

Gehad Mostafa Hasan Eldibany

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Education

Master's Degree in Quantum Technologies Universidad Internacional Menéndez Pelayo (& CSIC)	10/2024–10/2025 <u>ECTS:</u> 60 <u>GPA:</u> 8.1
Bachelor of Science (Honours) in Physics The Open University UK	01/2019–10/2023 <u>ECTS:</u> 180 <u>Grade:</u> First-class Honours

Research Experience

Master's Thesis: Free-Space Quantum Key Distribution Under Atmospheric Fluctuations

CSIC — 12/2024-09/2025

Investigated the atmospheric transmission effects on QKD downlinks and optimizing the operational parameters and the receiver.

Supervisors: Dr Daniel Balado Souto and Dr Verónica Fernández Márquez.

Undergraduate Thesis: Review of Entanglement-Based Quantum Cryptography

The Open University — 04/2023-08/2023

Explored entanglement-based QKD protocols, scalability challenges and the early implementations in currently operational networks and satellite-based quantum communication.

Research Internships

- **Max Planck Institute for the Physics of Complex Systems** (05/2025-Present)
Supervisor: Dr Ashley Cook | Project: Topological skyrmion semimetals.
- **The Nordic Institute for Theoretical Physics** (08/2025-Present)
Supervisor: Dr Sofia Qvarfort | Project: Quantum metrology in superconducting systems.

Course Projects

- **Analysis of the Green's function of a metallic slab in different media & quantum dynamics of an emitter near metal-dielectric interface** 02/2025
- **Investigating the violation of CHSH inequality using a quantum computer** 03/2023
Used IBM Quantum Computing to create entanglement and analyse the CHSH sum.
- **Investigating the Hall effect to identify an unknown conductor** 01/2023
Identified conductors by measuring Hall coefficients using an electromagnet setup.
- **Investigation of the Nucleus Processing over the Orbit of 2P/Encke** 04–06/2022
Designed a remote-sensing mission concept for Jupiter-family comet studies.
- **Identifying planetary atmospheres using infrared spectroscopy in a gas cell** 03/2022
Analyzed gas spectra using an IR spectrometer to infer planetary atmosphere characteristics.
- **Experimental verification of Compton effect** 02/2022
Validated photon scattering predictions using an X-ray apparatus.
- **Mapping the Spiral Structure of the Milky Way Using a Radio Telescope** 12/2021
Collected HI emission data with a radio telescope to map the Galaxy's arms using Python.

Conferences and Schools

The Quantum Technologies for Young Researchers workshop (QTYR2025) 07/2025
CSIC, Spain

Presented a poster titled "*Investigation of Beam Wander's Impact on QBER in a Free-Space BB84 QKD Receiver*"

49th International Nathiagali Summer College on Quantum Technologies 06/2024
ICTP, Pakistan Atomic Energy Commission, and National Centre for Physics

9th Spring Plasma Physics School, ICTP and EGYPlasma 03/2024

Multi-Scale Methods Summer School, Gdańsk University of Technology 07/2023
ECTS: 6 | Grade: 93%

Trainings and Courses

Statistics, Machine Learning, Git & GitLab, CI Workshops 10/2024–12/2024
Helmholtz Association

Helmholtz Summer School: From Data to Knowledge 09/2024

Qiskit Global Summer School 2024, IBM 07/2024

Quantum Barsaat 2024 (quantum computing & annealing), QWorld 07/2024

Introduction to Quantum Computing with Google Quantum AI 09/2023–04/2024
The Coding School | Project: Encryption with a BB84-generated key using Cirq.

Global Quantum Program, Womanium 07/2023–08/2023

Science Journalism Training Program, British Council 11/2021–12/2021

Skills

- **English language:** Proficient | IELTS Academic [02/2024]: 8.0
- **Digital skills:** Python, LaTex, Git, SLURM

Transferable Skills and Volunteering

- **Problem solving:** Awarded *Best Problem Solving* at the 9th Spring Plasma Physics School.
- **Teamwork and leadership:** Collaborated with established researchers and research groups during my internships at MPI-PKS and Nordita. and Volunteering (since 2014) and currently the team leader of [Egypt Scholars Library](#), a platform for science-focused articles for Arabic speakers. Selected as the *Volunteer of the Year* in 2022.
- **Editing and science communication:** Worked (since 2013) as a translator and editor and won the *Best Coverage of the RO Water Treatment Project* during the 2nd science journalism training organized by the British Council.
- **Peer support and communication skills:** Provided guidance to new physics students as a Science Project Student Buddy at The Open University (For the academic year 2023/2024).
- **Time management and organisation:** Managing work and study simultaneously for nearly 12 years.
- **Coordination skills:** Coordinated *Egypt Scholars Science Writing Contest* in 2022.