

Feige Wang

Department of Astronomy and Steward Observatory, The University of Arizona

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Academic Experience

Assistant Research Professor <i>Steward Observatory, The University of Arizona</i>	October 2022 – Present
NASA Hubble Fellow <i>Steward Observatory, The University of Arizona</i>	October 2019 – September 2022
ENIGMA Postdoctoral Fellow <i>Department of Physics, UC Santa Barbara</i> Faculty Mentor: Professor Joseph F. Hennawi	November 2017 – September 2019
Visiting Postdoctoral Scholar <i>Kavli Institute for Astronomy and Astrophysics, Peking University</i>	August 2017 – October 2017
Visiting Researcher <i>Steward Observatory, The University of Arizona</i>	August 2014 – November 2015

Education

Ph.D. in Astrophysics, Peking University, Beijing, China Thesis: <i>Quasars at Cosmic Dawn</i> Advisers: Professor Xiaohui Fan and Professor Xue-Bing Wu	September 2012 – July 2017
B.S. in Physics, Shandong University, Shandong, China Thesis: <i>Star Formation and AGN Activities in Barred Galaxies.</i> Advisor: Professor Chen Cao	September 2008 – June 2012

Research Interests

- High-Redshift Galaxy and Quasar
- Intergalactic Medium and Cosmic Reionization
- Protocluster and Large Scale Structure
- Supermassive Black Hole
- Metal Content in the Early Universe
- Imaging/Spectroscopic Survey and Data Mining

Collaborations

Steering Committee	JWST EREBUS collaboration for studying the early universe
Member	Roman Space Telescope Cosmic Dawn Science Investigation Team (Link)
Member	LSST AGN Science Collaboration (Link)
Member	Dark Energy Spectroscopic Instrument (DESI, Link)
Co-I	The Ultimate X-SHOOTER Legacy Survey of Quasars (XQR-30, Link)

Selected Research Funding (\$1.88 Million)

• \$20,000	PI	2022A NASA Keck Program	2022 – 2023
• \$251,577	PI	HST Cycle 29 Medium Size Program (16665)	2022 – 2024
• \$428,684	PI	JWST Cycle 1 Medium Size Program (2078)	2022 – 2024
• \$125,235	PI	JWST Cycle 1 Program (2028)	2022 – 2024
• \$81,346	Co-PI	JWST Cycle 1 Program (2249)	2022 – 2023
• \$197,000	PI	Chandra Cycle 23 Large Program (23700397)	2022 – 2024
• \$94,694	PI	HST Cycle 28 Program (16187)	2021 – 2024
• \$30,000	Admin PI	HST Cycle 28 Program (16258)	2021 – 2024
• \$209,680	Science PI	Chandra Cycle 22 Large Program (22700552)	2020 – 2022
• \$350,130	Science PI	NASA Hubble Fellowship	2019 – 2022
• \$91,463	Science PI	Chandra Cycle 19 Program (19700283)	2017 – 2020

Awards and Honors

- 2019-2022 NASA Hubble Fellowship
- 2020 Top Cited Paper (Wang+2017) Award by IOP Publishing
- 2017 First-class Prize of Natural Science in Chinese Universities, the Ministry of Education of China (second author)
- 2017 Outstanding Research Paper (Wang+2015) Award, Beijing Astronomical Society
- 2015-2016 Chinese National Scholarship
- 2015 Top Ten Major Progress in Science and Technology in Chinese Universities, the Ministry of Education of China (second author)
- 2015 Top Ten Progresses in Science in China, the Ministry of Science and Technology of China (second author)
- 2014-2015 China Scholarships Council Fellowship
- 2010 National Astronomical Observatory of China Scholarship

Professional Service

- May 2017 - Present Referee for A&A, AJ, ApJ, ApJL, ApJS and MNRAS
- September 2016 - Present Member of American Astronomical Society
- May 2022 HST Cycle 30 Review Panelist
- June 2021 SOC, “Quasars at the Reionization Epoch” Symposium at the European Astronomical Society Annual Meeting
- May 2021 Gemini Large Program Review Panelist
- April 2021 Chinese Telescope Access Program (TAP) External Reviewer
- March 2021 NASA FINESST (Future Investigators in NASA Earth and Space Science and Technology) Fellowship Reviewer
- October 2020 Chinese Telescope Access Program (TAP) External Reviewer
- March 2020 Chinese Telescope Access Program (TAP) External Reviewer
- March 2020 NASA FINESST (Future Investigators in NASA Earth and Space Science and Technology) Fellowship Reviewer
- August 2020 – December 2021 Organizer for the EURECA Seminar at University of Arizona
- October 2018 - June 2019 Co-organizer for Santa Barbara Astro Lunch

Mentoring Experience

Graduate students:

- Maria Pudoka (UoA, co-advised with Xiaohui Fan, Aug. 2021 – present)
- Yunjing Wu (Tsinghua, co-advised with Zheng Cai, Mar. 2020 – present)
- Yun-Hsin Huang (UoA, co-advised with Xiaohui Fan, Dec. 2019 – present)
- Wei-Leong Tee (UoA, co-advised with Xiaohui Fan, Oct. 2019 – present)
- Victoria Jones (UoA, co-advised with Xiaohui Fan, Oct. 2019 – Mar. 2021 => Company)

Undergraduate students:

- Zhuoqi Liu (UCSB, Oct. 2018 – Apr. 2021 => graduate student, University of Michigan)

Teaching and Outreach

Invited public lecture (Chinese) at *Weihai Observatory Public Lecture*, December 25, 2021

Invited public lecture at *Steward Observatory Public Evening Lecture Series*, December 6, 2021

Invited public lecture at *San Diego Astronomy Association*, April 19, 2021

Invited press talk at *237th AAS press conference*, January, 2021

Interviews (2021-2022): by *Cronkite News*, *Science News Magazine*, *KJZZ-NPR's The Show*

Selected Media Coverages (2015–2022):

Altmetric, BBC, CBS, CNN, Discover, EarthSky, National Geographic, Nature, NewScientist, Space, Science, Science Daily, Science News, SciTech Daily, USA Today

Peking University

February 2016 - July 2016

Teaching Assistant in Fundamental Astronomy

Peking University

February 2013 - July 2014, February 2016 - April 2017

Teaching graduates and undergraduates on astronomical observations with campus observatory

Shandong University

September 2009 - July 2011

Sidewalk astronomy (co-organizer)

Campus Observatory Public Nights (co-organizer)

Shandong University

October 2008 - July 2009

Sidewalk astronomy (served bimonthly)

Campus Observatory Public Nights (served about once per month)

Colloquia and Seminars

- * NAOC GTC Academy Seminar (**Invited**), Sep 2022
- * IHEP AGN Group Seminar (**Invited**), May 2022
- * The Kavli Institute for Astronomy and Astrophysics (KIAA/PKU) Colloquium (**Invited**), Jan 2022
- * Caltech TAPIR Seminar (**Invited**), Jan 2021
- * Herzberg DAO Astronomy Colloquium (**Invited**), Dec 2020
- * UT Austin Astro Colloquium (**Invited**), Sep 2020
- * Steward Early Career Scientist Online Talk (**Invited**), May 2020
- * Santa Barbara Astro Lunch Talk, Nov 2018
- * ESO Thirty Minute Talk (**Invited**), Apr 2018
- * Santa Barbara Astro Lunch Talk, Feb 2018
- * NOAO FLASH Talk, Sep 2016
- * ASU Cosmology Seminar, Sep 2016
- * Carnegie Lunch Talk, Sep 2016
- * UCO/Lick Observatory, IMPS Seminar, Sep 2016
- * Caltech Tea Talk, Sep 2016
- * NOAO FLASH Talk, Oct 2015

Meetings and Conferences

2018 – present:

- Oct. 2022, “*A SPectroscopic survey of biased halos In the Reionization Era (ASPIRE)*”, Recorded talk for the workshop of Cosmic Dawn with JWST
- Sep. 2022, “*The Environment of the Earliest Supermassive Black Holes*”, Live talk at the 2022 NHFP Science Symposium
- Jan. 2022, “*Probing the Most Distant Quasars and Their Environments with Current and Upcoming Facilities*”, **Invited talk** at the Quasars and Galaxies through Cosmic Time (Zoom)
- Oct. 2021, “*Probing the Early Universe with Distant Quasars*”, Live talk at the 2021 NHFP Science Symposium
- Jan. 2021, “*A Luminous Quasar at Redshift 7.642*”, Live talk at the 237th AAS virtual conference
- Oct. 2020, “*Finding the First Luminous Quasars with Roman*”, Live talk at the “Galaxy Formation and Evolution in the Era of the Nancy Grace Roman Space Telescope” virtual conference
- Jul. 2020, “*Evolution of Reionization-Era Quasars*”, Live talk at Summer All Zoom Epoch of Reionization Astronomy Conference (SAZERAC virtual conference)

- Mar. 2020, “*Observations of Reionization-Era Supermassive Black Holes*”, **Invited talk** at the Black Holes and Galaxies at the Edge of the Universe Conference (Ringberg Castle, Germany)
- Oct. 2019, “*Exploring Reionization-Era Quasars*”, **Invited talk** at the Cosmic Evolution of Quasars Conference (Beijing, China)
- Jul. 2019, “*Exploring Reionization-Era Quasars: The First Statistical Quasar Sample at $z \sim 7$* ”, talk at the Barefoot Reionization conference (Fitzroy Island, Australia)
- Jan. 2019, “*The First Statistical Complete Quasar Sample at the Epoch of Reionization*”, talk at the Extremely Big Eyes on the Early Universe conference (UCLA, U. S.)
- Jan. 2019, “*Exploring Reionization-Era Quasars: Quasar Luminosity Function and Contribution to the Cosmic Reionization at $z \sim 7$* ”, 233th AAS Meeting Poster (Seattle, U. S.)
- Mar. 2018, “*A New Survey of $z \sim 7$ Quasars: Doubled The Number of Quasars at $z > 6.5$* ”, talk at the symposium of Arthur M. Wolfe Symposium in Astrophysics (Esalen, U. S.)

2013 – 2017:

- Aug. 2017, “*Primordial Environment of the Most Massive Black Hole at $z = 6.3$* ”, talk at the annual academic meeting of Chinese Astronomical Society (Urumqi, China)
- May. 2017, “*Quasars at Cosmic Dawn*”, **Invited talk** at the Kavli Institute for Astronomy and Astrophysics 10th Anniversary Symposium (Beijing, China)
- Feb. 2017, “*Quasars at Cosmic Dawn: Discoveries and Probes of the Early Universe*”, talk at Bilateral Workshop between the KIAA/PKU and PUC (Beijing, China)
- Jan. 2017, “*Quasars at Cosmic Dawn: Discoveries and Probes of the Early Universe*”, 229th AAS Meeting Dissertation Talk (Dallas, U. S.)
- Nov. 2016, “*Quasars at Cosmic Dawn: Discoveries and Probes of the Early Universe*”, talk at the annual academic meeting of Chinese Astronomical Society (Wuhan, China)
- Jun. 2016, “*Environment of The Ten Billion M_{\odot} BH at $z = 6.30$* ”, poster at the conference of Illuminating the Dark Ages: Quasars and Galaxies in the Reionization Epoch (MPIA, Germany)
- Feb. 2015, “*The First Ten Billion Solar Mass Black Hole at the End of Re-ionization*”, talk at the Steward Internal Symposium (Steward Observatory, U. S.)
- Feb. 2015, “*Ten Billion Solar Mass Black Holes at the End of Re-ionization Discovered Using SDSS-WISE Photometry*”, poster at the meeting of WISE at 5: Legacy and Prospects (Caltech, U. S.)
- May. 2014, “*Finding Luminous Quasars at $z \sim 5$* ”, poster at the Sino-Germany workshop on galaxies and cosmology (Xi’an, China)
- Oct. 2013, “*Radio-Loud Fraction of SDSS Quasars—With/Without FIRST Detection*”, talk at the annual academic meeting of Chinese Astronomical Society (Suzhou, China)

Observation, Data Reduction & Instrumentation Experience

~ 30 nights	10 <i>m</i> Keck Telescopes, DEIMOS / HIRES / LRIS / MOSFIRE / NIRES, Mauna Kea, HI, USA.
3.5 nights	2 × 8.4 <i>m</i> Large Binocular Telescope, LUCI / MODS, Mt. Graham, AZ, USA.
5.0 nights	8 <i>m</i> Gemini North Telescope, GMOS / GNIRS, Mauna Kea, HI, USA.
~ 30 nights	6.5 <i>m</i> MMT telescope, Red Channel / MMIRS / MAESTRO / MMTCam / SWIRC, Mt. Hopkins, AZ, USA.
~ 40 nights	6.5 <i>m</i> Magellan telescopes, FIRE/IMACS/LDSS3/MIKE, LCO, CHILE.
~ 30 nights	5.1 <i>m</i> Hale telescope, TripleSpec / DBSP, Palomar Observatory, CA, USA.
> 15 nights	2.4 <i>m</i> Lijiang telescope, YFOSC, Yunnan Astronomical Observatory, Yunan, China.
~ 15 nights	2.3 <i>m</i> ANU telescope, WiFeS, Siding Spring Observatory, Australia.
9.0 nights	2.3 <i>m</i> Bok telescope, B&C spectrograph / 90” Prime, Kitt Peak Observatory, AZ, USA.
> 20 nights	2.16 <i>m</i> Xinglong telescope, BFOSC, Hebei, China.

JWST Data Reduction: One of *unfold_jwst* core developers (support for NIRCcam imaging, NIRISS imaging, and NIRCcam wide field slitless spectroscopy)

Spectroscopic Data Reduction: One of *PypeIt* core developers (support for 20+ spectrographs)

Imaging Data Reduction: *Developer for [PyPhot](#)* (support for Magellan/IMACS, LBT/LBC, Keck/LRIS, MMT/MMIRS and CFHT/WIRCam)

Instrumentation: *Designed a narrow band filter for Magellan/IMACS by collaborating with [ASAHI](#)*

Selected Telescope Proposals (as PI or Contact)

Space telescopes:

- **JWST:** A SPectroscopic survey of biased halos In the Reionization Era (ASPIRE): A JWST Quasar Legacy Survey.
Principal Investigator, NIRCcam+NIRISS, 61.5 primary + 29.6 parallel hours, Cycle 1, 2021
- **JWST:** Mapping a Distant Protocluster Anchored by a Luminous Quasar in the Epoch of Reionization.
Principal Investigator, NIRSpec+NIRCcam, 16.3 primary + 5.8 parallel hours, Cycle 1, 2021
- **JWST:** Monster in the Early Universe: Unveiling the Nature of a Dust Reddened Quasar Hosting a Ten-Billion Solar Mass Black Hole at $z = 7.1$.
Co-PI, NIRSpec+MIRI, 5.5 primary hours, Cycle 1, 2021
- **HST:** The HST/JWST Quasar Legacy Survey: Probing the Primordial Environment of Quasars and the Topology of Cosmic Reionization.
Principal Investigator, WFC3, 66-orbits, Cycle 29, 2021
- **HST:** Mapping A Distant Protocluster Anchored by A Luminous Quasar in the Epoch of Reionization.
Principal Investigator, WFC3, 17-orbits, Cycle 28, 2020
- **HST:** The Environment of the most distant Radio Loud Quasar.
Grant Administrative Principal Investigator, WFC3, 25-orbits, Cycle 28, 2020
- **HST:** Galactic Environment of A Twenty-Billion Solar-Mass Black Hole at the End of Reionization.
Technical Contact, ACS & WFC3, 11-orbits, Cycle 22, 2014
- **CXO:** Chandra Observations of The Most Distant Galaxy Protocluster Anchored by A Luminous Quasar at $z = 6.63$
Principal Investigator, ACIS-I, 900 ks (**Large program**), Cycle 23, 2021
- **CXO:** A Chandra X-ray Survey of a Complete Luminous Quasar Sample at Redshift $z \sim 7$
Technical Contact, ACIS-S, 710 ks (**Large program**), Cycle 22, 2020
- **CXO:** A Complete X-ray Survey of Luminous Quasars at the End of Reionization: a Changing Population?
Technical Contact, ACIS-S, 134 ks, Cycle 19, 2017

(Sub)-millimeter and radio telescopes:

- **ALMA:** A SPectroscopic survey of biased halos In the Reionization Era (ASPIRE): An ALMA/JWST Legacy Quasar Survey.
Principal Investigator, 99.9 hours (**Large program**), Cycle 9, 2022
- **ALMA:** Resolving the puzzle of growing the ultraluminous quasar at $z = 6.3$ with ALMA and JWST.
Principal Investigator, 27.9 hours, Cycle 9, 2022
- **VLA:** A Multi-wavelength Quasar Legacy Survey: Radio Emission from the Earliest SMBHs.
Principal Investigator, 93.2 hours, 2022A
- **ALMA:** A Comprehensive Study of Quasar Host Galaxy and Cosmic Reionization with a Large Statistical Quasar Sample at $z > 6.5$.
Principal Investigator, 6.7 hours, Cycle 7, 2019
- **ALMA:** ALMA Mapping of the Most Distant Galaxy Protocluster Anchored by A Luminous Quasar at $z = 6.63$.
Technical Contact, 15.8 hours, Cycle 7, 2019
- **ALMA:** A Comprehensive Study of Quasar Host Galaxy and Cosmic Reionization with a Large Statistical Quasar Sample at $z > 6.5$.
Principal Investigator, 6.7 hours, Cycle 6, 2018
- **ALMA:** Diagnose Gas Excitation in the Most Luminous Quasar at Cosmic Dawn.
Technical Contact, 9.8 hours, Cycle 5, 2017

- **ALMA:** Probing the Host Galaxy of the Most Massive Black Hole at the End of Reionization.
Technical Contact, 2.2 hours, Cycle 3, 2015
- **IRAM (30m):** Dust Emission in Ultra-Luminous Quasars at $z > 5$.
Principal Investigator, NIKA, 21 hours, 2015A

Ground based optical and infrared telescopes:

- **Steward Observatory Accesses:** *Principal Investigator*, 23 nights on Magellan (6.5m), 7 nights on MMT (6.5m), and 12 nights on LBT (2×8m) from 2019B to 2022B
- **UC Keck Accesses:** *Technical Contact*, 11 nights on Keck (10m), and 1 night on Subaru (8m) from 2018B to 2021A
- **Keck (10m):** Characterizing a Distant Protocluster Anchored by a Luminous $z=6.64$ Quasar with Keck/JWST/HST/Chandra.
Principal Investigator, DEIMOS, 2 nights, 2022A (NASA Keck)
- **Keck (10m):** Probing Cosmic Reionization with a Ultra-Luminous Quasar at $z = 6.3$.
Technical Contact, HIRES, 1 night, 2014B (NASA Keck)
- **Gemini (8m):** Searching for Quasars Deep Into the Epoch of Reionization.
Principal Investigator, GNIRS (4 nights) and Flamingos2 (2 nights), 2019A – 2019B
- **Gemini (8m):** GNIRS Peers Deep Into the Reionization with A Newly Discovered Luminous Quasar at $z = 7.5$.
Principal Investigator, GNIRS, 6.4 hours, 2019A (DDT)
- **Gemini (8m):** GMOS Spectroscopy of A Newly Discovered Very Distant Quasar.
Principal Investigator, GMOS, 4.9 hours, 2019A
- **Gemini (8m):** A Twenty Billion Solar Mass Black Hole Hosted by A Young Quasar at Cosmic Dawn?
Principal Investigator, GNIRS, 1.3 hours, 2018A (DDT)
- **Gemini (8m):** GNIRS Followup of A Newly Discovered $z = 7$ Quasar.
Principal Investigator, GNIRS, 4.7 hours, 2018A
- **Subaru (8m):** Probing reionization-era quasar environment with narrow band imaging.
Principal Investigator, HSC, 2 nights, 2021A
- **VLT (8m):** Deep X-SHOOTER Spectroscopy of A Newly Discovered Luminous Quasar at Redshift $z = 7.5$.
Principal Investigator, X-SHOOTER, 34.7 hours, P105
- **VLT (8m):** Exploring the Cosmic Reionization and Black Hole Growth with Three New Luminous Quasars at $z \sim 7$.
Principal Investigator, X-SHOOTER, 29.5 hours, P103
- **VLT (8m):** The Most Sensitive Study of Metals in the IGM at the Epoch of Reionization.
Technical Contact, X-SHOOTER, 18.0 hours, P102
- **VLT (8m):** X-SHOOTER Followup of A Newly Discovered Quasar at Redshift Seven.
Technical Contact, X-SHOOTER, 4.5 hours, P100 (DDT)
- **Magellan (6.5m):** A Survey of Luminous Quasars at $z \gtrsim 7$: Early Black Hole Growth and Reionization History.
Principal Investigator, FIRE, 1.5 nights, 2017B
- **Magellan (6.5m):** Probing IGM Evolution with Ultra-luminous Quasars at $z > 5$.
Principal Investigator, FIRE, 1 night, 2014B
- **Hale (5.1m):** Searching for $z \sim 6$ Quasars with DECaLS Deep Imaging Survey.
Principal Investigator, DBSP, 10 nights, 2016A-2017A
- **Hale (5.1m):** Probing a Ultra-luminous Giant Lyman Alpha Blob in an Extreme Overdense Field at $z = 2.310$.
Principal Investigator, CWI, 2 nights, 2015A
- **Hale (5.1m):** Black Hole Growth in the Most Distant Radio Loud Quasars.
Principal Investigator, TripleSpec, 3 nights, 2015A
- **Hale (5.1m):** Are BAL Quasars Transition Objects?
Principal Investigator, TripleSpec, 2 nights, 2014A