HUIMIN QU

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

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Astrophysics PhD candidate experienced in Bayesian inference, gravitational lens modeling, and multi-wavelength data analysis.

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++, Fortran; experience with HPC and MPI

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., Microlensing^2 of the multiply imaged quasar in J1721+8842, the Double Source Plane Einstein Zig-Zag Gravitational Lens, to be submitted soon.

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* 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

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 (Accepted)*

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*
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, 10th 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	