MING-FENG HO

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 3047 Physics Building, 900 University Ave., Riverside, CA 92521

EDUCATION

· Ph.D. student in Physics & Astronomy, University of California, Riverside   *2018 - 2024 May (expected)*
  Research advisor: Prof. Simeon Bird
  Thesis: New directions to intergalactic medium and cosmology using Bayesian surrogate models
· M.S. in Astrophysics, National Taiwan University   *2016 - 2018*
· B.S. in Physics, National Taiwan University   *2010 - 2014*

RESEARCH INTERESTS

· **Cosmology**: Cosmological inference, hydrodynamical simulations, IGM as a cosmological probe.
· **Bayesian statistics**: Gaussian process, multi-fidelity, hierarchical inference, Bayesian deep learning.
· **IGM/CGM**: Damped Lyα absorbers (DLAs), metal absorbers, quasar emission modeling, redshift inference.
· **Black holes**: Population inference for gravitational waves, primordial black holes (PBHs).

AWARDS AND GRANTS

1. NASA FINESST Fellowship   *2021 - 2024*
2. Anne Kernan Award (Outstanding Senior Graduate Student Researcher), UC Riverside   *2023*
3. Provost's Scholars Fellowship (honored), UC Riverside   *2021*
4. Benjamin C. Shen Award (Outstanding Junior Graduate Student Researcher), UC Riverside   *2021*
5. GSA Conference Travel Award, UC Riverside   *2019*
6. Student Thesis Award, Physics Society of Taiwan   *2019*
7. Dean's Fellowship, UC Riverside   *2018*
8. Laureate for Philosophical Treatise, National Taiwan University   *2012*

RESEARCH MENTORSHIP

Advisor for UCR/UCLA undergraduates advised by Prof. Simeon Bird

· Kevin Hong (co-advised with Sum Qezlou): Animating the evolution of universe using `Blender` [Video] *2022*
· Ryan Tsaio: Automated detection of Lyman limit systems   *2023*

Research advisor for King's high school students

· Emma Shah (now UC Berkeley; co-advised with Phoebe R. Upton Sanderbeck): DLA spatial separation on the detection pipeline   *2020 - 2021*
· Emma Shah and Rafael Rosales: A better prior for QSO redshift estimation (`jibanCat/gpy_dla_detection`, Gold medal in the county-level science fair)   *2021 - 2022*

Team Lead for Data Science Challenge, Lawrence Livermore National Laboratory

· Adhith Karthikeyan, Alex Chen, Matthew Lee: Deep learning for galaxy/asteroid   *2021*

PUBLICATION

Summary

- 12 publications, 10 refereed and 2 in review (76 total citations; Google scholar 10/29/2023).
- 4 first-author publications (64 total citations).
- 3 second-author publications with major contributions (involving writing and software development).
- 2 third-author publications with important software contributions.
- 3 collaboration papers.

First and second author (⋆the most important)

- **Ming-Feng Ho**, Simeon Bird, Martin A. Fernandez, Christian R. Shelton, *MF-Box: Multi-fidelity and multi-scale emulation for the matter power spectrum,* MNRAS, 526(2):2903–2919, December 2023 [2306.03144].
- ⋆**Ming-Feng Ho**, Simeon Bird, Christian R. Shelton, *Multi-Fidelity Emulation for the Matter Power Spectrum using Gaussian Processes,* MNRAS, 509(2):2551–2565, January 2022 [2105.01081].
- ⋆**Ming-Feng Ho**, Simeon Bird, and Roman Garnett, *Damped Lyman-alpha Absorbers from Sloan Digital Sky Survey DR16Q with Gaussian processes,* MNRAS, 507(1):704–719, October 2021 [2103.10964].
- ⋆**Ming-Feng Ho**, Simeon Bird, and Roman Garnett, *Detecting multiple DLAs per spectrum in SDSS DR12 with Gaussian processes,* MNRAS, 496(4):5436–5454, August 2020 [2003.11036].
- Reza Monadi, **Ming-Feng Ho**, Kathy L. Cooksey, Simeon Bird, *Machine Learning Uncovers the Universe's Hidden Gems: A Comprehensive Catalogue of CIV Absorption Lines in SDSS DR12,* MNRAS, 526(3):4557–4574, December 2023 [2305.00023].
- M.A. Fernandez, **Ming-Feng Ho**, Simeon Bird, *A Multi-Fidelity Emulator for the Lyman-α Forest Flux Power Spectrum,* MNRAS, 517(3):3200–3211, December 2022 [2207.06445].
- Leah Fauber, **Ming-Feng Ho**, Simeon Bird, Christian R. Shelton, Roman Garnett, Ishita Korde, *Automated measurement of quasar redshift with a Gaussian process,* MNRAS, 498(4):5227–5239, November 2020 [2006.07343].

Third-author papers

- Simeon Bird, Martin Fernandez, **Ming-Feng Ho**, Mahdi Qezlou, Reza Monadi, Yueying Ni, Nianyi Chen, Rupert Croft, Tiziana Di Matteo, *PRIYA: A New Suite of Lyman-alpha Forest Simulations for Cosmology,* JCAP, 2023(10):037, October 2023 [2306.03144].

Co-authored papers

- Scott E. Perkins, Peter McGill, William Dawson, Natasha Abrams, Casey Y. Lam, **Ming-Feng Ho**, Jessica Lu, Simeon Bird, Kerianne Pruett, Nathan Golovich, George Chapline, and James Barbieri, *Disentangling the Dark Mass Spectrum with Photometric Microlensing Surveys, arXiv e-prints,* page arXiv:2310.03943, October 2023, accepted to Astrophysical Journal. [2310.03943]
- Kai-Yang Lin, et. al. (include **Ming-Feng Ho**), *AMiBA: Cluster Sunyaev-Zel'dovich Effect Observations with the Expanded 13-Element Array,* Astrophysical Journal, Oct. 2016, 91 [1605.09261]

In Review

- Hurum Tohfa, Simeon Bird, **Ming-Feng Ho**, Mahdi Quezlou, Martin Ferandez, *Forecast Cosmological Constraints with the 1D Wavelet Scattering Transform and the Lyman-α forest, arXiv e-prints,* page arXiv:2310.06010, October 2023. [2310.06010]
- Martin Fernandez, Simeon Bird, **Ming-Feng Ho**, *Cosmological Constraints from the eBOSS Lya Forest using the PRIYA Simulations, arXiv e-prints*, page arXiv:2309.03943, September 2023 [2309.03943].

SCIENTIFIC PRESENTATIONS

Summary

- 20 talks, posters and presentations since 2019
- 6 remote talks, 8 in-person seminar talks, 1 poster, 5 conference talks

Selected Talks

- *Invited Talk: CfA Seminar (topic: Multi-fidelity emulators and cosmological constraints)*   *Nov 2023*
- *Invited Talk: IPMU APEC seminar (topic: PRIYA emulator using Astrid simulations)*   *Oct 2023*
- *Contributed Talk: Royal Astronomical Society 1D ML (topic: GP-DLA finder)* [▶ Video]   *Mar 2023*
- *Contributed Tutorial: KITP Galaxy ML Workshop (topic: GP emulator)*   *Feb 2023*
- *Invited Talk: KICP seminar (topic: MF emulator)*   *Jan 2023*
- *Contributed Talk: CCA's CAMELS Workshop (topic: MF emulator using Astrid)*   *Nov 2022*

SERVICE

Selected service

- Referee for Physical Review D, Astrophysical Journal, and MNRAS   *2021 - present*
- P&A PeER Mentorship (PAPER) Leader   *2023 - present*
- P&A Student Seminar (PASS) Founder   *2022 - 2023*
- Head Steward (Riverside), UAW 2865   *2021 - 2022*
- UC Astronomy Osterbrock Sierra Conference Co-I   *2021*

PUBLIC OUTREACH

1. UCR's Stargazing Series Presenter and Moderator ($\times$ many times) [▶ Video]   *2020 - 2021*
2. UCR's Mercury Transit Presenter (hands-on demos)   *2019*

WORKING EXPERIENCE

Research Assistant for Digital Humanities   Taipei, Taiwan

- Text mining for digital humanities, working at Academia Sinica, Chinese literature and Philosophy   *2018*

Magazine Editor/Freelance Writer   Taipei, Taiwan

- Editing for Little Newton, and also writing literature, receiving the nation-wide Hakka literature award   *2015*

Taiwanese Military Service   Keelung, Taiwan

- Digitalize historical court records   *2014 - 2015*

OTHER SKILLS

- Languages: Mandarin (native), English, Japanese (limited listening/reading), Taiwanese (limited listening)