# Sean Byrne

Sean_Byrne@uml.edu — (860) 752-4867
502 Moody St, Apt 24, Lowell, MA 01854

## Education

**Ph.D., Physics** *2020–Present*
University of Massachusetts Lowell
Dissertation: Effect of the $^{57}$Ni(p,$\gamma$)$^{58}$Cu Reaction Rate on the $\nu p$-Process
**M.A., Physics** *2020–2023*
University of Massachusetts Lowell
Thesis: Constraining the Half-life of $^{72}$Rb for the $^{72}$Rb(p,$\gamma$) Reaction
**B.S., Physics & Biomolecular Science** *2017–2020*
Minors: Mathematics, Chemistry Central Connecticut State University *Magna Cum Laude*

---

## Research and Technical Experience

**Graduate Research Assistant** *2020–Present*
*University of Massachusetts Lowell* — Advisor: Dr. Andrew Rogers
- Conducted nuclear physics experiments at the Argonne National Laboratory and FRIB.
- Analyzed experimental data using ROOT and C++ with multi-detector coincidence techniques.
- Led and trained undergraduate and graduate researchers.

**Astronomy Research Intern** *2018–2020*
*Yale University* — Dr. Charles Bailyn
- Modeled X-ray binary systems to extract black hole parameters through optical light curve fitting.
- Developed image reduction and analysis pipelines using Python and IRAF.

**Biomolecular Science Researcher** *2017–2019*
*Central Connecticut State University & Northeastern University*
- Investigated stress responses in planaria and antibiotic resistant bacteria using Western blotting, PCR, and protein assays.

---

## Professional Experience

**United States Marine Corps** *2013–2018*
*Combat Engineer, Sergeant (E5)*
- Squad Leader from rank E3; oversaw field operations and safety protocols.
- Trained allied forces in Southeast Asia and managed engineering operations.
- Secret security clearance held until 2022.

---

## Technical Skills

**Programming:** Python, C++, ROOT, LaTeX, IRAF, Git, Bash/WSL
**Simulation & Tools:** Monte Carlo Simulation, MESA, Nuclear reaction modeling ,WinNet, OneZone, Linux/Unix, Windows , Microsoft tools, signal processing , numerical methods, experimental design

**Instrumentation:** HPGe detectors, semiconductors, scintillators, neutron and charged particle detectors, NIM and DAQ modules, vacuum systems, cryogenic equipment
**Soft Skills:** Leadership, mentoring, training, science communication, project coordination, teamwork and team bulding, critical thinking, problem solving, complex data interpretation
**Military Skills:** Explosives experience, Logistic coordination, high-pressure performance, conflict resolution, decision-making, self-defense training, weapons training, land navigation, tactical communication, route clearance

---

## Awards & Honors

- UML Student Veteran of the Year (2023)
- Physics Department Service Award (2023)
- FAMOUS Travel Grant (2020)
- CT NASA Fellowship (2019)
- CCSU Research Grant (2018)
- NSF REU — Northeastern University (2018)
- Warrior-Scholar Project Fellowship (2017)

---

## Leadership & Service

- Co-Chair, Gordon Research Seminar *2025 - 2027*
- President, Graduate Physics Association *2022-2025*
  Vice President *2025–2026*
- Steward, Graduate Student Organization *2021–2025*
- President, UML Student Veterans Organization *2022–2023*
  Vice President *2021-2022*
- Volunteer Firefighter, Hazardville, CT *2006–2010*
- Association for Research at University Nuclear Accelerators ECR committee *2025 - present*