Yuanhong Qu

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Research Interests

My research has been focused on understanding the underlying physics of Fast Radio Bursts and Long Period Radio Transients. My areas of expertise include plasma physics, relativity physics, magnetohydrodynamics, radiation transfer and magneto-elastic dynamics.

Education

University of Nevada, Las Vegas — Las Vegas, Nevada, USA
Ph.D. candidate in Astronomy. Advisor: Prof. Bing Zhang — Aug 2021–May 2026 (expect)

Tianjin Normal University — Tianjin, China
B.S. in Physics (highest distinction) — Sep 2017–June 2021

Publications

All paper (22 on ADS) citations: 372, h-index: 10; **first-author citations**: 148, h-index: 5.

Leading Author Publications (8 on ADS):

1. **Qu, Y.** & Bransgrove, A. Three-Dimensional Numerical Simulations of Magnetar Crust Quakes. *arXiv e-prints,* arXiv:2508.12567. arXiv: 2508.12567 [astro-ph.HE] (Aug. 2025).
2. **Qu, Y.**, Zhang, B. & Kumar, P. Polarization Angle Orthogonal Jumps in Fast Radio Bursts. *arXiv e-prints,* arXiv:2504.07449. arXiv: 2504.07449 [astro-ph.HE] (Apr. 2025).
3. **Qu, Y.** & Zhang, B. Magnetic Interactions in White Dwarf Binaries as Mechanism for Long-period Radio Transients. *ApJ* **981,** 34. arXiv: 2409.05978 [astro-ph.HE] (Mar. 2025).
4. **Qu, Y.** & Zhang, B. Coherent Inverse Compton Scattering in Fast Radio Bursts Revisited. *ApJ* **972,** 124. arXiv: 2404.11948 [astro-ph.HE] (Sept. 2024).
5. **Qu, Y.** & Zhang, B. Polarization of fast radio bursts: radiation mechanisms and propagation effects. *MNRAS* **522,** 2448–2477. arXiv: 2302.09697 [astro-ph.HE] (June 2023).
6. **Qu, Y.**, Zhang, B. & Kumar, P. The plasma suppression effect can be ignored in realistic FRB models invoking bunched coherent radio emission. *MNRAS* **518,** 66–74. arXiv: 2111.12269 [astro-ph.HE] (Jan. 2023).
7. **Qu, Y.**, Kumar, P. & Zhang, B. Transparency of fast radio burst waves in magnetar magnetospheres. *MNRAS* **515,** 2020–2031. arXiv: 2204.10953 [astro-ph.HE] (Sept. 2022).
8. **Qu, Y.** & Zhang, B. Neutrino emission from fast radio burst-emitting magnetars. *MNRAS* **511,** 972–979. arXiv: 2111.04121 [astro-ph.HE] (Mar. 2022).

Contributing Author Publications:

9. Liu, X., Xu, H., Niu, J., *et al.* Polarization Position Angle Swing and the Rotating Vector Model of Repeating Fast Radio Bursts. *ApJ* **988,** 175 (Aug. 2025).
10. Zhang, J.-S., Wang, T.-C., Wang, P., *et al.* A prolific repeating fast radio burst source and a crisis of the magnetar model. *arXiv e-prints,* arXiv:2507.14707. arXiv: 2507.14707 [astro-ph.HE] (July 2025).
11. Zhou, D., Wang, P., Fang, J., *et al.* Searching for periodic signals and quasi-periodic oscillations from an extremely active cycle of FRB 20240114A. *arXiv e-prints,* arXiv:2507.14708. arXiv: 2507.14708 [astro-ph.HE] (July 2025).
12. Zhang, L.-X., Tian, S., Shen, J., *et al.* Investigating FRB 20240114A with FAST: Morphological Classification and Drifting Rate Measurements in a Burst-Cluster Framework. *arXiv e-prints,* arXiv:2507.14711. arXiv: 2507.14711 [astro-ph.HE] (July 2025).
13. Wang, P., Zhang, J. S., Yang, Y. P., *et al.* Decadal evolution of a repeating fast radio burst source. *arXiv e-prints,* arXiv:2507.15790. arXiv: 2507.15790 [astro-ph.HE] (July 2025).
14. Feng, Y., Zhang, Y.-K., Xie, J., *et al.* Multi-year polarimetric monitoring of four CHIME-discovered repeating fast radio bursts with FAST. *Science China Physics, Mechanics, and Astronomy* **68,** 289511. arXiv: 2507.02355 [astro-ph.HE] (Aug. 2025).
15. Zhou, D., Han, J. L., Zhang, B., *et al.* Bright Bursts with Submillisecond Structures of FRB 20230607A in a Highly Magnetized Environment. *ApJ* **988,** 41. arXiv: 2504.11173 [astro-ph.HE] (July 2025).
16. Xie, J.-T., Feng, Y., Li, D., *et al.* Polarization Characteristics of the Hyperactive FRB 20240114A. *ApJS* **278,** 49. arXiv: 2410.10172 [astro-ph.HE] (June 2025).
17. Feng, Y., Li, D., Zhang, Y.-K., *et al.* An Extremely Active Repeating Fast Radio Burst Source in a Likely Nonmagneto-ionic Environment. *ApJ* **974,** 296. arXiv: 2304.14671 [astro-ph.HE] (Oct. 2024).
18. Kumar, P., **Qu, Y.** & Zhang, B. The Origins of Narrow Spectra of Fast Radio Bursts. *ApJ* **974,** 160. arXiv: 2406.01266 [astro-ph.HE] (Oct. 2024).
19. Jiang, J. C., Xu, J. W., Niu, J. R., *et al.* Ninety percent circular polarization detected in a repeating fast radio burst. *National Science Review* **12,** nwae293. arXiv: 2408.03313 [astro-ph.HE] (Sept. 2024).
20. Niu, J. R., Wang, W. Y., Jiang, J. C., *et al.* Sudden Polarization Angle Jumps of the Repeating Fast Radio Burst FRB 20201124A. *ApJL* **972,** L20. arXiv: 2407.10540 [astro-ph.HE] (Sept. 2024).
21. Zhang, Y.-K., Li, D., Zhang, B., *et al.* FAST Observations of FRB 20220912A: Burst Properties and Polarization Characteristics. *ApJ* **955,** 142. arXiv: 2304.14665 [astro-ph.HE] (Oct. 2023).
22. Xiao, S., Yang, J.-J., Luo, X.-H., *et al.* The Minimum Variation Timescales of X-Ray Bursts from SGR J1935+2154. *ApJS* **268,** 5. arXiv: 2307.07079 [astro-ph.HE] (Sept. 2023).

Seminars & Conference Talks

- KIPAC Tea Talk (SLAC National Accelerator Laboratory) — Sep 26, 2025
- Astronomy Tea Talk (Caltech) — Sep 15, 2025
- Space Sciences Laboratory & Multi-RAPTOR Forum (UC Berkeley) — Sep 02 & 03, 2025

- Frontiers of Relativistic Plasma Physics in Astrophysics and Laboratory Experiments (KITP conference) Aug 20, 2025
- The Dynamic Radio Sky 2025 (Sydney, Australia) July 31, 2025
- (**invited**)3nd Fast Radio Bursts Workshop (Beijing, China) Jun 05, 2025
- (**invited**)Commensal Real-time ASKAP Fast Transients (CRAFT) meeting May 07, 2025
- KIPAC Compact Objects Group meeting (Stanford) & KIPAC Tea (SLAC) Apr 22 & 25, 2025
- Fast Radio Burst Frontiers: Unveiling Their Origins with Multi-Wavelength and Multi-Messenger Synergy (Pittsburgh, Pennsylvania) Mar 03, 2025
- NCfA Multimessenger Symposium (University of Nevada, Las Vegas) Feb 27, 2025
- (**invited**)2nd Fast Radio Bursts Workshop (Wuhan, China) Jun 06, 2024
- Princeton University (Thunch) Mar 28, 2024
- NCfA Multimessenger Symposium (University of Nevada, Las Vegas) Mar 01, 2024
- DSA-2000 Key Science (Community Zoom Meeting) Feb 15, 2024
- Colombia University (Theoretical High Energy Astrophysics Seminar) Feb 02, 2024
- (**invited**)Washington University in St.Louis (Space Sciences/Astrophysics Seminar) Oct 02, 2023
- (**invited**)Yunnan Observatory of Chinese Academy of Sciences (Astrophysics Lunch Talk) Jun 02, 2023
- (**invited**)Yunnan University (Astrophysics Lunch Talk) May 29, 2023
- (**invited**)The Institute of High Energy Physics of the Chinese Academy of Sciences (Seminar) May 26, 2023
- (**invited**)Peking University (Astrophysics Lunch Talk) May 25, 2023
- The National Astronomical Observatories of the Chinese Academy of Sciences (Seminar) May 24, 2023
- Beijing Normal University (Astrophysics Lunch Talk) May 23, 2023
- (**invited**)Nanjing University (Seminar) May 14, 2023
- (**invited**)Midwest Magnetic Fields Workshop 2023 (Wisconsin-Madison) May 23, 2023
- Fast Radio Bursts Conference (Hefei, China) May 08, 2023
- (**invited**)Zhejiang Lab (Astrophysics Lunch Talk) Mar 02, 2023
- (**invited**)Yukawa Institute for Theoretical Physics, Kyoto University (Fast Radio Bursts and Cosmic Transients Conference) Jun 07, 2022
- Swinburne University of Technology (Australasian pulsar/FRB videoconference) Mar 08, 2022
- (**invited**)The Ohio State University (CCAPP AstroParticle Lunch Talk) Nov 19, 2021

Posters

- The 22nd meeting of the AAS High Energy Astrophysics Division (HEAD) Oct 12-16, 2025
  On the Physical Origins of Long Period Radio Transients

- KITP Frontiers of Relativistic Plasma Physics in Astrophysics and Laboratory Experiments — Aug 18, 2025
  On the Physical Origins of Long Period Radio Transients
- Simons Summer School "Extreme Plasmas in the Universe" SCEECS — June 07, 2024
  Coherent Inverse Compton Scattering in Fast Radio Bursts
- Fifth Purdue Workshop on Relativistic Plasma Astrophysics — May 06, 2024
  Coherent Inverse Compton Scattering in Fast Radio Bursts
- Australia-China Workshop on Astrophysics — July 31, 2023
  Polarization of Fast Radio Bursts: radiation mechanisms and propagation effects
- NCfA Multimessenger Symposium — Feb 22, 2023
  Neutrino emission from FRB-emitting magnetars
- NCfA Multimessenger Symposium — Feb 22, 2023
  Polarization of Fast Radio Bursts: radiation mechanisms and propagation effects

Proposals

- GMRT proposal 2025: 45 hours (Co-investigator)
  Probing the Nature of the First X-ray Pulsed Long-Period Radio Transient (PI: Andy Wang)

Grants, Awards and Assistantships

- UNLV Top Tier Doctoral Graduate Research Assistantship — 2024 Fall–current
- UT Austin Research Assistantship — 2025 Fall
- UNLV Teaching Assistantship — 2022 Spring–2024 Spring
- UT Austin Research Scientist Associate I Assistantship — 2022 Summer
- UNLV Top Tier Doctoral Graduate Research Assistantship — 2021 Fall

Service and Outreach

- **Referee** of Nature Astronomy, ApJ, MNRAS, and JHEAP — 2023–Current
- **Referee** of FAST (Five-hundred-meter Aperture Spherical Telescope) Proposal — 2025–Current
- College of Science Research Showcase (**Speaker**) — Apr 10, 2025
- **Judge of Beal Bank Science Fair** — Mar 27, 2025
  Elementary, middle, and high school divisions
- Las Vegas Astronomical Society — Jan 18, 2025
  Public Talk*: Fast Radio Bursts*
- Volunteer at Astronomy on Tap, Las Vegas (∼1/season) — 2021–Current
- 26th Annual Graduate & Professional Student Research Forum, Las Vegas — Apr 06, 2024
- **Judge of Beal Bank Science Fair** — Mar 21, 2024
  Elementary, middle, and high school divisions
- Journal club and Astro coffee in UNLV (**Speaker** $\sim$ 1/semester) — 2021–Current

Major collaboration

- FAST FRB Key Science Project 2022–Current

Membership

- American Astronomical Society (AAS) 2025–Current

Teaching & Grader

- **Lecturer & Grader** Physics 151 L: General Physics I (Mechanics & Thermal Physics) 2023-2024
- **Grader** PHYS 180: Physics for Scientists and Engineers I Spring semester 2022

Skills

- **Languages:** Python, Linux, LaTeX
- **Softwares:** RUNKO

References

- **Prof. Bing Zhang** (PhD Advisor)
  University of Nevada, Las Vegas, Nevada, USA
  bing.zhang@unlv.edu
- **Prof. Pawan Kumar**
  University of Texas at Austin Texas, USA
  pk@astro.as.utexas.edu
- **Prof. Lorenzo Sironi**
  Columbia University, New York
  New York, USA
  lsironi@astro.columbia.edu