Haochen Wang

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Education

Ph.D. in Physics, Massachusetts Institute of Technology (MIT) 2019 – May 28, 2026
Advisor: Kiyoshi Masui

B.S. in Astronomy/Math, Minor in Music, University of Southern California (USC) 2015 – 2019
Salutatorian of Class of 2019

Research Positions

Center for Particle Cosmology Fellow, University of Pennsylvania Sept. 2026 – present
Supervisor: Bhuvnesh Jain

Beus Prize Fellow, Arizona State University Starting Sept. 2027
Supervisor: Judd Bowman

Graduate Research Assistant, MIT Synoptic Radio Lab 2019 – 2026
Advisor: Kiyoshi Masui

Undergraduate Research Assistant, NANOGrav Pulsar Timing Array 2018 – 2019
Advisor: Michele Vallisneri

Undergraduate Research Assistant, USC Solar Physics Group 2015 – 2019
Advisor: Edward Rhodes

Collaboration Membership

Canadian Hydrogen Intensity Mapping Experiment (CHIME) Collaboration 2019 – present

CHIME/Fast Radio Burst (FRB) Collaboration 2024 – present

Roman High Latitude Imaging Survey Project Infrastructure Team 2026 – present

Honors and Awards

School of Science Community Service Fellowship, MIT 2024
Emerson/Harris Scholarship, MIT 2021, 2022, 2023, 2024
MIT Physics Whiteman Graduate Fellowships, MIT 2019, 2020
Salutatorian of Class of 2019, USC 2019
Renaissance Scholar Award, USC 2019
Trustee Award, USC 2019
Black Alumni Association Scholarship, USC 2016, 2017, 2018
Morning Light Foundation Scholarship, American scholarship foundation in Los Angeles 2016, 2017, 2018

Mentoring and Advising

Shion Andrew, MIT Physics graduate student project 2023 – 2026
Project: "Linear filter for radio frequency interference mitigation"

April Cheng, MIT Undergraduate Research Opportunities Program (UROP) 2023 – 2025
Project: "Exploring selection biases in FRB dispersion–galaxy cross-correlations"

Panupong (Pitt) Phoompuang, MIT UROP 2022 – 2025
Project: "Mitigating antenna gain errors with HyFoReS in CHIME simulations"

Teaching Positions

Teaching Assistant, MIT

8.962 Graduate General Relativity	Spring 2022 and 2024
8.942 Graduate Cosmology	Fall 2022 and 2024
8.033 Undergraduate Relativity	Fall 2021 and 2022

Course Instructor, MIT Introduction to Technology, Engineering, and Science (MITES)

Astrophysics Project Course — Summer 2021, 2022, and 2023

Leadership and Service

FRB Session Organizer, the 33rd Texas Symposium on Relativistic Astrophysics 2025
Member, MIT Graduate Students Advising Graduate Admissions Committee 2022 – 2025
President, MIT Physics Graduate Student Council (PGSC) 2022 – 2023
Chair, MIT Ashdown House Communities Committee 2022 – 2023
Organizer, MIT Astrophysics Journal Club 2021 – 2023
Arts Officer, MIT Ashdown House Communities Committee 2021 – 2022
Volunteer, USC Black Alumni Association 2016 – 2019

Public Engagement and Science Communication

Volunteer, Public Outreach in Physics at the University of Pennsylvania 2026
Co-organizer and Lead Observer, MIT Sidewalk Astrogazer Club 2023 – 2025
Volunteer, Cambridge Science Festival Oct. 2023, Sep. 2024
Volunteer, MIT Museum After Dark May 2023
Volunteer, Boston Astronomy on Tap 2023 – 2024

Professional Development Activities

Panelist, MIT Physics Graduate Student Open House Apr. 2022, Mar. 2023
Panelist, MIT Physics Graduate Student Admissions Webinar Nov. 2022, Nov. 2023, Oct. 2024
Editor, MIT Physics Graduate Student Handbook 2022, 2023

Peer Review Service

Physical Review D 2023 – present
Physical Review Letters 2025 – present
The Astrophysical Journal 2024 – present
The Astrophysical Journal Letters 2025 – present

Seminars & Conference Presentations

Invited talk, Journal Club, University of Pennsylvania	May 2026
Invited talk, Texas Symposium on Relativistic Astrophysics, Arizona State University	Dec. 2025
Invited talk, Dark Universe Science Center Journal Club Talk, University of Washington	Nov. 2025
Invited talk, Astrophysics Lunch Talk, University of Washington	Nov. 2025
Invited talk, KIPAC Seminar, Stanford University	Nov. 2025
Invited talk, Observers Group Seminar, Northwestern University	Oct. 2025
Invited talk, Journal Club, University of Pennsylvania	Oct. 2025
Invited talk, Cosmology Seminar, Yale University	Sep. 2025
Invited talk, Cosmo-ph Seminar, McGill University	Nov. 2024
Invited talk, Astronomy Tea Talk, California Institute of Technology	Oct. 2024
Invited talk, Cosmology Seminar, Arizona State University	Oct. 2024
Invited talk, Astronomy Lunch Talk, University of California, Berkeley	Oct. 2024
Contributed talk, Line Intensity Mapping 2024 Meeting	Jun. 2024
Contributed talk, American Physical Society April Meeting	Apr. 2022
Contributed talk, Summer All Zoom Epoch of Reionisation Astronomy Conference	Mar. 2022
Poster presentation, USC Undergraduate Research Symposium Presentation	Apr. 2019

Publications

Refereed Lead-author Papers

S. Andrew, **H. Wang** [1], K. Masui et al. (2026) — Submitted to Phys. Rev. Lett.
Fast radio burst dispersion is an unbiased tracer of matter on large scales — arXiv:2604.25828

H. Wang, P. Phoompuang [2], K. Masui et al. (2025) — Phys. Rev. D **113**
Mitigating antenna gain errors with HyFoReS in CHIME simulations — arXiv:2506.09170

H. Wang, K. Masui, S. Andrew et al. (2025) — Phys. Rev. Lett. **137**
Measurement of the dispersion–galaxy cross-power spectrum with the second CHIME/FRB catalog — arXiv:2506.08932

H. Wang, K. Masui, K. Bandura et al (2025). — Phys. Rev. D **111**
Demonstration of hybrid foreground removal on CHIME data — arXiv:2408.08949

H. Wang, J. Mena-Parra, T. Chen, and K. Masui (2022) — Phys. Rev. D **106**
Removing systematics-induced 21-cm foreground residuals by cross-correlating filtered data — arXiv:2203.07184

H. Wang, S. Taylor, and M. Vallisneri (2019) — M.N.R.A.S. **487**
Bayesian cross validation for gravitational-wave searches in pulsar-timing array data — arXiv:1904.05355

A. Cheng [3], S. Andrew [4], **H. Wang**, and K. Masui (2025) — Astrophys. J. **998**
Exploring selection biases in FRB dispersion-galaxy cross-correlations with magnetohydrodynamical simulations — arXiv:2506.03258

Refereed Co-author Papers

[1] Co-first author
[2] Undergraduate student under my supervision
[3] Undergraduate student under my co-supervision
[4] Junior graduate student under my guidance

A. Khadir, A. Pandhi, J. Hessels et al. (including **H. Wang**) (2026) — Submitted to Astrophys. J.
Search for a dispersion measure excess toward nearby galaxy halos using fast radio bursts from the Second CHIME/FRB Baseband Catalog — arXiv:2611.12860

J. Sullivan, K. Masui, R. Raikman et al. (including **H. Wang**) (2026) — Submitted to Phys. Rev. D
Mapping large-scale structure without galaxy formation - combining fast radio bursts with CMB lensing — arXiv:2611.05351

M. Lazda, N. Gusinskaia, G. Sachdeva et al. (including **H. Wang**) (2026) — Submitted to Astron. J.
The CHIME/FRB Outriggers: commissioning the Hat Creek Outrigger and an updated calibration scheme for mitigating RFI — arXiv:2609.10686

R. Raikman, **H. Wang**, K. Masui, and S. Andrew (2026) — Submitted to Phys. Rev. D
The FRB–galaxy overdensity cross-correlation statistic in dispersion space — arXiv:2607.26135

S. Andrew, J. Mena-Parra, **H. Wang** et al. (2026) — Submitted to Astron. J.
A spatial filter for mitigating radio interference and its application to CHIME/FRB Outriggers — arXiv:2603.25833

CHIME Collaboration (including **H. Wang**) (2026) — Submitted to Astrophys. J.
Interpretation of 21 cm auto power spectrum measurement at $z \sim 1$ by the Canadian Hydrogen Intensity Mapping Experiment — arXiv:2603.25680

CHIME/FRB Collaboration (including **H. Wang**) (2026) — Astrophys. J. S. **283**
The Second CHIME/FRB Catalog of fast radio bursts — arXiv:2601.09399

CHIME Collaboration (including **H. Wang**) (2026) — Submitted to Astrophys. J.
The squeezed bispectrum from CHIME HI emission and Planck CMB lensing: current sensitivity and forecasts — arXiv:2601.03240

CHIME Collaboration (including **H. Wang**) (2025) — Submitted to Astrophys. J.
Detection of the cosmological 21 cm signal in auto-correlation at $z \sim 1$ with the Canadian Hydrogen Intensity Mapping Experiment — arXiv:2511.19620

A. Lanman, S. Simha, K. Masui et al. (including **H. Wang**) (2025) — Submitted to Astrophys. J.
Constraining baryon fractions in galaxy groups and clusters with the first CHIME/FRB outrigger — arXiv:2509.07097

C. Leung, S. Simha, I. Medlock et al. (including **H. Wang**) (2025) — Submitted to Astrophys. J. Lett.
Stellar mass-dispersion measure correlations constrain baryonic feedback in fast radio burst host galaxies — arXiv:2507.16816

CHIME/FRB Collaboration (including **H. Wang**) (2025) — Astrophys. J. Lett. **989**
FRB 20250316A: a brilliant and nearby one-off fast radio burst localized to 13 parsec precision — arXiv:2506.19006

CHIME Collaboration (including **H. Wang**) (2025) — Submitted to Astrophys. J. Lett.
Discovery of an HI 21 cm absorption system at z=2.327 with CHIME — arXiv:2506.11269

CHIME/FRB Collaboration (including **H. Wang**) (2025) Submitted to Astrophys. J.
CHIME/FRB outriggers: design overview arXiv:2504.05192

CHIME/FRB Collaboration (including **H. Wang**) (2025) Astrophys. J. S. **280**
A catalog of local universe fast radio bursts from CHIME/FRB and the KKO outrigger arXiv:2502.11217

S. Andrew, C. Leung, A. Li et al. (including **H. Wang**) (2025) Astrophys. J. **981**
A very long baseline interferometry calibrator grid at 600 MHz for fast radio transient localizations with CHIME/FRB outriggers arXiv:2409.11476

CHIME Collaboration (including **H. Wang**) (2024) Astrophys. J. **976**
Holographic beam measurements of the Canadian Hydrogen Intensity Mapping Experiment (CHIME) arXiv:2408.00172

CHIME and GMIMS Collaborations (including **H. Wang**) (2024) Astrophys. J. **971**
Faraday tomography with CHIME: the 'tadpole' feature G137+7 arXiv:2405.15678

CHIME/FRB Collaboration (including **H. Wang**) (2024) Astrophys. J. **969**
Updating the first CHIME/FRB catalog of fast radio bursts with baseband data arXiv:2311.00111

CHIME Collaboration (including **H. Wang**) (2024) Astrophys. J. **963**
A detection of cosmological 21 cm emission from CHIME in cross-correlation with eBOSS measurements of the Lyman-α forest arXiv:2309.04404

CHIME/FRB Collaboration (including **H. Wang**) (2023) Astrophys. J. **947**
CHIME/FRB discovery of 25 repeating fast radio burst sources arXiv:2301.08762

CHIME Collaboration (including **H. Wang**) (2023) Astrophys. J. **947**
Detection of cosmological 21 cm emission with the Canadian Hydrogen Intensity Mapping Experiment arXiv:2202.01242

CHIME Collaboration (including **H. Wang**) (2022) Astrophys. J. **923**
Using the Sun to measure the primary beam response of the Canadian Hydrogen Intensity Mapping Experiment arXiv:2201.11822

CHIME Collaboration (including **H. Wang**) (2022) Astrophys. J. S. **261**
An overview of CHIME, the Canadian Hydrogen Intensity Mapping Experiment arXiv:2201.07869

CHIME/FRB Collaboration (including **H. Wang**) (2021) Astrophys. J. S. **257**
The First CHIME/FRB Fast Radio Burst Catalog arXiv:2106.04352

CHIME/Pulsar Collaboration (including **H. Wang**) (2021) Astrophys. J. S. **255**
The CHIME Pulsar Project: system overview arXiv:2008.05681

CHIME/FRB Collaboration (including **H. Wang**) (2020) Nature **587**
A bright millisecond-duration radio burst from a Galactic magnetar arXiv:2005.10324

CHIME/FRB Collaboration (including **H. Wang**) (2020) Nature **582**
Periodic activity from a fast radio burst source arXiv:2001.10275