



# Connor J. Stone PhD

ASTROPHYSICIST · FATHER · SCIENCE COMMUNICATOR

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*"I do Astrostatistics and software development for supernovae, astronomical images, and gravitational lensing"*

## Current Positions

**Postdoctoral Fellow** University of Toronto, Dunlap Institute (Sept. 2025 - Exp. Aug. 2028)  
**Rubin Fellow** Rubin Observatory, via University of Toronto (Sept. 2025 - Exp. Aug. 2028)

## Previous Positions

**Postdoctoral Fellow** Université de Montréal (Sept. 2022 - Exp. Aug. 2025)  
**Joint Postdoctoral Fellow** Mila (Sept. 2022 - Exp. Aug. 2025)  
**CITA National Fellow** Canadian Institute for Theoretical Astrophysics (Sept. 2022 - Exp. Aug. 2025)  
**NSERC Postdoctoral Fellow** Natural Sciences and Engineering Research Council of Canada (Nov. 2022 - Exp. Aug. 2024)  
**Queen's Observatory Coordinator** Queen's University (June. 2018 - Apr. 2022)

## Education

### Queen's University (Department of Physics, Engineering Physics & Astronomy)

Ph.D. Astrophysics

- **Topic:** Deciphering the Complexity of Galaxy Structure: New Catalogs, Deep Photometry, and Intrinsic Scatter
- **Advisor:** Professor Stéphane Courteau

*Kingston, Ontario*

*May. 2018 - Aug. 2022*

### Queen's University (Department of Physics, Engineering Physics & Astronomy)

M.Sc. Physics

- **Topic:** From Surface Events in DEAP-3600 to the Radial Acceleration Relation in Spiral Galaxies
- **Advisors:** Professor Anthony Noble and Professor Stéphane Courteau

*Kingston, Ontario*

*May. 2016 - Aug. 2018*

### University of Waterloo (Department of Physics & Astronomy)

B.Sc. Physics

- Co-operative program
- Dean's Honours List

*Waterloo, Ontario*

*Sept. 2011 - Apr. 2016*

## Publications

### COMPLETE RECORDS

#### First author publications

<https://ui.adsabs.harvard.edu/public-libraries/855ilJitQxKOS5q1XQhI7g>

*NASA ADS*

#### All authored publications

<https://ui.adsabs.harvard.edu/public-libraries/VX2TrCdNQ42VR0Y6xpu6kQ>

*NASA ADS*

### HIGHLIGHTED CONTRIBUTIONS

#### [5] Caustics: A Python Package for Accelerated Strong Gravitational Lensing Simulations

**Connor Stone**; Alexandre Adam; Adam Coogan; M. J. Yantovski-Barth; Andreas Filipp; Landung Setiawan; Cordero Core; Ronan Legin; Charles Wilson; Gabriel Missael Barco; Yashar Hezaveh; Laurence Perrault-Levasseur.

*JOSS (sub.)*

*June 2024*

#### [4] Echoes in the Noise: Posterior Samples of Faint Galaxy Surface Brightness Profiles with Score-Based Likelihoods and Priors

Alexandre Adam; **Connor Stone**; Connor Bottrell; Ronan Legin; Yashar Hezaveh; Laurence Perrault-Levasseur.

*AJ (sub.)*

*Nov. 2023*

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|--|--------------------|
| [3] <b>AstroPhot: Fitting Everything Everywhere All at Once in Astronomical Images</b><br>Connor Stone; Stéphane Courteau; Jean-Charles Cuillandre; Yashar Hezaveh; Laurence Perrault-Levasseur; Nikhil Arora. | MNRAS<br>Aug. 2023 |
| [2] <b>Realistic galaxy image simulation via score-based generative models</b><br>Michael J. Smith; James Geach; Ryan Jackson; Nikhil Arora; Connor Stone; Stéphane Courteau. MNRAS 511: 1808-1818             | MNRAS<br>Jan. 2022 |
| [1] <b>The Intrinsic Scatter of Galaxy Scaling Relations</b><br>Connor Stone; Stéphane Courteau; Nikhil Arora. ApJ 912: 41   | ApJ<br>May 2021    |

## Grants, Scholarships, & Awards

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|--|---|
| <b>NOVA FRQNT-NSERC</b><br>Amount: \$210,000 over 3 years; Competitive, jointly awarded with Co-Is at 3 other institutions   | FRQNT and NSERC<br>Mar. 2023 - Feb. 2026  |
| <b>NSERC Postdoctoral Fellowship</b><br>Amount: \$90,000 over 2 years; Competitive   | Natural Sciences and Engineering<br>Research Council of Canada<br>Nov. 2022 - Aug. 2024 |
| <b>CITA National Fellowship</b><br>Amount: \$105,000 over 3 years; Competitive   | Canadian Institute for Theoretical<br>Astrophysics<br>Sept. 2022 - Aug. 2025            |
| <b>The Walter C. Sumner Memorial Fellowship</b><br>Amount: \$8,000; Competitive  | Walter C Sumner Foundation<br>Sept. 2021 - Apr. 2022                                    |
| <b>Natural Sciences and Engineering Research Council of Canada (NSERC) Postgraduate Scholarship – Doctoral (PGS-D)</b><br>Amount: \$63,000 over 3 years; Competitive | Government of Canada<br>Sept. 2019 - Aug. 2022  |
| <b>Arthur B. McDonald Prize for Academic Excellence</b><br>Amount: \$30,000; Competitive   | McDonald Institute<br>Sept. 2018 - Aug. 2019  |
| <b>Ontario Graduate Scholarship</b><br>Amount: \$30,000 over 2 years; Competitive  | Province of Ontario<br>Sept. 2016 - Aug. 2018   |
| <b>Graduate Entrance Tuition Award</b><br>Amount: \$6,414; Grade Based   | Queen's University<br>May 2016  |
| <b>Queen Elizabeth II Aiming for the Top Scholarship</b><br>Amount: \$14,000 over 5 years; Grade Based   | Province of Ontario<br>Sept. 2011 - Apr. 2016   |
| <b>President's Scholarship</b><br>Amount: \$2,000; Grade Based   | University of Waterloo<br>Sept. 2011  |
| <b>Physics Alumni Award</b><br>Amount: \$1,000; Grade Based  | University of Waterloo<br>Sept. 2011  |

## Teaching & Supervision

### SUPERVISING

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|---|---|
| <b>Sacha Perry-Fagant</b><br>Project: Posterior sampling of Star Formation Histories in Galaxies.                     | PhD<br>Sept. 2023 - Present             |
| <b>Raj Patel</b><br>Project: The Universal Rotation Curve of Disk Galaxies.   | MSc<br>Sept. 2021 - Nov. 2023           |
| <b>Brianna Nix</b><br>Project: studying the halos of Virgo Cluster galaxies.  | Undergraduate<br>Sept. 2021 - Apr. 2022 |
| <b>Jacob Meadus</b><br>Project: studied SED fits on reduced flux measurement data for PROBES galaxies.                | Undergraduate<br>Sept. 2020 - Apr. 2021 |
| <b>Katherine Fraser</b><br>Project: studied PROBES galaxies with complex morphologies, extraction of WISE photometry. | Undergraduate<br>May 2020 - Aug. 2020   |

## Maggie Oxford

Project: studied scaling relations in super-massive black hole hosts.

Undergraduate

May 2020 - Aug. 2020

## Kelsey Eakin

Project: studied inner rotation curve slopes versus photometric properties of PROBES galaxies.

Undergraduate

May 2019 - Apr. 2020

## Presentations

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|------------|--|------------------------------------|
| Oct. 2025  | <b>Two sample tests and Bayesian PSFs</b> , Team talk  | University of Toronto              |
| Oct. 2025  | <b>CanDIAPL workshop: Rubin Supernova Dark Energy Science</b> , Workshop talk                                      | University of Waterloo             |
| Sept. 2025 | <b>AstroPhot: Fitting Every Supernova Everywhere All at Once</b> , Collaboration talk                              | LSST DESC                          |
| July 2025  | <b>AstroPhot: Fitting Everything Everywhere All at Once in Astronomical Images</b> , Workshop talk                 | University of Manitoba             |
| July 2025  | <b>Caustics: a differentiable, GPU accelerated, gravitational lensing simulator</b> , Workshop talk                | Tucson, AZ                         |
| June 2025  | <b>CASCADE: making scientific simulators and pipelines easy</b> , Conference talk                                  | St. Mary's University              |
| May 2025   | <b>World Coordinate Systems in Astronomy</b> , Workshop talk   | Ciela Institute                    |
| May 2025   | <b>Pixel level Bayesian analysis of PSFs and Strong Gravitational Lenses</b> , Conference talk                     | Paris                              |
| May 2025   | <b>CASCADE: building scientific simulators, solving the args problem</b> , Collaboration talk                      | LSST DESC                          |
| May 2025   | <b>Pushing the limits of Bayesian analysis for gravitational lensing</b> , Invited talk                            | American Museum of Natural History |
| Sept. 2024 | <b>Easy A: Getting a Perfect Score in Astronomical Image Processing</b> , Invited talk                             | Queen's University                 |
| Aug. 2024  | <b>Ready Player One: Getting a Good Score in Observational Astronomy</b> , Invited talk                            | Universe TBD                       |
| Aug. 2024  | <b>Caustics: a differentiable, GPU accelerated, gravitational lensing simulator</b> , Conference talk              | South Africa                       |
| Aug. 2024  | <b>Linear Regression: a Machine Learning Perspective</b> , Invited Lecture   | Kingston, Ontario                  |
| July 2024  | <b>Understanding Bayesian Statistics with the On/Off Problem</b> , Invited Lecture                                 | Kingston, Ontario                  |
| July 2024  | <b>Development of AstroPhot and Caustics: Fitting Everything Everywhere all at Once</b> , Conference talk          | Tacoma, USA                        |
| June 2024  | <b>Bayesian Statistics and Linear Regression: a Machine Learning Perspective</b> , CRAQ summer school Lecture      | Montréal, Québec                   |
| June 2024  | <b>Caustics: the gravitational lensing simulator of the future</b> , Conference talk                               | Toronto, Ontario                   |
| May 2024   | <b>Caustics: A Differentiable, GPU Accelerated, Gravitational Lensing Simulator</b> , Conference talk              | Rome, Italy                        |
| March 2024 | <b>Caustics: The gravitational lensing simulator of the future</b> , Contributed tutorial session                  | Oxford, UK                         |
| Jan. 2024  | <b>Caustics: The gravitational lensing simulator of the future</b> , Poster  | New Orleans, USA                   |
| Oct. 2023  | <b>AstroPhot: Fitting Everything Everywhere All at Once in Astronomical Images</b> , Conference talk               | Banff, Alberta                     |
| Aug. 2023  | <b>AstroPhot: Fitting Everything Everywhere All at Once in Astronomical Images</b> , Seminar                       | Waterloo, Ontario                  |
| April 2023 | <b>Ready Player One: Getting a Good Score in Observational Astronomy</b> , CITA Seminar                            | Toronto, Ontario                   |
| May 2023   | <b>Surveys 2 Discoveries</b> , tutorial session  | Montréal, Quebec                   |
| Jan 2023   | <b>Timescales in Astrophysics</b> , Conference talk  | United Arab Emirates               |
| May 2022   | <b>Canadian Astronomy in the Roaring 2020's: CASCA 2022</b> , Poster and flash talk                                | Virtual                            |
| 2017-2021  | <b>Queen's university, Department of Physics, Engineering Physics &amp; Astronomy</b> , Twice yearly Journals Club | Kingston, Ontario                  |
| May 2021   | <b>Canadian Astronomical Society, Société Canadienne Astronomie 2021</b> , Poster and flash talk                   | Virtual                            |
| July 2020  | <b>Arthur B. McDonald Institute, Tools from the Couch</b> , Seminar  | Virtual                            |
| June 2020  | <b>Arthur B. McDonald Institute, Tools from the Couch</b> , Seminar  | Virtual                            |
| Aug 2019   | <b>Santa Cruz Workshop on Galaxy Formation</b> , Poster and flash talk   | Santa Cruz, CA                     |
| July 2018  | <b>The Physics of Galaxy Scaling Relations and the Nature of Dark Matter</b> , Poster and flash talk               | Kingston, Ontario                  |
| May 2017   | <b>The Canadian Association of Physicists Congress</b> , Talk  | Kingston, Ontario                  |
| June 2015  | <b>The Canadian Association of Physicists Congress</b> , Poster  | Edmonton, Alberta                  |

## Public Outreach

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### PRESS/MEDIA APPEARANCES

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| Jan. 2021 <b>Grad Chat Podcast</b> , Queen's School of Graduate Studies  | Kingston |
| Dec. 2020 <b>Celestial Occurrences in December 2020</b> , Global News  | Kingston |
| Sept. 2020 <b>PhD candidate Connor Stone explains the discovery of phosphine in the clouds of Venus</b> , Discovery Canada | Virtual  |
| July 2020 <b>Comet remains to be seen for the month of July</b> , Whig Standard  | Kingston |
| June 2020 <b>Queen's University astrophysicist sheds some light on the historic SpaceX launch</b> , Global News            | Kingston |
| June 2020 <b>First Crewed SpaceX Launch</b> , CFRC   | Kingston |
| Apr. 2020 <b>Spotting Comet ATLAS C/2019 Y4</b> , YourTV Kingston  | Kingston |
| Nov. 2019 <b>Mercury moves across the sun</b> , Global News  | Kingston |
| July 2019 <b>Canada's contributions to the Apollo 11 mission</b> , Global News   | Kingston |
| June 2019 <b>A Nobel Pursuit</b> , The Queen's Gazette   | Kingston |
| Dec. 2018 <b>Queen's Phd student tells us how we can spot the International space station in the sky</b> , Global News     | Kingston |

## PUBLIC TALKS

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|---|----------|
| March 2023 <b>Mysterious Galaxies at the Beginning of Time</b> , Queen's Observatory                                | Kingston |
| May 2022 <b>Virtual Planetarium Keynote</b> , Science Rendezvous Kingston   | Virtual  |
| May 2021 <b>Virtual Planetarium Keynote</b> , Science Rendezvous Kingston   | Virtual  |
| June 2019 <b>Where Does it All Come From?</b> , Queen's Observatory   | Kingston |
| May 2019 <b>Young Persons Lecture Competition (Honourable Mention)</b> , Institute of Materials, Minerals, & Mining | Kingston |
| Oct. 2018 <b>Grad Student Panel Discussion: Get the Real Deal</b> , School of Graduate Studies                      | Kingston |
| Oct. 2018 <b>Tools for Machine Learning</b> , Queen's Machine Intelligence and Neuroevolution Design (Q-MIND)       | Kingston |
| Feb. 2018 <b>What is Dark Matter?</b> , Queen's Observatory   | Kingston |

## Service

### Ciela Institute Professional Development Series

Tutorials on professional applications of tools like Blender, GIMP, Audacity, etc.

Université de Montréal

July 2023 - Aug. 2025

### Ciela Institute Astromatic Hackathon

Lecture, plus LOC responsibilities for the week long hackathon

Université de Montréal

August 2023

### UNIONS data working group meeting

LOC and primary event coordinator

Université de Montréal

May 2023

### Surveys 2 Discoveries conference

Member of the LOC. Organizing payment system, booking logistics, forms and attendee data.

Université de Montréal

May 2023

### UdeM Astronomy Department Seminar Committee

Organizing and coordinating seminar program including inviting international speakers to the department.

Université de Montréal

Sept. 2022 - Aug. 2025

### Equity, Diversity, and Inclusion Committee

Organizing and coordinating EDI activities in the Institute including the development of the code of conduct.

Ciela Institute

Sept. 2022 - Aug. 2025

### Journal Referee

The ApJL, ApJ, JOSS, ICML, and CanTAC

ApJL, ApJ, JOSS, ICML, CanTAC

2021 - Present

### Physics Department Outreach Committee

Organizing and coordinating outreach activities in the Physics department.

Queen's University

Sept. 2021 - Aug. 2022

### Q-GraPh Graduate Physics Journals Club

Creator/Organizer. Year-round weekly Journals Club. Organized over 170 talks.

Queen's University

May 2017 - Apr. 2022

### Data Science Discussion Group

Co-Creator/Organizer. Year-round monthly discussions on Machine learning and Data Science

Queen's University

Sept. 2017 - Sept. 2019

### The Physics of Galaxy Scaling Relations and the Nature of Dark Matter

Member of the LOC, involved in various elements of conference organization and operations.

Queen's University

July 2018