Ian Branigan

izb2@cornell.edu · (252) 412-6084 · linkedin.com/in/ian-z-branigan/ · omicet.github.io

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EDUCATION

Cornell University, College of Arts and Sciences   Aug 2023–Present

Major: Physics | Minor: Astronomy (intended) | Expected graduation: May 2027 | Major GPA: 4.0/4.0 | Overall GPA: 4.0/4.0

Relevant coursework: Planetary Physics, Planetary Atmospheres, Intro & Intermediate Mathematical Physics, Basics of Quantum Mechanics, Analytical Mechanics, Advanced Electricity and Magnetism

Other relevant education

Sagan Summer Workshop, NASA Exoplanet Science Institute (virtual attendee)   2022 & 2023

RESEARCH EXPERIENCE

Cornell University Department of Astronomy   Jan 2024–Present

Project: *A Novel Retrieval Technique to Probe Photochemical and Mixing Processes in Exoplanets*

Mentor: Nikole Lewis

- Constructed a grid of 3840 1-D atmospheric disequilibrium chemistry (vertical mixing+photochemistry) models for the exoplanet WASP-39b using the chemical kinetics code `VULCAN`
- Performed grid retrievals on the full JWST transmission spectrum of WASP-39b using `POSEIDON` to place constraints on PT profile, C/O, metallicity, and eddy diffusivity
- Edited `VULCAN` and `POSEIDON` Python source code as needed to implement disequilibrium retrieval methodology
- Communicated work via oral presentation to experts in exoplanet science (247th AAS Meeting)

North Carolina School of Science and Mathematics   Jan 2022–Dec 2022

Mentor: Jonathan Bennett

- Conceptualized and carried out an independent project to compute Kepler/K2 and TESS transit depths of 24 exoplanets, using Python packages `Lightkurve` (accessing time series data) and `exoplanet` (lightcurve fitting with MCMC)
- Authored a paper summarizing results, published in student journal *Broad Street Scientific*
- Presented research via oral and poster presentations (NC Astronomers' Meeting, NCS-AAPT Meeting)

COMPUTER SKILLS

Python (NumPy, Matplotlib), Zsh, Git and GitHub, LaTeX, Java

OUTREACH

Science Olympiad Test Writing   Aug 2023–Present

- Developing exam questions to assess understanding of fundamental astronomical concepts (stellar astrophysics, exoplanets, supernovae, solar system objects, etc.) for 8 middle and high school competitions.

OTHER EXPERIENCES

Kendo Club at Cornell University, Co-President   Jul 2025–Present

- Managing activities of the 7-member executive board of the club (e.g. coordination of regular practices, logistics of travel and lodging for tournaments and promotion tests, use of club finances)
- Assisting head instructor in teaching new club members, with a focus on safe practice of the martial art

NASA Proposal Writing and Evaluation Experience   May 2024–Aug 2024

- Collaborated with a team to conceptualize a technology idea aligned with NASA's needs and author a 7-page project proposal

HONORS

Roger and Mary Lou West Undergraduate Research Fellowship (awarded by Cornell Dept of Astronomy)   Summer 2025

Rawlings Cornell Presidential Research Scholar   Aug 2023–Present