

Jessica Speedie

PhD Candidate, Department of Physics & Astronomy, University of Victoria, BC, Canada

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Research Interests

The where, how and when of planet formation; hunting for embedded protoplanets and characterizing their environment

Education

University of Victoria

Ph.D. Candidate, Department of Physics & Astronomy, GPA: 8.40/9.0

Sep. 2020 - [Aug. 2025]

Victoria, BC, Canada

McMaster University

B.Sc., Honours Integrated Science (Physics), GPA: 11.6/12.0, *Summa Cum Laude*

Sep. 2016 - Apr. 2020

Hamilton, ON, Canada

Employed Research Positions

🔗 indicates number of 1st-author papers resulting from appointment; 📖 means undergraduate journal

Department of Physics & Astronomy, University of Victoria

🔗🔗🔗 Graduate Student Researcher. Advisor: Dr. Ruobing Dong

Sep. 2020 - Present

Victoria, BC, Canada

Department of Physics & Astronomy, McMaster University

🔗 Undergraduate Research Assistant. Advisor: Dr. Ralph Pudritz

May - Jul. 2020

Hamilton, ON, Canada

Canadian Institute for Theoretical Astrophysics (CITA), University of Toronto

🔗 Summer Undergraduate Research Program (SURP). Advisor: Dr. J. J. Zanazzi

May - Aug. 2019

Toronto, ON, Canada

Institute for Research on Exoplanets (iREx), University of Montréal

📖 Trottier Summer Intern. Advisor: Dr. David Lafrenière

May - Aug. 2018

Montréal, QC, Canada

Department of Physics & Astronomy, McMaster University

📖 Undergraduate Research Assistant. Advisor: Dr. Laura Parker

Jul. - Aug. 2017

Hamilton, ON, Canada

Funding & Awards

Over \$146,000 CAD in external (competition-based) funding during ~4 years as graduate student

\$1,000 CAD · University of Victoria Fellowship - Doctoral, University of Victoria 2024

\$10,000 USD · ALMA Ambassador, Cycle 11, National Radio Astronomy Observatory (NRAO) 2024

\$105,000 CAD · NSERC Canada Graduate Scholarship - Doctoral (CGS-D) 2022-2025

5x \$5,000 CAD · President's Research Scholarship, University of Victoria 2020, 2021, 2022, 2023 & 2024

2x \$1,500 CAD · University of Victoria Graduate Award, University of Victoria 2021 & 2022

\$5,125 CAD · The R. M. Petrie Memorial Fellowship, University of Victoria 2021

\$5,200 CAD · NSERC Michael Smith Foreign Study Supplement 2021

\$17,500 CAD · NSERC Canada Graduate Scholarship - Master's (CGS-M) 2020

\$15,000 CAD · British Columbia Graduate Scholarship (superseded by NSERC CGS-M) 2020

Nominated for Chancellor's Gold Medal by Department of Physics & Astronomy, McMaster University 2019

\$800 CAD · The University Senate Scholarship, McMaster University 2019

\$625 CAD · The Boyd McLay Scholarship in Physics, McMaster University 2019

\$9,500 · NSERC Undergraduate Student Research Award, University of Toronto 2019

\$8,400 CAD · NSERC Undergraduate Student Research Award (declined), McMaster University 2019

\$1,600 CAD · The Gladys A. Young Scholarship, McMaster University 2018

\$600 CAD · The Gerald and Verna Simpson Memorial Scholarship, McMaster University 2018

\$6,000 CAD · Trottier Excellence Grant for Summer Interns, University of Montréal 2017

Publications

A full listing of my publications can be found on [ADS](#)

First Author (5)

5. **Speedie, J.**, Dong, R., Hall, C., Longarini, C., +6 authors (2024), [Nature](#), 632, 8028
Gravitational Instability in a Planet-Forming Disk
4. **Speedie, J.** & Dong, R. (2022), [ApJL](#), 940(2), L43
Testing Velocity Kinks as a Planet Detection Method: Do velocity kinks in surface gas emission trace planetary spiral wakes in the midplane continuum?
3. **Speedie, J.**, Booth, R.A. & Dong, R. (2022), [ApJ](#), 930, 40 (22pp)
Observing Planet-driven Dust Spirals with ALMA
2. **Speedie, J.**, Pudritz, R.E., Cridland, A.J., Meru, F. & Booth, R.A. (2022), [MNRAS](#), 510(4), 6059-6084
Turbulent Disk Viscosity and the Bifurcation of Planet Formation Histories
1. **Speedie, J.** & Zanazzi, J. J. (2020), [MNRAS](#), 497(2), 1870-1883
The Structure and Stability of Extended, Inclined Circumplanetary Disk or Ring Systems

(Published in undergraduate-refereed journals)

2. **Speedie, J.** & Lafrenière, D. (2018), [The iScientist](#), 4(1), 3-14
Improved Surface Gravity and Mass Constraints for Substellar Objects from Spectral Line Profile Measurements at High Resolution in the Near-Infrared
1. **Speedie, J.** & Parker, L.C. (2017), [The iScientist](#), 3(1), 3-12
Star Formation and Morphology of Galaxies in Local Compact Groups


Co-Author (3)


3. Calcino, J., Norfolk, B., Price, D.J., Hilder, T., **Speedie, J.**, Pinte, C., et al. (2024), [MNRAS](#), in press. [arXiv:2407.21309](#)
Observational Signatures of Circumbinary Discs II: Kinematic Signatures in Velocity Residuals
2. Longarini, C., Lodato, G., Clarke, C.J., **Speedie, J.**, Paneque-Carreno, T., +4 authors (2024), [A&A Letters](#), 686, L6
Angular momentum transport via gravitational instability in the Elias 2-27 disc
1. Stevenson, E.T., Ribas, A., **Speedie, J.**, Booth, R.A., & Clarke, C. (2024), [MNRAS](#), 530(4), 4802-4825
Searching for planet-driven dust spirals in ALMA visibilities

Successful Proposals for Telescope Observing Time



PI · 30.6 hours · ALMA Radio Telescope (Chile), Program ID: 2024.1.01060.S <i>A cloulet-capture origin of late infall streamers in the AB Aur system</i>	2024
PI · 9.7 hours · ALMA Radio Telescope (Chile), Program ID: 2023.1.00491.S <i>Kinematic signatures of gravitational instability in the AB Aurigae planet-forming disk</i>	2023
PI · 13.4 hours · ALMA Radio Telescope (Chile), Program ID: 2022.1.01266.S <i>Putting kinematic planetary detection techniques to the test in HD 97048</i>	2022
Co-I · 9.1 hours · ALMA Radio Telescope (Chile) <i>Inspecting the planetary signature in the continuum emission of the disc around HD 97048</i>	2022

Seminars & Lunch Talks







20. NRC Herzberg Astronomy & Astrophysics Research Centre , DAO Science Tea, Victoria, BC	[Oct. 2024]
19. Centre for Astrophysics, Harvard & Smithsonian , Cambridge, MA	Feb. 2024
18. Planet Formation Lab, EAPS, MIT , Cambridge, MA	Feb. 2024
17. Department of Physics & Astronomy , McMaster University, Hamilton, ON	Jan. 2024
16. NRC Herzberg Astronomy & Astrophysics Research Centre , DAO Science Tea, Victoria, BC 	Nov. 2023
15. Center for Simulational Physics, University of Georgia , Athens, GA	Aug. 2023

14. University of Victoria Astronomy Summer Seminar , Victoria, BC 	Jul. 2023
13. Center for Integrative Planetary Science (CIPS) , University of California Berkeley, CA (online)	Mar. 2023
12. National Radio Astronomy Observatory (NRAO) / UVA , TUNA Lunch Talk, Charlottesville, VA	Nov. 2022
11. Institute of Astronomy, University of Cambridge , Cambridge, UK	Aug. 2022
10. Department of Physics & Astronomy, University College London , London, UK	Aug. 2022
9. Astronomy & Astrophysics Group, University of Warwick , Coventry, UK	Jul. 2022
8. Department of Physics & Astronomy, Queen Mary University , London, UK	Jul. 2022
7. Stars & Planets Group, Imperial College London , London, UK	Jul. 2022
6. Astrophysics Seminar, University of Leicester , Leicester, UK	Jun. 2022
5. Department of Astronomy, Institute for Advanced Study, Tsinghua University , Beijing (online)	Jun. 2022
4. Jets and Accretion Discs Study Group, Joint ALMA Observatory , Santiago, Chile (online)	May 2022
3. Planet Formation Group, Center for Computational Astrophysics, Flatiron Institute , NY (online)	Mar. 2022
2. Center for Astrophysics, Harvard & Smithsonian , Cambridge, MA (online)	Nov. 2021
1. University of Victoria Astronomy Summer Seminar , Victoria, BC (online)	Aug. 2021






Conference Talks

10. Born in Fire: Eruptive Stars and Planet Formation , Universidad Diego Portales, Santiago (online)	[Sep. 2024]
9. New Heights in Planet Formation , ESO, Garching, Germany	Jul. 2024
8. Disks and Planets Across ESO Facilities , ESO, Garching, Germany (online) 	Nov. 2022
7. CITA Planet Day , Canadian Institute for Theoretical Astrophysics, University of Toronto, ON	Aug. 2022
6. Canadian Astronomical Society Annual General Meeting , University of Waterloo, ON (online)	May 2022
5. Planet-forming Disks: From Surveys to Answers , Leiden, The Netherlands (online) 	Sep. 2021
4. Five Years After HL Tau: A new era in planet formation , ESO, Chile (online) 	Dec. 2020
3. Synthesis Undergraduate Research Symposium , McMaster University, Hamilton, ON	Apr. 2019
2. Canadian Conference for Undergrad Women in Physics , Ottawa, ON  1st prize best talk (\$100)	Jan. 2019
1. Synthesis Undergraduate Research Symposium , McMaster University, Hamilton, ON	Apr. 2018

Conference Posters

6. Canadian Astronomical Society Annual General Meeting , University of Toronto, ON	Jun. 2024
5. ALMA At 10 Years: Past, Present, and Future , Puerto Varas, Chile 	Dec. 2023
4. Canadian Astronomical Society Annual General Meeting , Dominion Radio A. Observatory (online) 	May 2021
3. Circumplanetary Disks & Satellite Formation Conference II , ETH Zürich, Switzerland (online) 	Mar. 2021
2. Five Years After HL Tau: A new era in planet formation , ESO, Chile (online) 	Dec. 2020
1. Physics Undergraduate Conference , Western University, London, ON   Runner-up best poster	Mar. 2018

Press & Media

NSERC Science Exposed, Research Image Contest (Top 20 Finalist) 	May 2024
National competition to showcase Canadian research and foster public interest in science and science curiosity	Canada
Canadian Astronomical Society (CASCA), Graduate Student Highlight 	Sep. 2022
Monthly article in which CASCA selects one outstanding Canadian graduate student and highlights their research	Canada
National Radio Astronomy Observatory (NRAO), ngVLA Science Showcase, eNews Article 	Apr. 2022
Article Title: <i>An ngVLA Avenue to Measure the Planet Formation Budget</i>	Charlottesville, VA
McMaster Department News, 1st Prize Best Talk, Canadian Conference for UGrad. Women in Phys. 	Jan. 2019
Talk Title: <i>Telling giant planets from brown dwarfs: an observational test with SPIRou</i>	Ottawa, ON
Institute for Research on Exoplanets, Summer Internship Text Interview 	Sep. 2018
Trottier Research Project and Experience Q&A-style interview	Montréal, QC

Public Outreach, DEI Efforts & Community Engagement

Public Presentation, Island County Astronomical Society Outreach with Island County Astronomical Society	[Nov. 2024] Victoria
Public Presentation, Royal Astronomical Society of Canada  Outreach with Victoria Chapter of the Royal Astronomical Society of Canada	[Sep. 2024] Victoria
Public Auditorium Presentation (2 times), Centre of the Universe Star Party  Outreach with Friends of the Dominion Astrophysical Observatory (FDAO)	Aug. 2024 Victoria
Annual YYJ Science Rendezvous Public observatory tours, solar telescope demonstrations (~1000 visitors)	May 2024 University of Victoria
Physics & Astronomy Research Night Promoting graduate research in astronomy	Mar. 2024 University of Victoria
Indigenous Plan Implementation Project Graduate representative during departmental implementation of strategies for indigenous student success	Apr. 2022 - 2023 University of Victoria
Verna J. Kirkness Program for Indigenous Youth Promoting post-secondary education in astronomy (online)	May 2021 University of Victoria
McMaster Undergraduate Academic Astronomy Club Research & Industry Symposium Promoting graduate research in astronomy (online)	Mar. 2021 McMaster University

Service

* indicates peer-elected leadership roles

Associate Member , NAASC ALMA Primer Video Working Group	2024-Present
Core Member , Square Kilometer Array (SKA) Cradle of Life Science Working Group	2024-Present
* Vice Chair (2yr) , Canadian Astronomical Society Graduate Student Committee	2023-Present
Journal Referee , <i>MNRAS</i> , <i>ApJ</i>	2022-Present
Organizer , ALMA Ambassador Data Processing Workshop (X students)	[2024]
Review Panelist , ALMA Archival Student Observing Support (SOS) awards	2024
Co-Lead Organizer , Canadian Astronomical Society Graduate Student Workshop (150 students)	2024
Usability Reviewer , Data Observatory Cloud Interferometric Radio Astronomical Imaging (CLIRAI) Platform	2024
User Feedback Group , Canadian Advanced Network for Astronomical Research Science Platform	2023-Present
Associate Member (1yr) , Square Kilometer Array (SKA) Cradle of Life Science Working Group	2023-2024
University Representative (1yr) , Canadian Astronomical Society Graduate Student Committee	2022-2023
Department Representative (1yr) , Graduate Student Society Council, University of Victoria	2021-2022
* Vice Chair (1yr) , Physics & Astronomy Graduate Student Association, University of Victoria	2021-2022
External Reviewer , UK National High Performance Computing Resources Grant Program	2021
* Student Affairs Officer (1yr) , Physics & Astronomy Graduate Student Association, University of Victoria	2020-2021
* Co-President (2yr) , McMaster Undergraduate Academic Astronomy Club (MUAAC), McMaster University	2018-2020
* Vice President (1yr) , McMaster Undergraduate Academic Astronomy Club, McMaster University	2017-2018
1st-Year Representative (1yr) , McMaster Undergraduate Academic Astronomy Club, McMaster University	2016-2017

Teaching & Mentorship

Teaching Assistant (Cumulative total: 24 months)

ASTRO 150: Concepts in Modern Astronomy (20 undergrads, 1 semester), University of Victoria	2021
PHYS 110: Introductory Physics (30 undergrads, 1 semester), University of Victoria	2020
ISCI 2A18: Advanced Calculus (55 undergrads, 4 semesters), McMaster University	2018-2020

Guest Lecturer (2 classes)

ISCI 2A18: Advanced Calculus (55 undergrads, 2 times), McMaster University	2019-2020
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Research Mentor (5 students)

Joshua Adams, Undergraduate research project, McMaster University	2024
Edward Stevenson, Honours/MSc research project (1 paper), University of Cambridge	2023-2024
Scott Holtshousen, Undergraduate research project, NRC Herzberg Astronomy & Astrophysics Research Centre	2023
Gillian Bogert, Masters research project, McMaster University	2021-2022
Elizabeth Patrascu, Undergraduate research project, McMaster University	2021

Academic Mentor (2 students), Student-run mentorship programs

Breanna Crompvoets (MSc student), University of Victoria	2021-2022
Dori Blakely (MSc student), University of Victoria	2021-2022

Instructional Workshops


Instructor, ALMA Ambassador Data Processing Workshop (2 days), University of Victoria	[Oct. 2024]
Tutorial Support, 20th Synthesis Imaging Workshop (2 days), Socorro, NM	May 2024

Workshop, School & Conference Participation

* indicates participation was competitive/application-based

* ALMA Ambassador Data Processing Training , NRAO, Charlottesville, VA	Aug. 2024
* Spatio-spectral Modeling of Interferometric Data Workshop , NAASC, Charlottesville, VA	May 2024
* ALMA Ambassador Proposal Preparation Training , NRAO, Charlottesville, VA	Feb. 2024
* Flatiron Computational Fluid Dynamics for Astrophysics Summer School , Flatiron Institute, NY	Jul.-Aug. 2023
NRAO 19th Synthesis Imaging Workshop , Charlottesville, VA	Jun. 2023
New Eyes on the Universe: SKA and ngVLA , Vancouver, BC	May 2023
1st Dustbusters School on Protostellar Discs and Planet Formation , Gargnano del Garda, Italy	May 2022
Distorted Astrophysical Discs: New Insights & Future Directions , Kavli Institute, Cambridge, UK (online)	May 2021
Exomoon Discussion Event , Columbia University, New York (online)	Nov. 2020
IMPRS 15th Summer School: Planet Formation in Protoplanetary Disks , Heidelberg, Germany (online)	Aug. 2020
Exoplanets III , Max Planck Institute for Astronomy & Center for Astronomy of Heidelberg University (online)	Jul. 2020
Sagan Exoplanet Summer Workshop , NASA Exoplanet Science Institute, Caltech, Pasadena, CA (online)	Jul. 2020
Canadian Astronomical Society Annual General Meeting , York University, Toronto, ON (online)	May 2020
Science of Early Life , The Origins Institute, McMaster University, Hamilton, ON	Jun. 2018
Gravitational Waves Fall Meeting , American Physical Society, Union College, Schenectady, New York	Nov. 2017

Professional Development & Certifications

Unconscious Bias Education Modules , University of Toronto (online)	May 2024
Intro to Coding with HTML & CSS, Certificate  , Digital Scholarship Commons, University of Victoria	Sep. 2022
Teaching Assistant Development Workshop , McMaster University	Sep. 2019

Non-refereed Contributions & White Papers

4. Benneke, B., Cowan, N., Rowe, J. et al. (incl. **Speedie, J.**), (2019), *Canadian Long Range Plan for Astronomy and Astrophysics White Papers, LRP2020*. Exoplanet instrumentation in the 2020s: Canada's pathway towards searching for life on potentially Earth-like exoplanets
3. **Speedie, J.**, Mahataji, K., D'Ercole, J., Raufdeen, F. (2018), *MacSphere: iSci Undergraduate Publications* Climate Model Diversity: Future Climate Predictions from the CMIP5 Multi-Model Ensemble
2. **Speedie, J.**, Mahataji, K., D'Ercole, J., Raufdeen, F. (2018), *MacSphere: iSci Undergraduate Publications* (Podcast) Motions and Notions - How to Love Uncertainty in Climate Science
1. **Speedie, J.** & Simon, C. (2018), *History of the Earth*, 8(1), 86-91
Earthism in Planetary Science

Education (Previous Life)

Humber College of Creative & Performing Arts

B.Mus. (*Not Completed*), Jazz Performance (Guitar), GPA: 90%

Sep. 2015 - Apr. 2016

Toronto, ON, Canada

Humber College of Creative & Performing Arts

College Certificate, Introduction to Commercial Jazz (Guitar), GPA: 90%

Sep. 2014 - Apr. 2015

Toronto, ON, Canada

Funding & Awards (Previous Life)

\$500 CAD · Peter Harris Memorial Award, Humber College of Creative & Performing Arts 2016

\$300 CAD · CJA Sousa Liberal Studies Achievement Award, Humber College of Creative & Performing Arts 2015

\$2,500 CAD · Academic Award of Excellence, Humber College of Creative & Performing Arts 2015

\$1,750 CAD · RBC Scholarship for Emerging Artists, Merriam School of Music 2014

Teaching (Previous Life)

Sherway Academy of Music

2015 - 2016

Guitar Teacher (Contact: Bill Zufelt)

85 31st St, Toronto, ON


- Prepared and taught weekly guitar and electric bass lessons for students ages 14-60; accompanied students during annual recitals.

CJ's Skateboard Park & School

2011-2015

Skateboarding & Inline Skating Instructor (Contact: Jay Mandarino)

60 Horner Ave, Etobicoke, ON (since relocated)

- Gave weekly individual and group skateboarding and inline skating lessons to children and adults with and without disabilities (autism, deafness)
- Acted as ambassador for females in skateboarding at live vert ramp demonstrations and on public news television broadcasts (e.g. Breakfast Television , 8:54)