

Aryanna Schiebelbein-Zwack

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EDUCATION

- University of Toronto**, PhD in Astronomy and Astrophysics 2022 – 2027 (anticipated)
Supervisor: Dr. Maya Fishbach Toronto, ON
- Binary black holes, from stellar masses to the supermassive, and how they evolve over redshift and connect to other transient phenomena
- University of Waterloo**, BSc Honours Physics and Astronomy; Minor Anthropology 2017 – 2022
Thesis Supervisor: Dr. Niayesh Afshordi Waterloo, ON
- Modelling noise of unknown origin in LIGO's Hanford and Livingston detectors using Bayesian statistics

RESEARCH

- The Mass Density in Merging Black Holes** May 2023 – Present
Supervisor: Dr. Maya Fishbach University of Toronto
- Using population fits to GWTC-3 to compute the mass density of black holes that merge over cosmic time and fit a model to describe formation parameters such as time delay between stellar formation and merger, and extrapolate to high redshifts
- Detecting Extreme Scattering Events with VAST** September 2022 – April 2023
Supervisor: Dr. Bryan Gaensler University of Toronto
- Simulating light curves of extreme scattering events and producing detection criteria when applied to the cadence of the VAST survey
- White Dwarfs with Infrared Excess with JWST** May 2021 – August 2021
Supervisor: Dr. Harvey Richer University of British Columbia
- Producing a catalog of white dwarfs located in the field of approved JWST observations of 47 Tucanae and using PYSYNPHOT to fit spectra to search for infrared excess
- Searching for Radio Transients in VLASS** May 2020 – August 2020
Supervisor: Dr. Gregory Sivakoff University of Alberta
- Creating a catalog of transient and variable sources in Epoch 1.1 and 2.1 of the Very Large Array Sky Survey (VLASS) with PyBDSF and reducing false transient detections with forced aperture photometry
- Simulating Radiation in Human Lungs** January 2019 – April 2019
Health Canada - Radiation Protection Bureau's Human Monitoring Lab Ottawa, ON
- Modelling the detection of lung radiation using Monte Carlo N-Particle (MCNP) transport code and researching the feasibility of 3D-printed lungs with radioactive inserts for calibration purposes

PUBLICATIONS

- Submitted**
- **Schiebelbein-Zwack, A.**, Fishbach, Maya., The Mass Density of Merging Binary Black Holes Over Cosmic Time. Submitted to The Astrophysical Journal. arXiv:2403.17156

Refereed

- Capello, Kevin, Tremblay, Marilyn, **Schiebelbein, Aryanna**, Janzen, Noah. 3D Printed Lung Phantom for Individual Monitoring. Health Physics 126(5):p 292-295, May 2024. DOI: 10.1097/HP.0000000000001777
- Capello, Kevin, Moffat, Ryan, **Schiebelbein, Aryanna**. Optimizing the Positioning of Detectors for Improved Counting Efficiencies Using Monte Carlo Simulations. Health Physics 126(5):p 309-314, May 2024. DOI: 10.1097/HP.0000000000001794

Non-refereed

- Hallinan, G., Mooley, K., Dong, D., Ravi, V., Law, C., Myers, S., Sivakoff, G., Scheers, F., **Schiebelbein, A.**, Chatterjee, S., Clarke, T., Eisenhardt, P., Stern, D., Jun, H., Diaz-Santos, T. (2020). A radio transient associated with SN 2019xhb discovered in Epoch 2 of the VLA Sky Survey (VLASS). The Astronomer's Telegram. No. 14020

Conference Posters

- Gerasimov, G., Burgasser, A., Homeier, D., Caiazzo, I., Richer, H., Correnti, M., Boley, A., Dieball, A., Heyl, J., **Schiebelbein, A.**, Tremblay, P. (2022, December 12-14). *Photometric abundances and age of the globular cluster 47 Tucanae from JWST observations of the lower main sequence and brown dwarfs* [Poster Abstract]. 2022 First Science Results from JWST, Baltimore MD, United States.

TALKS

<i>Population Studies of Binary Black Holes</i> , 02/27/2024	Toronto TASTY Talks
<i>The Mass Density in Merging Black Holes</i> , 01/29/2024	Nordic Winter School for Multimes. Astro.
<i>Populations of Black Holes over Cosmic Time</i> , 11/17/2023	33rd Midwest Relativity Meeting
<i>Populations of Black Holes over Cosmic Time</i> , 10/10/2023	Perimeter Institute Strong Gravity Group
<i>Modelling Mystery Noise in LIGO Detectors</i> , 04/22/2022	University of Waterloo
<i>Correlation of Mystery Noise in LIGO Detectors</i> , 01/13/2022	University of Waterloo
<i>White Dwarfs with Infrared Excesses</i> , 01/13/2022	University of British Columbia
<i>A Search for Radio Transients</i> , 08/27/2020	University of Alberta

SCHOLARSHIPS AND AWARDS

General Motors Women in Science and Mathematics Award (\$5000)	2023
Ontario Graduate Scholarship (\$15000 over 12 months)	2023
NSERC Canada Graduate Scholarship - Masters (\$17500 over 12 months)	2022
David A. Dunlap Department of Astronomy and Astrophysics Entrance Award (\$5000)	2022
Carl Reinhardt Fellowship in Astronomy (\$4750)	2022
I.R. Dagg Memorial Scholarship (\$1500)	2021
NSERC Undergraduate Student Research Award (\$9000)	2021
Science Distinguished Alumni of Honour Award (\$1000)	2020
Summer Undergraduate Physics Research Award (\$9000)	2020
President's Entrance Scholarship (\$2000)	2017

CONFERENCES AND WORKSHOPS ATTENDED

The CRAQ Summer School: Machine Learning Applied to Astrophysical Data	2024 (Upcoming)
Gravitational Waves: A New Ear on the Chemistry of Galaxies	2024 (Upcoming)
Nordic Winter School for Multimessenger Astrophysics	2024
33rd Midwest Relativity Meeting	2023
Dunlap Institute Virtual Summer School	2021
Canadian Conference for Undergraduate Women in Physics	2019

TEACHING ASSISTANT

AST 251: Life on Other Worlds (University of Toronto)	Winter 2024
AST 121: Origin and Evolution of the Universe (University of Toronto)	Winter 2023
AST 201: Stars and Galaxies (University of Toronto)	Winter 2023
AST 101: The Sun and Its Neighbours (University of Toronto)	Fall 2022, 2023
PHYS 121/131L: Mechanics Laboratory (University of Waterloo)	Fall 2020

SERVICE

Outreach

Telescope Director October 2023 - Present
AstroTours Toronto, ON

- Training volunteers on how to use telescopes, picking relevant and accessible astronomical targets, and compiling information for dissemination to the general public

Notebook Co-Lead September 2023 - Present
Coding the Cosmos Toronto, ON

- Managing the development of Jupyter notebooks for astronomy workshops for high school students

Keynote Co-Director September 2022 - August 2023
AstroTours Toronto, ON

- Organized the largest event ever hosted by the AstroTours lecture series with over 400 members of the general public in attendance, with additional activities such as telescope tours and a planetarium

Camp Guest July-August 2023
Astronomy in Action Toronto, ON

- A paid lecturer for groups of primary school aged students to incite excitement about space

Notebook Developer June 2023
Age of the Universe Toronto, ON

- Developing a Jupyter notebook for the Age of the Universe workshop for high school students that instructs them to calculate the age of a globular cluster using real astronomical data

Panelist / Volunteer November 2019 – May 2021
PhysiX: Girls Matter Waterloo, ON

- Answering questions about physics and the university experience to middle school aged students during the 2019 offering, and moderating a quantum cryptography workshop in 2021

Mentorship

Undergraduate Mentorship Program

September 2022-Present

Mentor

University of Toronto

- Providing guidance to an undergraduate student on navigating academia, particularly research and graduate school applications

Director

September 2018 – September 2019

Physics Interconnected

University of Waterloo

- Managing the student ran Physics mentorship program at the University of Waterloo, as well as mentoring younger students

Other

CASCA Representative

September 2023 – Present

Graduate Astronomy Student Association

Toronto, ON

- Acting as a liason between the University of Toronto's Astronomy graduate students and the Canadian Astronomical Society

President

January 2018 – March 2019

Women in STEM

Waterloo, ON

- Led the executive team to promote diversity through workshops and social events. Organized an event for approximately 100 high school students to provide an introduction to university-level STEM through workshops

MEDIA

USRA Student Experiences [!\[\]\(1f99bf65f43889da445ecc1fe8d9504f_img.jpg\)](#)

University of British Columbia (2021)

DIVSS Students in Focus [!\[\]\(a2bb1e57b467f1e41142026aa73db90f_img.jpg\)](#)

University of Toronto (2021)