Amir Shapour Mohammadi
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Education

Undergraduate - Princeton University, B.A. Physics (Cum Laude) 2024

Minors: Applied and Computational Mathematics, Near Eastern Language & Culture (Persian)

Clubs/Societies: Society of Physics Students (Mentorship Chair), American Physical Society

- *Physics:* Condensed Matter Physics, Low-dimensional Quantum Devices, Quantum Information Theory, Thermal Physics, Statistical Mechanics, Dynamical Systems, Electrodynamics, Quantum Field Theory
- *Mathematics:* Abstract Algebra, Linear Algebra, Real and Complex Analysis, Topology, Differential Geometry

Experience

HRL Laboratories, LLC (Malibu, CA) **(**Full-time) May 2023 – August 2023
Adviser: Andrew Oriani (Full-time) June 2024 – present
Description:

- Design new electrical control systems for manipulation and readout of quantum dot spin-qubits.
- Develop FPGA software for full control of semiconductor spin-qubits.

Yazdani Research Lab (Princeton, NJ) (Part-time) February 2023 – May 2024
Adviser: Ali Yazdani and Duncan Haldane, Professors, Physics
Group objective: Understand novel quantum phases of matter using scanning tunnelling spectroscopy.
Description:

- Develop Python simulations to analyze experimental signatures of fractional quantum Hall phases in bilayer graphene; results are under review in *Science*.

Petta Research Lab (Princeton, NJ) (*Part-time and full-time) May 2021 – May 2024
Adviser: Jason Petta, Professor, Physics
Group objective: Control of semiconductor quantum dots to facilitate high-fidelity manipulations.
Description:

- Develop experimental techniques for high-performance data acquisition and threshold-detection of qubit readout using digitizer and FPGA.
- Extensive experience writing instrument drivers and interfacing with devices using WaveMetrics proprietary language Igor PRO. Coded additional tools in C.
- Develop Python simulation for modelling spin qubits hosted in quantum dots.

Technical Skills

Coding: Experience using Python, MATLAB, Wolfram Mathematica, Qiskit, Vivado, PuTTY, LTspice, MATCONT. Extensive experience writing instrument drivers in Igor Pro and C. Professional experience with using Git, LaTeX.
Laboratory Equipment: Extensive experience using electrical equipment for pulse generation and readout including vector network analyzer, oscilloscope, spectrum analyzer, sampling module, FPGA, AWG, DAC, ADC.

Publications

High-Resolution Tunneling Spectroscopy of Fractional Quantum Hall States *ArXiv*, under review in *Science*

Presentations

Sources of Dephasing in Si/SiGe Quantum Dots APS March Meeting 2023

Conferences

APS March Meeting (Las Vegas, NV) 2023
ARO/LPS Quantum Computing Programming Review (Annapolis, MD) 2022

Awards/Honors

Allen G. Shenstone Prize in Physics (Princeton University) 2023, 2024
Manfred Pyka Memorial Prize in Physics (Princeton University) 2022

**Full-time during summers of 2021 and 2022, part-time for all other times*