

# MING-FENG HO

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## EDUCATION

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- 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

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- **CGM/IGM:** IGM/CGM as a cosmological/astrophysics probe, gas in galaxy formation simulations.
- **Bayesian modeling:** Gaussian process, multi-fidelity, Bayesian model selection, hierarchical inference.
- **Quasar observations:** damped Ly $\alpha$  absorbers (DLAs), quasar redshift estimation, continuum inference.
- **Black holes:** population inference of black hole binaries, primordial black holes (PBHs).

## AWARDS AND GRANTS

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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

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### 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](https://github.com/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

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### Summary

- 11 refereed/in review publications (73 total citations; Google scholar 09/15/2023).

- 4 first-author publications (61 total citations).
- 3 second-author publications with major contributions.
- 2 co-author publications with important software contributions.
- 2 collaboration papers.

### First and second author

- *MF-Box: Multi-fidelity and multi-scale emulation for the matter power spectrum*  
**Ming-Feng Ho**, Simeon Bird, Martin A. Fernandez, Christian R. Shelton, *submitted to MNRAS*.
- *Machine Learning Uncovers the Universe's Hidden Gems: A Comprehensive Catalogue of CIV Absorption Lines in SDSS DR12*  
Reza Monadi, **Ming-Feng Ho**, Kathy L. Cooksey, Simeon Bird, *accepted to MNRAS*.
- *A Multi-Fidelity Emulator for the Lyman- $\alpha$  Forest Flux Power Spectrum*  
M.A. Fernandez, **Ming-Feng Ho**, Simeon Bird, *MNRAS*, Dec., 2022.
- *Multi-Fidelity Emulation for the Matter Power Spectrum using Gaussian Processes*  
**Ming-Feng Ho**, Simeon Bird, Christian R. Shelton, *MNRAS*, Jan., 2022.
- *Damped Lyman-alpha Absorbers from Sloan Digital Sky Survey DR16Q with Gaussian processes*  
**Ming-Feng Ho**, Simeon Bird, and Roman Garnett, *MNRAS*, Jul., 2021.
- *Automated measurement of quasar redshift with a Gaussian process*  
Leah Fauber, **Ming-Feng Ho**, Simeon Bird, Christian R. Shelton, Roman Garnett, Ishita Korde, *MNRAS*, Sep., 2020.
- *Detecting multiple DLAs per spectrum in SDSS DR12 with Gaussian processes*  
**Ming-Feng Ho**, Simeon Bird, and Roman Garnett, *MNRAS*, Jun., 2020.

### Co-author papers with important software contributions

- *Cosmological Constraints from the eBOSS Lya Forest using the PRIYA Simulations*  
Martin Fernandez, Simeon Bird, **Ming-Feng Ho**, *submitted to JCAP*.
- *PRIYA: A New Suite of Lyman-alpha Forest Simulations for Cosmology*  
Simeon Bird, Martin Fernandez, **Ming-Feng Ho**, Mahdi Qezlou, Reza Monadi, Yueying Ni, Nianyi Chen, Rupert Croft, Tiziana Di Matteo, *submitted to JCAP*.

### Others

- *Disentangling the Dark Mass Spectrum with Photometric Microlensing Surveys*  
Scott E. Perkins, Peter McGill, Willian Dawson, Natasha Abrams, Casey Y. Lam, **Ming-Feng Ho**, Jessica Lu, Simeon Bird, Kerianne Pruett, Nathan Golovich, George Chapline, and James Barbieri, *submitted to A&A*.
- *AMiBA: Cluster Sunyaev-Zel'dovich Effect Observations with the Expanded 13-Element Array*  
K.-Y. Lin, et. al. (**M.-F. Ho** in co-authorship), *APJ*, Oct., 2016.

## SCIENTIFIC PRESENTATIONS


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### Summary

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

### Selected Talks

- *Contributed Talk: Royal Astronomical Society 1D ML (topic: GP-DLA finder)* [YouTube 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
- *Contributed Talk: Cosmology from home (topic: MF emulator)* [YouTube Video] Jul 2022

· *Contributed Talk: Cosmology from home (topic: GP-DLA finder)*  Video]

*Sep 2021*

## SERVICE


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### Selected service

- Referee for Physical Review D, Astrophysical Journal, and MNRAS *2021 - present*
- P&A PeER Mentorship (PAPER) Leader *Spring 2023 - present*
- P&A Student Seminar (PASS) Founder *Spring 2022 - Winter 2023*
- P&A Graduate Student Association Secretary *2021*
- UC Astronomy Osterbrock Sierra Conference Co-I *2021*

## PUBLIC OUTREACH

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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

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**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

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