Sepideh Abdollahihashjin

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

Senior Undergraduate, Physics, Sharif University of Technology

Education

Sharif University of Technology, Tehran, Iran
Bachelor of Science, Physics — *Sep 2018 - May 2023 (Expected)*
– *CGPA: 17.46/20*

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

Research Interests

- **Superconducting Circuits**
- **Circuit Quantum Electrodynamics**
- **Quantum Computation and Information**
- **Complex Systems**
- **Computational Physics**

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.

Research Projects

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.

Quantum Information Science Group, Sharif University, Iran
Supervisor: Prof. Vahid Karimipour — *Feb - Jun 2022*

– **Generalized Landau-Streeter Channel in The High-Dimensions**: Computing quantum information properties of the generalized form of the Landau-Streeter Channel in the higher dimensions.

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

– **Abelian Sandpile Model**: Examining Self-organized Criticality in the 2d-grid for Abelian Sandpile Model by focusing on longer links' existence.

Sharif University, Iran
Supervisors: Dr. Fakhteh Ghanbarnejad and Dr. Farnoush Farahpour — *Apr 2020 - Apr 2021*

– **The way observation reflects the reality of SIR, SEIR, SIRD dynamics**: Estimating the real epidemic dynamics with a random sampling at a macroscopic level.

Course Projects

Information Theory: The Capacity of Classical-Quantum Channels
Supervisor: Prof. Mohammad R. Aref - Report file — *Fall 2021*

Quantum Mechanics: Discrete Element Method Simulation for Different Potentials
Supervisor: Dr. Abolhassan Vaezi - Simulation files — *Spring 2021*

Computational Physics: Ising Model and Phase Transitions Simulation
Supervisor: Dr. Fakhteh Ghanbarnejad — *Fall 2020*

Optics: Optical Communication
Supervisor: Dr. Sadegh Raeisi - Report file — *Spring 2022*

Advanced Quantum Mechanics: Geometric Phase in Quantum Mechanics
Supervisor: Dr. Amin Faraji Astaneh - Report file — *Fall 2021*

Workshops

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

Silver medal, in Iran's national Olympiad of Astronomy and Astrophysics, 2017

Member of **Iran's National Elites Foundation**

Selected Courses

Quantum Theory courses:

- Advanced Quantum Mechanics (M.Sc, 18.5/20), Quantum Computing (Ph.D., 16/20)

Information Theory courses:

- Information Theory (M.Sc, 16/20), Quantum Information Theory (Audit)

Complex Systems courses:

- Complex Systems (M.Sc, 19.5/20), Stochastic Process (M.Sc, 18.9/20), Computational Physics (M.Sc, 18.9/20)

Further descriptions

teaching experiences

Teacher Assistant: Stochastic Processes in Bioinformatics (M.Sc)
Dr. Mohammad Hossein Rohban — *Spring 2022*

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

Teacher Assistant: Statistical Modeling (M.Sc)
Dr. Fakhteh Ghanbarnejad — *Spring 2021*

Olympiad Instructor
Providing courses to prepare high school students for the National Astronomy Olympiad. *2017 - Present*

- Topics: Classical Mechanics, Astrophysics, Cosmology, Spherical Astronomy, Data analysis
- Institutions: Farzanegan 1, Farzanegan 2, Salam, Summer school of National Astronomy and Astrophysics Olympiad (Observational Astronomy test writer)

Further descriptions

Skills

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

Tools: cQED (Qubit measurement), Quantum Orchestration Platform (QOP), LaTeX, Mathematica

Languages

Persian: Native, **English**: Advanced **French**: 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, Ecole Normale Supérieure, Lyon, France
Email address: ***alexis.jouan@espci.fr*** — *Webpage*