Dr. Ryan Chown

Postdoctoral Scholar
Department of Astronomy, The Ohio State University
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Education

McMaster University — Hamilton, ON
Ph.D. Astronomy — 08/2021
Thesis: *Multi-wavelength studies of the interstellar medium and star formation in nearby galaxies*
Advisors: Prof. Christine D. Wilson and Prof. Laura Parker
Finalist, J. S. Plaskett Medal for Most Outstanding PhD Thesis, Canada

McGill University — Montreal, QC
M.Sc. Physics — 05/2015 - 05/2017
Thesis: *Mapping the Millimeter-wave Sky with Combined South Pole Telescope and* Planck *Data*
Advisor: Prof. Gil Holder

McGill University — Montreal, QC
B.Sc. Physics, with a Minor in Computer Science — 09/2012 - 04/2015

Academic Positions

The Ohio State University — Columbus, OH
Postdoctoral Scholar — 10/2023-

The University of Western Ontario — London, ON
Postdoctoral Scholar — 10/2021-09/2023

Academic Service

Journal referee: *Astronomy & Astrophysics* (1) — 2023–
Telescope proposal review: *CFHT* (1) — 2023–

Awards

Visiting Scholar, Tsinghua University, Beijing, China — 2019
Mitacs Globalink Research Award — 2018
McMaster Graduate Fellowship — 2018
McGill University Graduate Excllence Award in Physics — 2015 and 2016
Carl Reinhardt Fellowship — 2015
McGill and Novelis Global Technologies Summer Research Award — 2014

McGill Summer Research Award 2013 and 2015

Collaborations

Physics at High Angular Resolution in Nearby Galaxies (PHANGS) collaboration 10/2023-

PDRs4All: Radiative Feedback from Massive Stars as Traced by Multiband Imaging and Spectroscopic Mosaics – A JWST Early Release Science (ERS) Program 10/2021-
- Led the Data Reduction working group to produce and share high-quality JWST data that were used in several publications in high-impact journals and in press releases
- Led and supported JWST Cycle 2 proposals
- Led the first paper on aromatic infrared bands in the Orion Bar using JWST
- Led an analysis on imaging and integral field unit cross-calibration with JWST
- Supervised and co-supervised undergraduate students working with JWST data
- Presented results at numerous venues (both public and technical)

The Virgo Environment Traced in CO survey (VERTICO; an ALMA large program) 2019-
- Gained "Survey Coordinator" status due to significant involvement in the completion of this survey and corresponding multiwavelength database

The JCMT Dust & Gas in Nearby Galaxies Legacy Survey (JINGLE) 2017-2021
- Reduced some of the CO data for the survey
- Wrote a science paper using JINGLE data combined with SCUBA-2 and CO data from my own proposals

The South Pole Telescope Collaboration 2013-2017
- Led the first public data release for the full SPT-SZ survey

Research Supervision Experience

Notes: * indicates that I was the primary (informal) supervisor
† = student held a MITACS Globalink Research Award

5. *,†Rajarshi Choudhury, *Indian Inst. of Sci. Ed. and Research Bhopal (undergraduate)* 2023
4. †Arnab Chowhan, *Centre for Excellence in Basic Sciences, Mumbai (undergraduate)* 2023
3. *,†Raphaela Kestler, *Durham University (undergraduate)* 2022
2. *,†Holly Raynor, *Durham University (undergraduate)* 2022
1. *Khaleda Ramzi, *Western University Work-Study Program (undergraduate)* 2022

Teaching Experience

PHYS 1AA3 Teaching Assistant McMaster
Introduction to Modern Physics 2020
PHYS 1A03 Teaching Assistant McMaster
Introductory Physics 2018, 2019, 2020

PHYS 1E03 Teaching Assistant — McMaster
Waves, Electricity, and Magnetic Fields — 2018
ASTRO 1F03 Teaching Assistant — McMaster
Astronomy and Astrophysics — 2017, 2021
ASTRO 2C03 Teaching Assistant — McMaster
Big Questions — 2017, 2021
PHYS 183 Teaching Assistant — McGill
The Milky Way and Beyond — 2016 and 2017
PHYS 230 Teaching Assistant — McGill
Dynamics of Simple Systems — 2015 and 2016

Professional Development

Western Certificate for University Teaching and Learning — August 2023
- An intensive five-component program designed "to enhance the quality of teaching by graduate students and postdoctoral scholars, and to prepare them for a future faculty or professional career"
- `https://teaching.uwo.ca/programs/certificates/cutl.html`

"What makes a great postdoc mentor" – Workshop at UWO (attendee) — January 2022

"Anti-racism for White Academic Labour Folks" – Workshop at UWO (attendee) — March 2022

Public Talks

3. "Are We Alone?" – a talk about searching for life in the Universe with JWST
   Amica Retirement Home in London, Ontario — June 2023
   Parkwood Institute for veterans in London, Ontario — January 2023
2. JWebbinar 23: PDRs4All Community Telecon
   Virtual — December 2022
1. "Patterns in the Cosmic Microwave Background"
   Astronomy on Tap, Montreal — May 2017

Outreach

McMaster Undergraduate Physics Society — Hamilton, ON
Organized and gave a seminar on Python for undergraduates in physics at McMaster — 2021
Astro McGill — McGill University
Volunteered at public Astro Nights — 2016-2017
Physics Matters — McGill University
I created the website for this program to advertise public physics talks being given — 2016-2017
Eureka! Science Festival — Montreal, QC
Instructed young kids with a laser maze activity — 2015

Invited Seminars

4. CANadian Virtual Astronomy Seminar (CANVAS), 30 March 2023.
3. Ringberg Seminar Series (remotely), MPIA, Germany, 25 May 2021.
2. Extragalactic Database for Galaxy Evolution Meeting (remotely), University of Maryland, USA, 5 May 2021.
1. Shanghai Astronomical Observatory, Shanghai, China, August 2018.

Contributed Talks

Illuminating the Dusty Universe: A Tribute to the Work of Bruce Draine, Florence, Italy	10/2023
Symposium on the Life Cycle of Cosmic PAHs, Aarhus University, Denmark	09/2022
KIAA Forum on Gas in Galaxies for Early Career Scientists, Peking University, Beijing	11/2021
238th AAS Meeting – Dissertation Talk, online	7/2021
Exploring Gas in and Around Galaxies meeting, Tsinghua University, Beijing	7/2018
KIAA Forum on Gas in Galaxies, Peking University, Beijing	6/2018
SDSS Chinese MaNGA Meeting, University of Chinese Academy of Sciences, Beijing	6/2018
South Pole Telescope Collaboration Conference, University of Chicago, IL	7/2017
The Centre for Research in Astrophysics of Quebec (CRAQ) Annual Meeting, Montreal, QC	5/2017
South Pole Telescope Collaboration Conference, University of Chicago, IL	8/2016
South Pole Telescope Collaboration Conference, University of Chicago, IL	7/2015

Conference Posters

First Science Results from JWST, STScI, Baltimore (remote)	9/2023
Canadian Astronomical Society Annual Conference, York University, Toronto, ON (remote)	5/2020
Views on the ISM in galaxies in the ALMA era, University of Bologna, Italy	9/2019
Canadian Astronomical Society Annual Conference, McGill University, Montreal, QC	6/2019

Approved Observing Proposals

As P.I.:

3. JCMT 21A – "Measuring global CO(2-1) to supplement interferometric observations from the EDGE survey."
2. JCMT 18B – "Observing red star-forming galaxies from xCOLD GASS with SCUBA-2."
1. JCMT 18A – "Extending the JINGLE RxA Samples to Include 'Red Misfit' Galaxies."

As Co-I.:

5. ALMA Cycle 9 – "The chemical richness of the Orion Bar and its role as a lab of CH_3CN chemistry in disk-evolved systems." P.I. F. Alarcón.
4. ALMA Cycle 7 (Large Program) – "The Virgo Environment Traced in CO survey (VERTICO)." P.I. T. Brown.
3. ALMA Cycle 7 – "Mapping CO emission in galaxies from the JINGLE survey." P.I. C.D. Wilson.

2. JCMT 20A (Large Program) – "JINGLE at the edge: the ISM of starbursts and green valley galaxies." P.I. L.-H. Lin.

1. JCMT 19B – "Observing CO(2-1) in Red Star-forming Galaxies." P.I. L.-H. Lin.

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PUBLICATIONS

*Overall summary: **38** peer-reviewed papers; **827** citations; h-index=**18***

B. First or second author papers

*Summary: **7** papers, **153** citations as of November, 2023.*

1. **R. Chown**, et al. "PDRs4All IV. An embarrassment of riches: the Aromatic Infrared Bands in the Orion Bar." Accepted to A&A (2023). arXiv:2308.16733.
2. **R. Chown**, et al. "The cold gas and dust properties of red star-forming galaxies." MNRAS 516 (1), 84-99 (2022).
3. **R. Chown**, et al. "A new estimator of resolved molecular gas in nearby galaxies." MNRAS 500 (1), 1261-1278 (2021).
4. **R. Chown**, et al. "Linking bar- and interaction-driven molecular gas concentration with centrally-enhanced star formation in EDGE-CALIFA galaxies." MNRAS 484 (4), 5192-5211 (2019).
5. **R. Chown**, et al. "Maps of the Southern millimeter-wave sky from combined 2500 deg^2 SPT-SZ and *Planck* temperature data." ApJS 239 (1), 10 (2018).
6. Y. Omori, **R. Chown**, et al. "A 2500 deg^2 CMB lensing map from combined South Pole Telescope and *Planck* data." ApJ 849 (2), 124 (2017).
7. T. M. Crawford, **R. Chown**, et al. "Maps of the Magellanic Clouds from combined South Pole Telescope and *Planck* data." ApJS 227 (2), 23 (2016).

C. Other papers with significant contributions during or after PhD

*Summary: **14** papers, **114** citations as of November, 2023.*

8. S. Pasquini, et al. "PDRs4All VI: Probing the Photochemical Evolution of PAHs in the Orion Bar Using Machine Learning Techniques." A&A, submitted (2023).
9. E. Peeters, et al. "PDRs4All III: JWST's NIR spectroscopic view of the Orion Bar." A&A, referee report received (2023).
10. Y.-S. Tan, et al. "Star Formation Efficiency in Nearby Galaxies Revealed with a New CO-to-H2 Conversion Factor Prescription." ApJ, submitted (2023).
11. E. Habart, et al. "NIR and MIR imaging view of the Orion Nebula." A&A, accepted (2023).
12. O. Berné, et al. "Far-UV driven photoevaporation flow from a protoplanetary disk." Science, referee report received (2023).
13. O. Berné, et al. "Formation of the Methyl Cation by photochemistry in a protoplanetary disk." Nature (2023). https://doi.org/10.1038/s41586-023-06307-x

14. I. D. Roberts, et al. "VERTICO VI: Cold-gas asymmetries in Virgo cluster galaxies." Accepted to A&A (2023).
15. M. J. Jiménez-Donaire, et al. "VERTICO III. The Kennicutt-Schmidt relation in Virgo cluster galaxies." A&A 671, A3 (2023).
16. A. Leroy, et al. "PHANGS-JWST First Results: Mid-infrared emission traces both gas column density and heating at 100 pc scales." ApJ 944 (2), L9 (2023).
17. A. Leroy, et al. "PHANGS-JWST First Results: A Global and Moderately Resolved View of Mid-Infrared and CO Line Emission from Galaxies at the Start of the JWST Era." ApJ 944 (2), L10 (2023).
18. Y. Gao, et al. "The correlation between WISE 12 μm emission and molecular gas tracers on sub-kpc scales in nearby star-forming galaxies." ApJ 940 (2), 133 (2022).
19. O. Berné, et al. "PDRs4All: A JWST Early Release Science Program on Radiative Feedback from Massive Stars." PASP 134 (1035), 054301 (2022).
20. N. Zabel, et al. "VERTICO II: How HI-identified Environmental Mechanisms Affect the Molecular Gas in Cluster Galaxies." ApJ 933 (1), 10 (2022).
21. T. Brown, et al. "VERTICO: The Virgo Environment Traced in CO Survey." ApJS 257 (2), 21 (2021).

D. Other papers with significant contributions prior to PhD

*Summary: **17** papers, **560** citations as of November, 2023.*

19. T. M. C. Abbott, et al. "Joint analysis of DES Year 3 data and CMB lensing from SPT and Planck III: Combined cosmological constraints." Phys. Rev. D 107 (2), id.023531 (2023).
20. C. Chang, et al. "Joint analysis of DES Year 3 data and CMB lensing from SPT and Planck II: Cross-correlation measurements and cosmological constraints." Phys. Rev. D 023530 (2023).
21. Y. Omori, et al. "Joint analysis of Dark Energy Survey Year 3 data and CMB lensing from SPT and Planck. I. Construction of CMB lensing maps and modeling choices." Phys. Rev. D 023529 (2023).
22. J. Sánchez, et al. "Mapping gas around massive galaxies: cross-correlation of DES Y3 galaxies and Compton-*y* maps from SPT and Planck." MNRAS 522 (2), 3163-3182 (2023).
23. D. Anbajagane, et al. "Shocks in the stacked Sunyaev-Zel'dovich profiles of clusters II: Measurements from SPT-SZ + Planck Compton-y map." MNRAS 514 (2), 1645-1663 (2022).
24. L. E. Bleem, et al. "CMB/kSZ and Compton-y Maps from 2500 deg^2 of SPT-SZ and Planck Survey Data." ApJS 258 (2), 36 (2022).
25. L. Salvati, et al. "Combining Planck and SPT Cluster Catalogs: Cosmological Analysis and Impact on the Planck Scaling Relation Calibration." ApJ 934 (2), 129 (2022).
26. L.M. Mocanu, et al. "Consistency of cosmic microwave background temperature measurements in three frequency bands in the 2500-square-degree SPT-SZ survey." JCAP 07, 038, (2019).
27. Y. Omori, et al. "DES Year 1 Results: Cross-correlation between DES Y1 galaxy weak lensing and SPT+*Planck* CMB weak lensing." Phys. Rev. D 100, 043517 (2019).
28. J. Prat, et al. "Cosmological lensing ratios with DES Y1, SPT and *Planck*." MNRAS 487, 1363-1379 (2019).

29. Y. Omori, et al. "DES Year 1 Results: tomographic cross-correlations between DES galaxies and CMB lensing from SPT+*Planck*." Phys. Rev. D 100, 043501 (2019).

30. T.M.C. Abbott, et al. "DES Year 1 Results: Joint analysis of galaxy clustering, galaxy lensing, and CMB lensing two-point functions." Phys. Rev. D 100, 023541 (2019).

31. G. Simard, et al. "Constraints on cosmological parameters from the angular power spectrum of a combined 2500 deg^2 SPT-SZ and *Planck* gravitational lensing map." ApJ 860 (2), 137 (2018).

32. Z. Hou, et al. "A comparison of maps and power spectra determined from SPT and *Planck* data." ApJ 853 (1), 3 (2018).

33. K. Aylor, et al. "A Comparison of Cosmological Parameters Determined from CMB Temperature Power Spectra from the South Pole Telescope and the *Planck* Satellite." ApJ 850 (1), 3 (2017).

34. B. Soergel, S. Flender, et al. "Detection of the kinematic Sunyaev-Zel'dovich effect with DES Year 1 and SPT." MNRAS 461 (3), 3172-3193 (2016).

35. E. Baxter, et al. "Joint measurement of lensing-galaxy correlations using SPT and DES SV data." MNRAS 461 (4), 4099-4114 (2016).