

Rohan I. Ojha

B.S. Electrical Engineering • Quantum Technology + Microelectronics and Semiconductors Concentrations
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Education

- Purdue University** - Senior 2022-2025
- [John Martinson Honors College](#), Dean's List and Semester Honors
 - Cumulative GPA: **3.96**, Major GPA: **4.00**
- Purdue University Graduate School** - Pursuing 1-year Master's in Electrical Engineering in "4+1" program 2025-2026

Work Experience

- **Sandia National Laboratories Center for Cyber Defenders (CCD) Intern** May 2024 - Present
 - Contributing to two R&D projects:
 - Quantum Error Correction: *Reconciling Quantum Circuit Simulations* (Continuing as year-round intern).
 - Quantum-Resistant Root of Trust: *Designing Hardware for secure exchanges using AES-GCM, Kyber, SPHINCS+.*
- **Purdue Quantum Science and Engineering Institute Quantum Nanophotonics Lab Research Assistant** Feb 2023 - Present
 - Developing a stable diffusion model for Metamaterial inverse design, enabling users to input desired optical properties and generate optimized unit cell designs efficiently.
 - **Co-authored:** ([SPIE Photonics](#) July 2024), *Residual Attention-based Processing of Tampered Optical Responses.*
 - Proposed a gold nanoparticle-based Physically Unclonable Function (PUF) and a Residual Attention-based tampering detection algorithm to combat the \$75 billion counterfeit semiconductor industry ([article](#)) ([press release](#)).
 - Writing for lab-invited review paper (in progress) on the application of autoencoders in modern nanophotonics, focusing on their role in inverse design and material property optimization.
 - Performed spectral analysis of [Quantum Emitters in Aluminum Nitride Induced by Zirconium Ion Implantation](#).
 - Developed automation and control software (e.g., linear actuator, power meter, variable attenuator drivers) for a Hanbury Brown and Twiss experimental setup to assess single photon emitters and optimize their fabrication.
 - Contributed to [Polytensor](#), an open-source Python package for CUDA-accelerated, parallel polynomial analysis.
- **Purdue Electrical Engineering Fundamentals (ECE 20001) Undergraduate Teaching Assistant** Aug 2023 - Present
- **Purdue Quantum Game Club** Jan 2023 - Present
 - Developed [Quantum Convolutional Neural Network \(QCNN\)](#) leveraging quantum hardware to classify MNIST images.
- **National Institute of Standards and Technology (NIST) Physical Measurement Lab (PML) Intern** Jun 2021 - Aug 2022
 - Controlled Scanning Tunneling Microscope (STM) and employed feedback-controlled lithography to create dangling bonds on hydrogen-terminated silicon chips for atom-specific patterning of phosphate.
 - Developed automated Fast-Fourier Transform-based algorithms in Java for atom/dangling bond location and STM image lattice determination, facilitating STM procedures for [atom-based device navigation](#) and control.

Coursework and Skills

- **Machine Learning:** Publication (developed counterfeit chip detection model with attention), PyTorch, Linear Algebra
- **Math and Physics:** Complex Analysis, Linear Algebra, Discrete Mathematics, Multivariable Calculus, Differential Equations, Probability and Statistics, Mechanics, Electricity and Magnetism, Quantum Physics
- **Software:** Python, PyTorch, C, RISC-V, MATLAB, Java, R, HTML, Excel, Git
- **Quantum Science:** Quantum Mechanics, Circuitry, Error Correction, Algorithms, Qiskit, Q#, Single Photon Emitters, TCSPC

Awards and Honors

- **Gold Medalist** – Kaggle [March Machine Learning Mania 2024](#) predicting March Madness tournament results. 2024
- **Private Pilot Glider License:** (at age 16), 46 hours in Schleicher ASK-21, funded by O'Callaghan Scholarship. 2022
- **International Science and Engineering Fair (ISEF) – 3rd Place, Physics and Astronomy (\$1,000).** Awarded for "Periodicity Felicity", a novel statistical method to search for binary black hole candidates. 2021