Minghao Guo

Personal Information

Email: mhguo@princeton.edu
Homepage: mh-guo.github.io
Address: Peyton Hall, Princeton University, Princeton, NJ 08544, USA
ORCID: orcid.org/0000-0002-3680-5420

Education

Princeton University — Princeton, US
Graduate Student, Department of Astrophysical Sciences — Sep. 2021 – Expected 2026

Peking University — Beijing, CN
Bachelor of Science in Physics, Yuanpei College — Sep. 2016 – July 2021

- Thesis: A Numerical Study of Scalar-tensor Gravity Theory

Research Interests

- Black hole (BH) physics, high energy astrophysics, accretion disks, active galactic nuclei (AGN)
- Galaxy dynamics and evolution, galaxy structure
- Modified gravity, neutron stars, pulsars, gravitational waves, dark matter
- Numerical simulations, Numerical methods, New numerical techniques

Publications

1. **Guo, Minghao**, James M. Stone, Eliot Quataert, and Chang-Goo Kim, "Magnetized Accretion onto and Feedback from Supermassive Black Holes in Elliptical Galaxies," arXiv e-prints , arXiv:2405.11711 (2024), arXiv:2405.11711 [astro-ph.HE] .
2. Rebecca Diesing, **Guo, Minghao**, Chang-Goo Kim, James Stone, and Damiano Caprioli, "Nonthermal Signatures of Radiative Supernova Remnants," arXiv e-prints , arXiv:2404.15396 (2024), arXiv:2404.15396 [astro-ph.HE] .
3. **Guo, Minghao**, James M. Stone, Chang-Goo Kim, and Eliot Quataert, "Toward Horizon-scale Accretion onto Supermassive Black Holes in Elliptical Galaxies," ApJ **946**, 26 (2023), arXiv:2211.05131 [astro-ph.HE] .
4. **Guo, Minghao**, Junjie Zhao, and Lijing Shao, "Extended reduced-order surrogate models for scalar-tensor gravity in the strong field and applications to binary pulsars and gravitational waves," PhRvD **104**, 104065 (2021), arXiv:2106.01622 [gr-qc] .
5. **Guo, Minghao**, Kohei Inayoshi, Tomonari Michiyama, and Luis C. Ho, "Hunting for Wandering Massive Black Holes," ApJ **901**, 39 (2020), arXiv:2006.08203 [astro-ph.HE] .
6. **Guo, Minghao**, Min Du, Luis C. Ho, Victor P. Debattista, and Dongyao Zhao, "A New Channel of Bulge Formation via the Destruction of Short Bars," ApJ **888**, 65 (2020), arXiv:1911.07002 [astro-ph.GA] .

References

Charles A. Young Professor of Astronomy, Eliot Quataert — Princeton University
quataert@princeton.edu

Professor James M. Stone — Institute for Advanced Study
jmstone@ias.edu

Director, Chair Professor Luis C. Ho — Peking University
lho.pku@gmail.com

Professor Kohei Inayoshi — Peking University
inayoshi.pku@gmail.com

Professor Lijing Shao — Peking University
lshao@pku.edu.cn

Honors and Awards

Weiming Bachelor	June 2021
Yuanpei Outstanding Young Scholars	Dec 2020
Lin-bridge First Prize for Undergraduate Research	Sep. 2020
Yuanpei College First Award for Undergraduate Research	June 2020
Xingcheng Award for Undergraduate Research	May 2019
National Undergraduate Research & Training Program	May 2019
Peking University Scholarship for Outstanding Freshmen	Sep. 2016

Conference & Workshp

Harvard BHI Workshop: Bridging Scales in the Black Hole Accretion-Feedback Problem — May 2024
(Oral presentation) *Multi-Scale Simulations of Galaxy-SMBH Feeding*

KITP Program: Turbulence in Astrophysical Environments — Jan. 2024
(Oral presentation) *Toward Horizon-scale Accretion onto Supermassive Black Holes in Elliptical Galaxies*

Black Holes on Broadway: The Next Generation of AGN Models in Galaxy Formation — Dec. 2023
(Oral presentation) *Toward Horizon-scale Accretion onto Supermassive Black Holes in Elliptical Galaxies*

Galaxy Formation in Hangzhou: Observations and Physics of AGN Feedback — Oct. 2023
(Oral presentation) *Toward Horizon-scale Accretion onto Supermassive Black Holes in Elliptical Galaxies*

The second Athena++ Workshop — May 2023
(Oral presentation) *Toward Horizon-scale Accretion onto Supermassive Black Holes in Elliptical Galaxies*

Learning the Universe Annual Meeting — Sep. 2022
(Oral presentation) *Accretion of Supermassive Black Holes in Elliptical Galaxies*

The 240th meeting of the AAS — June 2022
(Poster presentation) *Accretion of Supermassive Black Holes in Elliptical Galaxies*

2020 PKU-DoA Undergraduate Astronomy Symposium — Sep. 2020
(Oral presentation) *Hunting for Wandering Massive Black Holes*

2019 PKU-DoA Undergraduate Astronomy Symposium — Sep. 2019
(Oral presentation) *A New Channel of Bulge Formation via the Destruction of Short Bars*

2019 Annual Meeting of Chinese Astronomical Society — Sep. 2019
(Oral presentation) *A New Channel of Bulge Formation via the Destruction of Short Bars*

IAU Symposium 353: Galactic Dynamics in the Era of Large Surveys — June 2019
(Poster presentation) *The Role of Short Bar Destruction in Regulating the Co-evolution of Black Holes and Bulges*

Technical Skills

Programming: Proficient in Python, C/C++, LaTeX, Mathematica, Git; Basic knowledge of Matlab and Fortran.
Software and Packages: AthenaK, Athena++, MPI, OMP, cuda, SymPy, yt, emcee, VisIt, ParaView, PLUTO, IRAF, GALFIT
Techniques: Massive parallel computing on supercomputer, dataset analyzing and visualization.