

Mengyuan XIAO

(She/her/hers)

Postdoctoral Researcher

Department of Astronomy,
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Research Interests

- The first generation of massive galaxies in the early Universe.
- The dusty star-forming galaxies in the early Universe.
- Star-formation, interstellar medium properties, and kinematics in high-redshift galaxies.

Education

- 2023- **Postdoctoral fellow**, *Geneva observatory*, University of Geneva, Advisor: Prof. Pascal Oesch
- 2018- **PhD Degree in Astrophysics**, *School of Astronomy & Space Science*, Nanjing University
2022 Advisors: Dr. David Elbaz and Prof. Qiu-Sheng Gu
- 2019-2022, *Joint PhD student*, CEA Saclay, France, Advisor: Dr. David Elbaz
- Feb-May 2019, *Visiting student*, NAOJ, Japan, Host: Assoc. Prof. Daisuke Iono
- 2014- **Master Degree in Astrophysics**, *School of Astronomy & Space Science*, Nanjing
2018 University, Advisor: Prof. Qiu-Sheng Gu
- Aug-Oct 2017, *Visiting student*, NAOJ, Japan, Host: Assoc. Prof. Daisuke Iono
- 2009- **Bachelor of Science**, *Science of Chinese Materia Medica*, School of Pharmacy, Nanjing
2013 University of Traditional Chinese Medicine

Honors and Awards

- 2024 Excellent Doctoral Thesis of Nanjing University
- 2023 MERAC Awards by Swiss Society for Astrophysics and Astronomy (SSAA).
- 2022 Nanjing University Cao Erjie Scholarship.
- 2021 Nanjing University Excellent Postgraduate.
- 2019 2019-2021 China Scholarship Council (CSC) Scholarship.
- 2019 Provincial Excellent Master's Thesis.
- 2018 Nanjing University Yingcai Scholarship for Graduate Student.
- 2017 Excellent Postgraduate in the Jiangsu Province.
- 2016 Nanjing University Excellent Postgraduate.
- 2016 National Scholarship (the most prestigious scholarship in China).
- 2015 Nanjing University Excellent Postgraduate Cadre.
- 2015 President of Postgraduate Student Union in School of Astronomy & Space Science.

- 2013 Nanjing University of Traditional Chinese Medicine People's Scholarship.
2012 Nanjing University of Traditional Chinese Medicine People's Scholarship.

Teaching Experience and Student Supervision

2024- present Supervision of semester thesis projects for Master student at the University of Geneva:

- A. Okeanova: *"Unveiling the fast formation of ultra massive galaxies (monsters) in the first Billion years"*
- A. Sawarkar: *"Spotlight on the most extreme and spectacular galaxy populations in the early Universe with JWST"*

2023- present Supervision of Master Thesis for A. Ganguly: *"Galaxy Morphology with the James Webb Space Telescope at Redshifts beyond 3"*

2017 Teaching assistant for *Extragalactic Astrophysics* at Nanjing University (professor: Dr. Qiusheng Gu).

2016 Teaching assistant for *Extragalactic Astrophysics* at Nanjing University (professor: Dr. Qiusheng Gu).

Community Activities and Outreach

2023- present Referee for Astronomy and Astrophysics

2024 Co-Organizer of colloquium, journal club talk, and academic visit at Geneva Observatory: Dr. Emanuele Daddi (CEA-Saclay, France), Dr. Boris Kalita (KIAA/IPMU, Japan), PhD candidate Yi Xu (Tokyo U., Japan), Master candidate Yuta Ishikawa (Waseda U., Japan)

2024 Co-Organizer of European Astronomical Society Annual Meeting; SS9: "Dust enrichment of early galaxies ($z > 5$) in the era of JWST and ALMA"

2023 Outreach, Introducing the JWST during the open days of the 250th Anniversary of the Geneva Observatory

2016 LOC, the Star Formation and SMBH accretion across the Universe, Nanjing, China

2015 LOC, the 2nd China MaNGA workshop, Nanjing, China

Computer Skills

- Skilled in Python and IDL.
- Experienced in data reduction for interferometric imaging and spectra.
- Experienced in the tool of image photometric reduction, decomposition, and SED fitting.
- Experienced in the tool of gas kinematics, galaxy blind detection, stellar population synthesis, and general spectral analysis.

Languages

- Chinese: *Native*
- English: *Advanced*
- French: *A1*

Conference & Seminar Contributions

- Invited Talk, Workshop 'Big Galaxies, Big Problems', Leiden, Netherlands, April, 2025
- Talk, Conference 'The 40th IAP Symposium: Unveiling the physics of early galaxy and black hole formation with JWST', Paris, France, Dec, 2024
- Talk, Conference 'Beyond the Edge of the Universe', Sintra, Portugal, Oct, 2024
- Talk, Conference 'Observing and Simulating Galaxy Evolution in the Era of JWST', Ascona, Switzerland, Aug, 2024
- Talk, EAS Symposium 'New light on Galaxies from Cosmic Dawn to Noon', Padova, Italy, July, 2024
- Talk, EAS Special Session 'Removing the Disguise: SMGs in the era of JWST', Padova, Italy, July, 2024
- Invited Talk, Conference 'Cosmic Odysseys 2024: The Interstellar Medium of Galaxies and AGN since Cosmic Dawn', Crete, Greece, July, 2024
- Talk, Conference 'Extreme galaxies in their extreme environments at extremely early epochs', Reykjavík, Iceland, April, 2024
- Invited Talk, Conference 'The Growth of Galaxies in the Early Universe –IX', Sesto, Italy, Jan, 2024
- Seminar Talk, Title 'A new era of studying extremely dust-obscured massive galaxies in the early Universe with JWST and ALMA', NAOJ, Japan, Nov, 2023
- Talk, Conference 'Resolving the Extragalactic Universe with ALMA & JWST', Tokyo, Japan, Nov, 2023
- CakeTalk, Title 'FRESCO: A new era of studying extremely dust-obscured massive galaxies in the early Universe with JWST spectroscopy', DAWN, Denmark, Aug, 2023
- Talk, Title 'Towards a Complete Picture of Galaxy Build-up at the First 3 Billion Years', Yunnan University, China, Jun, 2022
- Talk, Workshop 'Sino-French workshop on confronting simulations with observations of high-redshift galaxies and (proto)clusters', Online, Nov, 2021
- Talk, Workshop 'High-z dusty galaxies', Marseille, France, Oct, 2021
- Two Posters (Lightning Talks), European Astronomical Society Annual Meeting (EAS Leiden 2021), Online, Jun, 2021
- Talk, Conference 'Galaxy Cluster Formation II (GCF 2021)', Online, Jun, 2021
- Poster (Lightning Talk), Workshop on Protoclusters: Galaxies in Confinement, Online, Nov, 2020
- Invited Talk, Conference 'THE GROWTH OF GALAXIES IN THE EARLY UNIVERSE – VI', Sesto, Italy, Jan, 2020
- Seminar Talk, Title 'Starbursts with regular rotating disks in $z=2.51$ Cluster', NAOJ, Japan, May, 2019
- Lightning Talk, Galaxy Evolution Workshop 'The Co-Evolution of Galaxies and Their Central Regions', Dali, China, Oct, 2018

- Talk, 2018 Annual Meeting of Chinese Astronomical Society, Kunming, China, Oct, 2018
- Talk, 2017 Annual Meeting of Chinese Astronomical Society, Urumqi, China, Aug, 2017
- Poster, Asia-Pacific Regional IAU Meeting, Taipei, China/Taiwan, Jul, 2017
- Talk, The 19th CAS Guoshoujing Symposium on Galaxies and Cosmology, Beijing, China, Jul, 2016
- Lightning talk, CLOUDY workshop, Shandong, China, Jun, 2016

Approved Proposals

- 2024 IRAM NOEMA Interferometer (ID: W24EP, Time awarded: 18.0 hrs) PI
Studying the efficient formation of three monsters in $z_{spec} \sim 6.7$ overdensity (PI: David Elbaz & **Mengyuan Xiao**)
- 2024 ALMA (ID: 2024.1.01744.S, Time awarded: 38.5 hrs) PI
ALMA+JWST: studying the efficient formation of massive galaxies at $z_{spec} = 3 - 5$ (PI: **Mengyuan Xiao**)
- 2023 JWST (ID: Cycle3 GO-5572, Time awarded: 16.8 hrs) PI
Red Monsters: Kinematics of Two ‘Universe Breaking’, Ultra- Massive Galaxies in the First Gyr (PI: **Mengyuan Xiao**)
- 2023 ALMA (ID: 2023.1.00837.S, Grade A, Time awarded: 1.0 hrs) PI
Hidden in plain sight: dynamical mass estimates for a newly-discovered red monster at $z_{spec} \sim 5.6$ in the GOODS-S field (PI: **Mengyuan Xiao**)
- 2023 IRAM NOEMA Interferometer (ID: S23CY, Grade A, Time awarded: 12.0 hrs) PI
Revealing the interstellar medium of two extremely massive galaxies at $z_{spec} > 7$ (PI: David Elbaz & **Mengyuan Xiao**)
- 2019 IRAM 30m (ID: 204-19, Time awarded: 19.45 hrs) PI
Probing Molecular Gas in Extremely Compact Starbursts as Major Merger Remnants (PI: **Mengyuan Xiao**)
- 2024 IRAM NOEMA Interferometer (ID: W24EA, Time awarded: 24.0 hrs) Co-I
Residual Cold Gas in A Descendant of High- z Ultra-Massive Galaxies (PI: Longji Bing)
- 2024 ALMA (ID: 2024.1.00638.S, Time awarded: 24.4 hrs) Co-I
Toward the Representative [CII] 158 μ m Lines in the Reionization Era (PI: Yoshi Fudamoto)
- 2024 ALMA (ID: 2024.1.00106.S, Time awarded: 35.3 hrs) Co-I
A survey of cold molecular gas in $z \sim 6.5$ quasars and their companion galaxies (PI: Romain Meyer)
- 2023 JWST (ID: Cycle 3 GO-4762, Time awarded: 15.3 hrs) Co-I
Panchromatic characterizations of the super-Eddington accretion black hole, host, and environment: Epicenter of red dots, mergers, and dusty starbursts at $z=7.2$ (PI: Seiji Fujimoto)
- 2023 JWST (ID: Cycle 3 GO-5664, Time awarded: 44.8 hrs) Co-I
Dissecting Little Red Dots: the connection between early SMBH growth and cosmic reionization (PI: Jorjyt Matthee)

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| 2023 | IRAM NOEMA Interferometer (ID: W23CX, GradeA, Time awarded: 13.5 hrs) | Co-I |
| | Exploring an ultra-massive and extremely efficient star forming galaxy at high redshift (PI: Guilaine Lagache) | |
| 2023 | IRAM NOEMA Interferometer (ID: W23CJ, GradeA, Time awarded: 24.4 hrs) | Co-I |
| | COSMOS DSFGs Unveiled: A Comprehensive Identification (PI: Alexandre Beelen) | |
| 2023 | VLA (ID: 23B-125, GradeA, Time awarded: 29.3 hrs) | Co-I |
| | A systematic CO(1-0) survey of $z=2.5-4$ protocluster cores (PI: Luwenjia Zhou) | |
| 2022 | VLA (ID: 22B-243, GradeB, Time awarded: 13.15 hrs) | Co-I |
| | The true extent of the cold gas content in a red sequence progenitor (PI: Carlos Gómez-Guijarro) | |
| 2022 | VLT KMOS (ID: 110.23UN, Time awarded: 12 hrs) | Co-I |
| | Instantaneous star formation rate to uncover the role of compact star formation in galaxy evolution (PI: Carlos Gómez-Guijarro) | |
| 2022 | VLT KMOS (ID: 110.240K, Time awarded: 21.25 hrs) | Co-I |
| | Uncovering the role of optically dark galaxies in an overdensity at $z = 3.5$ (PI: Maximilien Franco) | |
| 2021 | IRAM NOEMA Interferometer (ID: W21CV, Time awarded: 39.5 hrs) | Co-I |
| | A Complete Census on the Counterparts of DSFGs in GOODS-N (PI: Longji Bing) | |
| 2021 | ALMA (ID: 2021.1.01650.S, Time awarded: 24.5 hrs) | Co-I |
| | Towards a systematic redshift determination of HST-dark galaxies (PI: Kotaro Kohno) | |
| 2021 | ALMA (ID: 2021.1.00815.S, Time awarded: 39.8 hrs) | Co-I |
| | Testing structure formation, quenching and gas accretion models with a sample of 36 groups/clusters at $2 < z < 3.5$ (PI: Emanuele Daddi) | |
| 2021 | JVLA (ID: VLA/21A-276, Time awarded: 25.20 hrs) | Co-I |
| | A deep CO(1-0) survey towards the most distant known galaxy cluster at $z=2.51$ (PI: Tao Wang) | |
| 2019 | JVLA (ID: VLA/20A-334, Time awarded: 36.20 hrs) | Co-I |
| | A deep CO(1-0) survey towards the most distant known galaxy cluster at $z=2.51$ (PI: Tao Wang) | |
| 2019 | IRAM NOEMA Interferometer (ID: W19BJ, Time awarded: 6 hrs) | Co-I |
| | CO observation of a star-forming S0 galaxy PGC 34107 (PI: Xue Ge) | |
| 2019 | IRAM 30m (ID: 199-19, Time awarded: 15.2 hrs) | Co-I |
| | Molecular gas in low-mass star-forming S0 galaxies (PI: Xue Ge) | |
| 2018 | JVLA (ID: VLA/19A-443, Time awarded: 49 hrs) | Co-I |
| | A deep and sharp view of CO(1-0) towards the most distant galaxy cluster at $z = 2.51$ with JVLA (PI: Tao Wang) | |
| 2018 | IRAM NOEMA Interferometer (ID: P329857, Time awarded: 2.5 hrs) | Co-I |
| | The properties of star formation and post-starburst in a S0 galaxy (PI: Xue Ge) | |

On-site Observing Experience

2020 IRAM 30m telescope, on-site observing, 7 nights, Pico Veleta, Spain
2017 CAHA 3.5m telescope, on-site observing, 3 nights, Calar Alto, Spain
2014 2.16m telescope, on-site observing, 1 night, Xinglong, China

— List of Publications and Present Work

8 primary author papers (5 first-author papers and 3 additional primary author publications), 238 citations (current as of 30-Oct-2024), h-index 7, [ADS library](#)
37 total papers, 969 citations (current as of 30-Oct-2024), h-index 17, [ADS library](#)

Primary Author Papers

- 2024 *Accelerated Formation of Ultra-Massive Galaxies in the First Billion Years*
Xiao, M.-Y., Oesch, P.A., Elbaz, D., L., Bing, and the JWST FRESCO team, [Nature in press](#)
- 2024 *Discovery of a new N-emitter in the epoch of reionization*
Schaerer, D., Marques-Chaves, R., **Xiao, M.-Y.**, et al. 2024, [A&A, 687, L11](#)
- 2023 *The hidden side of cosmic star formation at $z > 3$: Bridging optically-dark and Lyman break galaxies with GOODS-ALMA*
Xiao, M.-Y., Elbaz, D., Gómez-Guijarro, C., Leroy, and the GOODS-ALMA team, [A&A, 672, A18](#)
- 2022 *Starbursts with suppressed velocity dispersion revealed in a forming cluster at $z = 2.51$*
Xiao, M.-Y., Wang, T., Elbaz, D., Iono, D., et al. 2022, [A&A, 664, A63](#)
- 2022 *GOODS-ALMA 2.0: Starbursts in the main sequence reveal compact star formation regulating galaxy evolution prequenching*
Gómez-Guijarro, C., Elbaz, D., **Xiao, M.-Y.**, et al. 2022, [A&A, 659, A196](#)
- 2022 *GOODS-ALMA 2.0: Source catalog, number counts, and prevailing compact sizes in 1.1 mm galaxies*
Gómez-Guijarro, C., Elbaz, D., **Xiao, M.-Y.**, et al. 2022, [A&A, 658, A43](#)
- 2018 *The Physical Characteristics of Interstellar Medium in NGC3665 with Herschel Observation*
Xiao, M.-Y., Zhao, Y.-H., Gu, Q.-S., & Shi, Y. 2018, [ApJ, 854, 111](#)
- 2016 *The Nuclear Activities of Nearby S0 Galaxies*
Xiao, M.-Y., Gu, Q.-S., Chen, Y.-M., & Zhou, L. 2016, [ApJ, 831, 63](#)

Contributing Author Papers

- 2024 *Unveiling dust, molecular gas, and high star formation efficiency in extremely UV-bright star-forming galaxies at $z \sim 2.1 - 3.6$*
Dessauges-Zavadsky, M., Marques-Chaves, R., Schaerer, D., **Xiao, M.-Y.**, et al. 2024, [arXiv:2410.11121](#)
- 2024 *The PANORAMIC Survey: Pure Parallel Wide Area Legacy Imaging with JWST/NIRCam*
Williams, C. C., Oesch, P. A., Weibel, A., ..., **Xiao, M.-Y.** 2024, [arXiv:2410.01875](#)
- 2024 *JWST FRESCO: a comprehensive census of $H\beta + [OIII]$ emitters at $6.8 < z < 9.0$ in the GOODS fields*
Meyer, R. A., Oesch, P. A., Giovinazzo, E., ..., **Xiao, M.-Y.**, et al. 2024, [arXiv:2405.05111](#)

- 2024 *A new census of dust and polycyclic aromatic hydrocarbons at $z = 0.7-2$ with JWST MIRI*
Shivaei, I., Alberts, S., Florian, M.,..., **Xiao, M.-Y.**, et al. 2024, [arXiv:2402.07989](#)
- 2024 *A first look at spatially resolved star formation at $4.8 < z < 6.5$ with JWST FRESCO NIRCам slitless spectroscopy*
Matharu, J., Nelson, E. J., Brammer, G.,..., **Xiao, M.-Y.** 2024, [A&A, 690, A64](#)
- 2024 *NOEMA formIng Cluster survEy (NICE): Characterizing eight massive galaxy groups at $1.5 \leq z \leq 4$ in the COSMOS field*
Sillassen, N. B., Jin, S., Magdis, G. E., **Xiao, M.-Y.**, et al. 2024, [A&A, 690, A55](#)
- 2024 *An $H\alpha$ view of galaxy build-up in the first 2 Gyr: luminosity functions at $z \sim 4 - 6.5$ from NIRCам/grism spectroscopy*
Covelo-Paz, A., Giovinazzo, E., Oesch, P. A., **Xiao, M.-Y.** 2024, [arXiv:2409.17241](#)
- 2024 *Galaxy build-up in the first 1.5 Gyr of cosmic history: insights from the stellar mass function at $z=4-9$ from JWST NIRCам observations*
Weibel, A., Oesch, P. A., Barrufet, L.,..., **Xiao, M.-Y.** 2024, [MNRAS, 533, 1808](#)
- 2024 *FRESCO: The Paschen- α Star-forming Sequence at Cosmic Noon*
Neufeld, C., van Dokkum, P., Asali, Y., ... **Xiao, M.-Y.** 2024, [ApJ, 972, 156](#)
- 2024 *Measuring the gas reservoirs in $10^8 \leq M_\star \leq 10^{11} M_\odot$ galaxies at $1 \leq z \leq 3$*
Mérida, R. M., Gómez-Guijarro, C., Pérez-González, P. G.,..., **Xiao, M.-Y.** 2024, [A&A, 686, A64](#)
- 2024 *Unveiling the hidden Universe with JWST: the contribution of dust-obscured galaxies to the stellar mass function at $z = 3 - 8$*
Gottumukkala, R., Barrufet, L., Oesch, P. A.,..., **Xiao, M.-Y.** 2024, [MNRAS, 530, 966](#)
- 2024 *Noema formIng Cluster survEy (NICE): Discovery of a starbursting galaxy group with a radio-luminous core at $z = 3.95$*
Zhou, L., Wang, T., Daddi, E.,..., **Xiao, M.-Y.**, et al. 2024, [A&A, 684, A196](#)
- 2024 *Little Red Dots: An Abundant Population of Faint Active Galactic Nuclei at $z \sim 5$ Revealed by the EIGER and FRESCO JWST Surveys*
Matthee, J., Naidu, R. P., Brammer, G.,..., **Xiao, M.-Y.**, et al. 2024, [ApJ, 963, 129](#)
- 2024 *Faint mm NIKA2 dusty star-forming galaxies: Finding the high-redshift population*
Bing, L.-J., Beelen, A., Lagache, G.,..., **Xiao, M.-Y.**, et al. 2024, [A&A, 683, A232](#)
- 2023 *FRESCO: An extended, massive, rapidly rotating galaxy at $z=5.3$*
Nelson, E. J., Brammer, G., Gimenez-Arteaga, C.,..., **Xiao, M.-Y.**, et al. 2023, [arXiv:2310.06887](#)
- 2023 *The JWST FRESCO survey: legacy NIRCам/grism spectroscopy and imaging in the two GOODS fields*
Oesch, P. A., Brammer, G., Naidu, R. P.,..., **Xiao, M.-Y.** 2023, [MNRAS, 525, 2864](#)

- 2023 *The IR Compactness of Dusty Galaxies Sets Star Formation and Dust Properties at $z \sim 0 - 2$*
McKinney, J., Pope, A., Kirkpatrick, A.,..., **Xiao, M.-Y.** 2023, [ApJ](#), **955**, 136
- 2023 *Mapping dusty galaxy growth at $z > 5$ with FRESCO: Detection of $H\alpha$ in submm galaxy HDF850.1 and the surrounding overdense structures*
Herard-Demanche, T., Bouwens, R. J., Oesch, P. A.,..., **Xiao, M.-Y.**, et al. 2023, [arXiv.2309.04525](#)
- 2023 *JWST CEERS probes the role of stellar mass and morphology in obscuring galaxies*
Gómez-Guijarro, C., Magnelli, B., Elbaz, D.,..., **Xiao, M.-Y.**, et al. 2023, [A&A](#), **677**, A34
- 2023 *Accelerated Structural Evolution of Galaxies in a Starbursting Cluster at $z = 2.51$*
Xu, C., Wang, T., Gu, Q.,..., **Xiao, M.-Y.**, et al. 2023, [ApJL](#), **951**, L21
- 2023 *The gas mass reservoir of quiescent galaxies at cosmic noon*
Blázquez-Sesé, D., Gómez-Guijarro, C., Magdis, G. E.,..., **Xiao, M.-Y.**, et al. 2023, [A&A](#), **674**, A166
- 2023 *GOODS-ALMA 2.0: Last gigayear star formation histories of the so-called starbursts within the main sequence*
Ciesla, L., Gómez-Guijarro, C., Buat, V.,..., **Xiao, M.-Y.** 2023, [A&A](#), **672**, A191
- 2022 *Star-forming S0 galaxies in the SDSS-IV MaNGA survey*
Xu, K., Gu, Q., Lu, S., Ge, X., **Xiao, M.-Y.**, & Contini, E. 2022, [MNRAS](#), **509**, 1237
- 2021 *PGC 38025: A Star-forming Lenticular Galaxy With an Off-nuclear Star-forming Core*
Chen, Z.-Y., Gu, Q.-S., García-Benito, R., Zhang, Z.-Y., Ge, X., **Xiao, M.-Y.**, & Yu, X.-L 2021, [APJ](#), **915**, 1
- 2021 *Investigating the Nature of MGRO J1908+06 with Multiwavelength Observations*
Li, J., Liu, R.-Y., Ona Wilhelmi, E.,..., **Xiao, M.-Y.** 2021, [APJL](#), **913**, L33
- 2020 *GOODS-ALMA: The slow downfall of star formation in $z = 2-3$ massive galaxies*
Franco, M., Elbaz, D., Zhou, L., Magnelli, B., Schreiber, C., ... **Xiao, M.-Y.** 2020, [A&A](#), **643**, A30
- 2020 *GOODS-ALMA: Using IRAC and VLA to probe fainter millimeter galaxies*
Franco, M., Elbaz, D., Zhou, L., Magnelli, B., Schreiber, C., ... **Xiao, M.-Y.** 2020, [A&A](#), **643**, A53
- 2020 *The Physical Properties of S0 Galaxy PGC 26218: The Origin of Starburst and Star Formation*
Ge, X., Gu, Q.-S., García-Benito, R., **Xiao, M.-Y.**, & Li, Z.-N. 2020, [ApJ](#), **889**, 132
- 2018 *Revealing the Environmental Dependence of Molecular Gas Content in a Distant X-Ray Cluster at $z = 2.51$*
Wang, T., Elbaz, D., Daddi, E., Liu, D.-Z., ..., **Xiao, M.-Y.**, et al. 2018, [ApJL](#), **867**, L29