RYAN Y. MANLEY

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EDUCATION

Purdue University, West Lafayette, IN — Aug 2024 – Present
Bachelor of Science in Electrical Engineering (BSEE), GPA: 4.00/4.00 — (Exp. Grad. May 2028)
Select Coursework: Honors Mechanics (PHYS172H), E&M (PHYS272), Quantum Science (PHYS342), Quantum Materials & Devices (Custom ECE296), Circuits (ECE2k1 & 2k7), C (CS159), Semiconductors (ENGR10301)
Phillips Exeter Academy, Exeter, NH, *High Honors* — Aug 2020 – Jun 2024

AWARDS

Charles W. Brown ECE Scholarship in ECE, Elmore Family School of ECE of Purdue University — 2025 – 2026
Dean's List, College of Engineering and College of Science of Purdue University — All Semesters
Semester Honors, College of Engineering and College of Science of Purdue University — All Semesters

TECHNICAL SKILLS

Programming Python (TensorFlow, Qiskit, Flask), Java, C, C++, MATLAB, R, JavaScript (Next, React), html, css
Software Quantum Espresso (DFT), SRIM, Onshape, Fusion 360, GitHub, Google Workspace, Microsoft Office
Lab/Hardware XRD, AFM, SQUID, PPMS, CVT, 2D Material Exfoliation & Stacking, Arduino, Laser Optics

RESEARCH

Nanometa Group at Purdue University, West Lafayette, IN
Student Researcher, PI: V.M. Shalaev, A. Boltasseva, and A.V. Kildishev, Distinguished Profs — Sep 2025 – Present
- Beginning work in the Birck Nanotechnology Center on computing with photonics and plasmonics to revolutionize electronics. Presented my research experience & ideas to this huge 40+ highly educated group that I'm learning from.

Quantum Heterostructures Group at Oak Ridge National Lab, Oak Ridge, TN
RSI Research Intern, PI: Benjamin Lawrie, Senior Research Scientist — May 2025 – Aug 2025
- Developed a novel quantum sensing fabrication protocol for boron vacancy defects in hexagonal boron nitride (hBN).
- Designed and built a room temperature quantum sensing microscope system with a mounted optics train.
- Automated nanoscale Johnson Noise measurements and analysis in Python, quantifying quantum decoherence from gold waveguides — addressing a key challenge in quantum device scaling.
- Made gradient dosage sample with helium ion microscope (HIM) to study spin-spin interaction with a SPAD array.
- Abstract, *Probing Johnson Noise with Shallow Spin Defects in 2D hBN*, accepted for me to give a 20-minute symposium talk for The Minerals, Metals & Materials Society (TMS) at the international March 2026 meeting and paper in progress.

Quantum Matter and Devices Group at Purdue University, West Lafayette, IN
Student Researcher, PI: Yong P. Chen, Karl Lark-Horovitz Professor (left Purdue Aug 2025) — Jan 2025 – Jun 2025
- Researched exploiting super lubricity to engineer twisted TMD semiconductor heterostructures that can form tunable moiré superlattices, enabling morphic quantum electronics via piezoelectric and magnetic in-situ twist angle control.

Emergent Crystalline Matter Group at University of Tennessee, Knoxville, TN
Summer Research Intern, PI: David Mandrus, Endowed Professor — Jul 2023 – Sep 2023 & Jul 2024 – Aug 2024
- Synthesized novel materials, including high entropy alloys and superconductors, using flux and chemical vapor transport (CVT) growth methods. Characterized materials with X-ray diffraction (XRD), SQUID, and PPMS systems.
- Developed the CrysTool Hub website, an open-source calculation & modelling tool to accelerate materials research.

Joint Science Technology Institute (JSTI) West with Los Alamos National Lab (LANL), Los Alamos, NM
Green Microbial Factory Group Member, PI: Raul Gonzalez — Jun 2022
- Awarded an internship fully paid by the US Department of Energy (DOE) & Defense Threat Reduction Agency (DTRA) to work with scientists from Los Alamos National Laboratory and high school students selected nationwide.
- As part of the 7 student Green Microbial Factory group, I studied, conducted research, and presented on the biotechnological potential of cyanobacteria and algae. Video interviewed to explain the group.
- Found optimum strains of Synechococcus for photosynthetic Polyhydroxybutyrate (PHB), a bioplastic, production, essentially creating bioplastics simply from sunlight, water, and air.

LEADERSHIP AND VOLUNTEERING

Quantum Student Organization (QSO), Purdue University

Vice President Feb 2025 – Present

- Direct all aspects of the 500+ member student organization, building faculty & company relations, budgeting, and discord communication to advance quantum education on campus.
- Help organize/lead Purdue's large quantum events, including Spring into Quantum, Quantum Open House, and QSTEP.
- Co-led the redesign of the org's website (from a google site) over the summer to enhance user experience, automation, security, and organizational transparency with a custom calendar, Microsoft authentication, and dynamic visuals.
- Develop and teach weekly quantum crash courses, publishing lessons on YouTube and lead project groups in research.

Honorary Leadership Nov 2024 – Jan 2025

- Learned leadership operations, organized discord, and gave a popular Grover's algorithm password hacking lesson.

Ghost Imaging Project Group Founder Aug 2024 – Jun 2025

- Founded and led a project group using Qiskit simulations to investigate applications of ghost imaging with entangled photons for enhanced medical diagnostics, such as early cancer detection.

Quantum Coalition (QC), International 501(c)(3) Non-Profit

Executive Board Member (Membership Manager & Learning Resources Lead) Sep 2025 – Present

- Manage and grow the coalition's international membership across 30+ universities, streamlining the onboarding process and boosting community engagement & collaboration between universities and industry.
- Lead a global team to build and curate a centralized library of quantum resources across universities and using the library to train a machine learning model for a quantum AI tutor to enhance quantum education and its accessibility.

Future Leaders in Quantum (FLiQ) Hackathon Organizer, Challenge Designer, and Judge Feb 2025 – Jul 2025

- Co-organized the global FLiQ hackathon with the UN's ITU and sponsors like IBM & Classiq for 150+ participants.
- Designed and judged the art track challenges as Purdue's representative with Princeton and MOTH Quantum.
- Moderated AI for Good program with Quantum Village Co-Founder & Director Victoria Kumaran to 500+ viewers.

IEEE, Systems, Man, and Cybernetics Society (SMC), Purdue University

Research Group Member Aug 2024 – Present

- Analyzing and taking data with custom EEG to identify potential biomarkers for early concussion detection.
- Compiling the data of various papers together to write a review article.

Exeter Computing Club, Phillips Exeter Academy

Components Project Team Leader Sep 2023 – Jun 2024

- Led a team of 8 to use an Arduino with various sensor components to create a modular unit that was placed on washer and dryers of dorms. Using photoresists on their ON light, it could show on a website when and how long laundry was in them to make their availability more transparent.

HackExeter Hackathon Organizer Apr 2022 – May 2022

- Contacted primary and middle school teachers to advertise this global, virtual hackathon, making it one of the largest in its history with 100+ participants.
- Coordinated the discord with bots and gave basic programming presentations to teach and direct participants.

Robotics Club, Phillips Exeter Academy

SeaPerch Team Cohead Sep 2022 – Mar 2023

- Co-led a team of 13 to use OnShape to design and build an underwater ROV, competing regionally at UNH.