Yuanhong Qu

Email: yuanhong.qu@unlv.edu
Address: Department of Physics and Astronomy, University of Nevada Las Vegas, Las Vegas, NV 89154, USA
Phone: 702-403-0589

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, special relativity, magnetohydrodynamics, classical electrodynamics and radiation transfer.

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

Research Experience

University of Nevada, Las Vegas — Las Vegas, Nevada
Advisor: Prof. Bing Zhang — Aug 2021-current

The University of Texas at Austin — Austin, Texas
Research Scientist Associate I. Advisor: Prof. Pawan Kumar — June-Aug 2022

Columbia University & Center for Computational Astrophysics — New York
Advisor: Prof. Lorenzo Sironi & Prof. Joonas Nattila — Oct 2024

Publications

All paper (16 on ADS) citations: 250, h-index: 9; **first-author citations**: 112, h-index: 5.

Leading Author Publications:

1. **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).
2. **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).
3. **Qu, Y.** & Zhang, B. Coherent Inverse Compton Scattering in Fast Radio Bursts Revisited. *ApJ* **972,** 124. arXiv: 2404.11948 [astro-ph.HE] (Sept. 2024).
4. **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).

5. **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).
6. **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).
7. **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:

8. Zhou, D., Han, J. L., Zhang, B., *et al.* Bright bursts with sub-millisecond structures of FRB 20230607A in a highly magnetized environment. *arXiv e-prints,* arXiv:2504.11173. arXiv: 2504.11173 [astro-ph.HE] (Apr. 2025).
9. Liu, X., Xu, H., Niu, J., *et al.* Polarization Position Angle Swing and the Rotating Vector Model of Repeating Fast Radio Bursts. *arXiv e-prints,* arXiv:2504.00391. arXiv: 2504.00391 [astro-ph.HE] (Apr. 2025).
10. Xie, J.-T., Feng, Y., Li, D., *et al.* Polarization Characteristics of the Hyperactive FRB 20240114A. *arXiv e-prints,* arXiv:2410.10172. arXiv: 2410.10172 [astro-ph.HE] (Oct. 2024).
11. 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).
12. 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).
13. Jiang, J. C., Xu, J. W., Niu, J. R., *et al.* Ninety percent circular polarization detected in a repeating fast radio burst. *arXiv e-prints,* arXiv:2408.03313. arXiv: 2408.03313 [astro-ph.HE] (Aug. 2024).
14. 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).
15. 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).
16. 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).

Selected Talks

- (invited) Commensal Real-time ASKAP Fast Transients (CRAFT) group meeting — Apr 29, 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
- (solicited)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)University of Ohio (CCAPP AstroParticle Lunch Talk) Nov 19, 2021

Selected Posters

- Simons Summer School "Extreme Plasmas in the Universe" SCEECS (Coherent Inverse Compton Scattering in Fast Radio Bursts) June 07, 2024
- Fifth Purdue Workshop on Relativistic Plasma Astrophysics (Coherent Inverse Compton Scattering in Fast Radio Bursts) May 06, 2024
- Australia-China Workshop on Astrophysics (Polarization of Fast Radio Bursts: radiation mechanisms and propagation effects) July 31, 2023
- NCfA Multimessenger Symposium (Neutrino emission from FRB-emitting magnetars) Feb 22, 2023
- NCfA Multimessenger Symposium (Polarization of Fast Radio Bursts: radiation mechanisms and propagation effects) Feb 22, 2023

Selected Grants and Awards

- UNLV Top Tier Doctoral Graduate Research Assistantship 2021–current

Selected Service and Outreach

- **Referee** of ApJ, MNRAS and JHEAP 2023–Current
- College of Science Research Showcase (**Speaker**) Apr 10, 2025
- **Judge of Beal Bank Science Fair** Mar 27, 2025
- Las Vegas Astronomical Society (**Public talk**: Fast Radio Bursts) Jan 18, 2025
- Volunteer at Astronomy on Tap, Las Vegas ($\sim$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
- Journal club and Astro coffee in UNLV (**Speaker** $\sim$ 1/semester) 2021–Current

Teaching

- **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