

DR. TOBY BROWN

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

RESEARCH INTERESTS

Extragalactic astronomy, galaxy evolution, star formation, observational astronomy

PROFESSIONAL EXPERIENCE

Postdoctoral Fellow

October 2017 - present

Department of Physics and Astronomy

McMaster University, Hamilton, Canada

- Devising, leading and completing successful research into the star formation cycle of galaxies
- Supervising PhD and undergraduate students in astrophysics and machine learning
- Speaking at international conferences, research institutions and public events
- Collaborating with leading experts to form productive international partnerships
- Developing data analysis, machine learning and visualization software (primarily in Python)

EDUCATION

Business Administration with Management

May 2018 - present

McMaster University CCE

Hamilton, Canada

- Continued education to ensure a strong foundation in business competencies, including finance, operations and general management

Doctor of Philosophy (Ph.D.), Astrophysics

October 2013 - August 2017

Swinburne University of Technology

Melbourne, Australia

- Large multi-wavelength study of the gas and star formation cycle of nearby galaxies
- Supervisors: Dr. Barbara Catinella (primary), Dr. Luca Cortese, Prof. Virginia Kilborn

Astrophysics MPhys, Hons

September 2009 - June 2013

University of Liverpool & Liverpool John Moores University

Liverpool, UK

- Received an Upper Second Class (2:1, GPA equivalent $\sim 3.33 - 3.67$)
- Science Editor at Liverpool Student Media, coordinating a team of student journalists

SUPERVISING AND TEACHING EXPERIENCE

MacDATA Fellow Supervisor

March 2018 - present

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

Hamilton, Canada

- Supervisor of McMaster's MacDATA Graduate (PhD level) Fellow
- Won C\$18,000 grant to pay student salary for 9 month astronomy-data science collaboration

Integrated Science Project Supervisor

November 2017 - present

McMaster University

Hamilton, Canada

- Supervisor for 8 high-achieving undergraduate students pursuing an Integrated Science degree
- Teaching and mentoring using problem-based learning

Teaching Assistant

February - November 2016

University of Western Australia

Perth, Australia

- Demonstrating, supervising and grading *Quantum Mechanics and Electromagnetism* labs and tutorials

Teaching Assistant

February - October 2015

Swinburne University of Technology

Melbourne, Australia

- Demonstrating, supervising and grading *Electronic Systems* labs and tutorials

Undergraduate Project Supervisor*Swinburne University*

September 2014 - July 2015

Melbourne, Australia

- Supervising 4 final year Animation undergraduate student projects

LEADERSHIP AND SERVICE ROLES

Women in Astronomy WG*International Astronomical Union*

November 2018 - present

- Report on the status of gender equality in astronomy and recommend future actions that will improve the environment for all astronomers

Bargaining Committee Member*Canadian Union of Public Employees - Local 3906*

October 2018 - present

Hamilton, Canada

- Elected to represent union members at the bargaining table with university leadership
- Negotiate and ratify postdoctoral collective agreement

Field Director*Municipal Council Election Campaign*

July - October 2018

Hamilton, Canada

- Devising campaign strategy and coordinating approximately 120 volunteers
- Campaign data analytics lead

Senior Field Organiser*Ontario New Democratic Party*

April - June 2018

Hamilton, Canada

- Coordinating approximately 200 volunteers for ONDP leader's successful re-election campaign

Political Action Committee Member*Canadian Union of Public Employees - Local 3906*

January - September 2018

Hamilton, Canada

- Oversee political donations, events and awareness campaigns of union

Steering Committee Member*Early Career Researcher Chapter*

May 2016 - May 2017

Astronomical Society of Australia

- Advocating for and represented early career astronomers in Australia
- Establish legacy database of students and postdocs who have left the field so that chapter members have ready-made networks outside of astronomy

Student Mentor*Swinburne University of Technology*

January - October 2015

Melbourne, Australia

- Assisting peers with academic and personal issues

Scientific Organising Committee Member

- ICRARcon, Mandura, Western Australia, 2016

Local Organising Committee Member

- ICRARcon, Mandura, Western Australia, 2016
- The Role of Neutral Hydrogen in Galaxy Evolution, Kuching, Borneo, 2015

CONTRIBUTED CONFERENCE TALKS

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

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

- Providing comment on STEM issues for local and national media, including The Conversation, ABC Radio National, ABC 720 Perth, ABC Melbourne

Media commentary

- Stories on my research have been featured in Scientific American, News.com.au, The Daily Telegraph, Space.com, Gizmodo, IFL Science, among others

INVITED COLLOQUIA

Royal Military College of Canada, Kingston, Canada	2018
Queens University, Kingston, Canada	2018
University of Victoria, Victoria, Canada	2018
National Research Council Hertzberg Institute, 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

SURVEY MEMBERSHIPS

- JINGLE (JCMT dust and gas In Nearby Galaxies Legacy Exploration, PI Wilson)
- DEVILS (Deep Extragalactic Visible Legacy Survey, PI Davies)
- DINGO (Deep Investigation of Neutral Gas Origins, PI Meyer)
- xGASS (extended GALEX Arecibo SDSS Survey, PI Catinella)
- HIX (HI eXcess galaxy survey, PI Lutz)

DR. TOBY BROWN - LIST OF PUBLICATIONS (4 FIRST AUTHOR, 8 CO-AUTHOR)

12. **Brown, T.** & Wilson, C.D., 2018, *Excess Formation of Massive Stars in Nearby ULIRGs*, ApJL, submitted
11. 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, submitted
10. Ellison S.L.; **Brown, T.**; Catinella, B.; Cortese, L., 2018, *Atomic gas fractions in active galactic nucleus host galaxies*, MNRAS, accepted
9. 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
8. 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., 2018, *Atomic hydrogen in IllustrisTNG galaxies: the impact of environment paralleled with local 21-cm surveys*, MNRAS, submitted (arXiv:1810.12158)
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*, arXiv:1810.10162
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