Alice P. Curtin

PhD Candidate, McGill University
Vanier Canada Graduate Scholar

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Research Interests

Fast radio bursts, Pulsars, Radio Telescopes, Magnetars, Galactic magnetic field, Very Long Baseline Interferometry, Compact object mergers

Education

Doctor of Philosophy, Physics, McGill University Fall 2021 - Present

- Advisor: Victoria Kaspi
- General GPA: 4.0

Master of Science, Physics, McGill University Fall 2019 - Fall 2021

- Advisor: Victoria Kaspi
- General GPA: 4.0

Bachelor of Arts Degree, Physics & Astronomy, Carleton College Fall 2015 - June 2019

- Thesis: *Jets in Active Galactic Nuclei*
- Advisor: Joel Weisberg
- General GPA: 3.75

Research Experience

McGill University September 2019 - Present

CHIME/FRB

- Investigate high-energy counterparts to fast radio bursts, particularly focusing on gamma-ray bursts
- Investigate repeating fast radio bursts at high time resolution
- Develop methods for detecting microstructure in FRBs

- Co-lead of Canadian Hydrogen Mapping Experiment Fast Radio Burst Project (CHIME/FRB) data quality monitoring team

CHIME/FRB Outriggers

- Measure precise positions, proper motions, and parallax for 84 pulsars with the Very Long Baseline Array

Carleton College January 2016 - Present
Conduct research on galactic magnetic field using Faraday rotation measures for pulsars with Joel Weisberg and Joanna Rankin

University of Utah Summer 2018
Study of high-energy gamma-ray emission from the microquasar SS 433
Supervisors: David Kieda and Anushka Udara Abeysekara

Awards and Recognitions

McGill Physics Travel Grant, *$3000* 2024, 2023, 2022
McGill Faculty of Science Funding for Science in Space Outreach Initiative, *$5000* 2023
Best Talk at CASCA, Penticton, BC 2023
"*Calibrating the CHIME/FRB Outriggers using Pulsars and the VLBA"*
Honorable Mention for EPO Poster at CASCA, Penticton, BC 2023
"*Science in Space How to Telescope – Designing and building telescopes in Minecraft to encourage belonging and equitable spaces in STEM"*
McGill Department of Physics Community Building Award, *$1000* 2023
Vanier Canada Graduate Fellow, NSERC, McGill University, *$150000* 2022-2025
Ranked #6 out of all NSERC Vanier Candidates in Canada
2022 Brockhouse Canada Prize*,* as part of the CHIME team 2022
Lancelot M. Berkeley – New York Community Trust Prize, 2022
as part of the CHIME/FRB team
McGill University McPhee Fellowship, *$10,000* 2020
Governor General's Innovation Award*,* as part of the CHIME team 2020
Distinction in Physics & Astronomy Bachelor Degree, Carleton College 2019
Distinction on Physics Thesis, "*Jets in Active Galactic Nuclei,"* Carleton College 2019
Honorable Mention for Research on SS 433, University of Utah 2018
Mike Ewers Award, Minnesota Space Grant Consortium, Carleton College, *$1000* 2018
Minnesota Space Grant Consortium Award, Carleton College, *$1000* 2016

Publications

Lead Author

1. **Curtin, A.P.**, et al. , *Constraining Near-Simultaneous Radio Emission from Short Gamma-ray Bursts using CHIME/FRB,* **in prep.**
2. **Curtin, A.P.**, Weisberg, J., Rankin, J., *New Arecibo Pulsar Faraday Rotation Measures and the Magnetic Field in the Galactic Plane*, **in prep.**
3. **Curtin, A. P.,** *"Limits on Fast Radio Burst-like Counterparts to Gamma-Ray Bursts Using CHIME/FRB",* ApJ, vol. 954, no. 2, IOP, 2023

Other

20 submitted or published articles with 1032 citations. Below, I list those that have been published.

1. Rankin, J, Venkataraman, A., Weisberg, J.M., **Curtin, A.P,** *Polarized Measurements of Arecibo Pulsars: Faraday Rotations and Profile Analyses*, (2021) Submitted to MNRAS
2. Sand, K., … **Curtin, A.P,** …, *A CHIME/FRB Study of Burst Rate and Morphological Evolution of the Periodically Repeating FRB 20180916B,* APJ (2023)
3. CHIME/FRB Collaboration: … **Curtin, A.P,** …, *CHIME/FRB Discovery of 25 Repeating Fast Radio Burst Sources,* AJ, (2023)
4. Cook, A.M.,, … **Curtin, A.P,** …, *An FRB Sent Me a DM: Constraining the Electron Column of the Milky Way Halo with Fast Radio Burst Dispersion Measures from CHIME/FRB*, AJ, (2021)
5. CHIME/FRB Collaboration: … **Curtin, A.P,** …, *Sub-second periodicity in a fast radio burst,* Nature, (2021)
6. CHIME/FRB Collaboration: … **Curtin, A.P,** …, *The First CHIME/FRB Fast Radio Burst Catalog,* AJS, (2021)
7. Josephy, A., Chawla, P., **Curtin, A.P**, …, No Evidence for Galactic Latitude Dependence of the Fast Radio Burst Sky Distribution, AJ (2021)
8. CHIME/FRB Collaboration: … **Curtin, A.P,** … , *A bright millisecond-duration radio burst from a Galactic magnetar,* Nature, (2020)

Proposals

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1. **VLBA –** *"Precise Pulsar Positions for CHIME/FRB Outrigger Calibration",* **A.P. Curtin,** Jane Kaczmarek, Victoria Kaspi, Emmanuel Fonseca, et al.**,** Hours Acquired: 180
2. **VLBA –** *"Precise Pulsar Positions for CHIME/FRB Outrigger Calibration",* **A.P. Curtin,** Jane Kaczmarek, Victoria Kaspi, Emmanuel Fonseca, et al.**,** Hours Acquired: 42

Talks

McGill University (Invited – with collaborators) Montreal, QC, 2023
"Building Connections: Science Outreach in the McGill Department of Physics and Trottier Space Institute"

FRB 2023 Online, 2023
"*A High-Time Resolution Study of 24 Repeating FRBs with CHIME/FRB*"

WVU Astronomy Journal Club Online, 2023
"Calibrating the CHIME/FRB Outriggers using Pulsars and the VLBA"

CASCA Penticton, BC, 2023
"Calibrating the CHIME/FRB Outriggers using Pulsars and the VLBA"

Northwestern CIERA Observer's Group Meeting Online, 2023
"Calibrating the CHIME/Outriggers for Fast Radio Burst Localizations"

FRB 2022 Busan, SK, 2022
"Searching for FRB-like Counterparts to GRBs using the First CHIME/FRB Catalog"

CRAQ Quebec, 2022
"Searching for FRB-like Counterparts from GRBs using the First CHIME/FRB Catalog"

RFI 2022 Online, 2022
"Radio Frequency Interference at the Canadian Hydrogen Intensity Mapping Experiment Fast Radio Burst Project"

RFI 2022 Online, 2022
"A New Pipeline for Characterizing and Recording Radio Frequency Interference for the Canadian Hydrogen Intensity Mapping Experiment Fast Radio Burst Project"

DRAO Tech Talk (Invited) Online, 2021
"Characterizing and Recording Radio Frequency Interference at the Canadian Hydrogen Intensity Mapping Experiment Fast Radio Burst Project"

Posters

FRB 2023 Online**,** 2023
"Constraining FRB-like Radio Emission from 28 SGRBs using CHIME/FRB"

CASCA Penticton, BC, 2023
"Science in Space: How to Telescope – building telescopes in Minecraft to encourage belonging and equitable spaces in STEM"

FRB 2022 Busan, SK, 2022
"Calibrating the CHIME/FRB Outriggers using Pulsars and the VLBA"

FRB 2021 Online, 2021
"Constraining FRB-like Counterparts from GRBs with the First CHIME/FRB Catalog"

AAS Meeting Seattle, WA, 2019
"VERITAS Observations of Very High-Energy Gamma-rays from the Microquasar SS 433"

Leadership and Community Involvement

CIBC Spring Break Camp on Space, Toronto, ON March 2024
Judge & Delegate Selection Committee Member for CCUWiP Conference January 2024
Co-founder and convenor of Joint CHIME/F4/DSA Journal Club September 2023 - Present
Co-founder and principal coordinator of Science in Space Spring 2022 - Present
How to Telescope Outreach Initiative, McGill University,
Trottier Space Institute, Dell Technologies
Graduate student coordinator for Physics Outreach, McGill University Fall 2021 - Present
Convenor of McGill Transient Discussion, McGill May 2022 - Present
Writer for Astrobites, Astrobites Feb 2021 - Present
Speaker at Astronomy on Tap, Montreal Fall 2023
Multi-National Outreach Alliance, McGill University Fall 2020
Student Volunteer for Goodsell Observatory, Carleton College Summer 2016 - June 2019
Science Summer Educator, Berkshire Museum, Pittsfield, MA Summer 2017
Student Leader for Young Summer Astronomy Experience, Carleton College Summer 2016

Committee Memberships

McGill Physics Outreach Committee Graduate Student Member Spring 2020 - Present[1]
Astrobites Admin Committee Member, Astrobites Fall 2023 - Present
Astrobites Social Media Chair, Astrobites Fall 2021 - Present
Astrobites Climate Change Committee Member, Astrobites Fall 2021 - Present
Action Plan Task Force for EDI Committee, McGill University Summer 2020 - Spring 2021
Values Statement Task Force for EDI Committee, McGill University Summer 2020
Physics Department Curriculum Committee, Carleton College Fall 2018 - June 2019
Committee member of Women in Physics +, Northfield, MN, Fall 2016 – June 2019

Teaching Experience

Undergraduates

- **Summer Undergraduate Supervisor** Summer 2023 - Winter 2024
  - Student: Sloane Sirota

[1] Longest standing graduate student member.

- Project: Investigate possible association between FRBs and GRBs; Co-supervised with Victoria Kaspi

- **Summer Undergraduate Supervisor** Summer 2022
  - Student: Sandhya Rotoo
  - Project: Investigate pulsar positions acquired using the VLBA; Co-supervised with Victoria Kaspi

Labs and Courses

- **McGill University**
  - Lab Designer, Facilitator and Grader for Introductory Physics Course — Summer - Fall 2020
  - Lab Assistant and Grader for Introductory Electricity and Magnetism — Fall 2019
  - Lab Assistant and Grader for Introductory Mechanics — Fall 2019
- **Carleton College**
  - Grader for Math 341, Fourier Series and Boundary Values Problems — Spring 2019
  - Lab Assistant for Physics 165, Electricity and Magnetism — Winter 2019
  - Problem Solving Facilitator for First and Second Year Physics — Winter 2019

Skills

Computer Skills: Advanced in IDL**;** Advanced in Python; Proficient in Unix, Mathematica and Excel**;** Experience with C++ and ROOT
Language Skills: Spanish (Proficient), French (basic)

Science Communication Articles

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1. *Some "not so fast" fast radio bursts* by Alice P. Curtin, Astrobites, November 2022
2. *An FRB way off in the distance* by Alice P. Curtin, Astrobites, October 2022
3. *Have we found the origins of fast radio bursts?* by Alice P. Curtin, Astrobites, September 2022
4. *Could some short and long gamma-ray bursts have the same parents?* by Alice P. Curtin, Astrobites, May 2022
5. *You'll be a limbo star. How (s)low can you go?* by Alice P. Curtin, Astrobites, February 2022
6. *Let's get building (some terrestrial planets)!*, Alice P. Curtin, Astrobites, December 2021
7. *Another Mysterious Fast Radio Burst Detected… Are We One Step Closer to Discovering their Origins?* by Alice P. Curtin, Astrobites, November 2021

8. *New Radio Source Towards the Center of our Galaxy — Say whaaaat*, Alice P. Curtin, Astrobites, October 2021
9. *A Fast Radio Burst in a Rather Peculiar Location* by Alice P. Curtin, Astrobites, August 2021
10. *If you had $100 million, how would you look for aliens?* by Alice P. Curtin, Astrobites, May 2021
11. *FRBs are spiraling out of control* by Alice P. Curtin, Astrobites, March 2021
12. *Three Little Outliers in a Sea of Planets, Stars, and Brown Dwarfs* by Alice P. Curtin, Astrobites, February 2021