

Michael Radica | Curriculum Vitae

Ph.D Candidate - Université de Montréal

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🌐 radicamc.github.io

General Information

- Nationality: Canadian
- Languages: English (Native), French (Advanced)
- Affiliations: Canadian Astronomical Society (CASCAS), Centre de Recherche en Astrophysique du Québec (CRAQ), Institute for Exoplanet Research (iREx)
- Research Interests:
 - Exoplanet atmosphere characterization
 - Links between atmospheric chemistry and planet formation
 - Exotic atmospheric chemistry
 - Development of astronomical data analysis tools

Education

- **Ph.D., Physique** 2019 - 2023 (expected)
Université de Montréal, Montréal, QC, Canada
Advisor: Dr. David Lafrenière
GPA: 4.3/4.3
- **M.Sc., Physics & Astronomy** 2017 - 2019
McMaster University, Hamilton, ON, Canada
Advisor: Dr. Douglas Welch
GPA: 11.7/12
- **B.Sc. Summa Cum Laude, Honours Physics Co-op** 2012 - 2017
McMaster University, Hamilton, ON, Canada
GPA: 11.3/12

Employment & Research Experience

- **Ph.D. Researcher** Sept 2019 - present
Supervisor: Dr. David Lafrenière
Université de Montréal, Montréal QC, Canada
 - Drawing links between atmospheric chemistry of exoplanets and their formation histories using next generation instrumentation.
- **M.Sc. Researcher** Sept 2017 - Aug 2019
Supervisor: Dr. Douglas Welch
McMaster University, Hamilton, ON, Canada
 - Developed a novel method to search for light echoes from core-collapse supernovae using the SITELLE instrument on the CFHT.
- **Planetarium Presenter** Sept 2017 - Aug 2019
William J. McCallion Planetarium
McMaster University, Hamilton, ON, Canada
 - Prepared and presented weekly shows on a variety of popular astronomy topics for the public.
- **Science Intern** Sept - Dec 2017
Supervisor: Dr. Laurie Rousseau-Nepton

Canada-France-Hawaii Telescope, Waimea, HI, USA

- Studied high resolution spectra from NGC 6822, using SITELLE, to quantify variations in dust extinction along different lines of sight.

○ **Research Assistant** May - Aug 2017
Supervisor: Dr. Douglas Welch
McMaster University, Hamilton, ON, Canada

○ **Research Assistant** May - Dec 2016
Supervisor: Dr. Chris O'Dea
University of Manitoba, Winnipeg, MB, Canada
- Analysis of emission from galaxy clusters to understand the connection between a cluster's X-Ray morphology and AGN feedback.

○ **Honours Thesis Researcher** Sept 2015 - Apr 2016
Supervisor: Dr. Laura Parker
McMaster University, Hamilton, ON, Canada
- Studied the evolution of dark matter haloes comparable in mass to galaxies, within the Bolshoi Cosmological Simulation.

○ **Research Assistant** Jan - Aug 2015
Supervisor: Dr. Judith Irwin
Queen's University, Kingston, ON, Canada
- Data reductions and analysis of radio emission images of galaxies, for the CHANG-ES Consortium.

Awards and Honours

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| ○ NSERC Canada Graduate Scholarship - Doctoral Program (3yr) \$105,000 | 2021 - 2023 |
| ○ FRQNT Bourse de Doctorat en Recherche (3yr) \$70,000 | 2021 - 2023 |
| ○ iREx Scholarship \$1,000 | 2019, 2020 |
| ○ Ontario Graduate Scholarship (1yr; <i>declined</i>) \$15,000 | 2019 - 2020 |
| ○ McMaster University Symposium Day, 1 st Place Talk | 2018 |
| ○ NSERC Canada Graduate Scholarship - Master's Program (1yr) \$17,500 | 2018 - 2019 |
| ○ Ontario Graduate Scholarship (1yr) \$15,000 | 2017 - 2018 |
| ○ Ontario Graduate Fellowship (1yr; <i>declined</i>) \$12,500 | 2017 - 2018 |
| ○ Canadian Undergraduate Physics Conference Research Presentations, 1 st Place | 2015, 2016 |
| ○ McMaster University Faculty of Science Dean's List | 2013 - 2017 |
| ○ McMaster University President's Award \$2,500 | 2012 |

All values in Canadian Dollars

Refereed Publications

2. [A Search for Supernova Light Echoes in NGC 6946 with SITELLE](#)
Radica, M.C., Welch, D., Rousseau-Nepton, L.
Monthly Notices of the Royal Astronomical Society, 497, 3297 (2020).
1. [CHANG-ES XXI. Transport processes and the X-shaped magnetic field of NGC 4217: off-center superbubble structure](#)
Stein, Y., Dettmar, R. -J., Beck, R., Irwin, J., Wiegert, T., Miskolczi, A., Wang, Q. D., English, J., Henriksen, R., **Radica, M.**, Li, J. -T.
Astronomy & Astrophysics, 639, A111 (2020).

White Papers and Conference Proceedings

1. [Exoplanet instrumentation in the 2020s: Canada's pathway towards searching for life on potentially Earth-like exoplanets](#)
Benneke, Bjorn; Cowan, Nick; Rowe, Jason; Marois, Christian; Metchev, Stanimir; Moores, John; Lee, Eve; Boley, Aaron; Doyon, Rene; Cumming, Andrew; Matthews, Jaymie; Lafreniere, David; Strong, Kimberly; Gladman, Brett; Menou, Kristen; Valencia, Diana; Mawet, Dimitri; Cook, Neil James; Ngo, Henry; Albert, Loic; Godin, Paul; Chauhan, Akash; Darveau-Bernier, Antoine; Lee, Junchan; Pelletier, Stefan; Coulombe, Louis-Phillippe; Miles-Paez, Paulo; Marquette, Melissa; Bell, Taylor; **Radica, Michael**; Gerard, Benjamin L.; Ouelette, Nathalie; Dang, Lisa; Naud, Marie-Eve; Moore, Kevin; Lim, Olivia; Wu, Yanqin; Gupta, Prashansa; Bastien, Pierre; Malo, Lison; Gagne, Jonathan; Beauvais, Simon-Gabriel; Cloutier, Ryan; Cadieux, Charles; Talens, Geert Jan; Herman, Miranda; Mann, Christopher; Piaulet, Caroline; Weiss, Lauren; Chan, Jonathan; Speedie, Jessica; Hedgepeth, Josh; Ali-Dib, Mohamad; Ellery, Alex; Lee, Christopher; Thorngren, Daniel; Navarro, Thomas; Nguyen, Giang; Keating, Dylan; Hallatt, Tim
White Paper for the Canadian Long Range Plan 2020

Succesful Observing Proposals

2. [Life on Venus? Mapping potentially biotic phosphine on our nearest neighbour](#)
Caroline Piaulet, Stefan Pelletier, Björn Benneke, **Michael Radica**, Étienne Artigau, Jason Rowe, René Doyon, Neil Cook, Thomas Navarro, David Lafrenière, Anne Boucher
1 hour, CFHT Semester 2020B, PID: 20BD001
1. [A SITELLE Survey for Highly Broadened H-alpha P-Cygni Profiles in NGC 6946 from Core-Collapse Supernova Light Echoes](#)
Michael Radica, Douglas Welch, Laurie Rousseau-Nepton
12 hours, CFHT Semester 2018B, PID: 18BC017

Conference/Colloquia Talks and Posters

Summary: 6 talks, 3 invited; 5 posters. * denotes an invited talk.

- *Towards a Robust Extraction Algorithm for NIRISS SOSS Spectra*
Michael Radica, Antoine Darveau-Bernier, David Lafrenière, Loic Albert & Geert-Jan Talens
Poster presentation, **Canadian Astronomical Society Annual General Meeting** May 2021
Dominion Radio Astrophysical Observatory, Penticton, BC, Canada
- *Towards a Robust Extraction Algorithm for NIRISS SOSS Spectra*
Michael Radica, Antoine Darveau-Bernier, David Lafrenière, Loic Albert & Geert-Jan Talens
Poster presentation, **Exoplanets 3** Jul 2020
Heidelberg, Germany
- *NEAT Exploration of Exoplanet Atmospheres*
Michael Radica, David Lafrenière & Antoine Darveau-Bernier
Poster presentation, **Canadian Astronomical Society Annual General Meeting** May 2020
York University, York, ON, Canada
- *A Search for Supernova Light Echoes in NGC 6946 with SITELLE*
Michael Radica, Doug Welch, & Laurie Rousseau-Nepton
Poster presentation, **Canadian Astronomical Society Annual General Meeting** Jun 2019
McGill University, Montréal, QC, Canada
- **The Search for Supernova Light Echoes in NGC 6946*
Michael Radica & Doug Welch

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| Invited Talk, McMaster University Symposium Day
McMaster University, Hamilton, ON, Canada | Oct 2018 |
| <ul style="list-style-type: none"> ◦ <i>*A High Resolution Study of NGC 6822 with SITELLE</i>
Michael Radica & Laurie Rousseau-Nepton
Invited Talk, Canada-France-Hawaii Telescope Colloquium Series
Canada-France-Hawaii Telescope, Waimea, HI, USA | Dec 2017 |
| <ul style="list-style-type: none"> ◦ <i>The Evolution of Dark Matter Substructure in Simulated Galaxy Clusters</i>
Michael Radica & Laura Parker
Contributed Talk, Canadian Undergraduate Physics Conference
Dalhousie University, Halifax, NS, Canada | Nov 2016 |
| <ul style="list-style-type: none"> ◦ <i>*Probing Correlations between AGN Activity and X-Ray Emission</i>
Michael Radica, Ajay Gill, Sarka Wykes & Chris O'Dea
Invited Talk, Summer AstroTea Series
University of Manitoba, Winnipeg, MB, Canada | Aug 2016 |
| <ul style="list-style-type: none"> ◦ <i>Segregation of Dark Matter Substructure in the Bolshoi Simulation</i>
Michael Radica & Laura Parker
Poster presentation, McMaster Honours Thesis Poster Presentation
McMaster University, Hamilton, ON, Canada | Jan 2015 |
| <ul style="list-style-type: none"> ◦ <i>Studying Radio Haloes of Galaxies with CHANG-ES</i>
Michael Radica & Judith Irwin
Contributed Talk, Canadian Undergraduate Physics Conference
Trent University, Peterborough, ON, Canada | Nov 2014 |
| <ul style="list-style-type: none"> ◦ <i>Quark Stars and Compact Stellar Remnants</i>
Michael Radica
Contributed Talk, McMaster Undergraduate Colloquium Series
McMaster University, Hamilton, ON, Canada | Feb 2013 |

Committee Membership

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| ◦ CASCA 2021 AGM Online Organizing Committee | Sept 2020 - May 2021 |
| ◦ CASCA Graduate Student Committee | Jan 2020 - present |
| ◦ UdeM Equity and Diversity Committee | June 2020 - present |

Technical Skills

- **Operating Systems:** Linux, OS X
- **Programming:** Python, C++
- **Astronomical Data Processing:** CIAO, CASA, IRAF, ds9, ORCS
- **Pubic Speaking:** I enjoy preparing and giving talks to all audiences, and have presented research at numerous conferences.

Teaching and Mentorship

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|---|----------------|
| <ul style="list-style-type: none"> ◦ Co-op Program Alumni Mentor
McMaster University
Mentor to an undergraduate student in the Physics & Astronomy co-op program. | 2020 - present |
| <ul style="list-style-type: none"> ◦ Teaching Assistant
Université de Montréal | 2020 - present |

Marking and presentation of tutorials (*en français*) for courses including:

- Astrobiologie (Winter 2020, 2021)
- Introduction à la Physique Numérique (Fall 2020)

○ **Graduate Student Mentor**

Sept 2018 - Aug 2019

McMaster University

Mentor to incoming M.Sc student.

○ **Teaching Assistant**

2017 - 2019

McMaster University

Marking and presentation of tutorials for courses including:

- Introduction to Physics for Engineers (Winter 2017)
- Planetary Astronomy (Winter 2018, 2019)
- Introduction to Astronomy (Fall 2018)
- The Big Questions in Astronomy (Fall 2018)
- Stellar Structure (Winter 2019)

○ **Senior Undergraduate Mentor**

May - Aug 2016

University of Manitoba

Research mentor to two first year undergraduate students.

○ **Certified Tutor**

2014 - 2019

- McMaster Physics Help Initiative (2014 - 2016)
- McMaster Physics Help Center (Winter 2018)
- Private Tutor (Fall/Winter 2019)

Science Outreach

- 24 Hours of Science - Astronomer in your Classroom (May 2021)
- Montréal Student Space Association iREx Liaison (2020 - present)
- William J. McCallion Planetarium Presenter (2017 - 2019)
- McMaster Sidewalk Astronomy Guide (2017 - 2019)
- McMaster University Fall Preview Lab Tour Guide (Oct 2013)