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

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

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

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* accepted.

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

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

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^{th} China Undergraduate Physicists Tournament (CUPT) *Aug 2019*
(First Prize in East China Division, May 2019)

SUMMER SCHOOLS

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

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

Prof. Geraint F. Lewis *The University of Sydney, Sydney, Australia*
✉ geraint.lewis@sydney.edu.au

Prof. Karl Glazebrook *Swinburne University of Technology, Melbourne, Australia*
✉ kglazebrook@swin.edu.au

Dr. Daniel J. Ballard *The University of Sydney, Sydney, Australia*
✉ daniel.ballard@sydney.edu.au