problem solving related to physics and robotics.
- Handling power tools like drills, cutters, grinders, circular saws, angle grinders, used for basic woodworking.