# Mahdi Qezlou

*Curriculum Vitae*

Department of Physics and Astronomy
University of California, Riverside
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🖥 Webpage
🐙 Github

## Education

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|---|---|
| 2018–present | **PhD, Physcis & Astronomy**, *University of California, Riverside*. <br> Applications of 3D Lyman-$\alpha$ 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 Baghram, SUT |

## Publications

### Journal Articles

**2022**   **Mahdi Qezlou**, Andrew B. Newman, Gwen C. Rudie, and Simeon Bird. Characterizing Protoclusters and Protogroups at z 2.5 Using Ly$\alpha$ 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`), $Ly-\alpha$ tomography at cosmic noon, Machine Learning & Bayesian statistics**.

### at UCR and Carnegie Observatories

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| Jan,2022 – present | ***Competitive constraints on CO emission at z $\sim 2.5$, a joint analysis with $Ly-\alpha$ tomography***, Ly-$\alpha$ tomography IMACS Survey (LATIS) collaboration.. <br> Enhancing the S/N of molecular line intensity detection by joining the power with 3D Ly-$\alpha$ absorption tomographies. Cosmology, Galaxy formation at cosmic noon *Publication :* Qezlou et. al. in prep |

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

## Fellowships & Awards

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| 2020 – 2021 | ***Carnegie-UCR Fellowship*** Graduate researcher fellow at Carnegie observatories to work on Ly$\alpha$ tomography IMACS survey (LATIS) project. |
| 2018-2019 | ***UCR Graduate Dean Fellowship***, for Fall, spring and Summer quarters |

## Computing skills

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| Computer Skills | Python, C, MPI parallel computing, HPC, Machine learning, Bayesian statistics |

## Mentorship Experience

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| 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 | **CASSI, Summer research program for undergraduates at Carnegie observatory,** , *Teaching python, parallel computing and visualizations to $\sim$ 4o students*. |

## Professional service

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| | Referee for high-impact journals: **ApJ Letters** |
| | Review panelist : **Gemini telescope** Canadian time allocation committee (CanTAC) |

## Teaching Assistantship

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| 2018 : | **Physics lab I**, UCR. |
| 2017-18 : | **Quantum mechanics I & II**, SUT. |
| 2016 : | **Special relativity**, SUT. |