

Jessica Speedie

PhD Student, Department of Physics & Astronomy, University of Victoria

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EDUCATION

University of Victoria

Ph.D. Student, Department of Physics & Astronomy, GPA: 8.25/9.0

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

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

EMPLOYED RESEARCH POSITIONS

🔗 indicates number of papers resulting from research position; 🔗 for published, 🔗 for undergraduate-refereed

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: 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

PUBLICATIONS

(As lead author)

4. **Speedie, J.** & Dong, R. (2022). Testing Velocity Kinks as a Planet Detection Method: Do velocity kinks in surface gas emission trace planetary spiral wakes in the midplane continuum? *The Astrophysical Journal Letters*, 940(2), L43.
3. **Speedie, J.**, Booth R.A. & Dong, R. (2022). Observing Planet-driven Dust Spirals with ALMA. *The Astrophysical Journal*, 930, 40 (22pp).
2. **Speedie, J.**, Pudritz R.E., Cridland A.J., Meru F. & Booth, R.A. (2022). Turbulent Disk Viscosity and the Bifurcation of Planet Formation Histories. *Monthly Notices of the Royal Astronomical Society*, 510(4), 6059-6084.
1. **Speedie, J.** & Zanazzi, J. J. (2020). The Structure and Stability of Extended, Inclined Circumplanetary Disk or Ring Systems. *Monthly Notices of the Royal Astronomical Society*, 497(2), 1870–1883.

(Undergraduate refereed journals)

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

(Non-refereed contributions & white papers)

6. Benneke, B., Cowan, N., Rowe, J. et al. (including **Speedie, J.**), (2019). Exoplanet instrumentation in the 2020s: Canada's pathway towards searching for life on potentially Earth-like exoplanets. *Canadian Long Range Plan for Astronomy and Astrophysics White Papers, LRP2020*. 🔗
5. Cappalietto, N., Hosein, H., Pasquariello, M., **Speedie, J.** (2018). Manipulating Wine Colour. Terroir (Wine Science Magazine). *MacSphere: iSci Undergraduate Publications*. 🔗

4. **Speedie, J.**, Mahataji, K., D'Ercole, J., Raufdeen, F. (2018). Climate Model Diversity: Future Climate Predictions from the CMIP5 Multi-Model Ensemble. *MacSphere: iSci Undergraduate Publications*. [↗](#)
3. **Speedie, J.**, Mahataji, K., D'Ercole, J., Raufdeen, F. (2018). Motions and Notions - How to Love Uncertainty in Climate Science. *MacSphere: iSci Undergraduate Publications* (Podcast). [↗](#)
2. **Speedie, J.** & Simon, C. (2018). Earthism in Planetary Science. *History of the Earth*, 8(1), 86-91. [↗](#)
1. **Speedie, J.** (2018). The Map that Changed the World of Mars. Synopsis (interdisciplinary science blog). [↗](#)

FUNDING & AWARDS

\$105,000 CAD · NSERC Canada Graduate Scholarship (Doctoral) , University of Victoria	2022
3x \$5,000 CAD · President's Research Scholarship , University of Victoria	2020, 2022 & 2023
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 , University of Victoria	2021
\$17,500 CAD · NSERC Canada Graduate Scholarship (Master's) , University of Victoria	2020
\$15,000 CAD · British Columbia Graduate Scholarship (superseded by NSERC CGSM), University of Victoria	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
\$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

SUCCESSFUL PROPOSALS FOR TELESCOPE OBSERVING TIME

13.4 hours · ALMA Radio Telescope (Chile) . PI: Speedie, J. Program ID: <i>2022.1.01266.S</i> (C ranked)	2022
9.1 hours · ALMA Radio Telescope (Chile) . Co-I's including: Speedie, J. (B-ranked)	2022



INVITED SEMINARS

National Radio Astronomy Observatory (NRAO) / UVa TUNA Lunch Talk , Charlottesville, VA	Nov. 2022
Institute of Astronomy, University of Cambridge , Cambridge, UK	Aug. 2022
Department of Physics & Astronomy, University College London , London, UK	Aug. 2022
Astronomy & Astrophysics Group, University of Warwick , Coventry, UK	Jul. 2022
Department of Physics & Astronomy, Queen Mary University , London, UK	Jul. 2022
Stars & Planets Group, Imperial College London , London, UK	Jul. 2022
Astrophysics Seminar, University of Leicester , Leicester, UK	Jun. 2022
Department of Astronomy, Institute for Advanced Study, Tsinghua University , Beijing, China (online)	Jun. 2022
Jets and Accretion Discs Study Group, Joint ALMA Observatory , Santiago, Chile (online)	May 2022
Planet Formation Group, Center for Computational Astrophysics, Flatiron Institute , New York (online)	Mar. 2022
Center for Astrophysics, Harvard & Smithsonian , Cambridge, Massachusetts (online)	Nov. 2021
University of Victoria Astronomy Summer Seminar , Victoria, BC (online)	Aug. 2021






PRESS

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

CONFERENCE TALKS

Disks and Planets Across ESO Facilities , European Southern Observatory Garching, Germany (online)	Nov. 2022
CITA Planet Day , Canadian Institute for Theoretical Astrophysics, University of Toronto, ON	Aug. 2022
Canadian Astronomical Society Annual General Meeting , University of Waterloo, ON (online)	May 2022
Planet-forming Disks: From Surveys to Answers , Leiden, The Netherlands (online) 	Sep. 2021
Five Years After HL Tau: A new era in planet formation , Euro. Southern Observatory, Chile (online) 	Dec. 2020
Synthesis Undergraduate Research Symposium , McMaster University, Hamilton, ON	Apr. 2019
Canadian Conference for Undergraduate Women in Physics , Uni. of Ottawa, ON  1st prize best talk	Jan. 2019
Synthesis Undergraduate Research Symposium , McMaster University, Hamilton, ON	Apr. 2018

CONFERENCE POSTERS

Canadian Astronomical Society Annual General Meeting , Dominion Radio A. Observatory, BC (online) 	May 2021
Circumplanetary Disks & Satellite Formation Conference II , ETH Zürich, Switzerland (online) 	Mar. 2021
Five Years After HL Tau: A new era in planet formation , Euro. Southern Observatory, Chile (online) 	Dec. 2020
Physics Undergraduate Conference , Western University, London, ON   Runner-up best poster	Mar. 2018

PUBLIC OUTREACH & EDI EFFORTS

Indigenous Plan Implementation Project	Apr. 2022 - Present
Graduate representative during departmental implementation of strategies in UVic 2022 Indigenous Plan	University of Victoria
Verna J. Kirkness Program for Indigenous Youth	May 2021
Promoting Post-Secondary Education in Astronomy (online presentation)	University of Victoria
McMaster Undergraduate Academic Astronomy Club Research & Industry Symposium	Mar. 2021
Promoting Graduate Research in Planet Formation (online presentation)	McMaster University

SERVICE TO MY INSTITUTION IN ROLES OF LEADERSHIP

Canadian Astronomical Society (CASCA): Graduate Student Council (GSC)	2022-Present
Society of 25+ institutions across the country	Canada
◦ University of Victoria Co-Representative Sep. 2022 - Present	
Graduate Student Society (GSS): Graduate Representative Council (GRC)	2021-2022
University of Victoria	Victoria, BC
◦ Department of Physics & Astronomy Representative Sep. 2021 - Aug. 2022	
Physics & Astronomy Graduate Student Association (PAGSA)	2020-2022
University of Victoria	Victoria, BC
◦ Vice Chair (elected role) Sep. 2021 - Aug. 2022	
◦ Student Affairs Officer (elected role) Sep. 2020 - Aug. 2021	
McMaster Undergraduate Academic Astronomy Club (MUAAC)	2016-2020
McMaster University	Hamilton, ON
◦ Co-President (elected role) held for 2 years, Sep. 2018 - Apr. 2020	
◦ Vice President of Functions (elected role) Sep. 2017 - Apr. 2018	
◦ First-year Representative Sep. 2016 - Apr. 2017	

SERVICE TO MY PROFESSION

Academic Journal Referee

Monthly Notices of the Royal Astronomical Society (1)

since Mar. 2022

Grant Program External Reviewer

UK National High Performance Computing Resources, DiRAC HPC (1)

since Dec. 2021

TEACHING RECORD (AS A GRADUATE STUDENT)

University of Victoria

Teaching Assistant, Department of Physics & Astronomy (*Total: 8 months*)

Sep. 2020 - Apr. 2021

Victoria, BC

- **Concepts in Modern Astronomy (ASTR 150; 20 students)** with Dr. Sara Ellison (*Jan.-Apr. 2021*). Prepared and led 3hr online demonstrations of astronomy lab experiments; marked lab reports.
- **Introductory Physics (PHYS 110; 30 students)** with Drs. Travis Martin & Mark Laidlaw (*Sep.-Dec. 2020*). Prepared and taught 1.5hr online demonstrations of physics lab experiments 3 times weekly to 50+ students; proctored online quizzes.

TEACHING RECORD (AS AN UNDERGRADUATE STUDENT)

McMaster University

Teaching Assistant, School of Interdisciplinary Science (*Total: 16 months*)

Sep. 2018 - Apr. 2020

Hamilton, ON

- **Advanced Calculus (ISCI 2A18; 50 students)** with Dr. George Dragomir (*Sep. 2019 - Apr. 2020*). Prepared and taught bi-weekly 1hr blackboard tutorials; marked assignments, quizzes and exams; substituted for class lectures.
- **Advanced Calculus (ISCI 2A18; 55 students)** with Dr. George Dragomir (*Sep. 2018 - Apr. 2019*). Prepared and taught bi-weekly 1hr blackboard tutorials to class of 50+ students; marked assignments, quizzes and exams.

PROFESSIONAL DEVELOPMENT & CERTIFICATIONS

ALMA Data Reduction Workshop

Calibration, cleaning, clean masking, by ALMA Ambassador Dr. Allison Towner

Oct. 2022

University of Florida (online)


Intro to Coding with HTML & CSS, Certificate

University of Victoria Libraries – Digital Scholarship Commons

Sep. 2022

University of Victoria, BC

ALMA Data Reduction Virtual Workshop

Tools for analysis of protoplanetary disks by Dr. Nienke van der Marel & Dr. Logan Francis 

Sep. 2020

University of Victoria, BC

Teaching Assistant Development Workshop

TA Professionalism, Academic Integrity, Marking Effectively

Sep. 2019

McMaster University, ON

ALMA Proposal Writing Workshop

Interferometry Basics, Proposal Prep. & OT Overview, by ALMA Ambassador Dr. Toby Brown

Apr. 2019

University of Toronto, ON

FUNDED RESEARCH VISITS

National Radio Astronomy Observatory (NRAO) / North American ALMA Science Center (NAASC)

Data Reduction Visitor. Support team: Dr. Ryan Loomis, Sarah Wood, Tristan Ashton

Nov. 2022

Charlottesville, VA

Astrophysics Group, Imperial College London

Visiting graduate researcher. Host supervisor: Dr. Richard Booth

Jun-Aug. 2022


London, UK


COMPUTATIONAL EXPERTISE


Languages: python, C/C++, \LaTeX , HTML/CSS

Astronomical Tools: ALMA Observing Tool (OT), CARTA, SAOImage DS9

Code Frameworks: CASA (reduction and imaging of radio interferometry observations)

FARGO3D (multifluid hydrodynamics code) on GPU clusters, e.g. Speedie et al. (2022b) 

REBOUND (*N*-body code) on CPU parallel, e.g. Speedie & Zanazzi (2020) 

PANDEXO (JWST simulator), e.g. 2nd-year Undergraduate Enrichment Project (2018) 

High Performance Computers Used:

◦ Canadian Advanced Network for Astronomical Research (CANFAR)

Sep. 2022 - Present

◦ Digital Research Alliance of Canada (formerly Compute Canada)

Sep. 2019 - Present

◦ Canadian Institute for Theoretical Astrophysics SciNet Sunnyvale cluster

May - Nov. 2019

OBSERVING EXPERIENCE

I'Observatoire du Mont-Mégantic

May 2018

3 full nights of observations using OMM's 1.6m telescope

Notre-Dame-des-Bois, QC, Canada

- **Instruments:** CPaPIR (Caméra PanorAmique Proche Infra-Rouge), PESTO (Planètes Extra-Solaires en Transit et Occultations).
- **Scientific targets:** détermination de l'occurrence du transit de Kepler-88 b (KOI-142); observations profondes de galaxies; et obtenir des belles images pour le calendrier de l'observatoire (OPIOMM).
- **Duties:** Object airmass minimization, filter initialization, telescope positioning, conducting focus and bias, finding chart comparison, launch scripts, dome and sky flats, observation log.

SCHOOLS & CONFERENCES ATTENDED

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 by Dr. David Kipping) 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

PUBLIC TEACHING

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)