Noor Aldeen **Almusleh**

Physicist

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Education

AABU (Al Al-bayt University) *Mafraq, Jordan*

B.Sc in Physics *July 2014 - January 2018*

- GPA– 84.5% (Excellent), with first-class honors.
- This is a four-year program with a fast track option delivered in English as the language of instruction. Relevant modules studied include Quantum Physics I (87%), Quantum Physics II (94%), Thermodynamics (90%), Statistical Mechanics (95%), Electricity and Magnetism I (74%), Electricity and Magnetism II (77%), Mathematical Physics I (94%), Mathematical Physics II (89%), Mathematical Physics III (95%), Astrophysics (98%), Nuclear Physics (80%), and Particle Physics (94%).
- Final year dissertation "**Heavy Quarkonium Mass Spectra From Complex Potential**"; this study was an attempt to improve our understanding of the heavy mesons (such as the bottomonium) by studying the solution of the relativistic Schrodinger equation for some complex potential. This project took five months and it was supervised by Dr. Ahmed Al-Jamel.

IBM

Qiskit Global Summer School on Quantum Machine Learning *July 2021 - August 2021*

- Completed the two-week intensive course which covered many topics in quantum computing such as **Deutsch-Jozsa Algorithm, Grover's Algorithm, quantum classifiers, Quantum Approximate Optimization Algorithm (QAOA), quantum fidelity, and quantum hardware**, completing all graded lab work assignments with a final cumulative score of 100%, demonstrating applied understanding and comfort with and about Quantum Computing and Quantum Machine Learning using Qiskit.

IELTS *December 2020 - December 2022*

- **Academic**: *Overall band score 6.5*

Research Experience

Astrophysics research group *Amman, Jordan*

Researcher *October 2019 - June 2021*

- Using different Python libraries such as NumPy, AstroPy, Matplotlib, and Seaborn as a computational tool to study the abundance ratio of the sample stars and to construct an action space map that indicates the eccentricity and the spherical coordinates for the sample stars from our study and the literature. This paper was written using LaTeX.

Al Al-bayt University *Mafraq, Jordan*

Research Assistance *June 2016 - December 2017*

- Conduct a theoretical study of some Cornell-like potential with a complex term in order to better describe the behavior of mesons constructed from heavy quarks (the bottom quark and the charm quark).
- Teaching research methods for undergraduate students such as how to use LaTeX, literature review, the scientific method, scientific papers organization, and edit and debug the template used at the university. This role included implementing technical support and some initial grading and providing the students with feedback to help them improve their work before the final submission.

Employment Experience

Ministry of Education, UAE *Dubai, UAE*

Teacher *January 2019 - Present*

- My primary duty was to teach AP-Physics for grades 9, 10, 11, and 12; to prepare students for AP-Physics 2 and AP-Physics C exams. I taught in a typical classroom, online, and a hybrid classroom. Also, creating lesson plans, exams, and support plans for different students. Furthermore, I manage various science activities every year, such as lab activities, field trips, and supporting students who wish to participate in science fairs and supervise them.
- I worked with different teachers from different countries and backgrounds (from the USA, Canada, the UK, New Zealand, Egypt, India, Philippines, Jordan, and the UAE). We had to plan to do cross-subject activities and plan the general trend for our lessons to help students relate between different subjects (such as chemistry and physics, or physics and mathematics, etc.)
- Using Python to organize classes data and develop simulations and codes to help students plotting graphs, and checking their lab assignments.

Jordan Ministry of Education *Zarqa, Jordan*

Physics Teacher *February 2018 - June 2018*

- Teaching physics for high school level; some of the topic taught Newtonian mechanics, thermodynamics, electromagnetism.
- During this teaching experience, I had to create lesson plans and deliver the content to large classrooms (around 35 students), requiring high classroom management techniques, which I acquire. In addition to designing science lab activities for the students to help them better understand the science.

Certifications & Badges

Nov 2021	**IBM Quantum Challenge Fall 2021**, Qiskit	*IBM*
Aug 2021	**Using Python to Access Web Data**, University of Michigan	*Coursera*
Jul 2021	**Quantum Machine Learning**, Qiskit	*IBM*
Jun 2021	**Python Data Structure**, University of Michigan	*Coursera*
Apr 2021	**Getting Started with Python**, University of Michigan	*Coursera*
Sep 2016	**Learning How to Learn**, UCSanDiego	*Coursera*
Aug 2016	**Scientific Methodology and Technical Writing**, Phi Science Institute	*Amman, Jordan*
Jan 2016	**Effective Business Websites**, HP LIFE e-Learning	*HP*
May 2015	**TOT**, Al Al-bayt University	*Mafraq, Jordan*

Skills

Programming	**Python**: Using `Matplotlib`, `Seaborn`, `Plotly`, `NumPy`, `Pandas`, `Dash`, `Scikit-learn`, `TensorFlow` and `AstroPy` to develop machine learning and deep leaning models (see my GitHub page), organize data, plot graphs, and run simulations helped develop the research papers above, organize students' data and analyze it, solve physics problems during my undergraduate studies, and solve Qiskit quantum computing challenges during the quantum machine learning summer school. **C++**: Solve physics problems and some puzzles during my BS degree. **Quantum computing with Qiskit**: Use different quantum algorithms such as VQE, QAOA, and QSVM to solve finance, chemistry, and optimization problems, as well as test quantum gates fidelity, training quantum circuits using gradient descent, using quantum kernels, and support vector machines. This was done using Qiskit and IBM quantum lab with five qubits and using some quantum simulators such as QasmSimulator, StatevectorSimulator, and UnitarySimulator.
Computer Skills	**Microsoft Windows, OS X, and Linux**: For research, programming, and teaching. Using the terminal and command prompt to run different codes, and handle data sets, folders, and documents. **Mathematica**: Work on my final year dissertation at university to solve differential equations and to develop materials with adopted simulations for teaching purposes. It was also used to create presentations and writing documents. **LaTeX**: Write research papers, curriculum vitae, and taking notes using local editor (TexMaker) and Overleaf.
Communication	Enhanced vocal and written commutation skills through working as an educator as this role required have very high communication skills and clear presentations to communicate with students and the management. Also, completing a dissertation and writing up numerous projects at university and research (including the publishing procedure and what it requires of communication by email) helped develop more written communication skills.
Team work	Successful organization of science events for Phi Science Institute and the Ministry of Education (UAE) relied on effectively working with all volunteers. Understanding the importance of proactively developing relationships with others, sharing information, and supporting contributions from team members, which were applied while working with a research group, helped develop excellent teamwork skills in academia.
Languages	Fluent in spoken and written **Arabic** Fluent in spoken and written **English** Beginner in **Japanese**

Publications

Metal-poor Stars Observed with the Automated Planet Finder Telescope. III. CEMP-no Stars are the Descendant of Population III Stars — *Astronomische Nachrichten (AN)*

Doi: http://doi.org/10.1002/asna.202113867 — *Accepted: June 2021*

Authors: **Nour Aldein Almusleh**, Ali Taani, Sergen Özdemir, Maria Rah, Mashhoor A. Al-Wardat, Gang Zhao, Mohammad K. Mardini

The Origin of LAMOST J1109+7459 — *Segue Virtual Journal*

Doi: https://doi.org/10.52526/25792776-2020.67.2-267 — *Accepted: November 2020*

Authors: Yazan Khrais and **Nour Aldein Almusleh**

Probability Distribution of Magnetic Field Strengths through the Cyclotron Lines in High-Mass X-ray Binaries — *Jordan Journal of Physics*

Doi: https://doi.org/10.47011/13.3.8 — *Accepted: February 2020*

Authors: A. Taani, A. Abushattal, A. Khasawneh, **N. Almusleh** and M. Al-Wardat

Workshops & Conferences

IBM Quantum Challenge Fall 2021 *Remote*

Nov 2021

- Completed four challenges, two foundational, one intermediate, and one advanced, using Qiskit while studying some related papers. These challenges were focusing on Variational Quantum Eigensolver (**VQE**), Quantum Approximate Optimization Algorithm (**QAOA**), Quantum Support Vector Machine (**QSVM**), and **Qiskit Runtime**. The challenges were, in order, Optimizing your portfolio with quantum computers (finance), Band gap calculation of OLED molecules (chemistry), Image classification by QSVM (machine learning), and Battery Revenue Optimization (optimiztion).

References

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