

Kaitlyn Yanna

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Education

Dual B.S. in Nuclear Science & Engineering and Global Studies & Languages (Spanish Studies)

Cambridge, MA

Massachusetts Institute of Technology

Sept 2021 - May 2025

- Double Majoring in Nuclear Science & Engineering and Global Studies & Languages (Spanish Studies)
- Minor in Physics
- Concentrating in Comparative Media Studies

Work Experience

Research Assistant

Cambridge, MA

Plasma Science and Fusion Center

March 2022 - Present

- Verifying STEP against 70+ experimental datasets to determine the accuracy of STEP of predicting profile temperature
- Built a database comprised of 100+ published papers about tokamaks ranging from 1970s-2023 to validate STEP. This database contains engineering parameters (magnetic field, plasma current, etc). The end goal is to publish the entire database
- Designed an ECE diagnostic for SPARC: edited and wrote data-verified code in Python to assess analytic theory for predicting and modeling the optical system and its gaussian beam parameters
- Researched the degradation of plasma facing mirrors used in ECE by designing and running experiments on a replica of ASDEX's optical system to model gaussian beam parameters to verify the model with collected and analyzed data
- **Technical Skills:** Python, Plasma Physics, Database Building
- **Soft Skills:** Collaboration, Science Communication

Science Undergraduate Laboratory Intern (SULI)

San Diego, CA

General Atomics/DIII-D

May 2024 - Aug 2024

- Modeled loss of scaled-up photonic waveguides in the microwave regime in COMSOL
- Validated theoretical models of impedance, mode conversion loss, and bending loss to published experimental data
- Built a literature database on photonic crystal and dielectric lined waveguides. This database contains information on bandwidth, confinement loss, and geometric cross-section
- Recommended waveguides for development in future fusion applications; this work was presented at APS DPP 2024
- **Technical Skills:** Waveguide Physics, Database Building, MATLAB, COMSOL
- **Soft Skills:** Science Communication

Research Assistant/Intern

Madrid, Spain

CIEMAT/Laboratorio Nacional de Fusión

May 2023 - Aug. 2023

- Characterized the phase difference between the density and electrostatic potential in the TJ-II stellarator to study how plasmas lose energy via turbulence
- Calculated the cross phase correlations between various ports of the heavy ion beam probe (HIBP) diagnostic
- Created and improved MATLAB codes to realize that the data is approaching the necessary quality
- Designed easily-readable graphs that inspired and informed future experimental campaigns; this work was presented at APS DPP 2023
- **Technical Skills:** Plasma Physics, Signal Processing, Cross-Correlation Analysis, MATLAB
- **Soft Skills:** Science Communication

Independent Researcher, Desk Worker

Madison, WI

Madison Area Technical College STEM Center

Aug. 2020 - Aug 2021

- Conducted independent research on composting optimization using a sensor system with Arduino ESP8266 for real-time data collection on moisture, temperature, and humidity
- Engineered an in-vessel rotary drum bioreactor to analyze the effects of uniform turning
- Performed literature review and analysis, concluding bioreactor and Bokashi method as optimal composting solutions
- Authored detailed report on findings and methodology
- **Technical Skills:** Manual Fabrication, Bioreactor, Arduino
- **Soft Skills:** Science Communication

Leadership Experience

Undergraduate Representative

Cambridge, MA

MIT's Chapter of the American Nuclear Society

Mar 2023 - Present

- Led and participated in preparing a report for the Visiting Committee, offering appraisal, advice, and insight on the undergraduate NSE program at MIT
- Advocate for undergraduate NSE students in ANS board meetings, securing an additional \$1,300 for study breaks and outings
- Plan study breaks and outings to fuel and recharge NSE undergraduates
- **Soft Skills:** Communication, Creativity

Student Ambassador

Cambridge, MA

MIT NSE Recruitment

Sep 2022 - Current

- Innovate creative short videos to encourage student and public interest in NSE
- Script, direct, act, film, and edit videos in collaboration with peers using Apple and Adobe products
- **Technical Skills:** Adobe Video Editing, Apple Video Recording
- **Soft Skills:** Collaboration, Science Communication, Educational Outreach

Member of the Undergraduate Student Advisory Group for Engineering

Cambridge, MA

MIT School of Engineering

Oct 2022 - May 2022

- Innovated ways to encourage first year MIT students to discover less common areas of engineering
- Conceptualized an "Intro to Engineering" course to encourage first years to explore engineering majors
- **Soft Skills:** Collaboration, Creativity

Student Mentor Trainer, Student Mentor

Cambridge, MA

MIT Project Manus

Feb. 2021 - Sept. 2023

- Taught first-year students on proper use of manual fabrication machines so that they feel empowered to use makerspaces
- Maintained high standards of shop cleanliness, supervised and supported other students in their projects
- Promoted to student-mentor trainer (September 2022): trained 3 other student mentors
- **Technical Skills:** Manual Fabrication, Digital Fabrication, Makerspace Safety
- **Soft Skills:** Teaching, Leadership

President, Social Media Ambassador

Cambridge, MA

P. Fitness Club

Sept. 2022 - Dec. 2022

- Organized social media presence on social media platforms to promote the club and encouraged 200 members to join
- Secured \$500 in funding by writing applications to foundations and funds to support this brand-new club financially
- Led peers to conceptualize ways to develop the club
- **Soft Skills:** Funding Writing, Non-profit Development, Leadership, Collaboration

Lead Student Delegate, Member of the Visiting Committee Undergraduate Delegation

Cambridge, MA

MIT NSE Department

2022, 2024

- Successfully advocated to publicize alternatives to computational courses and for easier student access to focus area subjects as recommended by the department
- Cohesively wrote and prepared a survey, report, and presentation to faculty and staff in collaboration with peers on the current state of the department
- Led peers to conceptualize ways to develop the club
- **Soft Skills:** Survey Conducting, Communication, Leadership, Collaboration

Manager Candidate, Crew Trainer, Crew Member

Deforest, WI

McDonald's

July 2020 - July 2021

- Communicated with a diverse range of stakeholders including customers, senior management, and coworkers
- Maintained high standards of customer service during high volume, rapidly evolving conditions
- Trained 5 new employees on the policies, protocols, and procedures
- **Soft Skills:** Communication, Leadership, Collaboration

Recognition

2024	Award , Outstanding UROP Award for "outstanding contributions by a Junior or Senior to a research project in the Department of Nuclear Science and Engineering," (MIT NSE Department)	Cambridge, MA
2024	Scholarship , ANS Fusion Energy Division Dr. Kenneth R. Schultz Undergraduate Scholarship	Cambridge, MA
2023	Program , Burchard Scholar as a "promising MIT junior who has demonstrated excellence in some aspect of the humanities, arts, or social sciences"	Cambridge, MA
2023	Fellowship , Kelley Douglas Traveling Fellowship for archival and library research	Cambridge, MA

Publications

JOURNAL ARTICLES

- N.T. Howard, **Kaitlyn Yanna**, et al. "Design and Analysis of a Electron Cyclotron Emission Based Temperature Profile Measurement in the SPARC Tokamak." To be submitted, Review of Scientific Instruments (2025)

CONFERENCES

- Photonic waveguide investigation for fusion applications CP12.00072
66th Annual Meeting of the American Physical Society (APS) Division of Plasma Physics, Atlanta (GA), Oct 7 - 11 2024
- Validation of the Stability, Transport, Equilibrium, & Transport module (STEP) using extensive experimental data
MIT Department of Nuclear Science & Engineering Research Expo, Cambridge (MA), April 26, 2024
- Study of the phase difference between turbulent density and electrostatic potential fluctuations in the TJ-II stellarator CP11.00138
65th Annual Meeting of the APS Division of Plasma Physics, Denver (CO), Oct 30 – Nov 3 2023

Skills

Programming	Python, MATLAB, GitHub, COMSOL, Javascript, LaTeX, Linux
Research	Plasma Physics, Database Building, Waveguide Physics, Signal Processing, Data Analysis, Experiment Design
Languages	English, Proficient in Spanish (C1/C2)
Soft Skills	Communication, Science Communication, Mentoring, Teaching, Leadership, Educational Outreach, Collaboration, Creativity

References available upon request.