

With a Master of Science degree in Gravity and Cosmology, my research interests encompass Accretion Disks, Active Galactic Nuclei, Dark Energy and Dark Matter, Black Hole Cosmology, Epoch of Re-ionization, and Negative mass cosmology. As a Research Assistant with more than two years of experience, I am dedicated to advancing our understanding of the universe through cutting-edge research.

🎓 Education

🏛️ Shahid Beheshti University

M.Sc of Gravity and Cosmology

2021 – 2023

Tehran, Iran

- Thesis Title: Negative Mass Cosmology with SNIa and BAO Data.
- Supervisors: Prof. Marzieh Farhang, Prof. Hossein Shojaei
- Thesis Grade: Outstanding
- Overall GPA: 14.89/20

🏛️ Shahid Beheshti University

B.Sc of Physics

2016 – 2021

Tehran, Iran

- Overall GPA: 15.49/20 (GPA of last year: 17.92)
- Final Projects:
 - Thesis title: Exoplanets and Habitable Zones
 - Supervisor: Prof. Nima Khosravi
 - Importance of Quasars for Dark Energy properties: during the Cosmology Undergraduate course

🧰 Research Experience

🏛️ PDAT – Physics Data and Astronomy Technology Laboratory

Research Assistant

Jan. 2023 – Present

Tehran, Iran

- **Working on "On the Accretion Efficiency of High Redshift Quasars based on the QUOTAS & QuasarNet Data set". (Paper is in preparation.)**

Using Data Analysis and Machine Learning to Investigate the Relations between *Black Hole Accretion Rate* and Super Massive Black Hole Mass, Bolometric Luminosity, Radiation Rate, λL_λ or specifically L_{5100} , Eddington Ratio (λ_{edd}) and Redshift Using QUOTAS Data and to find the best fit with logical parameters.

🏛️ PDAT – Physics Data and Astronomy Technology Laboratory

Research Assistant

Jan. 2023 – Present

Tehran, Iran

- **Worked on rotating Black Hole's Spin Effect on Black Hole Accretion Rate.**

Using Data Analysis via Python to Investigate whether a rotating BH's Spin (a) can affect BH's Accretion efficiency or not.

🏛️ PDAT – Physics Data and Astronomy Technology Laboratory

Research Assistant Intern

Sep. 2022 – Jan. 2023

Tehran, Iran

- **Worked on Thermal Evolution from 21cm emission.**

Using Data Analysis via Python to solve the Thermal evolution equation from 21cm heating, Ly α heating, and X-ray heating; and Investigating the relation between T_k and T_{spin} with Redshift using 21CMSOLVER code.

🏛️ Shahid Beheshti University

Research Assistant

Jun. 2022 – Present

Tehran, Iran

- **M.Sc. Thesis Title: Negative Mass Cosmology with SNIa and BAO Data.**

- Abstract: The Thesis presents the concept of negative mass in the cosmological model. We explore the potential impact of negative mass on the acceleration of the universe's expansion and its role as a component of the cosmos. The study aims to determine if the cosmological constant and cold dark matter can assume negative values within this model. A novel model is proposed to explain the observed positive acceleration of the cosmos in terms of the Hubble parameter while discounting certain characteristics. The model is tested using type Ia supernovae and baryon acoustic oscillations data, revealing two scenarios for obtaining the best values of cosmic parameters. It is important to note that this project does not investigate the negative mass cluster.

- Supervisors: Prof. Marzieh Farhang, Prof. Hossein Shojaei

- Future Aspects Include: Investigating the effects of Negative mass and comparing the data by adding another set of parameters Using MCMC.

Shahid Beheshti University

Research Assistant

Nov. 2019 – Jun. 2020

Tehran, Iran

» **B.Sc. Thesis Title: Exoplanets and Habitable Zones.**

- › Supervisor: Prof. Nima Khosravi
- › Abstract: Exoplanets are planets that orbit stars other than the sun, offering valuable information about planetary formation, evolution, and the possibility of extraterrestrial life. Despite challenges in detection and characterization, the study of exoplanets is crucial for understanding their significance to Earth and exploring potential habitable zones.

Publications

A. Khosravi, S.S. Tabasi, A. Karamzadeh, J.T. Firoozjaei, "On the Accretion Efficiency of High Redshift Quasars based on the QUOTAS & QuasarNet Data set"

- › Under preparation.

Teaching Assistant Experience

Shahid Beheshti University

Teacher Assistant

Feb. 2023 – Jun. 2023

Tehran, Iran

- › Course: Cosmology (I) for Graduate Students
- › Reference: Cosmology by Daniel Baumann
- › Lecturer: Prof. Hossein Shojaei
- › Highlights: Responsible for holding exercise classes, Designing computational exercises using Python and Mathematica, preparing students, recitations, and grading homework.

Workshops, Seminars, and Meetings

Cosmology: From Theory to Observation

Institute for Research in Fundamental Sciences (IPM)

Aug. 2023

Tehran, Iran

Cosmology and Astrophysics with New Data

K. N. Toosi University of Technology

Jul. 2022

Tehran, Iran

Machine Learning and Physics

SciSchool Institute

June. 2022

Tehran, Iran

Statistical Analysis of Cosmic Fields

Shahid Beheshti University

Oct. 2021

Tehran, Iran

Introduction to Various Topics in Quantum Physics

Inter Disciplinary Schools

Oct. 2020

Tehran, Iran

Introduction to Cosmology

Inter Disciplinary Schools

Oct. 2020

Tehran, Iran

Neuroscience: From Conciseness to Memory

Sharif University of Technology

Sep. 2019

Tehran, Iran

Research Interests

- Data Driven Cosmology
- Computational Cosmology and Astrophysics
- Accretion disks (Accretion efficiency)
- Active Galactic Nuclei (Quasars)
- PBH and SMBH cosmology
- Dark matter and Dark Energy
- 21cm Cosmology
- Galaxy and Star Formation
- Large Scale Structure
- Epoch of Re-ionization
- Intergalactic Mediums
- Negative Mass Cosmology
- Interactive Dark Matter and Dark Energy (IDM)

Skills

Programming Languages Python, HTML/CSS, C++

Development Tools and Technologies Pandas, Seaborn, Matplotlib, SciPy, SymPy, NumPy, Scikit-Learn, TensorFlow, Git, Jupyter Notebook, WordPress, etc.

Softwares Wolfram Mathematica (xAct, etc.), Astrometrica, Microsoft Office, Adobe (Photoshop, After Effects, InDesign)

Industry Knowledge Machine Learning, Data Analysis, Statistical Data Analysis, Numerical Analysis

Markup Languages \LaTeX

Languages English (Full professional proficiency), Farsi (Native), Dutch (Basic), French (Basic)

Familiar with Linux, Julia, Λ CDM Cosmology, Λ CDM cosmology, Negative mass Cosmology, IDM

Honors and Awards

Ranked within the top %10 in Gravity and Cosmology among my M.Sc. graduating class.

Shahid Beheshti University

Sept. 2023

Tehran, Iran

Ranked within the top %15 in Physics among my B.Sc. graduating class.

Shahid Beheshti University

Dec. 2020

Tehran, Iran

Ranked within the top %2 In the Iranian University Entrance Exam for Master Degree.

For Shahid Beheshti University

2021

Tehran, Iran

Ranked within the top %3 In the Iranian University Entrance Exam for Bachelor Degree.

For Shahid Beheshti University

2016

Tehran, Iran

Got Through the first level of Astronomy Student Olympiad.

Manzoumeh Kherad Institute

2015

Tehran, Iran

Got Through the first level of Physics Student Olympiad.

Manzoumeh Kherad Institute

2015

Tehran, Iran

Ranked within the Top three projects in Physics and Astrophysics Society two years in a row.

Manzoumeh Kherad Institute

2014–2015

Tehran, Iran

Relevant Courses

Supervised Machine Learning: Regression and Classification

by Andrew NG

Coursera

Data Analysis Using Python

by Mahdieh Tavakoli

Pazhvak Danesh

Introduction to General Relativity In Mathematica Using xAct

by Sajad Aghapoor

SciSchool Institute

Graduate Cosmology (II)

by Prof. Nima Khosravi

Shahid Beheshti University

Grade: 4.0/4.0

Advanced Astrophysics (I)

by Prof. Sadollah Nasiri Gheydari

Shahid Beheshti University

Grade: 4.0/4.0

Under-Graduate Cosmology

by Prof. Nima Khosravi

Shahid Beheshti University

Grade: 4.0/4.0

Under-Graduate Astronomy & Astrophysics

by Prof. Nima Khosravi

Shahid Beheshti University

Grade: 4.0/4.0

Earth in Space

by Prof. Alireza Salehipoor

Shahid Beheshti University

Grade: 4.0/4.0

References

Prof. Marzieh Farhang | Associate Professor at Physics Department of Shahid Beheshti University

 M.Sc. Supervisor


 Email: [M_farhang \[at\] sbu.ac.ir](mailto:M_farhang@sbu.ac.ir)

Prof. Javad Taghizadeh Firouzjaee | Associate Professor at Physics Department of Khajeh Nasir Toosi University of Technology

 Supervisor at Physics Data and Astronomy Technology Laboratory

 Email: [firouzjaee \[at\] kntu.ac.ir](mailto:firouzjaee@kntu.ac.ir)

Prof. Hossein Shojaei | Assistant Professor at Physics Department of Shahid Beheshti University

 M.Sc. Supervisor

 Email: [H_shojaei \[at\] sbu.ac.ir](mailto:H_shojaei@sbu.ac.ir)