

Aiden Zelakiewicz

CORNELL UNIVERSITY · CARL SAGAN INSTITUTE

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Education

Cornell University

PHD IN ASTRONOMY; NOMINAL ADVISOR: LISA KALTENEGGER

Ithaca, New York

Aug. 2023 - PRESENT

- Graduate Teaching Assistant: Astronomy 1101 (FA23), Astronomy 1102 (SP24), Astronomy 1101 (FA24)
- Carl Sagan Institute member
- Astronomy Graduate Network (AGN) Event Coordinator

The Ohio State University

BS IN ASTRONOMY & ASTROPHYSICS

Columbus, Ohio

Aug. 2019 - May 2023

- Graduated Summa Cum Laude
- Cumulative GPA of 3.92 | Dean's List all semesters
- Highlighted Coursework: Computational Physics, Big Data Analytics, Astro Data Analysis, Statistical Mechanics, Planetary Science, Theoretical Mechanics

Research Projects

Mapping NIR Extinction Towards the Galactic Center

ADVISOR: B. SCOTT GAUDI & SAMSON A. JOHNSON; THE OHIO STATE UNIVERSITY

Columbus, Ohio

Aug 2021 - PRESENT

- Creating near-infrared extinction and reddening maps for the *Nancy Grace Roman Space Telescope* microlensing survey using H- and K-band photometry data from the UKIRT observatory's microlensing survey. This is in collaboration with and advised by Dr. Samson A. Johnson and Dr. B. Scott Gaudi.
- Project was primarily programmed in Python where Red Clump photometry data was fit to a luminosity function. The resultant parameters could then be used to determine the extinction and spectral reddening. To produce these calculations, packages such as NumPy, Astropy, Lmfit, emcee, SciPy, Matplotlib, and Pickle were used. This was conducted across numerous Python and data files, all managed using git to keep track of versions.
- A first author paper detailing this project is currently in the works.

Synthesizing and Detecting Technosignatures Using Generative Adversarial Networks

ADVISOR: JOHN HOANG; UNIVERSITY OF CALIFORNIA, BERKELEY

Berkeley, California

June 2022 - Aug. 2022

- Utilized novel conditional bi-directional generative adversarial networks (cBiGAN) for the Berkeley SETI Research Center advised by Dr. John Hoang. Used cBiGANs to synthesize radio technosignature data and eventually detect anomalous data from the Green Bank Telescope.
- Utilized GPU and parallel processing to improve model training times on a supercomputer cluster. The models were constructed using PyTorch with both a sequential and functional format. Tracked and monitored training of the models using tools like Tensorboard and Neptune.
- Ability to create synthetic data 100 times faster than traditional iterative methods used by Breakthrough Listen team on large datasets.
- Underwent training to operate the Parkes Telescope and conducted an observation at the Allen Telescope Array.

Honors & Awards

Apr. 2024 **NSF GRFP Honorable Mention**, Honorable Mention in the 2024 National Sciences Foundation (NSF)

Graduate Research Fellowship Program (GRFP) competition.

Nov. 2022 **L. Earl Slusher Scholarship**, Awarded to an astronomy major who has shown exceptional promise for going on to graduate work in Astronomy, selected by the department chair among faculty-nominated students.

Columbus, Ohio

Dec. 2021 **Tuttle Scholarship**, Recognizes outstanding astronomy majors, nominated by faculty.

Columbus, Ohio

2019-2023 **Dean's List (8 out of 8 semesters)**, The Ohio State University

Columbus, Ohio

Work Experience

Cornell University

GRADUATE TEACHING ASSISTANT

Ithaca, New York

Aug. 2023 - PRESENT

- TA for Astronomy 1101 and 1102, leading two sections for each course.
- Student Evaluations are available upon request, but some highlights are listed below.
 - > "...it is clear that Aiden's goal is not simply to cram an assortment of knowledge into students, but rather to educate them on fundamental concepts and guide them toward an appreciation and application of those concepts."
 - > "[Aiden] was empathetic, understanding, engaging, funny, and genuinely made me interested in astronomy..."

The Ohio State University

UNDERGRADUATE RESEARCHER

Columbus, Ohio

May 2021 - Aug. 2023

- Working with Dr. Samson A Johnson to create near-infrared extinction and reddening maps towards Galactic Center
- Utilized H- and K-band photometry data from UKIRT fields.

University of California, Berkeley

BERKELEY SETI RESEARCH CENTER REU INTERN

Berkeley, California

June 2022 - Aug. 2022

- Worked with postdoctoral scholar Dr. John Hoang to create a cBiGAN to synthesize radio technosignature data.
- Used PyTorch to create the model and the Breakthrough Listen compute nodes to train it using GPUs and parallel processing.

Park Place Cafe

WAITER

Milwaukee, Wisconsin

May - Aug. of 2019 & 2020

- Critical time management skills under high stress situations
- Communication and general people skills

Volunteering & Outreach

Cornell Departments of Physics and Astronomy TA Training

TA TRAINING FACILITATOR

Ithaca, New York

July 2024 - Aug 2024

- Lead incoming TAs in best practices for how to best mentor their students.
- Designing a lesson on Inclusive Pedagogy to give future TAs the tools they need to create an inclusive learning environment.

Astronomy Camp

INSTRUCTOR AND COUNSELOR

Mt. Lemmon, Arizona

June. 2023 & 2024

- Counselor and mentor for middle-high schoolers interested in astronomy and astrophysics.
- Operated 24", 32", and 61" telescopes and guided campers to observe on their own.
- Gave a public lecture on exoplanet detection methods.

Polaris

UNDERGRADUATE MENTOR | MENTEE: ERIN BERNTHOLD

Columbus, Ohio

Aug. 2022 - May. 2023

- Support and foster a healthy environment to increase retention of underrepresented physics/astronomy students.
- Mentor for incoming underrepresented freshman and sophomore physics/astronomy majors.
- Creating and overseeing an intro level research project with mentee.

Breakthrough Discuss Conference

FRONT DESK ASSISTANT

Santa Cruz, California

June 2022

- Assisted the Breakthrough Initiative team to check attendees in during the conference.
- Manned the COVID testing booth to check and administer COVID-19 tests.

WestFest

VOLUNTEER

Columbus, Ohio

Sep. 2021 & 2022

- Free science outreach festival with a focus on sustainability.
- Created activity kits for use by attendees.

Publications

FIRST AUTHOR

1. **A Near-Infrared Extinction and Reddening Map Towards the Galactic Bulge Using UKIRT**
Zelakiewicz, A.; Johnson, S. A.; Gaudi, B. S.; et al. (In Prep)

In Prep

COAUTHOR

1.

Exploring the Use of Generative AI in the Search for Extraterrestrial Intelligence (SETI)
Hoang, J.; Zheng, Z.; **Zelakiewicz, A.**; et al. 2023, arXiv:2308.13125

Aug 2023

Skills

Programming	Python, C++, Wolfram, Bash, LaTeX
Technology	Git & GitHub, PyTorch, TensorFlow Keras, Visual Studio Code, Mathematica, InDesign, Premiere Pro, Lightroom
Systems	Windows, Mac OS, Linux (WSL)
Languages	English - Native, French - Working Proficiency, Japanese - Basic

Presentations & Posters

Jan. 2023	A Near-Infrared Extinction and Reddening Map Towards the Galactic Bulge Using UKIRT Zelakiewicz, A. , Johnson, S. A., Gaudi, B. S., Bryden G. 241st American Astronomical Society Meeting	Seattle, Washington
Nov. 2022	A Near-Infrared Extinction and Reddening Map Towards the Galactic Bulge Using UKIRT Zelakiewicz, A. , Johnson, S. A., Gaudi, B. S., Bryden G. Great Lake Exoplanet Area Meeting	Columbus, Ohio
Nov. 2022	A Near-Infrared Extinction and Reddening Map Towards the Galactic Bulge Using UKIRT Zelakiewicz, A. , Johnson, S. A., Gaudi, B. S., Bryden G. Autumn Undergraduate Research Festival	Columbus, Ohio
Aug. 2022	Reverse-Engineering Anomalous Dynamic Spectra with Conditional Bi-Directional Generative Adversarial Networks Zelakiewicz, A. , Hoang, J. Berkeley SETI Research Center Symposium	Berkeley, California
Jul. 2021	Near Infrared Extinction and Reddening Towards the Galactic Center Zelakiewicz, A. , Johnson, S. A., Gaudi, B. S. Summer Undergraduate Research Program Symposium	Columbus, Ohio

Extracurricular Activity

Astronomy Graduate Network EVENT COORDINATOR	Ithaca, New York May 2024 - PRESENT
<ul style="list-style-type: none">Coordinate and plan events for the graduate student body and broader Cornell Astronomy community.	
Buckeye Gaming Collective COMPETITOR & VOTING MEMBER	Columbus, Ohio Aug. 2020 - May. 2023
<ul style="list-style-type: none">Manager and leader of a podium-placing team.Partook in managing tryouts for a fielded roster.Organized broadcasts and handled tournament fees.	