

# HUIMIN QU

Sydney Institute for Astronomy, 423D A28, The University of Sydney

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Astrophysics PhD candidate with expertise in Bayesian inference, gravitational lens modeling, and developing data-driven methodologies for complex astronomical datasets.

## EDUCATION

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**Ph.D. Candidate**, The University of Sydney

Mar 2023 – Sep 2026 (*expected submission*)

Advisor: Geraint F. Lewis

*Reconstructing the dark matter properties of lensing galaxies in the strong gravitational lensing regime.*

**B.Sc. (Honours)**, Xiamen University

Sep 2018 - Jun 2022

Major: Astronomy GPA: 3.91/4.00 Rank: 1%

*Growths of Stellar-mass Black Holes in the Center of Gamma-ray Bursts and the Lower Mass Gap*

## SKILLS

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**Programming:** Python, JAX, Shell, Git, C++; experience with HPC, MPI and GPU acceleration

**Quantitative Skills:** Bayesian data analysis, joint modeling, optimization algorithms (PSO, SVI), sampling algorithms including HMC, machine learning algorithms

**Software development:** Extended Lenstronomy to enable robust multi-band modeling with astrometric offsets for large survey datasets.

## PUBLICATIONS

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1. **Qu H.-M.**, et al., Revealing the Mass Structure of a Galaxy-Galaxy Hyperbolic Umbilic Lens with Gravitational Lensing and Kinematics, in prep.
2. **Qu H.-M.**, et al., Ground- to Space-Based Lens Reconstructions: Comparing HST and PISCO Inferences for Eight AGEL Systems, in prep.
3. Salama N., Ballard D. J., **Qu H.-M.**, Lewis G. F., Compound Microlensing in J1721+8842: the Einstein Zig-Zag Gravitational Lens, submitted to *MNRAS*.
4. **Qu H.-M.**, Ballard D. J., Lewis G. F., Glazebrook K., Stark A., et al., Multi-band Reconstruction of Sixteen Gravitational Lens Systems using PISCO data, *MNRAS*, under review (minor revisions submitted).
5. Barone T. M., Vasan G. C. K., Tran K.-V., et al. (including **Qu H.-M.**), The AGEL Survey Data Release 2: A Gravitational Lens Sample for Galaxy Evolution and Cosmology, *AJ* accepted.
6. **Qu H.-M.**, Liu T., Revisiting black hole hyperaccretion in the center of gamma-ray bursts for the lower mass gap, *ApJ* 929, 83 (2022).
7. Liu T., Qi Y.-Q. Cai Z.-Y., Sun M.-Y., **Qu H.-M.**, et al., Neutrino-dominated accretion flows: second nucleosynthesis factory in core-collapse supernovae and regulation of iron markets in galaxies, *ApJ* 920, 5 (2021).

## CONFERENCE & SEMINAR TALKS

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**ASA ECR Symposium Talk**

RSAA, ANU, Canberra, Australia, 2026 (*Accepted*)

44th International Workshop on Bayesian Inference and Maximum Entropy Methods in Science and Engineering (**MaxEnt 2025**)

Auckland, New Zealand, Dec 2025

**Visitor Talk**

Technical University of Munich, Garching, Germany Oct 2025

**1st Workshop Scaling Up Lensing**

*Liège, Belgium Oct 2025*

**ASA Annual Science Meeting**

*Adelaide, Australia, Jul 2025*

School of Physics HDR Symposium

*USYD, Sydney, Australia Jun 2025*

**Dark Matter under the Gravitational Lens**

*Hong Kong, China Apr 2025*

Mount Stromlo Student Seminar

*Canberra, Australia Sep 2024*

Undergraduate Astronomy Symposium of Peking University

*Remote Sep 2020*

## SELECTED HONORS & AWARDS

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International Research Training Program (RTP) Scholarship

*Mar 2023 – Sep 2026 (expected)*

*Approximately 30 awards per year in this category at USYD*

ASA Student Travel Grant, AUD2,500

*2025*

Hunstead Support Scholarship \$5000 Outstanding Undergraduate Student Award, Xiamen University  
*2022*

National Scholarship, PRC Ministry of Education, three times, total ¥24,000

*2019–2021*

Guangqi Fellowship, Shanghai Astronomical Observatory, CAS, total ¥14,000

*2019–2022*

Second Prize, 10<sup>th</sup> China Undergraduate Physicists Tournament (CUPT)

*Aug 2019*

*(First Prize in East China Division, May 2019)*

## SUMMER SCHOOLS

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ANITA Summer School

*Mount Stromlo Observatory, 2025*

*Program: Computational Multiphysics Hydrodynamics*

HPC and Data in Astrophysics

*Remote, 2024*

CSST Summer School of Galaxy Sciences

*Remote, 2022*

## TEACHING

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**Tutor & Demonstrator** (PHYS1001–1003)

*USYD, Australia, 2024–2025*

**Tutor** (PHYS4123 *General Relativity and Cosmology*)

**Tutor** (Modern Cosmology; High-Energy Astrophysics)

*XMU, China, 2021–2022*

## REFERENCES

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**Prof. Geraint F. Lewis**

*The University of Sydney, Sydney, Australia*

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**Prof. Karl Glazebrook**

*Swinburne University of Technology, Melbourne, Australia*

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**Dr. Daniel J. Ballard**

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