Ryan **Cooley**

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Education

Tufts University *Medford, MA*

B.S. IN CHEMICAL PHYSICS *Expected Graduation June 2027*

- GPA: 3.89/4.00, Dean's List (All Semesters)
  Mathematics: Calculus I–III; Linear Algebra | **Physics:** Physics 11–12; Modern Physics; Galactic & Extragalactic Astrophysics | **Chemistry:** General; Organic; Physical Chemistry | **Computer Science:** Introduction to Computer Science

Skills

Programming & Automation: Python (PCEP), C++, Git, VBA | **Molecular Simulation:** OpenMM, VMD | **Astronomical Data:** CIAO, DS9 | **Web & Document:** HTML/CSS/JavaScript, LaTeX | **Linux & Security:** Command-line (OverTheWire Bandit)

Professional Experience

Entegris *Billerica, MA*

METROLOGY RETENTION INTERN *May 2025 - August 2025*

- Conduct retention tests using ICP-MS for trace-element analysis, dynamic light scattering for particle sizing, and fluorescence spectroscopy on a Hitachi F-7000
- Develop and maintain Excel VBA macros to automate data transformation, statistical analysis, and formatted report generation
- Reduce end-to-end processing time by over **1200%** (from 36 min to under 3 min) through automation
- Build modular error-handling and logging routines to ensure data integrity and facilitate debugging
- Author SOP documentation and deliver training sessions to lab personnel for sustainable workflow adoption

Chestnut Hill Realty *West Roxbury, MA*

ADMINISTRATIVE ASSISTANT *May 2024 - August 2024*

- Managed office tasks, organized property tours, and handled calls with prospective and current tenants
- Coordinated maintenance requests enhancing tenant satisfaction

Research Experience

Ding Lab at Tufts University *Medford, MA*

UNDERGRADUATE RESEARCH ASSISTANT *May 2024 - Present*

- Simulate water models (TIP3P vs. bundled) in OpenMM/Python and process trajectories with NumPy to validate force-field parameters
- Collaborate on coarse-grained force-field development by integrating new parameters into test simulations
- Analyze simulation outputs with Matplotlib to track energy convergence and structural metrics
- Discuss scientific papers (linear algebra, coupling analysis, "bundled water") in weekly lab meetings
- Initiate free-energy calculation research for credit in Fall 2025, applying alchemical methods to probe solvation energetics

Harvard-Smithsonian Center for Astrophysics *Cambridge, MA*

ASTROPHYSICS INTERN *June 2022 - August 2023*

- Created astronomical images from Chandra data using CIAO and DS9 under the mentorship of Dr. Felipe Andrade-Santos
- Learned to use LaTeX for scientific paper creation and publication

Extracurricular Activity

Students for the Exploration and Development of Space (SEDS) *Tufts University*

CUBESAT COMMUNICATIONS & GROUND STATION LEAD *November 2023 - Present*

- Apply FCC Amateur Radio Technician License knowledge to research ground-station hardware and uplink/downlink protocols for CubeSat operations
- Support orbital mechanics analysis in MATLAB, using "42" for trajectory simulations and MASTER for space-debris analysis
- Develop data-analysis methodologies and contribute to team proposals on CubeSat mission performance

Additional Memberships *Tufts University*

AMERICAN CHEMICAL SOCIETY; SOCIETY OF PHYSICS STUDENTS; CLUB SQUASH; CLUB ROCK CLIMBING

Honors & Awards

Sigma Pi Sigma (Physics & Astronomy Honor Society) *Tufts University*

INDUCTED MEMBER *April 2025 - Present*

- Recognized for exceptional academic performance and leadership in physics