

# MING-FENG HO

📧 [jibancat.github.io](https://jibancat.github.io)

✉ [mho026@ucr.edu](mailto:mho026@ucr.edu)

## EDUCATION

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<b>University of California, Riverside (UCR)</b> , Riverside, United States	<i>2018 - Present</i>
Ph.D. student in Physics & Astronomy	
NASA FINESST FI	<i>2021 - Present</i>
<b>National Taiwan University (NTU)</b> , Taipei, Taiwan	<i>2016 - 2018</i>
M.S. in Astrophysics	
<b>National Taiwan University (NTU)</b> , Taipei, Taiwan	<i>2010 - 2014</i>
B.S. in Physics	

## RESEARCH INTERESTS

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(Keywords) Cosmology, intergalactic medium,  $\text{Ly}\alpha$  forest, Gaussian processes, emulation, Bayesian statistics, machine learning, black holes.

## RESEARCH EXPERIENCE

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<b>Graduate Student Researcher</b>	Riverside, CA
<i>Department of Physics &amp; Astronomy, University of California</i>	<i>September 2018 - Present</i>

- 1. Multi-fidelity emulation for cosmological simulations.
- 2. Automate the detection of damped  $\text{Ly}\alpha$  absorbers (DLAs) using Gaussian processes.
- 3. Analyze black hole population using a Bayesian hierarchical model.

<b>Graduate Research Assistant</b>	Taipei, Taiwan
<i>Graduate Institute of Astrophysics, National Taiwan University</i>	<i>August 2016 - February 2018</i>

- Generate spherical convolutional feature maps on HEALPix grids. (🐱 [jibanCat/Conv1d-HEALPix](#))

<b>Undergraduate Researcher</b>	Taipei, Taiwan
<i>Department of Physics, National Taiwan University</i>	<i>June 2013 - August 2014</i>

- **Instrumental:** Calibrate 13 element AMiBA array, an interferometer radio telescope using Sunyaev-Zel'dovich effect.

## ACADEMIC ACHIEVEMENTS

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

## COLLABORATION & MENTORING EXPERIENCE


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### Project Instructor

*Department of Physics & Astronomy, University of California*

Riverside, CA

*September 2020 - March 2022*

- Mentor high school students (Emma Shah and Rafael Rosales) on science fair projects on using Gaussian process to analyze quasar spectra. (Gold medal in the county competition) ( [jibanCat/gpy\\_dla\\_detection](#))

### Team Lead

*Data Science Challenge, Lawrence Livermore National Laboratory (LLNL)*

Virtual

*September 2021*


- Lead a team of CS undergrads to build machine learning/deep learning models for star-galaxy classification and asteroid detection.

### Research Assistant

*Institute of Chinese Literature and Philosophy, Academia Sinica*

Taipei, Taiwan

*March 2018 - August 2018*

- Hired as a programmer for an interdisciplinary text mining and machine learning project between department of Literature, Computer Science, and History. ( [jibanCat/DigitalHumanities](#))



## PUBLICATIONS

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### Papers


- *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*.
- *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, *submitted to MNRAS*.
- *A Multi-Fidelity Emulator for the Lyman- $\alpha$  Forest Flux Power Spectrum*  
M.A. Fernandez, **Ming-Feng Ho**, Simeon Bird, *accepted to MNRAS, 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*.
- *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*.

### Selected Talks

- *Invited Talk: Multi-Fidelity Emulation for Matter Power Spectrum and Ly $\alpha$  Flux Power Spectrum*  
**Ming-Feng Ho**, M.A. Fernandez, Simeon Bird, Christian R. Shelton, KICP, January 2023,
- *Contributed Talk: Multi-Fidelity Emulation for Matter Power Spectrum and Ly $\alpha$  Flux Power Spectrum*  
**Ming-Feng Ho**, M.A. Fernandez, Simeon Bird, Christian R. Shelton, Cosmology from home, July 2022, [ Video].
- *Contributed Talk: Finding Strong Ly $\alpha$  Absorbers in the Shadows of Quasars with Bayesian Machine Learning*  
**Ming-Feng Ho**, Simeon Bird, Roman Garnett, Cosmology from home, September 2020, [ Video].

## SERVICE & OUTREACH

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1. Mentor of Physics and Astronomy PeER Mentorship (PAPER) *2023*
2. Founder of UCR's Physics and Astronomy Student Seminar (PASS) *2022*
3. Co-I of UC Astronomy Osterbrock Sierra Conference *2021*
4. Secretary of Physics Graduate Student Association *2021*
5. Volunteer in UCR's Stargazing Series:  Video] *2020 - 2021*
6. Volunteer in UCR's Mercury Transit Public Outreach *2019*
7. Mandatory military service, Taiwan *2014 - 2015*