MENG-XIANG LIN

CITA National Fellow at Simon Fraser University
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CURRENT POSITION

Simon Fraser University *September 2025 - Present*
Canadian Institute of Theoretical Astrophysics
CITA National Fellow

WORK EXPERIENCE

University of Pennsylvania *September 2022 - August 2025*
Center of Particle Cosmology Postdoctoral Fellow

EDUCATION

The University of Chicago *September 2015 - August 2022*
Ph.D. in Astronomy and Astrophysics
Advisor: Prof. Wayne Hu

Peking University *September 2011 - July 2015*
B.S. in Astronomy and Astrophysics

AWARDS AND HONORS

CITA National Fellowship	2025 - 2028(expected)
Brinson Fellowship (U. Chicago)	2016 & 2017
The Guanghua Scholarship (Peking U.)	2014
The Excellence Award of Study (Peking U.)	2013 & 2014.

RESEARCH KEYWORDS

Cosmology, Dark Energy, Gravitational Waves

PUBLICATION

(Total citations: **1000** by 2025.09.16)
Major contributions ((co-)first author or corresponding author):

Jiaming Pan, **Meng-Xiang Lin**, Gen Ye, Marco Raveri, Alessandra Silvestri, "Consistent Initial Conditions for Early Modified Gravity in Effective Field Theory", submitted. arXiv: 2506.17411

Santiago Jaraba, Sachiko Kuroyanagi, Qiuyue Liang, **Meng-Xiang Lin**, Mark Trodden, "First astrometric constraints on parity-violation in the gravitational wave background", JCAP 08, 057 (2025). arXiv: 2505.18085

Justin Khoury, **Meng-Xiang Lin**, Mark Trodden, "Apparent $w < 1$ and a Lower S_8 from Dark Axion and Dark Baryons Interactions", submitted. arXiv: 2503.16415

Wayne Hu, Qiuyue Liang, **Meng-Xiang Lin**, Mark Trodden, "Testing Gravity with Realistic Gravitational Waveforms in Pulsar Timing Arrays", JCAP 12, 054 (2024). arXiv: 2408.11774

Qiuyue Liang, **Meng-Xiang Lin**, Mark Trodden, Sam S. C. Wong, "Probing Parity Violation in the Stochastic Gravitational Wave Background with Astrometry", Phys. Rev. D 109, 083028 (2024). arXiv: 2309.16666

Meng-Xiang Lin, Bhuvnesh Jain, Marco Raveri, Eric J. Baxter, Chihway Chang, Sujeong Lee, Jessica Muir, "Late Time Modification of Structure Growth and the S8 Tension", Phys. Rev. D 109, 063523 (2024). arXiv: 2308.16183

Qiuyue Liang, **Meng-Xiang Lin**, Mark Trodden, "A Test of Gravity with Pulsar Timing Arrays", JCAP 11, 042 (2023). arXiv: 2304.02640

Meng-Xiang Lin, Evan McDonough, J. Colin Hill, Wayne Hu, "Dark matter trigger for early dark energy coincidence", Phys. Rev. D 107, 103523 (2023). arXiv:2212.08098

Jose Maria Ezquiaga, Wayne Hu, Macarena Lagos, **Meng-Xiang Lin**, Fei Xu, "Modified gravitational wave propagation with higher modes and its degeneracies with lensing", JCAP 08, 016 (2022). arXiv:2203.13252

Evan McDonough, **Meng-Xiang Lin**, J. Colin Hill, Wayne Hu, Shengjia Zhou, "The Early Dark Sector, the Hubble Tension, and the Swampland", Phys. Rev. D 106, 043525 (2022). arXiv:2112.09128

Jose Maria Ezquiaga, Wayne Hu, Macarena Lagos, **Meng-Xiang Lin**, "Gravitational wave propagation beyond general relativity: waveform distortions and echoes", JCAP 11, 048 (2021). arXiv:2108.10872

Meng-Xiang Lin, Wayne Hu, Marco Raveri, "Testing H_0 in acoustic dark energy models with Planck and ACT polarization data", Phys. Rev. D 102, 123523 (2020). arXiv:2009.08974

Meng-Xiang Lin, Giampaolo Benevento, Wayne Hu, Marco Raveri, "Acoustic Dark Energy: Potential Conversion of the Hubble Tension", Phys. Rev. D 100, 063542 (2019). arXiv:1905.12618

Meng-Xiang Lin, Marco Raveri, Wayne Hu, "Phenomenology of modified gravity at recombination", Phys. Rev. D 99, 043514 (2019). arXiv:1810.02333

Meng-Xiang Lin, Ren-Xin Xu, Bing Zhang, "Oscillation Driven Magnetospheric Activity In Pulsars", *Astrophys. J.* 799, 152 (2015). arXiv:1512.04609

Minor contributions:

DES Collaboration: T.M.C. Abbott et al, "Dark Energy Survey: implications for cosmological expansion models from the final DES Baryon Acoustic Oscillation and Supernova data", submitted. arXiv: 2503.06712

DES and SPT and ACT collaborations: D. Anbajagane et al, "Cosmological shocks around galaxy clusters: A coherent investigation with DES, SPT & ACT", MNRAS 527, 9378 (2024). arXiv:2310.00059

Macarena Lagos, **Meng-Xiang Lin**, Wayne Hu, "Curvature perturbations in the effective field theory of inflation", Phys. Rev. D 100, 123507 (2019). arXiv:1908.08785

Miguel Escudero, Asher Berlin, Dan Hooper, **Meng-Xiang Lin**, "Toward (finally!) ruling out Z and Higgs mediated dark matter models", *JCAP* 12, 029 (2016). arXiv:1609.09079

S. Dai, M. C. Smith, **M. X. Lin**, Y. L. Yue, G. Hobbs, R. X. Xu, "Gravitational Microlensing by Neutron Stars and Radio Pulsars: Event Rates, Timescale Distributions, and Mass Measurements", *Astrophys. J.* 802, 120 (2015). arXiv:1502.02776

RESEARCH TALKS

Invited Talk Fundamental Physics Across the Gravitational Wave Spectrum; KICP, Chicago, August 2025; "*Theoretical Estimation of Stochastic Gravitational Wave Background in Pulsar Timing Arrays*"

Invited Talk International Workshop on New Opportunities for Particle Physics 2025; IHEP, Beijing, China, July 2025; "*Explain both DESI Dynamical Dark Energy and S8 Tension with Dark Axion and Dark Baryons Interactions*"

Selected Talk Dark Side of Universe 2025; Montreal, Canada, July 2025; "*Apparent w¡-1 and a Lower S8 from Dark Axion and Dark Baryons Interactions*"

Invited Talk APEC Seminar; IPMU, Tokyo, Japan, May 2025; "*Apparent Phantom Dark Energy and Growth Suppression from Dark Axion and Dark Baryons Interactions*"

Invited Talk Physics High Energy Theory Seminar; Columbia University, New York, USA, April 2025; "*Apparent Phantom Dark Energy and Growth Suppression from Dark Axion and Dark Baryons Interactions*"

Invited Talk Cosmology Lunch; Institute for Advanced Study, Princeton, USA, March 2025; "*Apparent Phantom Dark Energy and Growth Suppression from Dark Axion and Dark Baryons Interactions*"

Invited Talk Institute of Theoretical Physics of CAS, Beijing, China, March 2025; "*Apparent* $w < -1$ *and a Lower* S_8 *from Dark Axion and Dark Baryons Interactions*"

Contributed Talk The 34th Midwest Relativity Meeting; UMich, Ann Arbor, USA, Nov 2024; "*Testing Gravity with Realistic Gravitational Waveforms in Pulsar Timing Arrays*"

Invited Talk CfPC workshop of Recent Developments on Cosmology and Particle Physics; UPenn, Philadelphia, USA, Nov 2024; "*Learning Gravity and Black Hole Evolution from Pulsar Timing Arrays*"

Invited Talk Kashiwa-no-ha Dark Matter and Cosmology Symposium (Satellite workshop of COSMO 2024); IPMU, Tokyo, Japan, Oct 2024; "*When Galaxy Surveys meet Cosmic Micro-Wave Background and Gravitational Wave Background*"

Invited Talk Tsung-Dao Lee Institute, Shanghai, China, Oct 2024; "*Learning Fundamental Physics from the Stochastic Gravitational Wave Background*"

Contributed Talk Fundamental Physics from Future Spectroscopic Surveys; LBNL, Berkeley, USA, May 2024; "*Dark Matter Tracking Modification of Structure Growth and the* S_8 *tension*"

Invited Talk Hong Kong City University, Hong Kong, China, Jan 2024; "*Testing Fundamental Physics with Gravitational Wave Propagations*"

Invited Talk Nanjing University, Nanjing, China, Jan 2024; "*Solutions towards the* H_0 *tension and* S_8 *tension*"

Invited Talk Zhejiang University, Hangzhou, China, Jan, 2024; "*Solutions towards the* H_0 *tension and* S_8 *tension*"

Invited Talk Beijing Normal University, Beijing, China, Jan 2024; "*Solutions towards the* H_0 *tension and* S_8 *tension*"

Invited Talk Peking University, Beijing, China, Jan, 2024; "*Testing Fundamental Physics with Gravitational Wave Propagations*"

Invited Talk Shanghai Jiao Tong University, Shanghai, China, Dec 2023; "*Solutions towards the* H_0 *tension and* S_8 *tension*"

Contributed Talk The 32nd Texas Symposium; Shanghai, China, Dec 2023; "*Testing Fundamental Physics with PTA and Astrometry measurements of Stochastic Gravitational Wave Background*"

Invited Talk APEC Seminar; IPMU, Tokyo, Japan, Dec 2023; "*Solutions towards the* H_0 *tension and* S_8 *tension*"

Invited Lunch Talk University of Chicago, Chicago, USA, Nov 2023; "*Dark Energy Tracking Modification of Structure Growth and the S8 Tension*"

Invited Talk CITA, Toronto, Canada, Nov 2023; "*Late Time Modification of Structure Growth and the S8 Tension*"

Invited Talk Penn/PDT Partners workshop; PDT Partners, New York, USA, May 2023; "*Testing Gravity with Gravitational Wave Propagation*"

Contributed Talk The 5th neighborhood workshop; Penn State University, State College, USA, April 2023; "*A Dark Matter Trigger for Early Dark Energy Coincidence*"

Invited Talk Testing Gravity 2023; Simon Fraser University, Vancouver, Canada, January 2023; "*Gravitational wave propagation beyond GR and its degeneracies with lensing*"

Symposium KICP/FNAL/UIUC Symposium; University of Chicago, Chicago, USA, May 2022; "*Gravitational wave propagation beyond GR and its degeneracies with lensing*"

Invited Talk MIT/Tufts Cosmology Seminar; MIT, Cambridge, USA, April 2022; "*Paths towards the Hubble Tension Solutions*"

Invited Talk Princeton University, Princeton, USA, December 2021; "*Seeking solutions for the Hubble tension*"

Contributed Talk MWRM2021; UIUC, Champaign, USA, November 2021; "*Gravitational wave propagation beyond GR: waveform distortions and echoes*"

Invited Talk University of Pennsylvania, Philadelphia, USA, October 2021; "*Seeking solutions for the Hubble tension*"

Invited Talk Columbia University, New York, USA, October 2021; "*Seeking solutions for the Hubble tension*"

Invited Talk SUSY2021; Beijing, China, August 2021; "*Gravitational wave propagation beyond GR: waveform distortions and echoes*"

Selected Talk COSMO19; RWTH Aachen University, Aachen, Germany, September 2019; "*Acoustic Dark Energy: Potential Conversion of the Hubble Tension*"

Postdoc Symposium University of Chicago, Chicago, USA, March 2019; "*Separate Universe and Consistency Relation beyond slow-roll inflation*"

Contributed Talk H_0 workshop; University of Chicago, Chicago, USA, October 2018; "*Modified Gravity On Reducing the H_0 tension*"

Poster TRISEP Summer School; Perimeter Institute, Waterloo, Canada, July 2018; "*Phenomenology of Modified Gravity at Recombination*"

MENTORING EXPERIENCE

Jiaming Pan, PhD at UMich (independent projects mentor), one paper submitted	2023-present
Mary Gerhardinger, PhD at UPenn (with Prof. Mark Trodden)	2023-present
Sanjit Kobla, undergrad at UPenn (with Prof. Bhuvnesh Jain), one paper in prep	2024-present

TEACHING EXPERIENCE

Guest Lecturer, Lectures on the Hubble Tension *by Prof. Wendy Freedman*	2021

Teaching Assistant, The Physics of Stars 2020

Teaching Assistant, Stars 2018

Teaching Assistant, The Milky Way 2017

Teaching Assistant, The Physical Universe 2017

Teaching Assistant, Current Topics in Astrophysics 2016

Teaching Assistant, Physics of Stars and Stellar System 2015

SERVICES

Organizer of Astro Journal Club at University of Pennsylvania 2022-2025

Co-organizer of CfPC workshop at University of Pennsylvania Nov 2024

PROFESSIONAL SKILLS

Computer Languages python, C/C++, MATLAB, fortran
Software & Tools Mathematica

EXTERNAL LINKS

Personal Website https://m-x-lin.github.io/index.html
INSPIRE-HEP https://inspirehep.net/authors/2636115?ui-citation-summary=true
ORCID https://orcid.org/0000-0003-2908-4597