Sepideh Abdollahihashjin

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Webpage : https://sepideh-abh.github.io/

Bachelor of Science in Physics, Sharif University of Technology

Education

Institute of Science and Technology Austria (ISTA)
Doctoral Research Rotations (Preliminary Phase) — *Sep 2023 - Dec 2024*

- Conducted research internships in three groups as part of the first-year exploratory phase of the PhD program.

Sharif University of Technology, Tehran, Iran
Bachelor of Science, Physics — *Sep 2018 - May 2023*
– *CGPA: 17.21/20*

Farzanegan 1 High School, Tehran, Iran
Diploma — *Sep 2014 - May 2018*
– *CGPA: 19.46/20*

Research Interests

- **Stellar Evolution**
- **Compact Objects**
- **Binary Stars**
- **Stellar and Galactic Dynamics**

Research Projects

Institute of Science and Technology Austria (ISTA)
Supervisor: Dr. Ilaria Caiazzo — *Apr - Aug 2024*

– **Observational Entropy and Correlations**: "Investigating the delay time in highly magnetic, fast-rotating white dwarfs caused by binary interactions by comparing age estimates derived from evolutionary models and velocity dispersion analysis, utilizing data from Gaia Data Release 3."

Institute of Science and Technology Austria (ISTA)
Supervisor: Dr. Ylva Götberg — *Jan - Mar 2024*

– **Stripped Stars Mass Range**: Exploring the mass of stripped stars produced through mass transfer in binary systems by modeling a 12 solar masses star orbiting an 8.6 solar masses companion using the MESA binary stellar evolution code, focusing on different evolutionary phases and orbital periods.

Quantum Information Group, Universitat Autònoma de Barcelona, Spain
Supervisor: Prof. Andreas Winter — *Apr 2022 - Present*

– **Observational Entropy and Correlations**: Finding properties of the observational entropy under different measurements and defining a family of measures of quantum correlation and entanglement by using observational entropy.

Sharif University of Technology, Iran
Supervisor: Dr. Saman Moghimi Araghi — *Jul 2021 - Jul 2022*

– **Abelian Sandpile Model**: Examining self-organized criticality in the 2d-grid for Abelian sandpile model focusing on longer links' existence.

Publication

Preparing Schrödinger Cat States in a Microwave Cavity Using a Neural Network — *Sep 2024*

Accepted for publication in PRX Quantum. arXiv

Conferences & Workshops

Austrian Early Career Conference 2024
Austrian Society for Astronomy and Astrophysics (ÖGAA) — *March 2024*

Poster presentation: How massive are stripped stars? An exploration of orbital period dependence

23rd European Workshop on White Dwarfs
Polytechnic University of Catalonia — *July 2024*

Topology and Non-equilibrium Dynamics in Engineered Quantum Systems
Max Planck Institute for the Physics of Complex Systems — *Oct 2022*

Quantum Transport with Ultracold Atoms
Max Planck Institute for the Physics of Complex Systems — *Aug - Sep 2022*

Journées de la Matière Condensée (JMC)
Société Française de Physique — *August 2022*

Awards & Achievements

- Awarded scholarship from the **National Elites Foundation**, Tehran, Iran, 2018
- **Silver medal**, in the National Olympiad of Astronomy and Astrophysics, Tehran, Iran 2017
- Member of **Iran's National Elites Foundation**, Tehran, Iran 2017
- Accepted into the pre-regional exam at the National Olympiad of Physics, Tehran, Iran 2016

Selected Courses

- **Physical Properties of Galaxies**
  University of Vienna (In progress)
- **Star Formation: From Molecular Clouds to Protostars**
  University of Vienna (In progress)
- **Galactic and Extra-galactic Star Clusters**
  University of Vienna (In progress)
- **Radiative Processes and Spectra in Astronomy**
  ISTA (In progress)

Further descriptions

teaching experiences

Teaching Assistant:
VISTA science experience center — *Oct 2024 - Present*

Teaching Assistant: Stochastic Processes in Bio-informatics (M.Sc)
Dr. Mohammad Hossein Rohban — *Spring 2022*

Teaching Assistant: Game Theory (M.Sc)
Dr. Mohammad Hossein Rahmati — *Spring 2022*

Teaching Assistant: Modeling Stochastic Phenomena (B.Sc/M.Sc)
Dr. Fakhteh Ghanbarnejad — *Spring 2021*

Olympiad Instructor
2017 - Present

Providing courses to prepare high school students for the national and the international Astronomy Olympiad.

- Teaching topics: classical mechanics, astrophysics, cosmology, spherical astronomy, data analysis
- Institutions: summer school of the National Astronomy and Astrophysics Olympiad - Austria and Iran, Farzanegan 1, Farzanegan 2, Salam

Further descriptions

Internship

Preparing arbitrary fock states in a cavity, using the GRAPE algorithm
Supervisors: Prof. Benjamin Huard and Dr. Audrey Bienfait
(Quantum Circuit Group, ENS Lyon, France) — *Jul - Oct 2022*

- Using the GRAPE algorithm to find the control pulses in a cavity-qubit coupled system to reach an arbitrary fock state in the cavity and finding the right translation between simulation values and amplitudes in the experiment.

Further descriptions.

Skills

Programming Languages: Python (Astropy, COSMIC, SciPy, Pandas, Matplotlib, Seaborn, Numpy, QuTiP, NetworkX), Matlab

Tools: MESA, LaTeX, Mathematica, Inkscape

Languages

Persian: Native, **English**: Advanced (TOEFL: 104/120), **German**: Beginner

References

Dr. Saman Moghimi Araghi, Sharif University of Technology, Tehran, Iran
Email address: ***samanimi@sharif.edu*** — *Webpage*

Dr. Audrey Bienfait, Ecole Normale Supérieure, Lyon, France
Email address: ***audrey.bienfait@ens-lyon.fr*** — *Webpage*

Prof. Benjamin Huard, Ecole Normale Supérieure, Lyon, France
Email address: ***benjamin.huard@ens-lyon.fr*** — *Webpage*

Dr. Alexis Jouan, ESPCI, Paris, France
Email address: ***alexis.jouan@espci.fr*** — *Webpage*