CHRISTOPHER PRAINITO

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EDUCATION

Harvard University Cambridge, MA
A.M. Candidate in Physics (Concurrent A.B./A.M. Degree). GPA: 4.0. May 2026
A.B. Candidate in Physics and Mechanical Engineering, Secondary Field in Astrophysics. GPA: 4.0. May 2026

RESEARCH EXPERIENCE

Harvard University Cambridge, MA
Undergraduate Researcher; Advisor: Carlos Argüelles-Delgado August 2025 – Present

- Design, simulate, and implement specialized hardware for a water-Cherenkov calibration system using a muon scintillator trigger array to validate Digital Optical Modules (DOMs) for the IceCube Neutrino Observatory.
- Developing an undergraduate thesis based on this project.

Harvard Satellite Team Cambridge, MA
Chief Engineer; Advisor: Robin Wordsworth September 2022 – Present

- Lead 5 subteams (25+ students) on research, design, and integration of novel CubeSat systems for our student-led NASA CSLI mission, which tests the viability of nickel-titanium shape-memory alloys for solar array reorientation.
- Execute complex engineering tasks and integration testing, interface with NASA and launch integrator, lead FCC small-satellite licensing filings, and track milestone completion for planned deployment in Q2 of 2026 via the ISS.

Stony Brook University Stony Brook, NY
Undergraduate Researcher (NSF REU); Advisor: Mengkun Liu May 2024 – July 2025

- Designed and developed a quadrature, phase-differential interferometer for improving sensitivity and resolution in scanning near-field optical microscopy (SNOM) measurements.
- Contributed to the development of a THz SNOM, interferometric feedback systems, and atomic force microscopy (AFM) strain stages in the Ultrafast & Near-field Infrared Laboratory (UNI-Lab).

Harvard University Cambridge, MA
Undergraduate Researcher; Advisor: Giulia Semeghini May 2023 – September 2023

- Designed, aligned, and optimized optical systems to lock the frequency of various lasers for a dual-species, neutral atom array experiment.

New Jersey Institute of Technology Newark, NJ
Student Researcher; Advisor: Omowunmi Sadik March 2021 – September 2022

- Independently developed a project proposal and fabricated a novel paper-based biosensor for SARS-CoV-2.
- First author of a peer-reviewed, Editor's Choice publication in MDPI Biosensors with 25+ citations.

PUBLICATIONS

Prainito, C. D. (2026). Factor Graph Optimization for Positioning, Navigation, and Timing—A Tutorial and Review. Manuscript submitted for publication in *IEEE Access* (approved for public release).

Jing, R., Zhou, B., Kang, D., Zheng, W., Zhou, Z., Wang, H., Chen, X., Yao, J., Cheng, B., Park, J.-H., Wehmeier, L., Dai, Z., Chen, S., **Prainito, C. D.**, Carr, G. L., Charaev, I., Bandurin, D., Gu, G., Li, Q., … Liu, M. (2025). Bolometric Superconducting Optical Nanoscopy (BOSON). *Physical Review X*, *15*(3). https://doi.org/10.1103/f13d-dpdn

Prainito, C. D., Eshun, G., Osonga, F. J., Isika, D., Centeno, C., & Sadik, O. A. (2022). Colorimetric Detection of the SARS-CoV-2 Virus (COVID-19) in Artificial Saliva Using Polydiacetylene Paper Strips. *Biosensors*, *12*(10), 804. https://doi.org/10.3390/bios12100804

KEY SKILLS

Software: Python, C, C++, C#, Geant4, ROOT, MATLAB, Verilog, VHDL, Java, JavaScript, SQL.
Hardware: CAD (SolidWorks, Fusion 360); metal machining; PCB design and assembly (KiCad).

SELECTED AWARDS & HONORS

John Harvard Scholar November 2023, 2024, & 2025
Harvard College

Department of Defense SMART Scholarship, Scholar August 2024
U.S. Department of Defense

Detur Book Prize Recipient January 2024
Harvard College

Davidson Fellows Scholarship, Fellow September 2022
Davidson Institute

International Science and Engineering Fair, Finalist May 2022
Regeneron Pharmaceuticals & Society for Science

Science Talent Search, Scholar January 2022
Regeneron Pharmaceuticals & Society for Science

TEACHING & MENTORSHIP EXPERIENCE

Harvard University Cambridge, MA
Astrophysics Department Lab Assistant September 2024 – Present

- Maintain and repair several of the Astrophysics Department's professional-grade telescopes and equipment.
- Assist with laboratory activities and observing sessions for astronomy courses.

Harvard University Cambridge, MA
Course Assistant September 2023 – Present

- Host office hours and lab sections to provide support to Linear Algebra (Math 22), Laboratory Electronics (Physics 123/223), and Mechanical Systems (Eng-Sci 125) students in successfully completing course assignments.
- Evaluate and grade assignments to ensure academic progress and comprehension of course material.

Harvard Summer School Cambridge, MA
Secondary School Program Proctor June 2023 – August 2023

- Ensured the well-being of 16 high school students throughout the duration of the summer semester, planned weekly activities for residential entryway, and scheduled individual meetings with students.

COMMUNITY ENGAGEMENT

Student Astronomers at Harvard-Radcliffe (STAHR) Cambridge, MA
Astrophotography Chair & Board Member September 2022 – Present

- Manage, maintain, and procure telescopes, mounts, cameras, and eyepieces for student-run observatory.
- Organize public events to engage the broader community in astronomy- and science-related events.

Students Giving Trees, Inc. Bellmore, NY
Founder, President, and Treasurer September 2020 – Present

- Founded a student-run, nonprofit organization to replenish tree population in local parks and preserves.
- Organize fundraising activities and plan community tree planting events in coordination with local legislators.

SELECTED PROJECTS

Telescope Mount Cambridge, MA
Harvard University Nectar Funding May 2023 – August 2023

- Independently designed, manufactured, and assembled a professional-grade mount for aiming a telescope at celestial objects and tracking their motion with sub-arcsecond RMS precision over 8+ hour sessions.