Michael Radica | Curriculum Vitae

Ph.D Student - Université de Montréal
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General Information

- Nationality: Canadian
- Languages: English (Native), French (Advanced)
- Affiliations: Canadian Astronomical Society (CASCA), Centre de Recherche en Astrophysiqe 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** Sept 2019 - present
  Université de Montréal, Montréal QC, Canada
  Supervisor: Dr. David Lafrenière
  GPA: 4.3/4.3
- **M.Sc., Physics & Astronomy** Sept 2017 - Aug 2019
  McMaster University, Hamilton, ON, Canada
  Supervisor: Dr. Douglas Welch
  GPA: 11.7/12
- **B.Sc. Summa Cum Laude, Honours Physics Co-op** Sept 2012 - Apr 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

- iREx Scholarship (**$1,000**) 2019, 2020
- Ontario Graduate Scholarship (**$15,000**) 2019 *(declined)*
  Awarded to top 2% of graduate students in Ontario.
- McMaster Symposium Day 1^{st} Place Talk 2018
- NSERC - Canada Graduate Masters Scholarship (**$17,500**) 2018
  Awarded to <1000 graduate students in Canada.
- Ontario Graduate Scholarship (**$15,000**) 2017
- CUPC 1^{st} Place Astrophysics Talk 2015, 2016
- McMaster University Dean's List 2013 - 2017
  Awarded to students in the to 5% of their class.
- McMaster President's Award (**$2,500**) 2012
  Awarded to top 1% of first year students.

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

Contributed Talks and Posters

- *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 Univeristy, 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
  Oral presentation, **McMaster University Symposium Day** Oct 2018
  McMaster University, Hamilton, ON, Canada

- *A High Resolution Study of NGC 6822 with SITELLE*
  Michael Radica & Laurie Rousseau-Nepton
  Oral presentation, **Canada-France-Hawaii Telescope Colloquium Series** Dec 2017

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

- *The Evolution of Dark Matter Substructure in Simulated Galaxy Clusters*
  Michael Radica & Laura Parker
  Oral presentation, **Canadian Undergraduate Physics Conference** Nov 2016
  Dalhousie University, Halifax, NS, Canada
- *Probing Correlations between AGN Activity and X-Ray Emission*
  Michael Radica, Ajay Gill, Sarka Wykes & Chris O'Dea
  Oral Presentation, **Summer AstroTea Series** Aug 2016
  University of Manitoba, Winnipeg, MB, Canada
- *Segregation of Dark Matter Substructure in the Bolshoi Simulation*
  Michael Radica & Laura Parker
  Poster presentation, **McMaster Honours Thesis Poster Presentation** Jan 2015
  McMaster University, Hamilton, ON, Canada
- *Studying Radio Haloes of Galaxies with CHANG-ES*
  Michael Radica & Judith Irwin
  Oral presentation, **Canadian Undergraduate Physics Conference** Nov 2014
  Trent University, Peterborough, ON, Canada
- *Quark Stars and Compact Stellar Remnants*
  Michael Radica
  Oral presentation, **McMaster Undergraduate Colloquium Series** Feb 2013
  McMaster University, Hamilton, ON, Canada

Committee Membership

- UdeM Representative, CASCA Graduate Student Committee (2020 - present)
- Graduate Student Liaison, UdeM Equity and Diversity Committee (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

- **Co-op Program Alumni Mentor** 2020 - present
  McMaster University
  Mentor to an undergraduate student in the Physics & Astronomy co-op program.
- **Teaching Assistant** 2020 - present
  Université de Montréal
  Marking and presentation of tutorials (*en français*) for courses including:
  - Astrobiologie (Winter 2020)
  - Introduction à la Physique Numérique (Fall 2020)
- **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)
- **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

- Montréal Student Space Association iREx Liaison (2020 - present)
- William J. McCallion Planetarium Presenter (2017 - 2019)
- McMaster Sidewalk Astronomy (2017 - 2019)
- McMaster Fall Preview Lab Tour Guide (Oct 2013)