

DR. TOBY BROWN

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Department of Physics & Astronomy, McMaster University, Hamilton, Canada

RESEARCH INTERESTS

Galaxy evolution, star formation, multi-wavelength astronomy

PROFESSIONAL EXPERIENCE

Postdoctoral Fellow

McMaster University

October 2017 - present

Hamilton, Canada

- PI of VERTICO, an ALMA Large Program that is mapping molecular gas in 51 Virgo Cluster galaxies
- Completing and publishing original research in leading astronomy journals
- Supervising PhD and undergraduate students in astrophysics and machine learning
- Speaking at international conferences, research institutions, and public events

Mitacs Visiting Scholar

University of Maryland

September - December 2019

College Park, MD, USA

- Externally funded (Mitacs) research visit to Prof. Alberto Bolatto's group at the University of Maryland
- Establishing a new collaboration between two of the leading star formation groups in North America

EDUCATION

Doctor of Philosophy (Ph.D.), Astrophysics

Swinburne University of Technology

October 2013 - August 2017

Melbourne, Australia

- Supervisors: Dr. Barbara Catinella, Dr. Luca Cortese, Prof. Virginia Kilborn

Astrophysics MPhys, Hons

University of Liverpool & Liverpool John Moores University

September 2009 - June 2013

Liverpool, UK

COMPETITIVE FUNDING AND HONOURS

ARCADE: ALMA Reduction in the CANFAR Data Environment (co-I, \$250,000)	2019
Mitacs Globalink Research Award (\$6,000)	2019
NAASC ALMA Ambassador (\$13,500)	2018
ASTRO-3D Science Visitor Program (\$1,500)	2018
TMT Early-Career Workshop Grant (\$1,800)	2018
ACURA Travel Award (\$1,000)	2018
MacDATA Fellow Supervisor (\$7,500)	2017
Famelab Australia Finalist	2016
ASA Travel Award (\$1,000)	2015
SUPRA Graduate Scholarship (\$98,000 + Tuition-fee Waiver)	2013

LEADERSHIP AND SERVICE ROLES IN ASTRONOMY

Principle Investigator, VERTICO

Virgo Environment Traced in CO, ALMA Cycle 7 Large Program

July 2019 - present

- Awarded the first Canadian-led ALMA Large Program, VERTICO (180 hrs)

- Recruiting and managing 30 world-class researchers for the VERTICO collaboration

2019 ALMA Ambassador

December 2018 - April 2019

North American ALMA Science Center

- Acting as an ALMA resource for the Canadian community
- Hosting ALMA preparation workshops and sharing ALMA/interferometry expertise

Postdoc Representative

July 2018 - present

Department of Physics & Astronomy, McMaster University

Women in Astronomy Working Group Member

November 2018 - present

International Astronomical Union

SKA HI Galaxy Science Working Group Member

November 2018 - present

Square Kilometer Array Organisation

Steering Committee Member

May 2016 - May 2017

Early Career Researcher Chapter, Astronomical Society of Australia

Student Mentor

January - October 2015

Swinburne University of Technology

Scientific Organizing Committee Member

June - September 2016

ICRARcon, Mandura, Australia

Local Organizing Committee Member

June - September 2016

ICRARcon, Mandura, Australia

Local Organizing Committee Member

June - September 2015

The Role of Neutral Hydrogen in Galaxy Evolution, Borneo, Malaysia

SUPERVISING AND TEACHING EXPERIENCE

MacDATA Fellow Supervisor

March 2018 - December 2018

Dept. Physics & Astronomy, & MacDATA Institute, McMaster University

Hamilton, Canada

- Supervisor of McMaster's MacDATA Graduate (PhD level) Fellow
- Won \$7,500 grant to pay student salary for 9 month astronomy-data science collaboration

Integrated Science Project Supervisor

November 2017 - present

McMaster University

Hamilton, Canada

Teaching Assistant

February - November 2016

University of Western Australia

Perth, Australia

Teaching Assistant

February - October 2015

Swinburne University of Technology

Melbourne, Australia

Undergraduate Project Supervisor

September 2014 - July 2015

Swinburne University of Technology

Melbourne, Australia

CONTRIBUTED CONFERENCE TALKS

Total number: 8

Metals in Galaxies Near and Far, The Lorentz Centre, Leiden, Netherlands

2019

The Life and Death of Star-Forming Galaxies, Perth, Australia

2019

KIAA Forum on Gas in Galaxies, Peking University, Beijing, China

2018

European Week of Astronomy, Liverpool, UK	2018
MockPerth, Perth, Australia	2017
Pathfinders HI Science Coordination Committee Meeting, Cape Town, South Africa	2016
Drifting through the Cosmic Web, Aix-en-Provence, France	2015
The Many Pathways to Galaxy Growth, Prato, Italy	2015

COLLOQUIA AND SEMINARS

Total number: 21

University of Maryland, College Park, MD, USA	2019
Harvard–Smithsonian Center for Astrophysics, Cambridge, MA, USA	2019
National Radio Astronomy Observatory, Charlottesville, VA, USA	2019
Swinburne University of Technology, Melbourne, Australia	2019
Carnegie Observatories, Pasadena, CA, USA	2018
York University, York, Canada	2018
Royal Military College of Canada, Kingston, Canada	2018
Queens University, Kingston, Canada	2018
University of Victoria, Victoria, Canada	2018
National Research Council Hertzberg Astronomy and Astrophysics, Victoria, Canada	2018
University of British Columbia, Vancouver, Canada	2018
McMaster University, Hamilton, Canada	2017
Liverpool John Moores University, Liverpool, UK	2016
Max Planck Institute for Extraterrestrial Physics, Garching, Germany	2016
European Southern Observatory, Garching, Germany	2016
University College London, London, UK	2016
University of Hertfordshire, Hatfield, UK	2016
LERMA, l'Observatoire de Paris, Paris, France	2016
Institut d'astrophysique de Paris, Paris, France	2016
ICRAR, University of Western Australia, Perth, Australia	2015
Centre de Recherche Astrophysique de Lyon, Lyon, France	2015

PUBLIC SPEAKING AND COMMUNICATION

Award-winning public talks

- Speaking to audiences of 700+, including the March for Science, the British Council's Famelab Australia Final, British live event series Cosmic Shambles

Media coverage

- Stories on my research have been featured in The Sun (UK), New York Post, Scientific American, Space.com, Gizmodo, IFL Science, among others

Media commentary

- Providing comment on STEM issues for local and national media, including The Conversation, CBC/Radio-Canada, Australian Broadcasting Corporation

LEADERSHIP ROLES OUTSIDE ASTRONOMY

Chair, Negotiating Committee

Canadian Union of Public Employees - Local 3906

October 2018 - present

Hamilton, Canada

- Elected to represent all postdocs in contract negotiations with McMaster University leadership

Field Director

Municipal Council Election Campaign

July - October 2018

Hamilton, Canada

Senior Field Organiser

Ontario New Democratic Party

April - June 2018

Hamilton, Canada

Political Action Committee Member

Canadian Union of Public Employees - Local 3906

January - September 2018

Hamilton, Canada

SURVEY MEMBERSHIPS

VERTICO (Virgo Environment Traced in CO, PI Brown)

WALLABY (The ASKAP HI All-Sky Survey, PIs Koribalski, Staveley-Smith)

JINGLE (JCMT dust and gas In Nearby Galaxies Legacy Exploration, PI Wilson)

DINGO (Deep Investigation of Neutral Gas Origins, PI Meyer)

xGASS (extended GALEX Arecibo SDSS Survey, PI Catinella)

HIX (HI eXcess galaxy survey, PI Lutz)

WHITE PAPERS

LRP2020: Canada and the SKA from 2020-2030, Co-Author, 2019, arXiv:1911.03250

LRP2020: Opportunities and Outcomes for Postdocs in Canada, Co-Author, 2019

DR. TOBY BROWN - LIST OF REFEREED PUBLICATIONS (4 FIRST AUTHOR, 10 CO-AUTHOR)

14. Gao, Y.; Xiao, T.; Li, C.; Jiang, X.; Tan, Q.; Gao, Y.; Wilson, C.D.; Bureau, M.; Saintonge, A.; Sánchez-Gallego, J.R.; **Brown, T.**; Clark, C.J.R.; Hwang, H.S.; Lamperti, I.; Lin, L.; Liu, L.; Lu, D.; Pan, H.; Sun, J.; Williams, T.G., 2019, *Estimating the molecular gas mass of low-redshift galaxies from a combination of mid-infrared luminosity and optical properties*, ApJ, accepted, arXiv:1911.02795
13. Lamperti, I.; Saintonge, A.; De Looze, I.; Accurso, G.; Clark, C.J.R.; Smith, M.W.L.; Wilson, C.D.; Brinks, E.; **Brown, T.**; Bureau, M.; Clements, D.L.; Eales, S.; Glass, D.H.W.; Hwang, H.S.; Lee, J.C.; Lin, L.; Michalowski, M.J.; Sargent, M.; Williams, T.G.; Xiao, T.; Yang, C., 2019, *JINGLE V: Dust properties of nearby galaxies derived from hierarchical Bayesian SED fitting*, MNRAS, accepted, DOI: 10.1093/mnras/stz2311
12. **Brown, T.** & Wilson, C.D., 2019, *Extreme CO Isotopologue Line Ratios in ULIRGS: Evidence for a Top-heavy IMF*, ApJ, 879, 17
11. Stevens, A.R.H.; Diemer, B.; Lagos, C.d.P.; Nelson, D.; Pillepich, A.; **Brown, T.**; Catinella, B.; Hernquist, L.; Weinberger, R.; Vogelsberger, M.; Marinacci, F., 2019, *Atomic hydrogen in IllustrisTNG galaxies: the impact of environment paralleled with local 21-cm surveys*, MNRAS, 483, 5334
10. Roberts, I.D.; Parker, L.; **Brown, T.**; Joshi, G.; Hlavacek-Larrondo, J.; Wadsley J., 2018, *Quenching low-mass satellite galaxies: evidence for a threshold ICM density*, ApJ, 873, 42
9. Ellison S.L.; **Brown, T.**; Catinella, B.; Cortese, L., 2018, *Atomic gas fractions in active galactic nucleus host galaxies*, MNRAS, 482, 5694
8. Saintonge, A.; Wilson, C.D.; Xiao, T.; Lin, L.; Hwang, H.S.; Tosaki, T.; Bureau, M.; Cigan, P.J.; Clark, C.J.R.; Clements, D. L.; De Looze, I.; Dharmawardena, T.; Gao, Y.; Gear, W.K.; Greenslade, J.; Lamperti, I.; Lee, J.C.; Li, C.; Michałowski, M.J.; Mok, A.; Pan, H.A.; Sansom, A.E.; Sargent, M.; Smith, M.W.L.; Williams, T.; Yang, C.; Zhu, M.; Accurso, G.; Barmby, P.; Brinks, E.; Bourne, N.; **Brown, T.** and the JINGLE Survey Team, 2018, *JINGLE, a JCMT legacy survey of dust and gas for galaxy evolution studies - I. Survey overview and first results*, MNRAS, 481, 3497
7. Pan, H-A; Lin, L; Hsieh, B-C; Xiao, T; Gao, Y; Ellison, S.L.; Scudder, J.M.; Barrera-Ballesteros, J.; Yuan, F.; Saintonge, A.; Wilson, C.D.; Hwang, H.S.; De Looze, I.; Gao, Y.; Ho, L.C.; Brinks, E.; Mok, A.; **Brown, T.**; Davis, T.A.; Williams, T.G.; Chung, A.; Parsons, H.; Bureau, M.; Sargent, M.T.; Chung, E.J.; Kim, E.; Liu, T.; Michałowski, M.J.; Tosaki, T., 2018, *The Effect of Galaxy Interactions on Molecular Gas Properties*, ApJ, 868, 132
6. **Brown, T.**; Cortese, L.; Catinella, B.; Kilborn, V.A., 2018, *The role of atomic hydrogen in regulating the scatter of the mass-metallicity relation*, MNRAS, 473, 1868
5. Stevens, A. & **Brown, T.**, 2017, *Physical drivers of galaxy atomic gas content: exploring environmental and evolutionary effects with Dark Sage*, MNRAS, 471, 447
4. Lutz, K. A.; Kilborn, V.A.; Catinella, B.; Koribalski, B. S.; **Brown, T.**; Cortese, L.; Denes, H.; Jozsa, G. I. G.; Wong, O. I., 2017, *The HIX galaxy survey I: Study of the most gas rich galaxies from HIPASS*, MNRAS, 467, 1083
3. Janowiecki, S.; Catinella B.; Cortese, L.; Saintonge, A.; **Brown, T.**; Wang, J., 2017, *xGASS: Exceptionally gas-rich central galaxies in small groups and their connections to pre-processing and galaxy evolution*, MNRAS, 466, 4795
2. **Brown, T.**; Catinella, B.; Cortese, L.; Lagos, C.d.P. ; Dave, R.; Kilborn, V.A.; Haynes, M.P.; Giovanelli, R.; Rafieferantsoa, M., 2017, *Cold gas stripping in satellite galaxies: from pairs to clusters*, MNRAS, 466, 1275
1. **Brown, T.**; Catinella, B.; Cortese, L.; Kilborn, V.A.; Haynes, M.P.; Giovanelli, R., 2015, *The effect of structure and star formation on the gas content of nearby galaxies*, MNRAS, 452, 2479