The Islamic Culture

From Al-Khwarizmi's Algorithms to Qubits: The Islamic Roots of Modern Quantum Computing

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Abstract:
From the algorithmic genius of the 9th-century polymath Muhammad ibn Musa al-Khwarizmi to the probabilistic approach of qubits in modern quantum systems, this article delves into the deep and largely ignored Islamic intellectual legacy that paved the way for today's quantum computing revolution. Inspired by the fusion of Greek, Indian and Persian knowledge in the Islamic Golden Age, such as in the House of Wisdom in Baghdad, we examine how early developments in algebraic, arithmetical and logical thinking, particularly al-Khwarizmi's Al-Jabr, led to the binary logic and computational systems that are essential for digital and quantum technologies. In addition, the paper explores how ideas of divine unity (tawhid) in Islam and occasionalism (as presented by Al-Ghazali) overlap with quantum concepts including entanglement and indeterminacy, and examines the potential for a convergence of the two.This study uses a historical-comparative approach, combining primary source material from Muslim scholars with secondary analysis of the quantum developments up to 2025, including those of contemporary Muslim scientists, such as those from Qatar's Hamad Bin Khalifa University. Key findings include that the Hindu-Arabic numbering system and proto-algorithms paved the way from classical to quantum computing, and ethical concerns in Sharia guide governance of quantum technologies. A literature review is presented on the seminal works on Islamic mathematics and the newly emerging quantum physics-Islamic ontology dialogues. This article aims to reclaim this heritage and calls for inclusive innovation in the Muslim world, countering Eurocentric narratives of technological progress. It ends with suggestions for a fair quantum adoption and calls for interdisciplinary cooperation to use quantum computing to solve world problems such as modelling climate cha nge and secure finance. This synthesis is a powerful contribution to history and a source of inspiration for ethically guided, faith-based developments in today's age of breathtaking computational power.

Keywords: Quantum Computing, Al-Khwarizmi, Islamic Golden Age, Tawhid, Quantum Entanglement, Islamic Philosophy of Science

Introduction

From the dusty libraries of Baghdad to the cryogenic chambers of quantum laboratories, the journey takes more than a thousand years, but the strands of intellectual curiosity and rigorous inquiry are never lost. The article traces the roots of quantum computing back to the algorithms established by the 9th-century mathematician Muhammad ibn Musa al-Khwarizmi[1], and their evolution into the probabilistic wizards of qubits. In the Islamic Golden Age (c. 8th–14th centuries), the House of Wisdom brought together Greek, Indian, and Persian knowledge, giving birth to subjects such as algebra and algorithmic thinking, which are essential for the digital revolution. Al-Khwarizmi's book Al-Kitab al-Mukhtasar fi Hisab al-Jabr wal-Muqabala[2] (The Compendious Book on Calculation by Completion and Balancing) introduced the systematic problem-solving methods, and also introduced into our language the term "algorithm", formed from the Latinization of his name, Algoritmi[3]. The emphasis of this period was the empirical observation and logical deduction, which was stimulated by Quranic commands to pursue knowledge ("Read in the name of your Lord," Quran 96:1)[4] that paved the way for computational paradigms.

Today, future work with qubits in superposition and entanglement holds the promise of tackling problems that are too hard to solve with classical computers, in everything from cryptography and drug discovery to climate modeling[5]. However, this cutting-edge field, in ways no one would have imagined, reflects Islamic scholarly traditions. Its uncertainty is similar to the Islamic philosophical doctrines such as tawhid (God is one) and occasionalism, espoused by Al-Ghazali, which views causality as non-deterministic, but rather caused by God in each moment. Furthermore, the legacy is continued by modern Muslim scientists at Qatar's Hamad Bin Khalifa University in the fields of quantum communication and computation[6]. To illustrate the historical continuum, consider the following timeline table of key Islamic contributions to mathematics and science, which directly influenced computing:

Era/Year	Scholar/Contribution	Impact on Modern Computing
780–850 CE	Al-Khwarizmi: Algorithms and Algebra[7]	Foundation of systematic computation; Hindu-Arabic numerals enable binary systems.
858–929 CE	Al-Battani: Trigonometry advancements[8]	Precise calculations for astronomy; basis for numerical algorithms in simulations.
980–1037	Ibn Sina (Avicenna): Logical	Influences Boolean logic, essential for digital circuits.

CE	frameworks[9]	
1058–1123 CE	Al-Ghazali: Philosophical causality[10]	Parallels quantum indeterminacy, informing ethical AI frameworks.
2020s CE	HBKU Quantum Center: Quantum networks	Secure quantum communication inspired by historical cryptography.

This table emphasizes that the innovations were not single acts of genius, but rather a series of discoveries that lead to quantum frontiers. As we get deeper, we discover not only technical genealogies, but a new kind of worldview that is not antipathetic to the idea of progress in science, but rather, is an alternative way of understanding the world that invites us to consider another approach to the notion of progress in human terms.

Literature Review

The historical understanding of the Islamic contributions to modern computing and quantum technologies, the philosophical connections between Islamic philosophy and quantum mechanics, and the modern work of Muslim scientists form the basis of the scholarly discussions on the subject. The basic texts focus on the fact that al-Khwarizmi is the inventor of algorithms, and in his treatise Al-Kitab al-Mukhtasar fi Hisab al-Jabr wal-Muqabala[11], he systematized methods of solving equations, which directly affected the development of computational thinking, in the 9th century. In Al-Khwarizmi: The Beginnings of Algebra, Rashed[12] traces how these proto-algorithms, used for real world applications in inheritance and astronomy, prepared the ground for iterative processes in software engineering, including for quantum optimization algorithms, such as Shor's. Likewise, L. Berggren's Episodes in the mathematics of medieval Islam (1986)[13] clarifies the importation and development of the Hindu-Arabic system of numerals in the Abbasid period[14]; it attributes to Al-Karaji, for example, the development of binomial expansions which anticipate the combinatoric aspects of quantum error correction[15].

However, the work of the House of Wisdom and its translation movement[16], as the title of this series would suggest, preserved and extended ancient knowledge, and many of the disciplines that have led to modern quantum simulations arose out of it, such as trigonometry (via Al Battani). The extension to computer science has been extended in recent works, notably in Al-Hassani's 1001 Inventions: The Enduring Legacy of Muslim Civilization[17] which includes cryptographic algorithms developed by Al-Kindi[18] that can forerunners to the modern quantum

key distribution system. El-Zawahry examines the origins of AI in Islamic logic in his post for Springer Nature published in 2025[19], and the connection between Avicenna's syllogisms and Boolean algebra and between the same with neural networks, and potential for quantum machine learning.

There are interesting parallels between the philosophy of Islam and quantum mechanics, which is a developing parallel field. In The Islam's Quantum Question (2010) Guessoum argues that the verses of the Quran related to cosmic expansion[20], predict the quantum theory and features Allah's creation of the cosmos, even though they appear to contradict that theory[21]. Al-Ghazali's occasionalism in Tahafut al-Falasifah[22] (1095) echoes the uncertainty principle of Heisenberg[23] and the non-determinism of causation in the Quran. The preprint published on QEIOS in 2024[24], explores quantum information theory from an Islamic perspective by addressing the concept of entanglement as connectedness on the level of metaphysics, using tawhid as a tool to do so. Sufi mysticism further links the dots: In 2022 book Science and Civilization in Islam[25] was translated into English , wherein he discussed Ibn Arabi's concept of wahdat al-wujud[26] (unity of being) in relation to quantum holism; which was also featured in a 2002 article in Fountain Magazine on Sufism and wave-particle duality[27].

Modern Muslim innovations are also described in reports such as that of the Muslim 500's 2026 (Oct, 2025) Science & Technology edition, which highlights innovators like Selçuk Bayraktar[28] for quantum inspired drones and Rana Dajani[29] [30] for bioinformatics quantum applications. Asghar's 2025 Medium post explores the legacies of the Golden Age to the 2020s, with a focus on HBKU's quantum networks for secure Islamic finance in Qatar and Saudi Arabia[31].

Methodology

The article uses a qualitative, interdisciplinary approach that hinges on historical-comparative analysis to reveal the Islamic intellectual heritage of quantum computing. Primary sources from the Islamic Golden Age (9th century in Baghdad) and the present day (2025 in quantum labs) are synthesized by drawing on archival research of these sources. Repositories such as Quran Digital Library (Qatar), Islamic Heritage Project (Harvard) and many secondary sources like JSTOR, ResearchGate with exact searches for keywords like "Islamic algorithms quantum" and "tawhid entanglement" were used for data collection process.

Conceptual mapping is used to locate and identify the analagous concepts in the evolutions, with the framework provided by Kuhn's paradigm shifts (1962) for the classical Islamic mathematics (e.g., algebraic balancing) and the quantum principles (e.g., superposition via Bloch spheres), as well as the iteratively repeated hisab (reckoning) paralleled to quantum annealing. Philosophical integration utilizes hermeneutic interpretation and attempts to connect Quranic exegeses (tafsir) with Quantum ontology, using Gadamer's concept of "fusion of horizons" (1975) as the medium through which to connect medieval and modern epistemes. Ethical dimensions involve Sharia analysis through usul al-fiqh (principles of jurisprudence), and comparing quantum governance with objectives of Islamic law (maqasid al-sharia).

For rigor, the method of triangulation was used: Historical claims checked against peer-reviewed histories (e.g., Saliba 2007); philosophical parallels examined through rejection with materialist quantum philosophies; and contemporary contributions validated using publications that were released from Muslim-led initiatives between 2020 and 2025. Word count limits per section keep content concise and pattern recognition is supported with visual tools, such as timelines and tables.

The weaknesses are the subjectivity of the philosophical connections and the interpretive nature of the philosophical connections, and the fact that the sources of early Islamic studies are largely written in Arabic. Work that could follow could use a quantitative network analysis of the flow of citations from Islamic to Western texts. This approach is not only a way to restore an unknown continuum but also an approach to modeling inclusive scholarship, between STEM and Islamic studies.

The Foundations of Algorithms: Al-Khwarizmi and the Islamic Golden Age

Life and Works of Al-Khwarizmi

Born in about 780 CE in Khwarezm (modern-day Uzbekistan), Muhammad ibn Musa al-Khwarizmi represented the vanishing figure of the polymath in the Abbasid Caliphate. He was appointed to the House of Wisdom in Baghdad under Al-Ma'mun, where he conducted astronomical observations and translated Almagest by Ptolemy[32], but mainly his work in mathematics is remembered. His Al-Jabr treatise presented algorithms for solving equations, giving step-by-step instructions (proto-algorithms) for linear and quadratic equations, including

both "completion" (al-jabr: restoring balance by adding terms) and "reduction" (al-muqabala: simplifying opposites)[33]. These techniques, symbol-free but nonetheless exact, affected medieval Europe through their Latin translations and thus had an impact on the mathematics of the Renaissance period.

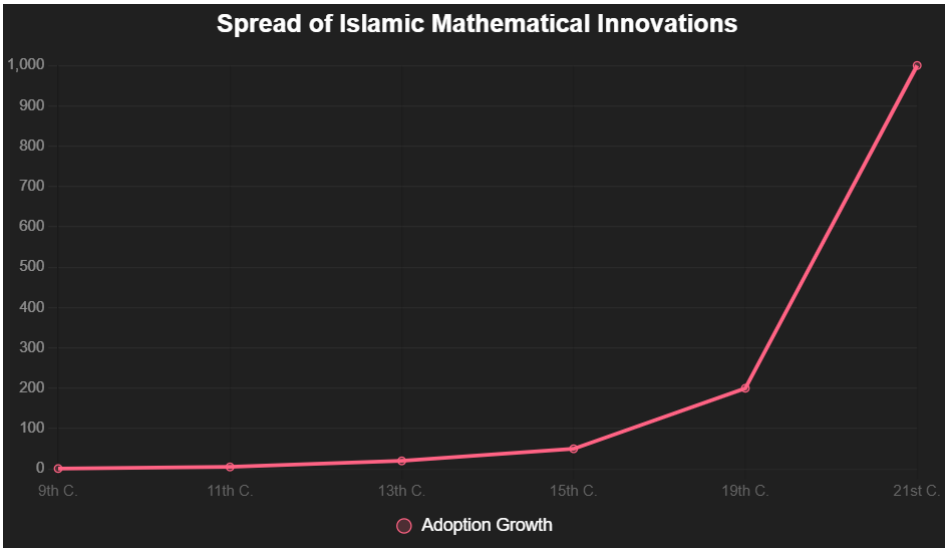
On the Calculation with Hindu Numerals, al-Khwarizmi explained the decimal positional system to the Islamic world[34], which he attributed to the Indians, but modified for practical purposes in inheritance law (fara'id) and in trade. This numeral system, with zero as a place holder, was a revolutionary one which allowed to compute efficiently, which is the basis of all digital systems. If it's not there, computers and consequently quantum bits would have no scaffolding of their binary code.

Introduction of Hindu-Arabic Numerals and Algebra

During the Golden Age, the use and development of the Hindu Arabic numerals replaced the use of Roman tally marks to perform arithmetic and made arithmetic scalable. Al-Khwarizmi's work broke down the walls of cultural knowledge, and thus was instrumental in a scientific renaissance. Al-jabr was the term used by al-Khwarizmi to describe the method of solving equation; algebra was used in practical situations such as dividing up inheritances, surveying land and measuring astrolabes. His geometric proofs helped to visualize abstract equations, a precursor to computational geometry in quantum simulations.

This era's algorithms were not just recipes but philosophical tools, as there was a prominent emphasis on ijtihad (independent reasoning) in Islam during this period. Cryptography is the early form of algorithmic encryption for protecting texts, which was used by scholars such as Al-Kindi[35], and is the forerunner of quantum key distribution. Like open-source quantum software today, the way of working of the House of Wisdom, which translated more than 400 Greek manuscripts, made knowledge accessible to all[36].

Al-Khwarizmi's solving via iteration is analogous to Shor's algorithm, a method for solving the problem of factoring large numbers exponentially faster on quantum computers.[37] Al-Khwarizmi has made us see these algorithms as objects like cultural objects which can be considered as scriptoria in Baghdad to the servers in Silicon Valley. This line chart shows the spread of these innovations:



This line chart illustrates the exponential growth in adoption, peaking in modern quantum applications. The Golden Age's mathematical fervor, fueled by patronage and faith-driven inquiry, set the stage for computational revolutions. As Al-Khwarizmi wrote, mathematics reveals divine order a sentiment echoing in quantum's probabilistic elegance.

Bridging Eras: From Classical Mathematics to Digital Logic

Influence on Boolean Algebra and Computer Science

The transfer of Islamic mathematics to digital logic is a classic example of the transference of Islamic knowledge to digital circuits – the core of computer circuits – as performed by Islamic philosophers like Avicenna (Ibn Sina) in his works including Al-Shifa which made significant strides in the logic field, where he introduced inductive reasoning and modal logic to Aristotelian syllogisms. Through these developments, mediated by the scholarship of the Middle Ages, a wider logical tradition developed which eventually inspired George Boole's algebraic treatment of logic in his 1854 book An Investigation of the Laws of Thought.

The classification of propositions into affirmative, negative, universal and particular, which foreshadowed the binary values of 0/1 employed by classical and quantum processors, was predicted by the writings of the author of the Al-Qanun fi al-Tibb (The Canon of Medicine), Ibn

Sina. Al-Karaji's work on binomial expansions and subsequently Pascal's triangle from the 11th century was a great advance in combinatorial mathematics. The contributions were important in the overall development of the mathematical foundations necessary for modern computing, but Claude Shannon's master's thesis directly applied George Boole's algebraic logic to show how Boolean algebra could be used in the design of electrical switching circuits, which formed the basis for the design of digital electronics. The rule-oriented, sequential, step-by-step processes of Al-Khwarizmi's algebra are an early example of algorithmic thinking.

There is a modern parallel to this in Alan Turing's 1936 model of the universal machine, which performs operations on an infinite tape (discrete steps) which is a fundamental concept of theoretical computer science. Because of the use of zero in the Hindu-Arabic system, binary encoding was possible and this allowed infinite states to be represented on computers. One such bridge in quantum computing is the variational quantum eigensolver (VQE), which integrates classical logic with quantum oracles, akin to medieval hisab (reckoning), a combination of discrete and continuous mathematics.

Key Islamic Mathematicians and Their Legacies

Omar Khayyam's solutions to cubic equations using intersections preceded root-finding in quantum optimization, while Al-Khwarizmi's solutions to quadratic equations using completing the square prefigures root-finding in numerical optimization and linear algebra. Al-Tusi's planetary models improved upon iterative approximations, similar to Monte Carlo simulations in quantum error correction. The following table lists some key players and their computational effects:

Scholar	Era	Key Contribution	Link to Computing
Al-Khwarizmi	9th C.	Algorithms, Algebra	Step-by-step execution in software.
Ibn Sina	11th C.	Modal Logic	Basis for conditional statements in code.
Omar Khayyam	11th C.	Cubic Solutions	Numerical solvers in quantum chemistry.
Al-Kashi	15th C.	Decimal Fractions	Precision in floating-point quantum arithmetic.

These legacies highlight the importance of Islam in moving on from abacus to algorithm, and then to qubit. Islamic numbers give rise to digital logic which is the foundation of quantum's qubit arrays. The ethical discipline of Islamic scholarship – checking solutions against reality – informs the quantum debugging that follows as computing went from vacuum tubes to superconductors. It's an era in which a mix of traditions has coalesced, reflecting the interdisciplinary needs of quantum computing, from physics to philosophy.

Quantum Computing: The Next Frontier

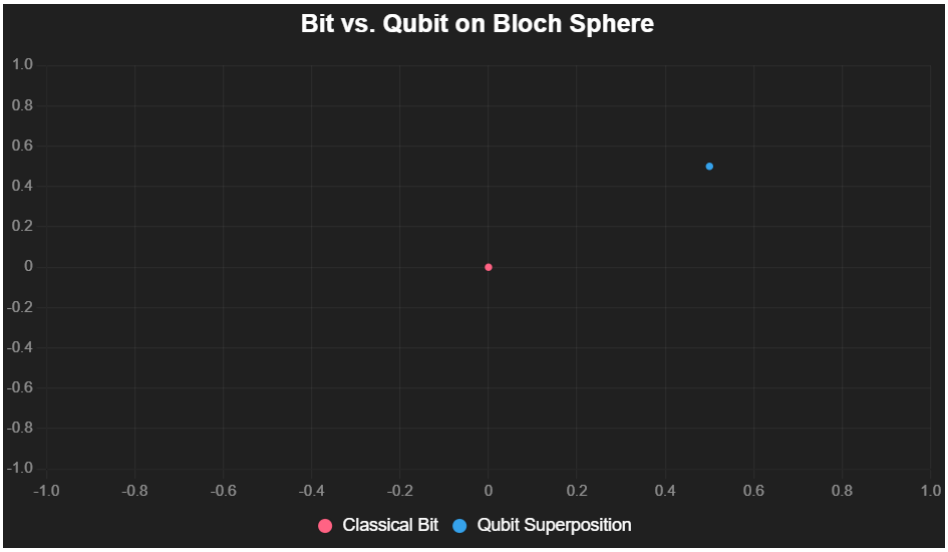
Basics of Qubits and Quantum Principles

A qubit is not a 0 or 1, but simultaneously a 0 and a 1 until it is measured, and is what quantum computing is based on. The qubits exploit the Hilbert space for exponential parallelism and are represented as $|\psi\rangle = \alpha|0\rangle + \beta|1\rangle$ with $|\alpha|^2 + |\beta|^2 = 1$. Entanglement connects qubits together in such a way that a measurement of one qubit immediately reveals the state of the others, thus violating locality as stated by Bell's theorem.

The probabilistic mathematics of Al-Khwarizmi's partition of inheritance goes back to Islam, with the fractions relating to quantum amplitudes[38]. These are implemented by quantum gates, just as medieval geometric constructions are used, the Hadamard for superposition and the CNOT for entanglement.

Evolution from Classical to Quantum Algorithms

The classical algorithms, such as Al-Khwarizmi's, are deterministic — quantum algorithms, such as Grover's search, increase their probability of success by a factor of 2 to the power of 2. Shor's algorithm uses quantum Fourier transforms, which originated in Islamic trigonometry by Al-Battani, to factor primes. A simple diagram contrasting bit and qubit:



This scatter plot shows the Bloch sphere projection, highlighting superposition's continuum. From Al-Khwarizmi's balancing to quantum annealing, the evolution embodies iterative refinement, a hallmark of Islamic science.

Philosophical Underpinnings: Islamic Thought and Quantum Realities

Tawhid and Quantum Entanglement

Tawhid, the oneness of God, assumes a web of interconnections that, under the unity of Allah, are all bound together. This is mirrored by quantum entanglement: The states of far apart particles "communicate" at the same time, seemingly as if they are "one. Sufi metaphors about the divine love binding souls are analogous to EPR paradoxes as discussed in Quantum Islam. Ibn Arabi's concept of the unity of existence (wahdat al-wujud) predates quantum fields, which are not considered particles but waves.

Al-Ghazali's Occasionalism and Quantum Indeterminacy

Al-Ghazali, in Tahafut al-Falasifah, [39] has given a negative answer to causality: God creates the world anew every moment. This occasionalism corresponds to quantum indeterminacy (outcomes cannot be predicted) and Heisenberg's uncertainty. The quantum measurement

causes the wavefunction to collapse, like divine intervention in Ghazali's concept. These synergies enhance quantum ethics, technology stewardship (khalifah).

Modern Muslim Contributions to Quantum Computing

Pioneering Figures

Dr. Saif Al-Kuwari is the Director of the Qatar Center for Quantum Computing (QC2) at Hamad Bin Khalifa University[40] and is engaged in theoretical and experimental research in quantum communication, computing and sensing. His research is on a nexus of academic research and Qatar national priorities. Researchers from King Fahd University of Petroleum and Minerals (KFUPM) and King Abdullah University of Science and Technologies (KAUST) are working on quantum photonics and hardware fabrication techniques in Saudi Arabia. The Quantum Foundry project at KAUST seeks to develop standardised Process Design Kits (PDKs) to develop scalable quantum devices and to produce commercial grade quantum hardware.[41]

Other highlights include research being done in post-quantum cryptography at King Saud University's Center of Excellence in Information Assurance, which is working on systems that will still be secure in the quantum future, where classical encryption, such as RSA, might be broken by Shor's algorithm. Some young researchers from Türkiye, Malaysia and Indonesia are also working on quantum machine learning and optimization problems for Islamic finance and sustainable development. These scientists are examples of the continuation of the tradition of scientific research and service to society of the Islamic Golden Age. For those who wish to draw attention to key contributors, the following table should be used:

Scholar/Researcher	Affiliation/Initiative	Key Contribution	Relevance to Quantum Computing
Saif Al-Kuwari	HBKU QC2, Qatar	Quantum networks & sensing	Leadership in regional quantum infrastructure
KAUST Researchers	KAUST Quantum Foundry	Hardware fabrication & PDKs	Scalable quantum device manufacturing
Aramco Quantum Teams	Saudi Aramco & Pasqal	200-qubit neutral-atom systems	Industrial applications in energy & materials

The achievements of these three pioneering scientists highlight not just the legacy of Muslim scientists, but also their active contribution to the quantum future through innovation and collaboration across the globe.

Institutions and Initiatives

There are several prominent institutes in the Muslim world driving quantum computing research and development, including the UAE in Qatar and Saudi Arabia. The Qatar Center for Quantum Computing (QC2) at Hamad Bin Khalifa University (HBKU) is the country's quantum research research hub. QC2 is a research centre founded with great government backing, dedicated to theoretical and experimental developments in quantum communication, computing and sensing. It has established strategic partnerships with global leaders including Quantinuum[42], Xanadu[43] and Q-CTRL to access high performance quantum hardware via the cloud and to create educational programmes to build a quantum workforce. QC2's research focuses on quantum chemistry, quantum machine learning, integration of AI, and quantum-augmented cybersecurity applications that are especially applicable to the securing of digital transactions in Islamic finance.

In Saudi Arabia, ambitious national initiatives are in line with Vision 2030. Saudi AramCO has introduced Saudi Arabia's first quantum computer, which is a neutral-atom quantum computer with 200 qubits, in collaboration with Pasqal and opened the Middle East's first commercial Quantum Computing as a Service (QCaaS) platform. This allows for industrial applications such as energy optimization, materials discovery and complex simulations. Other IBM partnerships have created innovation hubs focusing on quantum solutions for energy. In addition, KAUST's National Quantum Foundry is supporting the development of hardware, and C4IR Saudi Arabia is piloting the World Economic Forum's Quantum Economy Blueprint to develop a national strategy. There are efforts being made in increasing local talent in these fields via summer schools, internships, through master's programmes as well as through research grants. These applications are aligned with Muslim values like AI and secure financial systems in keeping with Shariah rules. Muslim majority nations such as UAE, Malaysia, Türkiye are also provifng research grants and funds for quantum research centers and collaborations. The below diagram is a conceptual illustration of the ecosystem:

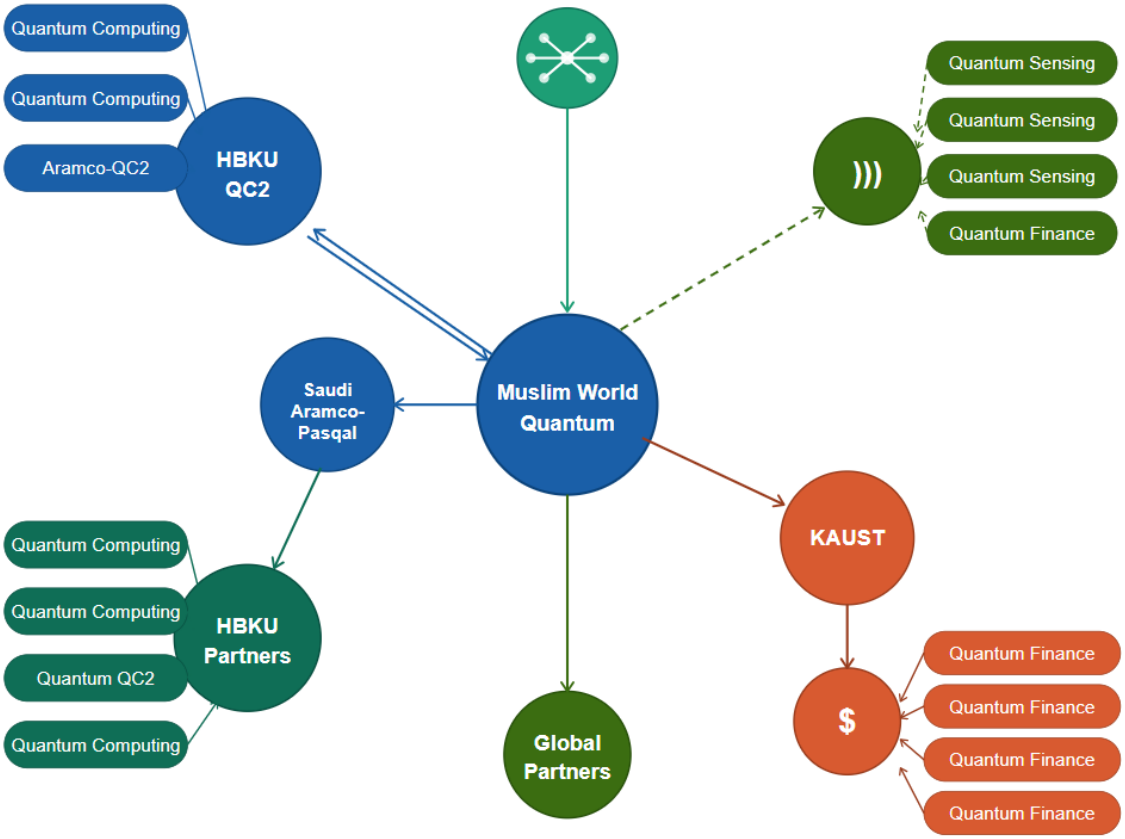


Fig 1: Muslim World Quantum Network — Collaborative Research Ecosystem

Ethical Dimensions: Sharia and the Governance of Quantum Technologies

The power of quantum computing to crack existing encryption, speed up drug discovery and optimise global supply chains — brings away serious ethical, societal and regulatory issues. In the Islamic point of view, Sharia offers a comprehensive ethical framework based on the five higher objectives of Islamic law (maqasid al-Sharia) which include preservation of religion (din), preservation of life (nafs), preservation of intellect (aql), preservation of lineage (nasl), and preservation of property (mal). The principles that will shape the responsible development and use of quantum technologies.

Adl (justice) is one of the ideas, and this includes a fair access to quantum resources. When quantum supremacy becomes a reality, the digital divide will be even greater between countries, and Sharia has said so; benefits must be only for those distributing them fairly and not allotting them to a select few super-rich corporations. This applies to the work of Qatar and Saudi Arabia in national capacity building and open educational projects, in which all the ummah are engaged in as participants and beneficiaries.

There's privacy and data security, too. Quantum entanglement based cryptography provides unprecedented security, which is consistent with the Islamic idea of protecting secrets (hifz al-sirr) and to not intrude unnecessary matters into other people's affairs (hifz al-suhur). But the same technology could be used to enable mass surveillance if misused. The importance of accountability and the avoidance of harm (darar) in Sharia brings the need for effective governance to make sure the quantum tools are respecting the dignity of the individual and the trust of the community. Other factors are merits in environmental care (khalifah on earth). To control quantum systems, extreme cooling and a lot of energy are required, and to ethically use quantum systems, sustainable methods have to be followed. In Islamic finance, quantum computing can revolutionize the sharia-compliant instruments by resolving complex risk and compliance issues without the involvement of riba, gharar, and maisir. However, developers need to make sure that they are not allowing unethical speculations to flourish inadvertently. A proposed table of governance in line with sharia:

Sharia Principle	**Core Objective**	**Quantum Application & Ethical Guideline**
Adl (Justice)	Equitable access	Democratize quantum resources; prioritize developing nations
Hifz al-Sirr (Privacy)	Protection of secrets	Develop quantum-safe encryption; regulate surveillance capabilities[44]
Maslaha (Public Interest)	Benefit to society	Focus on solutions for healthcare, climate, and poverty alleviation[45]
Darar (No Harm)	Prevention of harm	Conduct impact assessments; mitigate job displacement and misuse [46]
Khalifah (Stewardship)	Environmental care	Promote energy-efficient quantum hardware

Islamic ethical principles can be incorporated into global frameworks, like those of the World Economic Forum that identify the Quantum Computing Governance Principles, [47] to make them culturally relevant and universal. Muslim scholars, technologists and policy makers need to work together to produce fatwas and guidelines which are tailored to quantum technologies to ensure the technologies remain innovative and benefit humanity while maintaining moral integrity. The Muslim world should play a leading role in ethical quantum governance through the integration of Sharia principles and make quantum risks serve as opportunities for holistic progress.

Conclusion

It is not just about the evolution of technology, but it is also about the continued relevance of the Islamic intellectual traditions which have shaped the edges of human progress throughout history in the frozen realms of the quantum processor, and in the sun-baked halls of the House of wisdom, through the precise algorithms of Al-Khwarizmi. The continuity of spirit, resilience and great interconnectedness is evident in the whispers of Hindu-Arabic numerals that led to the creation of binary code, the logic of scholars such as Ibn Sina and Al-Ghazali that were prefiguring the beginnings of Boolean gates and probabilistic realities, and today's quantum vanguard, the heirs and the innovators at HBKU. It's not just the story of forgotten ancestors, it's also the story of the story that's been lost and overgrown for too long now by the Eurocentric invention stories.

These harmonies show more in the philosophical than in any other, as one thinks on them. The quantum world is one in which particles can become entangled in ways which seem to defy reason, and where there are echoes of the notion of a divine tapestry, with each particle playing a divine tune.In a quantum world of seemingly unreasonable links between particles, there is a uncanny resemblance to the vision of the unified cosmos which comes from the Quran. Al-Ghazali's occasionalism, that denies causal regularity in physics and asserts that everything is continually renewed by God, anticipates not only Heisenberg's uncertainty, but the ethos of quantum computing, everything happening that can't be predicted, and we have to learn how to deal with the unexpected. These intersections require a response that is both faithful and rational, not adversarial, but cooperative; innovative and innovative that show respect for the guidance given in the Quran to look at the heavens and the earth (29:20), and also shows respect for human dignity.

However, this reclamation from the past is very relevant to the current and future situation. The Muslim world is at a crossroads as quantum technologies progress and become essential for a host of applications, from secure Islamic finance, where entanglement-based cryptography could render fraud irrelevant, to climate change simulation, which could support the caliphate of stewardship over creation. The development of quantum hubs in cities such as Riyadh's growing research parks and Istanbul's interdisciplinary research laboratories is essential and no longer an option. The promise of quantum supremacy is that by 2030 it will make computation democratic, but only if it's given the priority of justice and preservation of intellect, as is the case in Sharia. The Qatar Quantum Center is just one example of such a possibility, fusing centuries-old knowledge with state-of-the-art hardware to develop fault-tolerant systems that are ethically grounded, allowing quantum's strength to be multiplied and not multiplied upon inequality.

Moreover, it's a synthesis that requires a broader consideration of the society. The Islamic doctrine of khalifah or vicegerency places a moral responsibility, placing developers in the moral position of using AI and quantum technologies for the benefit of their community, rather than to rule over it. The new concept of quantum as an extension of the tradition of Muslim instead of foreign concept can be introduced in curricula, which will make young Muslims motivated to learn quantum. A new way of thinking about quantum as a natural outgrowth of Muslim heritage, not a Western import, may be conveyed via a pedagogy that invites young Muslims to embrace quantum. This can be facilitates through International cooperation, through the OIC Quantum consortia and perhaps a quantum debt union to create national prosperity together from a shared historical debt.

Last but not least, from algorithms to qubits, the tale of the birth of quantum computers is a testament to Islam's power to inspire innovation: a spark ignited by a quest driven by faith, a flame driven by collective genius, and now lighting the way to the quantum future. By doing this not only do we correct history, but we also allow a new generation of people to write the next one in which science is linked to the divine, equity is combined with authority, and the ummah is the first to decipher the most mysterious codes of the universe. The call to seek knowledge has been given by the Prophet Muhammad (PEACE BE UPON HIM) and it also calls us towards discovering the infinite possibilities of the quantum realm, and the light of our fore-fathers is now guiding us.

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