Máire Volz

Scientist / Educator / Artist

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Personal Information

- ★ **Location:** Boston, MA
- ★ **Email:** mvolz@bu.edu

Awards

- ★ **Dean's Fellowship** Boston University
- ★ **BA with Distinction** University of Colorado Boulder
- ★ **Chancellor's Achievement Scholarship** University of Colorado Boulder
- ★ **Dean's List** University of Colorado Boulder, 2018 - Present
- ★ **Chambliss Student Poster Award** Honorable Mention, AAS 237
- ★ **Wesley Yordon Prize** University of Colorado Boulder

Skills

- ★ **Language:** Fluent in French
- ★ **Coding:** Proficient in Python (Pandas, Specutils, Astropy, etc.) Familiar with IDL, MATLAB, AstroImageJ, SAOImage DS9
- ★ **Communications:** Multimedia presentations (Ppt., Video, Interactive, Virtual, etc.) Teaching (Grade school and undergraduate level math and astronomy)
- ★ **Artistic:** Sewing, Painting, Collaging, Beading, Embroidery, Graphic Design

Greetings, I'm Máire (MOY-ruh)! I am very passionate about space and personal expression through fashion and art. I strive to discover the hidden meaning in the Universe through science and art, and have a passion for inspiring others to do so as well. I hope to continue asking and answering questions for myself and others as I move on in my career.

Education

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2023 - Present

Boston University Graduate Student - Department of Astronomy

Relevant Coursework

- Introduction to Astrophysics (AS 701)
- Observational Techniques (AS 709)

Courses Taught

- Principles of Astronomy I (For Majors) (AS 202): I organized lab lectures, graded reports, ran observing labs on a 10" telescope, and held office hours for a class of 30 students.

Research Projects

- Reduction and analysis of James Webb Space Telescope MIRI spectral data of protoplanetary disks: flux calibration, line identification, error analysis, etc.

2018 - 2022

University of Colorado, Boulder Bachelors in Arts - Astrophysics

Relevant Upper Class Coursework

- Astronomical Observation (ASTR 3510)
- Spectroscopy (ASTR 3520)
- Advanced Theoretical Optics (PHYS 4510)
- Astronomical Instrumentation Laboratory (ASTR 3560)
- Modern Physics, Quantum Mechanics (PHYS 2170, 3220)
- Advanced Mechanics and Electromagnetism (PHYS 3210, 3320)
- Stellar and Galactic Astrophysics (ASTR 3730, 3830)
- Research Methods in Astronomy (ASTR 3400)

GPA: 3.913 **Credits:** 152.0

Professional Experience

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6/2022 - 5/2023

NASA Headquarters USRA Intern

At my position at NASA with my sponsor Dr. Antonino Cucchiara, I created new resources promoting diversity in the NASA Hubble Fellowship postdoctoral program. The deliverables of this internship, produced using Python code, included:

- New databases of fellows' academic and professional information
- A Minority Serving Institution faculty information database
- An interactive map displaying fellowship host institutions and nearby Minority Serving Institutions.
- A publicly-available algorithm I wrote that determines the astronomical expertise of a researcher based on their name using their authored papers in NASA ADS.

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My internship at NASA required the following responsibilities:

- Mature and independent time management skills in a work-from-home environment.
- Open and honest communication and collaboration on tasks with my supervisor.
- Independent learning and problem solving.
- Incorporating new information on Pandas, Natural Language Processing, and tone analysis.

It was an incredible opportunity working with NASA. It reinvigorated my love of scientific outreach, and the importance of equitable opportunities for all astronomers.

Presentations: I presented my expertise-finding algorithm as an iPoster at the 242nd AAS meeting in Albuquerque, New Mexico.

8/2022 - 6/2023

Denver Public Schools Denver Math Fellows Math Instructor

As a Math Fellow at North High School in Denver, CO, I have the ultimate goal of closing the opportunity gap for Denver's highest-need students.

My position requires me to do the following things:

- Collaborate with my 2 coworkers on daily 88-minute lessons.
- Keep students engaged with grade-level math content and balancing that with their specific academic needs.
- Constantly modify lesson plans throughout the day to maximize student understanding.
- Monitor classroom behavior in a small environment.
- Provide both small group and one-on-one support without compromising class time.
- Form meaningful connections with both students and their families.
- Promote a healthy relationship with mathematics for all students.

Being a Math Fellow allows me to not only share my love and appreciation for STEM topics, but also give back to underserved communities of people who may not have received the same encouragement and support that I did in math and science classes.

6/2021 - 8/2021

Black Rocket Lead Instructor

As a lead instructor at Black Rocket STEM summer camp, I led multiple classes that taught computer, coding, and engineering skills to students aged 8-14. The courses were taught on a weekly schedule and used video games such as Minecraft and Roblox to introduce kids to scientific concepts (electrical engineering, structural engineering, physics, etc).

My time as an instructor at Black Rocket was an incredibly influential experience as it was my first true leadership role, managing an entire classroom of children. It developed my science communication skills with a younger audience and inspired a new appreciation for teaching. Teaching and working with children is now a passion of mine, in addition to advancing my own understanding of scientific concepts.

8/2020 - 6/2022

Team Fairy Tale CU Boulder UROP Team Member

In my position as a member of Team Fairy Tale, I worked under the guidance of Dr. Suzanne Magnanini and Sean Babbs as a cataloguer for CU Boulder's Special Collections' supply of fairy tale texts.

The books in CU's collection range in age from medieval to modern, and feature prominent authors such as Charles Perrault and Straparola. I have input tales to the database in both 18-century French and English; each entry involves a summary of the tale, descriptions of illustrations, classification of the tale using the ATU system, as well as noting any cultural modification of the tale based on the decade and country in which it was published.

As a part of a team of over 10 people working during a pandemic, my organization and communication skills matured greatly over the course of my time on Team Fairy Tale. It is currently my fourth semester on the team and my experience has offered a deeply appreciated stability and a real sense of long-term teamwork and how it pays off.

8/2020 - 1/2021

Laboratory for Atmospheric and Space Physics ESCAPE Team Member / Researcher

Working under the guidance of Dr. Allison Youngblood and Dr. Kevin France, I coded a series of Python simulations of spectral data for the Extreme-Ultraviolet Stellar Characterization for Atmospheric Physics and Evolution (ESCAPE) Small Explorer Mission, currently in phase A studies. My code achieved the following things:

- Combined multiple individual functions into one program executable in a single command prompt.

- Incorporated and simulated anticipated effective area, signal, noise, and SNR values of the ESCAPE probe at multiple wavelengths and orders in the EUV spectrum.
- Spectral orders could be sorted in various ways; the code was capable of shifting higher orders to correspond to their *true* wavelength values, or could be presented on a plot simulating their physical position on ESCAPE's detector.
- Numerically convolved sample spectra and effective area data .
- Returned graphable flux vs. wavelength and SNR vs. wavelength arrays for provided target star spectrum as seen by ESCAPE.

At the end of my time working on the ESCAPE mission, I presented my work at the 237th AAS conference via Zoom. As a part of my presentation, I simulated ESCAPE's spectral capabilities for Proxima Centauri and the Sun at a distance of 10 pc. I created a virtual poster with interactive tabs viewable on it's own, and also orally presented my work to a group of fellow scientists. I was awarded an honorable mention in the Chambliss Student Poster Award competition for my work.

8/2019 - 5/2020

TNO RECON Research Team Member

As a part of the course ASTR 3400 mentioned earlier, I worked on a team of around 20 fellow students led by PI Dr. John Keller on the Trans-Neptunian Object Research and Collaborative Occultation Network (TNO RECON) project. During my time on the TNO RECON team, I achieved the following:

- I sorted through raw video data of occultations from various observation locations.
- I created Python code to reduce said video data to a scientific standard using darks, flats, and biases with the goal of updating the course curriculum from IDL-based data reduction to Python.
- I used principles of data and error analysis alongside Astropy and Numpy tools to estimate the actual size and shape of TNO targets.
- I improved on my interpersonal skills in a science setting by working in a large group to achieve a common goal.

This position was my first and a very informative experience in astronomical research and data analysis.