Aiden **Zelakiewicz**

Student · Undergraduate Researcher

N53 W16418 Whitetail Run, Menomonee Falls, WI 53051, United States

(518) 878-5758 | aidenzelak@gmail.com | zelakiewicz.dev | Shockblack | zelakiewicz

Education

The Ohio State University

Columbus, Ohio

BS in Physics and Astronomy & Astrophysics

Expected Graduation: May 2023

- Cumulative GPA of 3.91
- Five-time Dean's List recipient
- Relevant Coursework: Computational Physics, Quantum Mechanics, E&M, Astro Data Analysis, Linear Algebra, Differential Equations

Research Projects

Mapping NIR Extinction Towards the Galactic Center

Columbus, Ohio

Advisor: Samson A. Johnson, The Ohio State University

May 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 OSU graduate student, Samson A Johnson and sponsored by Dr. 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, Lmfit, Astropy, 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

Berkeley, California

Advisor: John Hoang, University of California, Berkeley

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 synthesizes radio technosignature data and 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.
- Reduced synthetic data creation run-time to less than 1% of traditional iterative methods used by Breakthrough Listen team.
- Underwent training to operate the Parkes Telescope and conducted observations at the Allen Telescope Array.

Skills

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

Work Experience

The Ohio State University

Columbus, Ohio

Undergraduate Researcher

May 2021 - PRESENT

- Working with graduate student 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, California

Berkeley SETI Research Center REU Intern

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

Milwaukee, Wisconsin

Waiter

May - Aug. of 2019 & 2020

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

Presentations

Aug. 2022 **Reverse-Engineering Anomalous Dynamic Spectra with Conditional Bi-Directional Generative Adversarial Networks,** Zelakiewicz, A., Hoang, J. — *UC Berkeley*

Jul. 2021 **Near Infrared Extinction and Reddening Towards the Galactic Center,** Zelakiewicz, A., Johnson, S. A., Gaudi, B. S. — *Ohio State*

Honors & Awards

2021 **Tuttle Scholarship,** Recognizes outstanding astronomy majors, nominated by faculty. — *Columbus, Ohio*

2019-2022 **Dean's List (6 out of 6 semesters),** The Ohio State University — *Columbus, Ohio*

Volunteering & Outreach

Polaris

Columbus, Ohio

Undergraduate Mentor — *Aug. 2022 - PRESENT*

- Mentor for incoming underrepresented freshman and sophomore physics/astronomy majors.
- Advising an intro level research project.
- Support and foster a healthy environment to increase retention and make students comfortable in the major.

Breakthrough Discuss

Santa Cruz, California

Front Desk Assistant — *June 2022*

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

WestFest

Columbus, Ohio

Volunteer — *Sep. 2021*

- Science outreach event with a focus on sustainability.
- Created activity kits for use by attendees.

Extracurricular Activity

Buckeye Gaming Collective

Columbus, Ohio

Competitor & Voting Member — *Aug. 2020 - PRESENT*

- Manager and leader of a podium-placing team.
- Partook in managing tryouts for a fielded roster.
- Organized broadcasts and handled tournament fees.

Delta Sigma Phi Fraternity

Columbus, Ohio

Historian & Assistant New Member Educator — *Mar. 2020 - PRESENT*

- Oversaw and produced media used for social pages.
- Assistant in ensuring new members uphold the standards and values of the organization.