Mahdi(Sum) Qezlou

Curriculum Vitae

Department of Physics and Astronomy
University of California, Riverside
✉ *mahdi.qezlou@email.ucr.edu*
⌂ *Webpage*
 Github

Employment history and Education

2024–present   **Postdoctoral Fellow**, *University of Texas, Austin*.
Inference on cosmological parameters through modeling the observed distribution of galaxies with the HETDEX observations

2018–2024   **PhD, Physcis & Astronomy**, *University of California, Riverside*.
Computational Astrophysics: Lyman-α forest tomography, Line Intensity Map, Machine Learning

Advisors and mentors: Simeon Bird, UCR. Andrew Newman, Carnegie Observatories. Gwen Rudie, Carnegie Observatories, Adam Lidz, UPenn

2013-2018 :   **B.Sc in Physics** , *Sharif University of Technology, SUT*.

Research Advisor :   Shant Baghram, SUT

Research Interests:

Cosmological hydrodynamic simulations (`MP_GADGET`), $Ly - \alpha$ **forest tomography at cosmic noon, Modeling Line Intensity Map Signal, Machine Learning, Artificial Intelligence, Bayesian statistics**.

Publications

on ADS   https://ui.adsabs.harvard.edu/public-libraries/UjaV3zMmSmGOO7h$_F dRJlA$

Selected Published

2023   **Mahdi Qezlou**, Simeon Bird, Adam Lidz, Guochao Sun, Andrew B. Newman, Gwen C. Rudie, Yueying Ni, Rupert Croft, and Tiziana Di Matteo. Boosting line intensity map signal-to-noise ratio with the Ly-α forest cross-correlation. , volume 524, pages 1933–1945, September 2023.

2022   **Mahdi Qezlou**, Andrew B. Newman, Gwen C. Rudie, and Simeon Bird. Characterizing Protoclusters and Protogroups at z 2.5 Using Lyα Tomography. , volume 930, page 109, May 2022.

2022   Andrew B. Newman, Gwen C. Rudie, Guillermo A. Blanc, **Mahdi Qezlou**, Simeon Bird, Daniel D. Kelson, Victoria Pérez, Enrico Congiu, Brian C. Lemaux, Alan Dressler, and John S. Mulchaey. A population of ultraviolet-dim protoclusters detected in absorption. , volume 606, pages 475–478, June 2022.

Other Published

2024   Andrew B. Newman, **Mahdi Qezlou**, Nima Chartab, Gwen C. Rudie, Guillermo A. Blanc, Simeon Bird, Andrew J. Benson, Daniel D. Kelson, and Brian C. Lemaux. LATIS: Constraints on the Galaxy-Halo Connection at z 2.5 from Galaxy-Galaxy and Galaxy-Lyα Clustering. , volume 961, page 27, January 2024.

2023   Simeon Bird, Martin Fernandez, Ming-Feng Ho, **Mahdi Qezlou**, Reza Monadi, Yueying Ni, Nianyi Chen, Rupert Croft, and Tiziana Di Matteo. PRIYA: A New Suite of Lyman-alpha Forest Simulations for Cosmology. *arXiv e-prints*, page arXiv:2306.05471, June 2023.

2022   Taro Matsuo, Thomas P. Greene, **Mahdi Qezlou**, Simeon Bird, Kiyotomo Ichiki, Yuka Fujii, and Tomoyasu Yamamuro. Densified Pupil Spectrograph as High-precision Radial Velocimetry: From Direct Measurement of the Universe's Expansion History to Characterization of Nearby Habitable Planet Candidates. , volume 163, page 63, February 2022.

Submitted Articles

2023   Hurum Tohfa, Simeon Bird, Ming-Feng Ho, **Mahdi Qezlou**, and Martin Ferandez. Forecast Cosmological Constraints with the 1D Wavelet Scattering Transform and the Lyman-α forest. *arXiv e-prints*, page arXiv:2310.06010, October 2023.

Fellowships & Awards

2023 – 2024   **_Dissertation-Year Fellowship_**, Awarded to only 3 students at UCR among all PhD majors.

2020 – 2022   **_Carnegie-UCR Fellowship_** Graduate researcher fellow at Carnegie observatories to work on Lyα tomography IMACS survey (LATIS) project.

2018 – 2019   **_UCR Graduate Dean Fellowship_**, for Fall, spring and Summer quarters

Computing skills

Computational   Machine learning, Bayesian Statistics

Programming   Python, C, MPI parallel computing, High-performance computing

Visualization   Virtual Reality engines, e.g. _Blender_ and _Unity_, YouTube Channel

Mentorship Experience

Fall-Winter 2022-23   **High-school science fair project, student: Joseph Zenarosa (Martin Luther King High, Riverside)**, Reionization in `ASTRID` , a cosmological hydrodynamic simulation.
Mentoring the student for science fair competition

summer 2022   **Undergraduate summer project, student: Kevin Hong (UCLA)**, _3D Visualization of cosmological hydrodynamical simulations_.
Mentoring student, visualizations using `Blender` open-source software

summer 2021 and 2022 and 2023   **CASSI, Summer research program for undergraduates at Carnegie observatory,** , _Teaching python, high-performance computing, and scientific visualizations to ~ 20 students each year_.

Talks

Fall   Cosmology and galaxy evolution with Ly-alpha tomography and Line Intensity Map

2023   Harvard, MIT, University of Pennsylvania, University of California Irvine, University of California Santa Barbara, University of Texas Austin

February   Presenting Tutorial on Machine Learning approaches in large-scale galaxy formation simulations

2023   KITP Program, Data Driven Astronomy

December   Boosting Line Intensity Map Signal-to-Noise with the Ly-α Forest Cross-Correlation

2023   Flatiron Institute, Cosmology and Astrophysics with Machine Leaning Simulations(CAMELS) workshop

October   Characterizing Protoclusters and Protogroups at z $\sim$ 2.5 Using Ly-α Tomography

2022   IPAC Talk Series

Jun   Characterizing Protoclusters and Protogroups at z $\sim$ 2.5 Using Ly-α Tomography

2022   Cosmology from home conference

September   Characterizing Protoclusters and Protogroups at z $\sim$ 2.5 Using Ly-α Tomography

2022   Protoclusters: galaxies in confinement

Professional service

Referee for high-impact journals: **ApJ Letters   Physical Review D**

Review panelist :   **Gemini telescope** Canadian time allocation committee (CanTAC)

Teaching Assistantship

2018 :   **Physics lab I**, UCR.

2017-18 :   **Quantum mechanics I & II**, SUT.

2016 :   **Special relativity**, SUT.