Syed Ali Asghar

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PROFILE

MSc Physics graduate and IBM Qiskit Advocate specializing in quantum computing and computational physics, with hands-on experience in developing and benchmarking variational quantum algorithms (VQE) for quantum chemistry and fluid dynamics. Recognized in international and local quantum hackathons (NED TechFest Runner-up, Classiq Open Challenge 2nd Place) and collaborative projects under the Womanium WISER program. Skilled in Qiskit, PennyLane, and hybrid quantum–classical simulation methods.

EDUCATION

University of Karachi Karachi, Pakistan
Masters of Science in Physics | **CGPA:** 3.26 / 4.00 *(First Division, Excellent)* JAN 2024 – DEC 2024

- **Relevant Coursework:** Quantum Mechanics II, Computational Physics, Statistical Mechanics
- **Thesis:** Relativistic and Nonextensive Generalizations of Planck's Blackbody Radiation Law

  * *Awarded after a 3-year BSc (Hons); together constituting a 4-year integrated program equivalent to an international Bachelor's degree in Physics.*

University of Karachi Karachi, Pakistan
Bachelor of Science (Honors) in Physics | **CGPA:** 3.19 / 4.00 *(First Division, Excellent)* JAN 2021 – DEC 2023

- **Relevant Coursework:** Classical Mechanics, Quantum Mechanics

RESEARCH & ACADEMIC EXPERIENCE

External Research Assistant MAR 2025 – Present
School of Mathematics and Computer Science (SMCS), Institute of Business Administration (IBA)
Supervisor: Dr. Jibran Rashid, Assistant Professor, IBA

- Benchmarking the Variational Quantum Eigensolver (VQE) pipeline across molecular systems (H_2 to larger molecules), analyzing the impact of ansätze, qubit mappings, basis sets, classical optimizers, and quantum backends.
- Leading student teams in algorithm optimization and implementation to identify efficient configurations for quantum chemistry simulations.

Research Collaborator JUN 2025 – AUG 2025
Womanium WISER Quantum Project (Remote)
Collaborators: Team members from India and Egypt

- Investigated quantum algorithms for solving the 1D viscous Burgers' equation using Quantum Tensor Networks (QTN) and Hamiltonian Simulation approaches for computational fluid dynamics.
- Benchmarked quantum solvers against classical and PINN baselines for accuracy and noise resilience; presented at WISER Demo Day 2025 (Special Mention Award), shortlisted for Quantum Solution Launchpad (QSL) Fellowship.

HACKATHONS & COMPETITIONS

Quantum Hackathon (Runner-up) | NED University, Karachi OCT 2025

- Secured Runner-up position at TechFest '25 by designing and optimizing quantum circuits for entanglement-based algorithms; awarded PKR 25,000 cash prize.

BlueQubit Hackathon APR 2025

- Competed in BlueQubit's global quantum hackathon, solving "Peaked Circuits" challenges by identifying high-probability bitstrings from QASM-defined quantum states.

QSite Hackathon 2024 (Second Place) | Classiq Open Challenge SEP 2024

- Implemented a quantum harmonic oscillator simulation on the Classiq platform, achieving 2nd place for circuit efficiency and physical accuracy.

IBM Quantum Challenge | IBM Qiskit JUN 2024

- Solved advanced quantum algorithm and circuit optimization tasks on real IBM hardware using Qiskit and noise-aware simulation workflows.

TEACHING & PROFESSIONAL EXPERIENCE

Applied Physics Lab Instructor, Iqra University | Karachi, Pakistan AUG 2025 – OCT 2025

- Conducted electronics-based physics labs for computer science undergraduates, linking theoretical concepts to practical circuit implementation and measurement.

Scientia Writing Internship, Scientia Magazine | Remote MAY – JUL 2025

- Wrote science communication articles on quantum computing and physics, simplifying advanced concepts for general audiences and promoting scientific literacy.

STANDARDIZED TESTS

IELTS | Overall band score: 7.5 | Listening 9.0, Reading 7.5, Speaking 7.0, Writing 6.5 NOV 2025

CERTIFICATIONS & EXTRA CURRICULAR ACHIEVEMENTS

Courses and Online Learning

- **QBronze Diploma** - *QWorld*
- **Practical Quantum Computing with IBM Qiskit for beginners** - *Packt (Coursera)*
- **Quantum Machine Learning Fundamentals Course** - *Ingenii*
- **Exploratory Data Analysis for Machine Learning** *(With Honors)* - *IBM (Coursera)*
- **Introduction to Python Programming** - *University of Pennsylvania (Coursera)*

WORKSHOPS & SUMMER SCHOOLS

- **Quantum Machine Learning Workshop** - *QPoland & Fundacja Quantum AI* OCT 2025
- **Qiskit Global Summer School** - *IBM Qiskit* AUG 2024

OUTREACH AND VOLUNTEERING

Founder and Coordinator — Zeta Science Forum 🔗 2024 – Present
Founded a student-led science forum promoting dialogue between physics, computer science, and philosophy students. Organized seminars on quantum computing, cosmology, and philosophy of science, with events featured on the forum's official website (Zeta Science Forum)

External Academic Mentor — Institute of Business Administration (IBA), Karachi MAR 2025 – Present
Mentored undergraduate teams working on Variational Quantum Eigensolver (VQE) benchmarking and algorithm optimization projects, bridging physics, quantum computing, and applied research in an interdisciplinary academic setting.

TECHNICAL SKILLS

Programming: Python (NumPy, SciPy, Matplotlib, Pandas), Julia
Quantum & Simulation Tools: Qiskit, Tangelo, Classiq, PennyLane, Multisim
Documentation & Version Control: LaTeX, Git, GitHub

(*Further details and accomplishments available on my portfolio:* syedaliasghar2001.github.io/Portfolio)