

Sam(Mahdi) Qezlou

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 [Webpage](#)
 [Github](#)



Curriculum Vitae

Education

- 2018–present **PhD, Physcis & Astronomy**, *University of California, Riverside*.
Applications of 3D Lyman- α forest tomography. Computational Astrophysics
Advisors : Simeon Bird, UCR. Andrew Newman, Carnegie Observatories. Gwen Rudie, Carnegie Observatories.
2013-2018 : **B.Sc in Physics** , *Sharif University of Technology, SUT*.
Research Advisor : Shant Baghran, SUT

Publications

Journal Articles

- 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 with the Ly- α Forest Cross-Correlation. *arXiv e-prints*, page arXiv:2303.17632, March 2023.
- 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 **Mahdi Qezlou**, Andrew B. Newman, Gwen C. Rudie, and Simeon Bird. Characterizing Protoclusters and Protogroups at z 2.5 Using Ly α 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.
- 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.

Research Experience:

Keywords:

Running Cosmological hydrodynamic simulations (MP_GADGET), Ly- α tomography at cosmic noon, Machine Learning & Bayesian statistics.

at UCR and Carnegie Observatories

- Jun2023 – **Line-intensity emulators for upcoming COMAP/EXCLAIM experiments**, PRIYA collaboration.
present Emulating the 3D power spectrum of the CO/[CII] emission observed with the upcoming line-intensity surveys using the cosmological hydro simulations Publication : [Qezlou et. al. in prep](#)
- Jun2023 – **Constraining cosmology with high-resolution Ly- α forest simulations and observations** , PRIYA
present collaboration..
Building an emulator for the high-resolution spectroscopic observations of the Ly- α forest using high-resolution hydrodynamical simulations Publication : [Qezlou et. al. in prep](#)
- Jan,2022 – **Boosting Line Intensity Map Signal-to-Noise with the Ly- α Forest Cross-Correlation**, Ly- α tomog-
2023 raphy IMACS Survey (LATIS) collaboration..
Enhancing the S/N of molecular line intensity detection by joining the power with 3D Ly- α absorption tomographies. Cosmology, Galaxy formation at cosmic noon Publication : [Qezlou et. al. 2023](#)

- Jan,2020 – **Characterizing galaxy protoclusters and protogroups in 3D Ly- α tomography surveys.**, Ly- α tomography IMACS Survey (LATIS) collaboration.
 Dec,2021 Image processing techniques helping detect progenitors of massive galaxies at $z \sim 2.5$ in 3D Lyman- α absorption tomography. *Publication* : [Qezlou et. al. 2021](#)
- 2018 – present **Scaling the post-processing tools for extremely large hydrodynamical simulations.**
 Collaborating with *Simeon Bird* on [fake_spectra](#) project. *Publication* : [Qezlou et. al. 2021](#)

Fellowships & Awards

- 2022-2023 **Dissertation-Year Fellowship**, Awarded to only 3 students at UCR among all PhD majors.
- 2020 – 2021 **Carnegie-UCR Fellowship** Graduate researcher fellow at Carnegie observatories to work on Ly α 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

- February 2023 Presenting Tutorial on Machine Learning approaches in large-scale galaxy formation simulations
[KITP Program, Data Driven Astronomy](#)
- December 2023 Boosting Line Intensity Map Signal-to-Noise with the Ly- α Forest Cross-Correlation
 Flatiron Institute, Cosmology and Astrophysics with Machine Learning Simulations(CAMELS) [workshop](#)
- October 2022 Characterizing Protoclusters and Protogroups at $z \sim 2.5$ Using Ly- α Tomography
[IPAC Talk Series](#)
- Jun 2022 Characterizing Protoclusters and Protogroups at $z \sim 2.5$ Using Ly- α Tomography
[Cosmology from home conference](#)
- September 2022 Characterizing Protoclusters and Protogroups at $z \sim 2.5$ Using Ly- α Tomography
[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.