

Dr. Samantha Berek

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EMPLOYMENT

University of Massachusetts, Amherst NSF Astronomy and Astrophysics Postdoctoral Fellow	2025 – present
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EDUCATION

University of Toronto PhD in Astronomy and Astrophysics and Data Sciences Institute Fellow * Advisors: Gwendolyn Eadie and Joshua Speagle * <i>Thesis</i> : Understanding Globular Cluster Populations and Their Host Galaxy Properties with Statistical Models	2020 – 2025
Yale University B.S. in Astrophysics and Anthropology, <i>cum laude</i>	2016 – 2020

GRANTS, FELLOWSHIPS AND AWARDS

National Science Foundation Postdoctoral Fellowship 330,000 USD	2025 – 2028
Data Sciences Institute Doctoral Student Fellowship 75,000 CAD	2024 – 2025
Connaught International Scholarship for Doctoral Students 50,000 CAD	2020 – 2025
Jui Lin Yen Award for Outstanding Research Contribution 1000 CAD	2024
American Statistical Association, Astrostatistics Student Paper Competition Finalist 100 USD	2024
School of Graduate Studies Conference Grant 900 CAD	2023
Frank S. Hogg Memorial Fellowship 5,000 CAD	2021 – 2022
Beckwith Prize in Astronomy 1,000 USD	2020
Michele Dufault Scholarship for Women in Science	2018-2019
Brooke Owens Fellow	Class of 2018
Samuel Hodgkinson Scholarship	2016-2018

PUBLICATIONS

SIGNIFICANT CONTRIBUTION

1. **Berek, S.** et. al. *Should zeros count? Modeling the galaxy-globular cluster scaling relation with(out) zero-inflated count models*, 2024, ApJ, 972, 1.

2. **Berek, S.** and Reina-Campos, M., et. al. *Galactic properties that favour star cluster formation: a statistical view*, 2023, MNRAS, 525, 2.
3. **Berek, S.** et al. *The HERBAL model: A hierarchical errors-in-variables Bayesian lognormal hurdle model for galactic globular cluster populations*, 2023, ApJ, 955, 1.
4. Lehner, N., **Berek, S.**, Howk, J.C., et. al. *Project AMIGA: The Circumgalactic Medium of Andromeda.*, 2020, ApJ, 900, 9L.
5. Booth, S.L., **Berek, S.**, Green, B., et. al. *Measuring and Learning from Success and Innovation in Early Stage Technology Development: A Case Study of NASA's Center Innovation Fund.* 2018. AIAA SPACE and Astronautics Forum and Expedition, 5160.

OTHER PUBLICATIONS

1. Harris, W. et al (incl. **Berek, S.**) *JWST Photometry of Globular Cluster Populations in MACS0417.5-1154*, 2025, ApJ, [accepted].
2. Muzzin, A. et al (incl. **Berek, S.**) *MINERVA: A NIRCам Medium Band and MIRI Imaging Survey to Unlock the Hidden Gems of the Distant Universe*, 2025, ApJS [submitted].
3. Sarrouh, G. et al (incl. **Berek, S.**) *CANUCS/Technicolor Data Release 1: Imaging, Photometry, Slit Spectroscopy, and Stellar Population Parameters*, 2025, ApJS [submitted].
4. Li, D. et al (incl. **Berek, S.**) *Discovery of two ultra-diffuse galaxies with unusually bright globular cluster luminosity functions via a mark-dependently thinned point process (MATHPOP)*, 2025, ApJ, 984, 2.
5. Sasserville, G., Hlavacek-Larrondo, J., **Berek, S.**, et. al. *A novel approach to understanding the link between supermassive black holes and host galaxies*, 2025, ApJ, 978, 1.
6. Butler, V. et al (incl. **Berek, S.**) *TIME: the Tomographic Ionized-carbon Mapping Experiment: an update on design, characterization, and data from the 2022 commissioning observations*, 2024, SPIE proceedings.

RESEARCH SUPERVISION

Ana Molina Colina (masters), co-supervised with Adam Muzzin <i>Project: Illuminating satellites of the highest redshift dwarf galaxies seen with JWST</i>	2025-present
Michelle Denny (undergraduate), co-supervised with Jacqueline Antwi-Danso <i>Project: Counting Massive Galaxies in the Early Universe with JWST</i>	2024
Rufat Ismayilov (undergraduate), primary supervisor <i>Project: Literature review of high-z galaxy discoveries with JWST and alternate cosmologies</i>	2023-2024
Grisha Kit (undergraduate), primary supervisor <i>Project: Literature review of high-z galaxy discoveries with JWST and the UV luminosity function</i>	2023-2024
Shu Yan (Alice) Wang (undergraduate), co-supervised with Josh Speagle <i>Project: Predictive Bayesian model comparison methods with astronomical applications</i>	2023

TEACHING EXPERIENCE

Course Instructor, AST 199 , University of Toronto <ul style="list-style-type: none"> * Astronomy at the Frontier, Spring 2024 (first-year seminar for non-majors) * Wrote syllabus and course content, including assignments, lectures, and class activities. * Taught class, led office hours, and handled communication with students. * Managed a teaching assistant for the course. 	2024
Teaching Assistant, AST 198/199 , University of Toronto <ul style="list-style-type: none"> * Astronomy at the Frontier, Fall 2024 (first-year seminar for non-majors) * Great Astronomical Issues, Fall 2023 (first-year seminar for non-majors) 	2023-2024

- * Assisted with teaching during class and led office hours.
- * Helped with course administration and discussion board/email moderation.
- * Graded assignments and class projects.

Guest Lecture, AST 199, University of Toronto 2023

- * Astronomy at the Frontier, Fall 2023 (first-year seminar for non-majors)
- * Gave a one hour long guest lecture about dark matter and dark energy to a class of 24 students.
- * Facilitated an article discussion activity after the lecture.

Teaching Assistant, AST 101/201 series, University of Toronto 2020 – 2023

- * AST101, The Sun and its Neighbors, Fall 2022, Fall 2021
- * AST201, Stars and Galaxies, Summer 2023, Spring 2023, Spring 2022, Spring 2021
- * Taught multiple tutorial sections of 30-40 students each per semester.
- * Ran telescope observing sessions for course projects.
- * Held help sessions and review sessions, and answered student questions on discussion boards/email.
- * Graded class projects, midterms, and final exams.

INVITED TALKS

University of Massachusetts Galaxy Lunch <i>Amherst, MA</i>	2025
University of Kansas Astro/Space Seminar (<i>virtual</i>)	2025
Joint Statistical Meetings 2024 (<i>Portland, OR</i>)	2024
Rubin Observatory Star Clusters Science Working Group (<i>virtual</i>)	2024
Astronomy Lunch Talk Series (TASTY) (<i>University of Toronto</i>)	2023
Great Lakes Clusters and Streams Conference Workshop (<i>University of Michigan</i>)	2023
Department of Statistical Sciences Brown Bag Seminar (<i>University of Toronto</i>)	2023
Senior Thesis Talk Series (<i>Yale University</i>)	2020

CONFERENCE TALKS

Bridging Scales: Star clusters and their host galaxies from the Local to high-z Universe (<i>Matera, Italy</i>)	2025
Small Galaxies, Cosmic Questions (<i>Durham, UK</i>)	2024
Globular Clusters and their Tidal Tails: from the Milky Way to the Local Group (<i>Toronto, ON</i>)	2024
Astrostatistics in Canada and Beyond (<i>Banff, AB</i>)	2023
Great Lakes Clusters and Streams (<i>Ann Arbor, MI</i>)	2023
A multi-wavelength view on globular clusters near and far: from JWST to the ELT (<i>Sexten, Italy</i>)	2023
McMaster Star Clusters workshop (<i>Hamilton, ON</i>)	2022
REU Symposium (<i>Notre Dame, South Bend, IN</i>)	2019

POSTERS

Small Galaxies, Cosmic Questions (<i>Hanover, NH</i>)	2025
Canadian Astronomical Society AGO (<i>Toronto, ON</i>)	2024
Joint Statistical Meetings (<i>Toronto, ON</i>)	2023
235th Meeting of the American Astronomical Society (<i>Honolulu, HI</i>)	2020
Conference for Undergraduate Women in Physics (<i>New Haven, CT</i>)	2020

MENTORING

Nan Jiang , University of Toronto (<i>undergraduate</i>)	2023-2024
Esther Wang , University of Toronto (<i>undergraduate</i>)	2022-2023
Emma Jarvis , University of Toronto (<i>undergraduate</i>)	2021-2022
Jeff Shen , University of Toronto (<i>undergraduate</i>)	2020-2021

LEADERSHIP AND SERVICE

Astrostatistics Interest Group of the American Statistical Association, <i>Secretary/Website Director</i>	2023-2025
STATSTRO Astrostatistics Workshop, <i>Organizing Committee Member</i>	2024, 2025
Globular Clusters and their Tidal Tails Conference, <i>Local Organizing Committee Member</i>	2024
Graduate Astronomy Student Association (GASA), <i>Co-President</i>	2022-2023
Graduate Astronomy Student Association (GASA), <i>Secretary</i>	2021-2022
UofT Department of Astronomy Training and Mentoring Committee, <i>Member</i>	2020-2022
UofT Graduate Student - Postdoc Mentorship Program, <i>Graduate Student Chair</i>	2021-2022
UofT GASA Graduate Student Peer Mentorship Program, <i>Chair</i>	2020-2021
Graduate Student Course Committee, <i>Member</i>	2020-2021
Astronomy Climate and Diversity Committee, <i>Member</i>	2019-2020
Ask a Brookie Mentor Program, <i>Co-Founder; Statistics and Data Lead</i>	2018-2019

OUTREACH

AstroTours public lecture	2025
* Gave the expert lecture for the AstroTours outreach program, a monthly talk series plus telescope viewing, lab tours, and demos for the public.	
Discover the Universe interview	2025
* Interview with Discover the Universe, an astronomy teaching and training program for primary and secondary school teachers across Canada to help them better teach their students about astronomy. The interview, about JWST proposals and data, is part of a video for teachers to incorporate into lesson plans.	
Toronto Public Library eclipse workshops	2024
* Taught a series of workshops about solar eclipses across Toronto Public Library branches in preparation for the 2024 total eclipse.	
Age of the Universe curriculum development and teaching	2023
* Developed material and taught for a summer program for Toronto high school students from underserved neighborhoods.	