

Qu, Zhijie

Department of Astronomy and Astrophysics
University of Chicago
Chicago, IL 60637
quzhijie@uchicago.edu

ORCID : 0000-0002-2941-646X
Homepage : <https://quzhijie.github.io>
ADS Library ID : Ji7tbpTxSJCxOVkkuOrS3g
Updated : January, 2025

Education and Employment

Assistant Professor, Tsinghua University, 2025-present.

Associate Fellow, KICP, University of Chicago, 2021-2025.

PhD, Astrophysics, University of Michigan, Ann Arbor, 2017-2021.

MS, Astrophysics, University of Michigan, Ann Arbor, 2015-2017.

BS, Astronomy (Graduate with Honors), Peking University, 2011-2015

Scholarships & Awards

2021 - The IAU PhD Prize (Galaxies and Cosmology), IAU.

2021 - The ProQuest Distinguished Dissertation Awards, The University of Michigan.

2020 - Rackham Dissertation Fellowship, The University of Michigan.

2016-2019 - Rackham Travel Awards, The University of Michigan.

2015 - Weiming Physics Scholarship, School of Physics, Peking University.

2015 - Xingcheng Undergrad Research Forum, First Prize, School of Physics, Peking University.

2014 - Science Base Scholarship, Second Prize, Peking University.

2014 - NAOC Scholarship, National Astronomical Observatories, Chinese Academy of Sciences.

2013 - Lin Bridge Scholarship, Department of Astronomy, Peking University.

2013 - Zhang Wenxin Scholarship, School of Physics, Peking University.

Professional Services

Referee of AAS Journals, A&A, MNRAS

External reviewer for HST Cycle 31

Research Advising

7. Eliana Schiller (undergrad @ UChicago), Co-advised with Hsiao-Wen Chen, 2024-present.
6. Wenhao Wang (undergrad @ XMU), 2024-present.
5. Suyash Kumar (Grad @ UChicago), Co-advised with Hsiao-Wen Chen, 2022-present.
4. Zeyang Pan (Grad @ UCAS), 2021-present.
3. Cameron Pratt (Grad @ UMich), Co-advised with Joel N. Bregman, 2020-present,
2. Hang Yang (visiting Grad @ UMich from PMO), Co-advised with Joel Bregman, 2019-present.
1. Ryan Lindley (Undergrad @ UMich), 2019-2021.

Proposals and Grants

15. 2024 - *Chandra*, Cycle 26, 26900274, GO, 190 ks, Co-I (PI: Bregman)
"Identifying the Hosts of Hot Gas Absorption"
14. 2024 - *James Webb Space Telescope*, Cycle 3, 6665, GO, 16.2 hours, Co-I (PI: Beckett)
"DISCS: Direct Imaging Survey of Circumgalactic Structure"
13. 2024 - *Hubble Space Telescope*, Cycle 32, 17815, GO, 20 orbits, Co-I (PI: Beckett)
"DISCS: Direct Imaging Survey of Circumgalactic Structure"
12. 2024 - *Hubble Space Telescope*, Cycle 32, 17803, GO, 51 orbits, Co-I (PI: Johnson)
"The first multi-phase survey of the circumgalactic medium of quasar hosts at $z < 1$ "
11. 2023 - *Hubble Space Telescope*, Cycle 31, 17517, GO, 131 orbits, Co-I (PI: Chen)
"CONTACT: Circumgalactic Observations of Nuv-shifted Transitions Across Cosmic Time"
10. 2022 - NASA Astrophysics Data Analysis Program, **Co-PI** (PI: Chen), \$454.6k
"Probing Feeding and Feedback in the Circumgalactic Medium Using OVI As a Tracer"
9. 2022 - *XMM-Newton*, AO22, 092249, GO, 133 ks, Co-I (PI: Bregman)
"Closing the Baryon Census of Nearby Luminous Spirals with X-ray and tSZ Observations"
8. 2022 - *Hubble Space Telescope*, Cycle 30, 17116, GO, 30 orbits, Co-I (PI: Bregman)
"The Hot Multi-Temperature Gaseous Halos of Galaxies and Groups"
7. 2022 - *Hubble Space Telescope*, Cycle 30, 17049, AR, **Co-PI** (PI: Polzin)
"Elucidating Galaxy Quenching with Absorption Probes of Halos around Low-mass Dwarfs"
6. 2021 - NASA Astrophysics Data Analysis Program, Co-I (PI: Bregman), \$692.8k (\$80.0k goes to U. Chicago)
"Resolving the Hot Halos to the Virial Radius and Beyond in the Local Universe"
5. 2019 - *Hubble Space Telescope*, Cycle 27, 15806, AR, **PI**, \$97.6k
"The Rotation, Accretion, and Mass of the Milky Way Warm Gas Disk and CGM"
4. 2018 - NASA Astrophysics Data Analysis Program, Co-I (PI: Bregman), 526.4k
"Hot Halos of Galaxies and Galaxy Groups-Reservoirs of Baryons and Metals"
3. 2018 - Magellan Telescope, Cycle 2018A, 2 nights, **PI**,
"Host Galaxies of the Mg X/Ne VIII Absorption Systems: LBQS 1435-0134"

2. 2018 - Magellan Telescope, Cycle 2017B, 3 nights, **PI**,
"Host Galaxies of the Mg X/Ne VIII Absorption Systems: PHL 1377"
1. 2017 - *Chandra* X-ray Observatory, Cycle 18, 50 ks, Co-I (PI: Bregman),
"Gaseous Galaxy Halos in the Transition Between Hot and Cold Mode Accretion."

References

Prof. Joel N. Bregman at the University of Michigan, Ann Arbor
Email: jbregman@umich.edu

Prof. Hsiao-Wen Chen at the University of Chicago
Email: hchen@astro.uchicago.edu

Dr. Gwen C. Rudie at Carnegie Observatories
Email: gwen@carnegiescience.edu

Conferences & Talks

18. Nov. 2024 - Contributing talk, Resolving the Circumgalactic Medium and its Impact on Galaxy Evolution, Santa Cruz, Chile.
17. Aug. 2024 - Toward a Holistic Understanding of the Multi-scale, Multiphase Circumgalactic Medium, Aspen, Colorado.
16. Feb. 2024 - Invited talk, "On the Cosmic Ecosystem: Insights from the Multiphase Circumgalactic Medium", Diffuse Gas in Cosmic Ecosystems (DGCE) Science Interest Group.
15. Apr. and Dec. 2023 - Seminars, FDU, XAO, XMU, SYSU, SHAO, SJTU, ZJU, THU, PKU, NAOC, PMO, USTC, NJU, China.
14. Dec. 2023 - Contributing talk, "The Mass Budget of Multiphase Circumgalactic Medium at $z \leq 1$ ", Resolving Galaxy Ecosystems Across All Scales, Hong Kong.
13. Nov. 2023 - Invited talk, Astro Galread Discussion Group, Princeton.
12. Feb. 2023 - Contributing talk, Oases in the Cosmic Desert, "On the thermodynamic properties of the cool CGM at $z < 1$ ", Tempe, Arizona.
11. Aug. 2022 - Instructor, The 1st "High-Resolution X-ray and UV (HiXUV) Spectroscopy Capability Building Workshops", Virtual Workshop.
10. Jan. 2021 - OSU CCAPP Seminar, "Warm-Hot Circumgalactic Medium and its Co-Evolution with Galaxy Disk", Columbus, Ohio.
9. Nov. 2020 - Caltech CGM Seminar, "Warm-Hot Circumgalactic Medium and its Co-Evolution with Galaxy Disk", Pasadena, California.
8. Oct. 2019 - WIM Workshop, Contributing Talk, "The Warm Gas in the MW – Rotation, Accretion, and Mass", Green Bank, West Virginia.
7. Aug. 2018 - XXX IAU General Assembly, "The Mass and Column Densities of Galactic Gaseous Halos", Vienna, Austria.

6. Jul. 2018 - CGM Workshop 2018, Contributing Talk, "The Mass and Column Densities of Galactic Gaseous Halos", Northwestern University, Evanston, Illinois.
5. Mar. 2018 - Seminar, "Understanding the Galaxy Evolution with Gaseous Halos", Peking University, Beijing, China.
4. Mar. 2018 - Colloquium, "Understanding the Galaxy Evolution with Gaseous Halos", The Purple Mountain Observatory, Nanjing, China.
3. Jan. 2018 - 231st AAS Meeting, "The Mass and Absorption Columns of Galactic Gaseous Halos", Washington, DC.
2. Aug. 2017 - 16th HEAD Meeting, "Detection of Possible Intervening Mg X Associated with A Hot Gaseous Galaxy Halo", Sun Valley, Idaho.
1. Jul. 2014 - Fast Pulsar Symposium 3, "Analysis of Short Bursts in AXPs/SGRs", Shanghai, China.

Publications (First-Authored or Corresponding-Authored; *Student)

16. **Zhijie Qu**, Hsiao-Wen Chen, Sean D. Johnson, Gwen C. Rudie, Fakhri S. Zahedy, David DePalma, Joop Schaye, Erin T. Boettcher, Sebastiano Cantalupo, Mandy C. Chen, Claude-André Faucher-Giguère, Jennifer I. Hsiu Li, John S. Mulchaey, Patrick Petitjean, and Marc Rafelski. The Cosmic Ultraviolet Baryon Survey (CUBS). VII. On the Warm-hot Circumgalactic Medium Probed by O VI and Ne VIII at $0.4 < z < 0.7$. *ApJ*, 968(1):8, June 2024
15. **Zhijie Qu**, *Zeyang Pan, Joel N. Bregman, and Jifeng Liu. The XMM-Newton Line Emission Analysis Program (X-LEAP). II. The Multiscale Temperature Structures in the Milky Way Hot Gas. *ApJ*, 965(2):100, April 2024
14. *Zeyang Pan, **Zhijie Qu**, Joel N. Bregman, and Jifeng Liu. The XMM-Newton Line Emission Analysis Program (X-LEAP). I. Emission-line Survey of O VII, O VIII, and Fe L-shell Transitions. *ApJS*, 271(2):62, April 2024
13. **Zhijie Qu**, Hsiao-Wen Chen, Gwen C. Rudie, Sean D. Johnson, Fakhri S. Zahedy, David DePalma, Erin Boettcher, Sebastiano Cantalupo, Mandy C. Chen, Kathy L. Cooksey, Claude-André Faucher-Giguère, Jennifer I. Hsiu Li, Sebastian Lopez, Joop Schaye, and Robert A. Simcoe. The Cosmic Ultraviolet Baryon Survey (CUBS) - VI. Connecting physical properties of the cool circumgalactic medium to galaxies at $z \approx 1$. *MNRAS*, 524(1):512–528, September 2023
12. **Zhijie Qu**, Hsiao-Wen Chen, Gwen C. Rudie, Fakhri S. Zahedy, Sean D. Johnson, Erin Boettcher, Sebastiano Cantalupo, Mandy C. Chen, Kathy L. Cooksey, David DePalma, Claude-André Faucher-Giguère, Michael Rauch, Joop Schaye, and Robert A. Simcoe. The Cosmic Ultraviolet Baryon Survey (CUBS) V: on the thermodynamic properties of the cool circumgalactic medium at $z < 1$. *MNRAS*, 516(4):4882–4897, November 2022
11. **Zhijie Qu**, Dimitra Koutroumpa, Joel N. Bregman, Kip D. Kuntz, and Philip Kaaret. The Solar Cycle Temporal Variation of the Solar Wind Charge Exchange X-Ray Lines. *ApJ*, 930(1):21, May 2022
10. **Zhijie Qu** and Joel N. Bregman. Absorption Line Search through Three Local Group Dwarf Galaxy Halos. *ApJ*, 927(2):228, March 2022
9. **Zhijie Qu**, *Ryan Lindley, and Joel N. Bregman. The Warm Gas in the Milky Way: The Kinematical Model of C IV and Its Connection to Si IV. *ApJ*, 924(2):86, January 2022
8. **Zhijie Qu**, Rui Huang, Joel N. Bregman, and Jiang-Tao Li. An X-Ray- and SZ-bright Diffuse Source toward M31: A Local Hot Bridge. *ApJ*, 907(1):14, January 2021
7. **Zhijie Qu**, Joel N. Bregman, Edmund Hodges-Kluck, Jiang-Tao Li, and *Ryan Lindley. The Warm Gas in the MW: A Kinematical Model. *ApJ*, 894(2):142, May 2020
6. **Zhijie Qu** and Joel N. Bregman. The Warm Gaseous Disk and the Anisotropic Circumgalactic Medium of the Milky Way. *ApJ*, 880(2):89, Aug 2019
5. **Zhijie Qu**, Joel N. Bregman, and Edmund J. Hodges-Kluck. HST/COS Observations of the Warm Ionized Gaseous Halo of NGC 891. *ApJ*, 876(2):101, May 2019
4. **Zhijie Qu** and Joel N. Bregman. The Mass and Absorption Column Densities of Galactic Gaseous Halos. II. The High Ionization State Ions. *ApJ*, 862(1):23, July 2018
3. **Zhijie Qu** and Joel N. Bregman. The Mass and Absorption Columns of Galactic Gaseous Halos. *ApJ*, 856(1):5, March 2018
2. **Zhijie Qu** and Joel N. Bregman. A Hot Gaseous Galaxy Halo Candidate with Mg X Absorption. *ApJ*, 832:189, December 2016

1. **Zhijie Qu**, Zhaosheng Li, Yupeng Chen, Shi Dai, Long Ji, Renxin Xu, and Shu Zhang. The Short Bursts in SGR 1806-20, 1E 1048-5937, and SGR 0501+4516. *PASP*, 127(949):211, March 2015

Publications (Co-Authored)

21. Jing Wang, Dong Yang, Xuchen Lin, Qifeng Huang, **Zhijie Qu**, Hsiao-Wen Chen, Hong Guo, Luis C. Ho, Peng Jiang, Zezhong Liang, Céline Péroux, Lister Staveley-Smith, and Simon Weng. FEASTS: Radial Distribution of HI surface densities down to $0.01 M_{\odot} \text{ pc}^{-2}$ of 35 Nearby Galaxies. *arXiv e-prints*, page arXiv:2501.01289, January 2025
20. Jiang-Tao Li, Xiaodi Yu, Huiyang Mao, Hanxiao Chen, Tiancheng Yang, **Zhijie Qu**, Fuyan Bian, Joel N. Bregman, Zheng Cai, Xiaohui Fan, Taotao Fang, Li Ji, Zhiyuan Ji, Sean D. Johnson, Guoliang Li, Weizhe Liu, Ying-Yi Song, Feige Wang, Tao Wang, Xin Wang, Christina Williams, Mingxuan Xu, Jinyi Yang, Yang Yang, and Xianzhong Zheng. Probing the He II re-Ionization ERA via Absorbing C IV Historical Yield (HIERACHY) II: Project Design, Current Status, and Examples of Initial Data Products. *arXiv e-prints*, page arXiv:2411.05396, November 2024
19. Nishant Mishra, Sean D. Johnson, Gwen C. Rudie, Hsiao-Wen Chen, Joop Schaye, **Zhijie Qu**, Fakhri S. Zahedy, Erin T. Boettcher, Sebastiano Cantalupo, Mandy C. Chen, Claude-André Faucher-Giguère, Jenny E. Greene, Jennifer I. Hsiu Li, Zhuoqi (Will) Liu, Sebastian Lopez, and Patrick Petitjean. The Cosmic Ultraviolet Baryon Survey (CUBS). IX. The Enriched Circumgalactic and Intergalactic Medium Around Star-forming Field Dwarf Galaxies Traced by O VI Absorption. *ApJ*, 976(1):149, November 2024
18. Suyash Kumar, Hsiao-Wen Chen, **Zhijie Qu**, Mandy C. Chen, Fakhri S. Zahedy, Sean D. Johnson, Sowgat Muzahid, and Sebastiano Cantalupo. On the Nature of the C IV-bearing Circumgalactic Medium at $z \sim 1$. *The Open Journal of Astrophysics*, 7:94, October 2024
17. Jing Wang, Xuchen Lin, Lister Staveley-Smith, Dong Yang, Fabian Walter, Zezhong Liang, Yong Shi, Jian Fu, Hong Guo, Luis C. Ho, Shu-ichiro Inutsuka, Fangzhou Jiang, Peng Jiang, **Zhijie Qu**, and Li Shao. FEASTS Combined with Interferometry. II. Significantly Changed H I Surface Densities and Even More Inefficient Star Formation in Galaxy Outer Disks. *ApJ*, 973(1):15, September 2024
16. Joel N. Bregman, Oleg Y. Gnedin, Patrick O. Seitzer, and **Zhijie Qu**. A Type Ia Supernova near a Globular Cluster in the Early-type Galaxy NGC 5353. *ApJL*, 968(1):L6, June 2024
15. Jiang-Tao Li, Li-Yuan Lu, **Zhijie Qu**, Robert A. Benjamin, Joel N. Bregman, Ralf-Jürgen Dettmar, Jayanne English, Taotao Fang, Judith A. Irwin, Yan Jiang, Hui Li, Guilin Liu, Paul Martini, Richard J. Rand, Yelena Stein, Andrew W. Strong, Carlos J. Vargas, Q. Daniel Wang, Jing Wang, Theresa Wiegert, Jianghui Xu, and Yang Yang. eDIG-CHANGES. II. Project Design and Initial Results on NGC 3556. *ApJ*, 967(2):78, June 2024
14. Sean D. Johnson, Zhuoqi (Will) Liu, Jennifer I. Hsiu Li, Joop Schaye, Jenny E. Greene, Sebastiano Cantalupo, Gwen C. Rudie, **Zhijie Qu**, Hsiao-Wen Chen, Marc Rafelski, Sowgat Muzahid, Mandy C. Chen, Thierry Contini, Wolfram Kollatschny, Nishant Mishra, Patrick Petitjean, Michael Rauch, and Fakhri S. Zahedy. Discovery of Optically Emitting Circumgalactic Nebulae around the Majority of UV-luminous Quasars at Intermediate Redshift. *ApJ*, 966(2):218, May 2024
13. Jennifer I. Hsiu Li, Sean D. Johnson, Erin Boettcher, Sebastiano Cantalupo, Hsiao-Wen Chen, Mandy C. Chen, David R. DePalma, Zhuoqi (Will) Liu, Nishant Mishra, Patrick Petitjean, **Zhijie Qu**, Gwen C. Rudie, Joop Schaye, and Fakhri S. Zahedy. The Cosmic Ultraviolet Baryon Survey (CUBS). VIII. Group Environment of the Most Luminous Quasars at $z \approx 1$. *ApJ*, 965(2):143, April 2024

12. *Cameron T. Pratt, **Zhijie Qu**, Joel N. Bregman, and Christopher J. Miller. Optimizing NILC Extractions of the Thermal Sunyaev–Zel’Dovich Effect with Deep Learning. *ApJ*, 964(2):122, April 2024
11. Mandy C. Chen, Hsiao-Wen Chen, Michael Rauch, **Zhijie Qu**, Sean D. Johnson, Joop Schaye, Gwen C. Rudie, Jennifer I. Hsiu Li, Zhuoqi (Will) Liu, Fakhri S. Zahedy, Sebastiano Cantalupo, and Erin Boettcher. An Ensemble Study of Turbulence in Extended QSO Nebulae at $z \approx 0.5\text{--}1$. *ApJ*, 962(1):98, February 2024
10. Hsiao-Wen Chen, **Zhijie Qu**, Michael Rauch, Mandy C. Chen, Fakhri S. Zahedy, Sean D. Johnson, Joop Schaye, Gwen C. Rudie, Erin Boettcher, Sebastiano Cantalupo, Claude-André Faucher-Giguère, Jenny E. Greene, Sebastian Lopez, and Robert A. Simcoe. The Cosmic Ultraviolet Baryon Survey: Empirical Characterization of Turbulence in the Cool Circumgalactic Medium. *ApJL*, 955(1):L25, September 2023
9. Joel Bregman, Renyue Cen, Yang Chen, Wei Cui, Taotao Fang, Fulai Guo, Edmund Hodges-Kluck, Rui Huang, Luis C. Ho, Li Ji, Suoqing Ji, Xi Kang, Xiaoyu Lai, Hui Li, Jiangtao Li, Miao Li, Xiangdong Li, Yuan Li, Zhaosheng Li, Guiyun Liang, Helei Liu, Wenhao Liu, Fangjun Lu, Junjie Mao, Gabriele Ponti, **Zhijie Qu**, Chenxi Shan, Lijing Shao, Fangzheng Shi, Xinwen Shu, Lei Sun, Mouyuan Sun, Hao Tong, Junfeng Wang, Junxian Wang, Q. Daniel Wang, Song Wang, Tinggui Wang, Weiyang Wang, Zhongxiang Wang, Dandan Xu, Haiguang Xu, Heng Xu, Renxin Xu, Xiaojie Xu, Yongquan Xue, Hang Yang, Feng Yuan, Shuinai Zhang, Yuning Zhang, Zhongli Zhang, Yuanyuan Zhao, Enping Zhou, and Ping Zhou. Scientific objectives of the Hot Universe Baryon Surveyor (HUBS) mission. *Science China Physics, Mechanics, and Astronomy*, 66(9):299513, September 2023
8. Rui Huang, Jiang-Tao Li, Wei Cui, Joel N. Bregman, Xiang-Dong Li, Gabriele Ponti, **Zhijie Qu**, Q. Daniel Wang, and Yi Zhang. An XMM-Newton View of the Andromeda Galaxy as Explored in a Legacy Survey (New-ANGELS). I. The X-Ray Source Catalog. *ApJS*, 268(1):36, September 2023
7. Li-Yuan Lu, Jiang-Tao Li, Carlos J. Vargas, Rainer Beck, Joel N. Bregman, Ralf-Jürgen Dettmar, Jayanne English, Taotao Fang, George H. Heald, Hui Li, **Zhijie Qu**, Richard J. Rand, Michael Stein, Q. Daniel Wang, Jing Wang, Theresa Wiegert, and Yun Zheng. eDIG-CHANGES I: extended H α emission from the extraplanar diffuse ionized gas (eDIG) around CHANG-ES galaxies. *MNRAS*, 519(4):6098–6110, March 2023
6. Mandy C. Chen, Hsiao-Wen Chen, Michael Rauch, **Zhijie Qu**, Sean D. Johnson, Jennifer I. Hsiu Li, Joop Schaye, Gwen C. Rudie, Fakhri S. Zahedy, Erin Boettcher, Kathy L. Cooksey, and Sebastiano Cantalupo. Empirical constraints on the turbulence in QSO host nebulae from velocity structure function measurements. *MNRAS*, 518(2):2354–2372, January 2023
5. Joel N. Bregman, Edmund Hodges-Kluck, **Zhijie Qu**, Cameron Pratt, Jiang-Tao Li, and Yansong Yun. Hot Extended Galaxy Halos around Local L* Galaxies from Sunyaev-Zeldovich Measurements. *ApJ*, 928(1):14, March 2022
4. *Cameron T. Pratt, **Zhijie Qu**, and Joel N. Bregman. The Resolved Sunyaev-Zel’dovich Profiles of Nearby Galaxy Groups. *ApJ*, 920(2):104, October 2021
3. Xiaodi Yu, Jiang-Tao Li, **Zhijie Qu**, Ian U. Roederer, Joel N. Bregman, Xiaohui Fan, Taotao Fang, Sean D. Johnson, Feige Wang, and Jinyi Yang. Probing the He II re-ionization ERA via Absorbing C IV Historical Yield (HIERACHY) I: A strong outflow from a $z \sim 4.7$ quasar. *MNRAS*, 505(3):4444–4455, August 2021
2. Joel N. Bregman, Michael E. Anderson, Matthew J. Miller, Edmund Hodges-Kluck, Xinyu Dai, Jiang-Tao Li, Yunyang Li, and **Zhijie Qu**. The Extended Distribution of Baryons around Galaxies. *ApJ*, 862(1):3, July 2018

1. Zhaosheng Li, **Zhijie Qu**, Li Chen, Yanjun Guo, Jinlu Qu, and Renxin Xu. An Ultra-low-mass and Small-radius Compact Object in 4U 1746-37? *ApJ*, 798(1):56, January 2015

Last updated: January, 2025