

Dongwoo Chung

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EDUCATION

PhD in Physics, Stanford University 2014–2020

Thesis topic: Line-intensity mapping with the CO Mapping Array Pathfinder and beyond

Advisor: Sarah Church

AB in Physics, Princeton University (*magna cum laude*) 2010–2014

Thesis topic: Characterization of a microwave SQUID multiplexer *Advisor:* Lyman Page

RESEARCH

Interests: spectral line-intensity mapping; cosmic star-formation history, galaxy formation, epoch of reionisation; empirical modelling of galaxy–halo connection; radio and mm-wave astronomical instrumentation and observational techniques.

Experience (selected):

CITA–Dunlap Institute Research Fellow, University of Toronto Nov 2020–present

- COMAP: signal forecasting, analysis and interpretation of early science results
- TIME: part of site team for 2021–22 season; instrument support, analysis of calibration and commissioning observations, simulations of signal observations
- CCAT-prime: continued advisory work on [C II] survey projections

Research assistant w/ Prof Sarah Church, Stanford University Mar 2015–Sep 2020

- Argus: commissioning of W-band focal plane array for Green Bank Telescope
- COMAP: signal forecasting, commissioning data analysis, and miscellaneous hardware/software tasks for dedicated $z \sim 3$ CO line-intensity mapping instrument
- CCAT-prime: signal and sensitivity forecasting for [C II] line-intensity survey

Student researcher in Gravity Group, Princeton University *intermittent, 2011–2014*
(w/ Prof Suzanne Staggs 2011–2012, w/ Prof Lyman Page 2013–2014)

- Demonstration of microwave SQUID multiplexer in basic cryogenic operation
- Measurement of MuSE bolometer frequency-dependent impedance
- Recording and analysis of SQUID bias noise in ACTPol lab tests

TEACHING AND MENTORING (SELECTED)

Summer undergraduates mentored:

- Patrick Horlavage (McGill; co-supervised w/ J Richard Bond) May–Aug 2022
- Ishika Bangari (U of Toronto; SURP 2021 poster hon. mention) Jun–Aug 2021
- Lisa Nasu-Yu (U of Toronto; co-supervised w/ Abigail Crites) Jun–Aug 2021

Stanford teaching assistantships:

- Electricity, Magnetism, and Optics Lab (PHYSICS 24) Jan–Mar 2019
- Introduction to Modern Physics (PHYSICS 70) Sep–Dec 2016
- Electricity and Magnetism Lab (PHYSICS 44) Mar–Jun 2015

ACADEMIC PRESENTATIONS

Contributed talks and department seminars:

KIPAC Tea talk	Stanford University	Jun 2022
AAS 240th Meeting	Pasadena, California	Jun 2022
CASCA 2022 AGM	Univ of Waterloo (<i>virtual</i>)	May 2022
CCPP Astronomy Seminar	New York University	Apr 2022
Annual CCAT-prime/FYST Collab. Meeting	Cornell/Köln (<i>virtual</i>)	Apr 2022
Tri-State Cosmology \times Data Science	CCA, Flatiron Institute	Apr 2022
KICP Line-intensity Mapping Workshop	Univ of Chicago (<i>virtual</i>)	Jun 2021
CITA seminar	CITA, University of Toronto	Nov 2020
Special SMA talk	CfA, Harvard & Smithsonian	Dec 2019
Cosmology/HEP seminar	Dept of Phys & Astro, JHU	Oct 2019
Astrophysics lunch	Dept of Astronomy, Cornell	Oct 2019
Cosmology seminar	Dept of Astro Scis, Princeton	Oct 2019
‘L2S2’ (Lines in the LSS) conf. (<i>two talks</i>)	Aix-Marseille Université	Jul 2019
Cosmological Signals from Cosmic Dawn to the Present	Aspen Center for Physics (<i>winter astrophys. conf.</i>)	Feb 2018
Second Annual Intensity Mapping Workshop	Johns Hopkins University	Jun 2017

Invited talks:

Cross-correlations with CHORD Workshop	McGill University (<i>virtual</i>)	Oct 2021
Annual CCAT-prime Collaboration Meeting	Univ of Waterloo (<i>virtual</i>)	Apr 2020
CCAT-prime / Chile Workshop	Cerro Calán	Apr 2019

Posters:

Radio/Millimeter Astrophysical Frontiers in the Next Decade (<i>w/ Church, S., Wechsler, R.</i>)	University of Virginia	Jun 2019
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OUTREACH AND SERVICE (SELECTED)

UofT DADDAA Graduate Admissions Committee	2021–2022
• Evaluated applications, interviewed select applicants; sole non-faculty member	
CITA National Jamboree	Sep 2021
• Co-organised Canada-wide hybrid in-person/remote meeting of CITA affiliates	
UofT Astronomy and Space Exploration Society, ‘Star Talk’	Aug 2021
• Discussed research topics and experiences with chiefly undergraduate audience	
Stanford Physics Equity and Inclusion Committee	2017–2019
• Coordinated discussions on admissions, health care, advising, LGBTQIA+ in physics	
Kavli Institute for Particle Astrophys. and Cosmology (KIPAC) Outreach	2015–2019
• Represented KIPAC at various education and public outreach events	

AWARDS AND HONOURS

KIPAC Giddings Graduate Student Fellowship, Stanford University	AY2014–15
Allen G. Shenstone Prize in Physics, Princeton University	2014
Joseph Henry Fellowship & Treiman Fellowship, Princeton University	2013
Kusaka Memorial Prize in Physics, Princeton University	2012, 2013

LIST OF PUBLICATIONS, PREPRINTS, AND PROCEEDINGS

First-author, refereed: (*in reverse order of preprint announcement*)

1. Chung, D. T., ‘Cross-correlations between mm-wave line-intensity mapping and weak lensing surveys: preliminary consideration of long-term prospects’, 2022, MNRAS, 513, 4090 [DOI: 10.1093/mnras/stac1142]
2. Chung, D. T. et al. (COMAP Collaboration), ‘COMAP Early Science: V. Constraints and Forecasts at $z \sim 3$ ’, 2022, ApJ, in press [arXiv:2111.05931]
3. Chung, D. T. et al. (COMAP Collaboration), ‘A model of spectral line broadening in signal forecasts for line-intensity mapping experiments’, 2021, ApJ, 923, 188 [DOI: 10.3847/1538-4357/ac2a35]
4. Chung, D. T., ‘A partial inventory of observational anisotropies in line-intensity mapping’, 2019, ApJ, 881, 149 [DOI: 10.3847/1538-4357/ab3040]
5. Chung, D. T., Viero, M. P., Church, S. E., & Wechsler, R. H., ‘Forecasting [C II] line-intensity mapping measurements between the end of reionization and the epoch of galaxy assembly’, 2020, ApJ, 892, 51 [DOI: 10.3847/1538-4357/ab798f]
6. Chung, D. T., Viero, M. P., Church, S. E., Wechsler, R. H. et al. (COMAP Collaboration), ‘Cross-correlating Carbon Monoxide Line-intensity Maps with Spectroscopic and Photometric Galaxy Surveys’, 2019, ApJ, 872, 186 [DOI: 10.3847/1538-4357/ab0027]
7. Chung, D. T., Li, T. Y., Viero, M. P., Church, S. E., & Wechsler, R. H., ‘On estimation of contamination from hydrogen cyanide in carbon monoxide line intensity mapping’, 2017, ApJ, 846, 60 [DOI: 10.3847/1538-4357/aa8624]

Contributing author, refereed:

1. Viero, M. P., Sun, G., Chung, D. T. et al., ‘The Early Universe Was Dust-Rich and Extremely Hot’, 2022, arXiv:2203.14312; submitted to MNRAS Letters
2. Cleary, K. A., et al. (COMAP Collaboration, including Chung, D. T.), ‘COMAP Early Science: I. Overview’, 2022, ApJ, in press [arXiv:2111.05927]
3. Lamb, J. W., et al. (COMAP Collaboration, including Chung, D. T.), ‘COMAP Early Science: II. Pathfinder Instrument’, 2022, ApJ, in press [arXiv:2111.05928]
4. Foss, M. K., Ihle, H. T. et al. (COMAP Collaboration, including Chung, D. T.), ‘COMAP Early Science: III. CO Data Processing’, 2022, ApJ, in press [arXiv:2111.05929]
5. Ihle, H. T. et al. (COMAP Collaboration, including Chung, D. T.), ‘COMAP Early Science: IV. Power Spectrum Methodology and Results’, 2022, ApJ, in press [arXiv:2111.05930]
6. Rennie, T. J. et al. (COMAP Collaboration, including Chung, D. T.), ‘COMAP Early Science: VI. A First Look at the COMAP Galactic Plane Survey’, 2022, ApJ, in press [arXiv:2111.05932]
7. Breysse, P. C. et al. (COMAP Collaboration, including Chung, D. T. as second author), ‘COMAP Early Science: VII. Prospects for CO Intensity Mapping at Reionization’, 2022, ApJ, in press [arXiv:2111.05933]
8. Silva, M. B. et al. (including Chung, D. T.), ‘Synergies between the COMAP CO Line Intensity Mapping mission and a $\text{Ly}\alpha$ galaxy survey: How to probe the early universe with voxel based analysis of observational data’, 2021, arXiv:2111.05354; submitted to A&A
9. CCAT-prime collaboration et al. (including Chung, D. T.), ‘CCAT-prime Collaboration: Science Goals and Forecasts with Prime-Cam on the Fred Young Submillimeter Telescope’. 2021,

arXiv:2107.10364; submitted to AAS Journals

10. Seo, Y. M., Majumdar, L., Goldsmith, P. F., et al. (including Chung, D.), ‘An Ammonia Spectral Map of the L1495-B218 Filaments in the Taurus Molecular Cloud: II CCS & HC₇N Chemistry and Three Modes of Star Formation in the Filaments’. 2019, ApJ, 871, 134 [DOI: 10.3847/1538-4357/aaf887]
11. Ihle, H. T., Chung, D., Stein, G. et al. (COMAP Collaboration), ‘Joint power spectrum and voxel intensity distribution forecast on the CO luminosity function with COMAP’, 2019, ApJ, 871, 75 [DOI: 10.3847/1538-4357/aaf4bc]

Proceedings and non-refereed articles:

1. Karkare, K. S. et al. (including Chung, D. T.), ‘Snowmass 2021 Cosmic Frontier White Paper: Cosmology with Millimeter-Wave Line Intensity Mapping’, 2022, arXiv:2203.07258
2. Choi, S. K. et al. (including Chung, D. T.), ‘Sensitivity of the Prime-Cam Instrument on the CCAT-prime Telescope’, 2020, JLTP, 199, 1089 [DOI: 10.1007/s10909-020-02428-z]
3. Herter, T. et al. (including Chung, D.), ‘The CCAT-Prime Submillimeter Observatory’, 2019, Bulletin of the AAS, 51, 213 [arXiv:1909.02587]
4. Vavagiakis, E. M. et al. (including Chung, D.), ‘Prime-Cam: A first-light instrument for the CCAT-prime telescope’, 2018, Proc SPIE, 10708, 107081U [DOI: 10.1117/12.2313868]
5. Stacey, G. J. et al. (including Chung, D. T.), ‘CCAT-Prime: science with an ultra-widefield submillimeter observatory on Cerro Chajnantor’, 2018, Proc SPIE, 10700, 107001M [DOI: 10.1117/12.2314031]
6. Kovetz, E. D. et al. (including Chung, D.), ‘Line-Intensity Mapping: 2017 Status Report’, 2017, arXiv:1709.09066