

Sepideh Abdollahi Hashjin

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Webpage

Education

2012–2018 **Diploma**, *Tehran Farzanegan 1 High School* .
2018–present **BSc. Physics**, Sharif University of Technology - SUT.

Honors

2017 **Silver Medal**, in *National Olympiad Astronomy and Astrophysics*.
since 2017 **Members of Iran's National Elites Foundation**.

Research Interests

Academic Research Interests.

- Quantum Information Theory and Quantum Communication
- Complex Systems
- Neuronal Dynamics
- Nonlinear Dynamics and Chaos
- Computational Physics
- Stochastic processes
- Spreading Phenomena
- Agent Based Modeling

Academic Research Experience

February 2020–Now Undergraduate Research Assistant Under supervision of Dr. Fakhteh Ghanbarnejad

- *How observation reflects reality of SIR dynamics.*
On collaboration with Dr. Farnoush Farahpour

January 2022–Now Undergraduate Research Assistant Under supervision of Prof. Vahid Karimipour

- *Capacity of covariant and symmetric pauli channels*

July 2021–Now Undergraduate Research Assistant Under supervision of Dr. Saman Moghimi Araghi

- *The effect of longer links' existence in the 2d-grid for abelian sandpile*

Related Courses

Courses Related to my Research Interests.

- Quantum computation (PhD) - Prof. Vahid Karimipour
- Information Theory (MSc) 16/20 - Prof .Mohammad R. Aref
- Advanced Quantum mechanics (MSc) 18.5/20 - Dr. Amin Faraji Astaneh
- Neuroscience (MSc) 19/20 -Dr .Saman Moghimi Araghi
- Complex systems (MSc) 19.5/20 -Dr .Saman Moghimi Araghi
- Nonlinear Dynamics and Chaos (MSc) 20/20 -Dr.Fakhteh Ghanbarnejad
- Computational physics (MSc) 18.8/20 -Dr.Fakhteh Ghanbarnejad
- Statistical Modeling (MSc) 20/20 -Dr.Fakhteh Ghanbarnejad
- Game theory (MSc) 20/20 -Dr.Mohammad Hossein Rahmati
- Stochastic processes 18.9/20 - Dr.Mostafa Esfahani Zadeh

Projects

Winter-Spring 2020 **Modeling Infectious Diseases.**

- SIR, SEIR and SIRD models and phase transitions
- Simulation of epidemics on networks(SIR, SEIR, SIS dynamics)
- Simulation of epidemics in metapopulations
- Agent Based Modeling
- How observation reflects reality of SIR, SEIR, SIRD dynamics

under supervision of Dr.Fakhteh Ghanbarnejad

Fall-Winter 2020-21 **Computational physics.**

- Simulation of cellular automata
- Monte Carlo simulation
- Fractal growth simulation
- Random walk simulation (human mobility)
- Ising model and phase transitions simulation
- Molecular dynamics simulation

under supervision of Dr.Fakhteh Ghanbarnejad

Fall-Spring 2020-21 **Qunatum Mechanic.**

- Discrete element method simulation for different potentials

under supervision of Dr. Abolhassan Vaezi

- February **Complex systems.**
2021–Now
- Analysing stock data (price return, ...)
 - BTW abelian sandpile simulation
 - Manna abelian sandpile simulation
 - Percolation simulation on networks (grids, complex networks, ...)
 - Lorenz system simulation

under supervision of Dr .Saman Moghimi Araghi

Academic Teaching Assistant Experience

Statistical Modeling (MSc) -Dr.Fakhteh Ghanbarnejad

Game theory(MSc) -Dr.Mohammad Hossein Rahmati

Stochastic Processes in Bioinformatics(MSc) -Dr.Mohammad Hossein Rohban

Computer Skills

Programming Languages Python (Advanced), Matlab (Advanced), Mathematica

Libraries Python: SciPy (Advanced), NetworkX (Advanced), Pandas (Advanced)
Matplotlib (Advanced), Seaborn (Advanced)

Languages

Persian Native

English Advanced

Work Experience

2017–Present **Olympiad Instructor.**

I'm teaching Astronomy and Astrophysics to students.

Topics I have taught so far:

- Classical Mechanics, Astrophysics, Cosmology, Spherical Astronomy, Data analysis

Places I've worked so far:

- Salam High school, Farzanega1, Farzanegan2, Summer school of Astronomy and Astrophysics
National Olympiad (also observational astronomy test writer)