Emma Lovett

Office: BU CAS 406 | elovett@bu.edu | www.linkedin.com/in/elovett

Education

Boston University — Boston, MA
M.S. Astronomy; PhD Candidate — *Sep. 2021 – Present*

University of Massachusetts Amherst — Amherst, MA
B.S. Astrophysics & B.S. in Physics, Major GPA: 3.8 — *Aug. 2017 – June 2021*

Research Interests

Europa & jovian moons — Atmospheric & Geologic modeling — Exoplanet characterization — Astrobiology

Publications

P.R. Lierle, C. Schmidt, J. Baumgardner, L. Moore, **E. Lovett** (2023). *The Rapid Imaging Planetary Spectrograph.* Publications of the Astronomical Society of the Pacific.

Talks Given

Oral Presentation on Europa's Na & K Exospheres During the Juno 2022 Flyby — Dec 2023
American Geophysical Union — *San Francisco, CA*

Presented constructed map of Na column density using ground-based data during the Juno flyby of 2022 Sept 29. Data were taken during enhanced Io output, and shows superthermal Na: an indication of a collisionless atmosphere. Expected Na volume density was reported to compare to Juno data.

Presentation on Galaxy Structure Dependence on Environment — May 2021
Massachusetts Undergraduate Research Conference — *Virtual*

Created an animation highlighting research results from my project with Dr. John Silverman on galactic structure as it relates to environment; this talk was aimed to introduce the topic to a broad audience with no background in astrophysics

Awards & Extracurricular Activities

Awards: 2023 NASA FINESST Fellow; BU Dean's Fellowship, 2022; Ida & Joseph Simenas Physics Scholarship, 2020
Boston University Affiliations: Founder of ASTRO365; Leadership Board for Inclusive Astronomy; Member of College of Arts & Sciences' Diversity Inclusion and Action Team
UMass Amherst Affiliations (2017 – 2021): Integrated Concentration in Renewable Energy; UMass Amherst Dept. of Engish Specialization in Creative Writing; Member of Women and Minorities in Physics

Experience

Graduate Student Researcher — November 2021 – Present
Supervisor: Dr. Carl Schmidt — *Boston University*

- NASA FINESST funded project to map and measure alkalis in Europa's exosphere as a proxy for subsurface ocean salinity and plume detection
- Co-Investigator in the largest current solar system campaign at Keck I/II (N078)

Executive Secretary on NASA SSW Panel — January 2023
PO: Dr. Majd Mayyasi — *Boston University, NASA*

- Read several SSW Atmosphere proposals
- Recorded panelist discussions and provided input on relevant research topics

Graduate Student Teaching Fellow January 2022 – June 2022

Instructor: Dr. Thomas Bania *Boston University*

- Holding weekly discussion sections to foster understanding of introductory astronomy course AS107 Life Beyond Earth to non-major students
- Hosting weekly night labs at BU's public observatory for students to complete laboratory assignments with telescopes and celestial pipes

Undergraduate Research Assistant June 2020 – May 2021

Supervisor: Prof. John Silverman *Kavli Institute of Physics and Mathematics of the Universe*

- Despite COVID restrictions, worked online with Dr. John Silverman at the Kavli IPMU in Japan to observe galaxies and became familiar with Python and advanced Unix commands
- Used data from the Hyper-Suprime Cam Subaru Strategic Program on the Subaru Telescope to compare physical properties of galaxies in different environments

Astronomy Tutor and Lab TA Jan. 2018 – May 2021

UMass Amherst, Dept. of Astronomy *Amherst, MA*

- Managed Astronomy Help Desk at UMass Amherst
- Answered student homework or exam preparation questions in person or via email
- Communicated scientific concepts to people with different majors and backgrounds
- Prepared experimental set ups for students before class

Projects

Alkali Abundance in Europa's Exosphere November 2021 – Present

- Measuring Na and K abundances in Europa's exosphere with Keck/HIRES during Juno's 2022 Europa flyby
- Results show superthermal Na- evidence that Europa's atmosphere is a surface-bound exosphere
- Creating maps of Europa's Na and K exospheres to show spatial asymmetries

Observing Galaxies in Three Environments June 2020 – May 2021

- Used data from the Hyper-Suprime Cam Subaru Strategic Program on the Subaru Telescope to compare physical properties of galaxies in different environments
- Confirmed correlation between environment and galactic structure in regard to Sersic index and size
- Speculated possible effects of galaxy mergers to explain the observed environmental dependence of galaxy structure
- Results published as a thesis titled "Observing Galaxies in Three Environments" for Commonwealth Honors College and presented at the Massachusetts Undergraduate Research Conference of 2021, supervised by Dr. John Silverman and reviewed by Dr. Mauro Giavalisco and Dr. Min Yun.

Technical Skills

Programming Languages: IDL, Python
Libraries: NumPy, Matplotlib, Coyote, SPICE
Other: Microsoft Office, Google Drive tools, TopCAT, SAOImage DS9, Mac OS Terminal, Windows, Adobe Illustrator, Adobe InDesign

Outreach

ASTRO365 Founder February 2022 – Present

Boston University *Boston, MA*

- Kick-started a public engagement program that provides opportunities to high school students in low-income, diverse communities to pursue careers in astronomy
- Inviting underprivileged high schools to attend events at BU that showcase departmental research and resources for undergrads, grads, post-docs, and faculty
- Feedback after first event shows over 50% increase in high school student interest in pursuing careers in astronomy

Inclusive Astronomy Co-Founder September 2023 – Present

Boston University *Boston, MA*

- Started an initiative in the BU Astronomy Department to streamline public engagement efforts and provide an affinity group for self-identified underrepresented people in astronomy
- Awarded funding through the Massachusetts Space Grant Consortium
- Organizing outreach efforts, such as Science Train, ASTRO365 Interactive Nights, andDeaf Open Night
- Fostering an inclusive environment for underrepresented minorities in the field through biweekly lunches, community-building vision board nights, and group outings where conversations center around inclusivity and accessibility

Open Night Host September 2021 – Present

Boston University *Boston, MA*

- Setting up telescopes and instructing members of the general public
- Answering general astrophysics and space physics questions from non-scientific audience

iCons "A Little About A Lot" Science Podcast Co-Host September 2019 – May 2021

UMass Amherst *Amherst, MA*

- Contributed to literary research on various scientific topics including wildfires and astrobiology
- Spoke on multiple episodes and gave a voice to marginalized communities during the COVID-19 hate crimes