

Egypt Quantum Snapshot 2026

Presentation

2026 Alexandria, Egypt Quantum Hackathon
September 2026

William Slater

Senior Cybersecurity Professional
& Quantum Technology Manager



Disclaimer

This presentation will be delivered in September 2026 at the request of the Alexandria Quantum Hackathon organizers.

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This Presentation and the Paper Are Readily Available

- State of Quantum in Egypt – 2026 (September 2026)
- Presentation
 - <https://billslater.com/egyptquantumdeck2026.pdf>
- Paper
 - <https://billslater.com/egyptquantum2026.pdf>
- BONUS!
 - State of Quantum in USA – 2026 (July 2026)
 - Presentation
 - <https://billslater.com/usaquantumdeck2026.pdf>
 - Paper
 - <https://billslater.com/usaquantum2026.pdf>

Agenda

- Executive Summary
- Methodology
- Three Quick Stories About Egypt
- Quantum in Egypt 2026
- PQC Info
- Egypt and the Quantum Workforce
- Egypt's Strategic Quantum Assessment
- Egypt's Strategic Quantum Outlook
- Conclusion
- Sources and Notes
- Supplemental Slides



Executive Summary (Part 1)

- Egypt's quantum ecosystem in 2026 is best characterized as an emerging national capability moving from dispersed academic research toward organized capacity building, access to physical quantum hardware, and early industry engagement. The most important 2026 development is the Ministry of Higher Education and Scientific Research-sponsored memorandum between the Electronics Research Institute (ERI) and Jet In Technology, SpinQ's authorized agent. The agreement provides access to a 25-qubit SpinQ processor for applied research and explicitly connects the work to mechanisms of Egypt's National Quantum Computing Strategy.
- Education has expanded materially. Cairo University launched a Quantum Technologies Spring School with Qiskit-oriented hands-on content; Nile University maintains a substantial undergraduate quantum-computing track; Ain Shams University teaches quantum computing, quantum communication, quantum security and post-quantum cryptography; Alamein International University offers thesis and professional master's programs in Quantum Science and Technology; and Misr International University began 2026 quantum-computing certificate cohorts with simulator and real-hardware exposure.
- Egypt does not yet appear to have a large domestic pure-play quantum-computing or quantum-sensing vendor sector. Accordingly, national market size, workforce, open-position, private-funding and patent figures in this report are presented as modeled estimates or conservative proxies where no official, reproducible national statistic was publicly available. This distinction is especially important because global market data are much better measured than Egypt-specific commercial data.

Executive Summary (Part 2)

- Hardware: first credible national access pathway to a 25-qubit processor; hardware design/fabrication remains predominantly academic and photonics/electronics oriented.
- Software/algorithms: growing use of Qiskit, quantum circuit optimization, QML, simulation, mapping and security research.
- PQC: research activity is visible, including embedded IKEv2/post-quantum work and university curricula, but no Egypt-wide mandatory PQC migration deadline was identified.
- Quantum communications: one of Egypt's comparatively strong research niches, including QKD, photonic entanglement and free-space/satellite-oriented work.
- Quantum sensing: technically promising through photonics, metrology and advanced sensing research, but commercial revenue remains very small and difficult to isolate.
- Workforce: estimated midpoint of roughly 340 quantum-engaged people, heavily concentrated in universities, graduate research, software/algorithms, communications and security.
- Market: modeled 2026 Egypt quantum-computing market about \$3.6M and quantum-sensing market about \$1.9M, versus global markets of about \$1.82B and \$0.62B respectively.

Methodology & Data Confidence

Data class	Treatment in this report	Confidence
Verified public fact	Directly supported by Egyptian government, university, company filing or high-quality industry source.	High
Derived global estimate	Mathematical derivation from a published market baseline and published growth rate.	Medium-High
Egypt analytical estimate	Modeled from ecosystem maturity, observable activity, procurement/training signals and global/regional benchmarks.	Medium-Low
Patent/workforce proxy	Conservative count or midpoint because no authoritative national quantum taxonomy is publicly reported.	Low-Medium

Three Quick Stories About Egypt

1. Church where they hid and saved Baby Jesus;
Population composition: 90.6% Muslim,
9.26% Coptic Christian.
2. Lovely Muslim Women on the streets on
Cairo.
3. Egyptian Engineering Projects.

Three Quick Stories About Egypt

Church on the location where they hid and saved Baby Jesus - **Inside the Church of Abu Serga: a Hidden Gem Where the Holy Family Sought Refuge**; Most Egyptians are proud of this important history. Egypt Population Religious composition: 90.6% Muslim, 9.26% Coptic Christian.



Regardless of Religious orientation, most Egyptians are proud of Egypt's historical role here.

Source:
<https://egyptianstreets.com/2021/12/17/inside-the-church-of-abu-serga-a-hidden-gem-where-the-holy-family-sought-refuge/>



Three Quick Stories About Egypt

Lovely Muslim Women on the streets on Cairo.

They wanted to get their picture made with me!

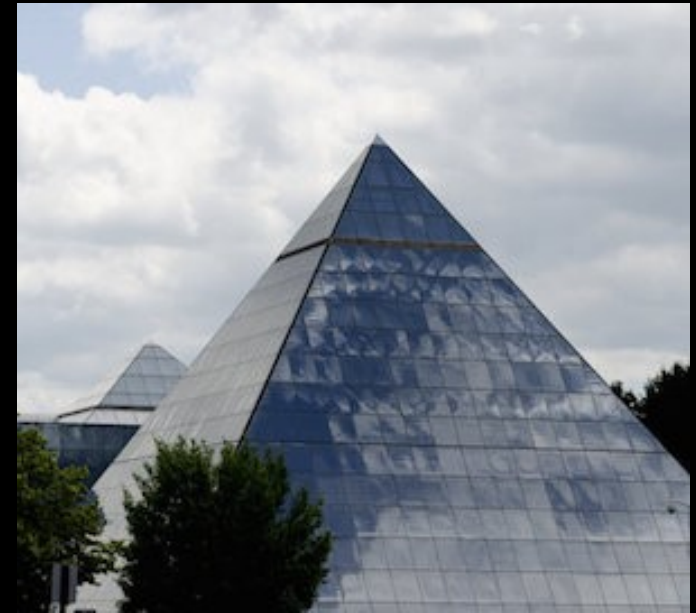


Three Quick Stories About Egypt

Egyptian Engineering Projects.

4500 years later...

Egyptians can proudly state that their culture has produced some of the most magnificent, and long-lived objects on Planet Earth – *The Great Pyramids.*



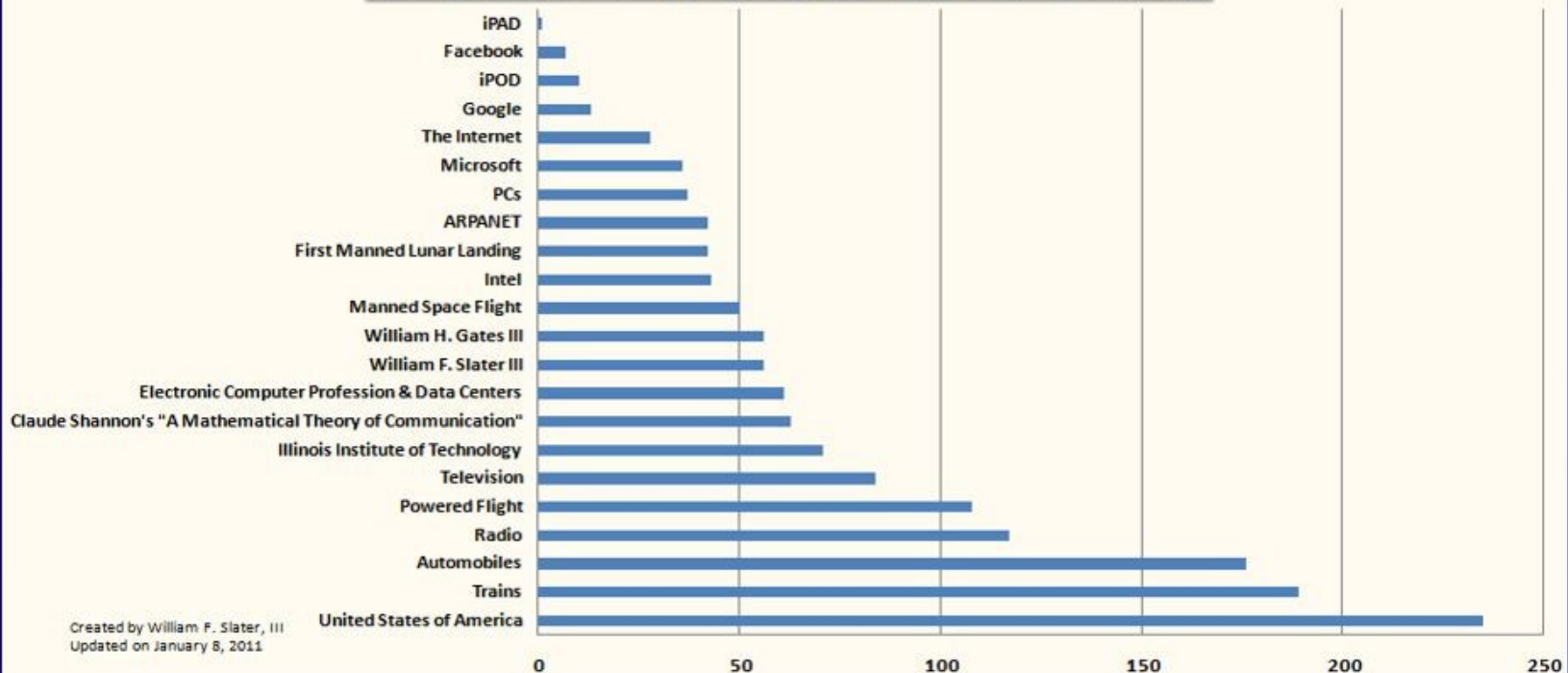
Three Quick Stories About Egypt

Egyptian Engineering Projects.



Relatively Speaking...

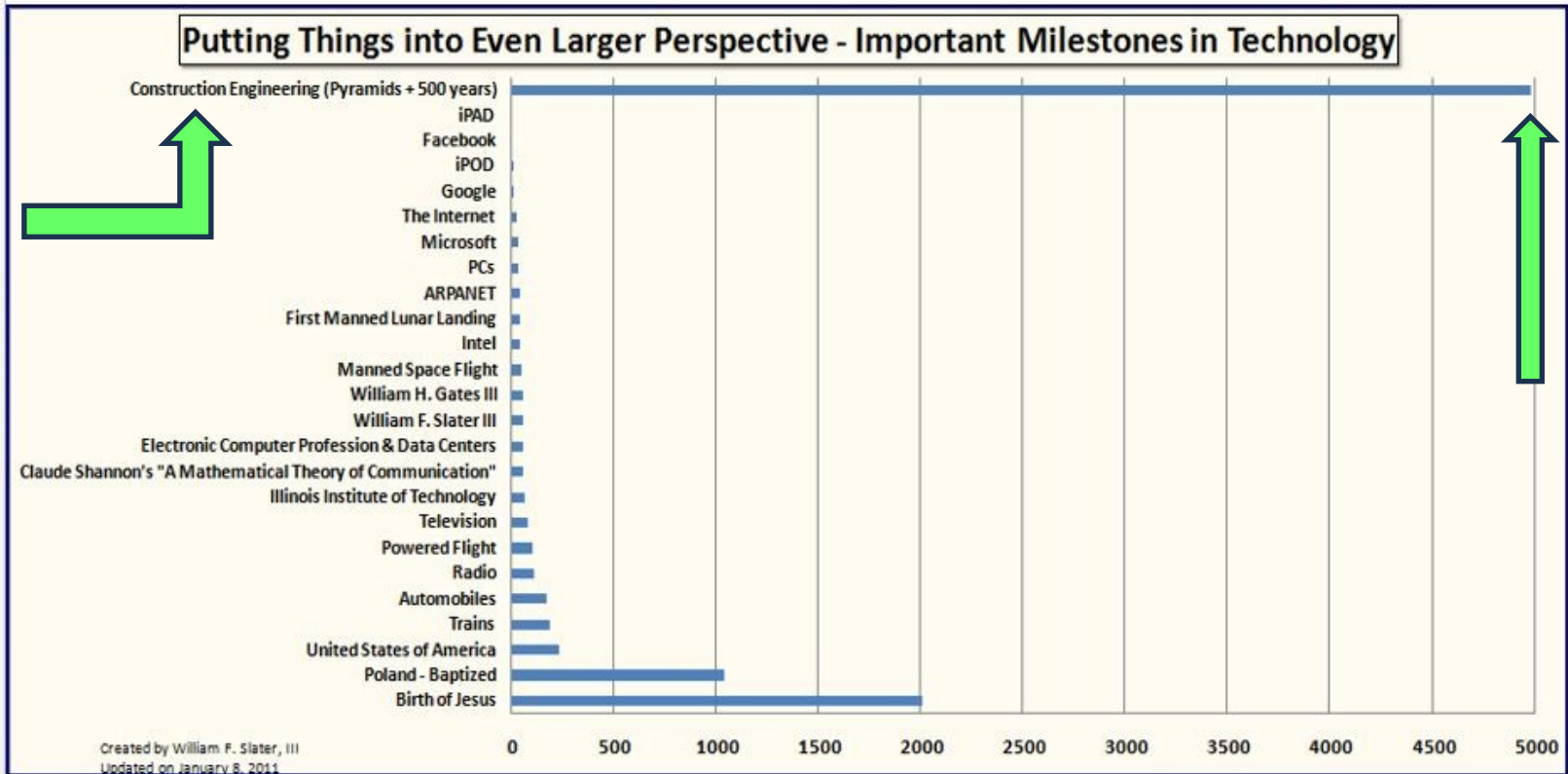
Putting Things into Perspective - Important Milestones in Technology



Created by William F. Slater, III
Updated on January 8, 2011

	United States of America	Trains	Automobiles	Radio	Powered Flight	Television	Illinois Institute of Technology	Claude Shannon's "A Mathematical Theory of Communication"	Electronic Computer Profession & Data Centers	William F. Slater III	William H. Gates III	Manned Space Flight	Intel	First Manned Lunar Landing	ARPANET	PCs	Microsoft	The Internet	Google	iPOD	Facebook	iPAD
Age in Years	233	178	128	117	106	84	71	60	58	56	56	50	43	42	42	37	38	28	18	10	7	1

Relatively Speaking...



January 12, 2016

CIS 227 – Vulnerability Analysis & Ethical Hacking - Lecture 01 - Spring 2016 - William Favre Slater, III

198

Quantum in Egypt – 2026

Updates

- ✓ 2025 Spending = \$???
- ✓ Hardware = Egypt's clearest hardware milestone in 2026 is access to a 25-qubit SpinQ processor through the ERI-Jet In Technology agreement
- ✓ Software = Egyptian quantum software work is primarily university-led. Cairo University's Spring School emphasizes practical Qiskit use, while Nile University's curriculum includes quantum architecture, distributed quantum computing, quantum implementation technologies, quantum information systems, adiabatic computing and QML. [2][3] Workforce = Getting Stronger and less PhD-Focused
- ✓ PQC Remains a Top Concern, and organizations are waking up to the threats of Q-Day and HNDL
- ✓ There are approximately 120 Billion Internet-connected devices that require updating
- ✓ Quantum Education and Awareness are driving more curiosity-seekers and enthusiasts to embrace Quantum as career destination.
- ✓ There are over 70 slides behind this that tell a very positive, interesting, complete story.



Egypt Quantum Snapshot 2026

What Is PQC?

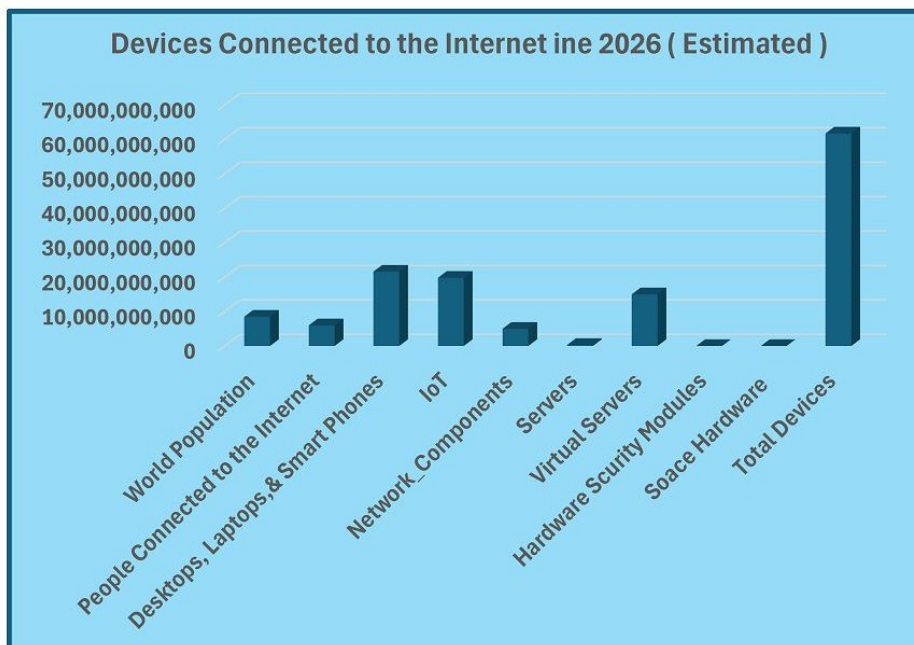
- **PQC is Post-Quantum Cryptography.**
- **It is a standard that has been developed to withstand efforts by Cryptographically Relevant Quantum Computers (CRQC) to break standard cryptography. NIST is the most prevalent set of PQC Standards, but there are also other standards available in Europe, Japan, China, etc.**

This Should Get Your Attention If You Care About PQC and the Internet

PQC System Engineer Readiness How Large Is This Opportunity?

World Population	8,500,000,000
People Connected to the Internet	6,000,000,000
Desktops, Laptops, & Smart Phones	21,600,000,000
IoT	19,800,000,000
Network Components	5,000,000,000
Servers	300,000,000
Virtual Servers	15,000,000,000
Hardware Security Modules	1,000,000
Soace Hardware	14,000
Total Devices	61,701,014,000

(All figures are estimated)



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Sunday, April 12, 2026
Chicago, Illinois, USA

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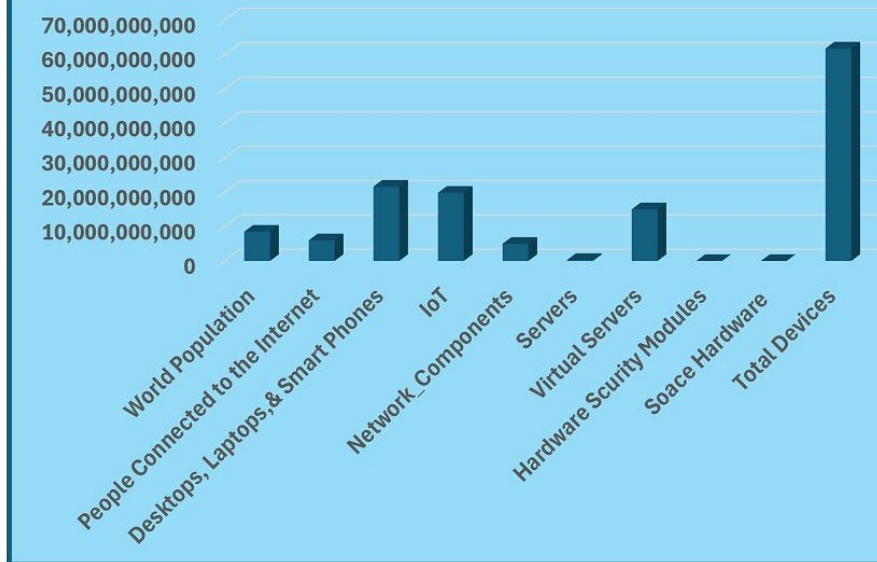
**Oops! Forgot the
Virtual Machines!
Total could be over
120 Billion...**

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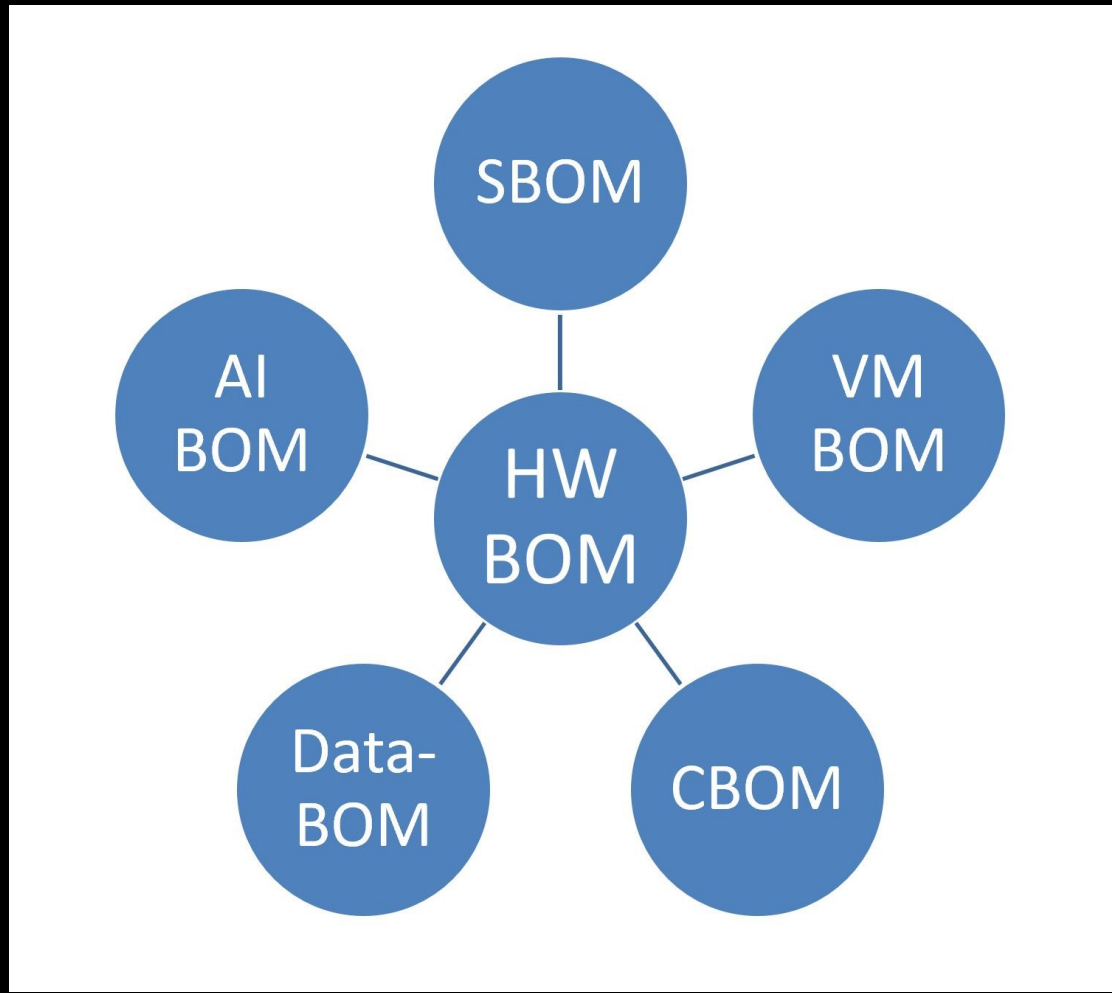
Sunday, April 12, 2026

Chicago, Illinois, USA

Devices Connected to the Internet ine 2026 (Estimated)



Our BOMs for PQC Migrations



This Should Get Your Attention If You Care About PQC and the Internet



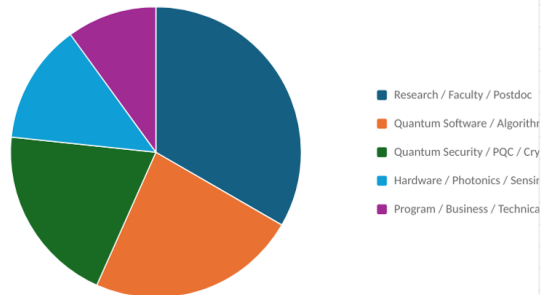
Egypt and the Quantum Workforce

Open Positions by Position Type	Estimated Openings
Research / Faculty / Postdoc	10
Quantum Software / Algorithms / QML	7
Quantum Security / PQC / Cryptography	6
Hardware / Photonics / Sensing	4
Program / Business / Technical Support	3

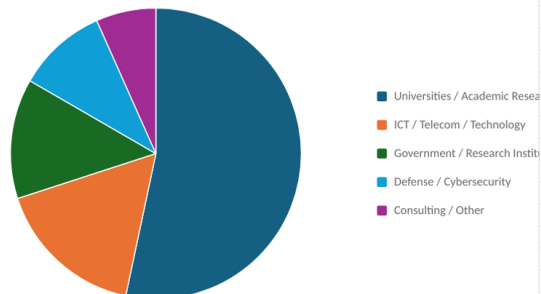
Open Positions by Industry Type	Estimated Openings
Universities / Academic Research	16
ICT / Telecom / Technology	5
Government / Research Institutes	4
Defense / Cybersecurity	3
Consulting / Other	2

Estimated Quantum-Engaged Workforce by Role	People (Midpoint Estimate)
Academic researchers / faculty	120
Graduate students / research assistants	95
Quantum software / algorithms / QML	45
Quantum communications / security / PQC	30
Quantum hardware / photonics	20
Quantum sensing / metrology	12
Policy / program / training	10
Industry product / business / consulting	8

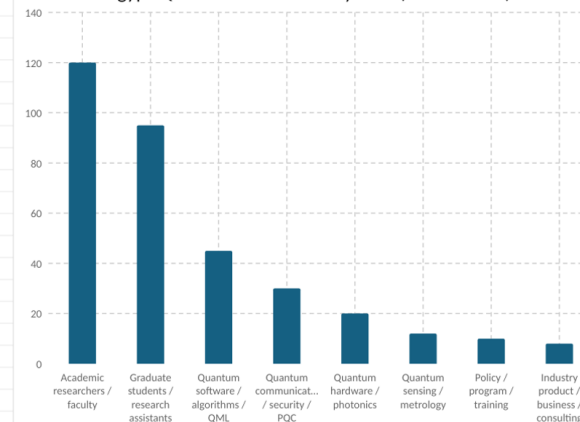
Egypt Quantum Openings by Position Type



Egypt Quantum Openings by Industry Type



Egypt Quantum Workforce by Role (2026 Model)



Egypt's Strategic Quantum Assessment

Dimension	2026 maturity	Assessment
Research	Moderate	Multiple credible universities/labs; communications and algorithms are visible strengths.
Education	Moderate and improving	Undergraduate, graduate and certificate programs are now clearly visible.
Hardware	Early	25-qubit access is meaningful; indigenous QPU manufacturing is not yet evident.
Software/Algorithms	<u>Early-Moderate</u>	Strong academic/software base, limited commercial productization.
PQC	<u>Early-Moderate</u>	Research and curriculum activity; national migration mandate not identified.
Quantum communications	Moderate research maturity	QKD/photonics expertise is a relative strength.
Quantum sensing	Early	Research adjacency is good; commercial market/revenue remains small.
Industry commercialization	Early	Partnership activity is rising, but few pure-play domestic firms.
Funding	Early	General R&D mechanisms exist; dedicated quantum budget is not transparent.
Workforce	Emerging	Estimated hundreds of engaged people; heavily academic.

Egypt and the Quantum Outlook

Egypt has enough academic depth to become a meaningful regional participant, but the next phase depends on converting education and research into persistent infrastructure, commercial programs and policy.

A plausible 2026-2030 pathway is:

- Formalize and publish the National Quantum Computing Strategy with measurable milestones, governance and budget transparency.
- Expand physical quantum hardware access beyond a single processor/vendor relationship and connect it to national HPC/cloud resources.
- Create a national PQC migration program for government and critical infrastructure, beginning with cryptographic discovery and hybrid deployment pilots.
- Fund 3-5 application testbeds in telecom/QKD, financial optimization, energy, materials, sensing/navigation and cybersecurity.
- Establish competitive quantum graduate fellowships and postdoctoral programs, plus K-12/STEM outreach pathways.
- Build shared photonics, cryogenic, device-fabrication and precision-measurement infrastructure that can support both quantum computing and sensing.
- Create commercialization incentives for Egyptian deep-tech startups and joint ventures, with explicit quantum eligibility.
- Measure the ecosystem annually: workforce, patents, publications, funding, revenue, hardware access, deployments and job openings.
- ***Collaborate with international partners (USA, China, Germany, Japan, etc.,) to seek win-win situations and outcomes.***

Quantum Technologies in Egypt Data Centers (Part 1 of 2)

QUANTUM TECHNOLOGIES IN DATA CENTERS IN EGYPT

Powering Egypt's Digital Future
with Quantum Innovation

Building secure, sovereign, and sustainable
infrastructure for the quantum era.



WHY IT MATTERS



Quantum computing will solve complex problems beyond classical computers—in cryptography, materials, logistics, finance, healthcare & more.



Quantum-ready data centers protect Egypt's digital infrastructure and national security.

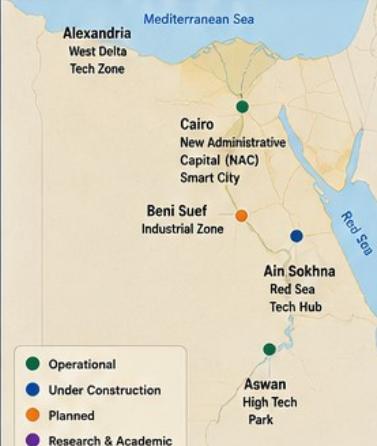


Positions Egypt as a regional leader in AI, HPC, and quantum innovation.



Drives economic growth, skilled jobs, and technology sovereignty.

WHERE QUANTUM DATA CENTERS ARE LOCATED / PLANNED



CURRENT & PLANNED QUANTUM TECHNOLOGY DATA CENTERS

LOCATION	FACILITY / PROJECT	STATUS	QUANTUM TECHNOLOGIES FOCUS	KEY PARTNERS
Cairo (NAC)	Egypt Quantum Computing Center (EQCC)	Operational (2023)	Quantum research, HPC, QKD testbeds, PQC labs	MCIT, ASRT, ITIDA, Universities
Cairo (NAC)	Microsoft Cloud Region - Egypt	Under Construction	Quantum-ready cloud infrastructure, Azure Quantum	Microsoft, MCIT, Telecom Egypt
Alexandria	Alexandria Data Center Hub	Under Construction	Hybrid HPC + quantum workloads for industry	Telecom Egypt, Intel, Oracle
Ain Sokhna	Red Sea Data Center & Quantum Hub	Planned (2025-2026)	QKD networks, secure communications, quantum simulation	Orascom, MCIT, NTRA, ZTE
Beni Suef	Upper Egypt Data Center	Planned	Edge computing, quantum-ready regional infrastructure	ITIDA, Private Investors
Aswan	Aswan High Tech & Research Park	Research & Academic	Quantum materials, quantum sensors, education & training	ASRT, Universities, STDF, Industry



Egypt aims to be the quantum & AI hub of Africa and the Middle East.

KEY QUANTUM TECHNOLOGIES ENABLED IN DATA CENTERS



QUANTUM COMPUTING

Solves optimization, simulation, machine learning & cryptography at massive scale.



QUANTUM COMMUNICATIONS (QKD)

Unhackable quantum key distribution for government, defense & financial networks.



POST-QUANTUM CRYPTOGRAPHY (PQC)

Protects data & systems from future quantum attacks using PQC algorithms.



QUANTUM SIMULATION

Simulates molecules & materials for pharma, energy, agriculture & advanced manufacturing.



QUANTUM SENSORS

Ultra-precise sensing for navigation, geology, healthcare & environment monitoring.



HYBRID HPC + QUANTUM

Integrates classical HPC with quantum systems for real-world problem solving.

Quantum Technologies in Egypt Data Centers (Part 2 of 2)

EXAMPLES OF EGYPT'S QUANTUM & DATA CENTER INITIATIVES						GOVERNMENT STRATEGY & GOALS	
							Egypt National Quantum Strategy (2023-2030) building capabilities, infrastructure and talent.
Egypt Quantum Computing Center (Cairo NAC) First national quantum research & innovation center in Africa.	Microsoft Cloud Region – Egypt (Cairo NAC) Bringing quantum-ready cloud services to enterprises and government.	Alexandria Data Center Hub Strategic gateway for Mediterranean cloud and quantum services.	Ain Sokhna Red Sea Hub Low latency, secure connectivity across Africa, Europe & Asia.	Beni Suef Data Center Extending digital infrastructure to Upper Egypt.	Aswan High Tech & Research Park R&D, quantum labs, education & talent development.		Investing in quantum research, HPC, and sovereign digital infrastructure.
							Strengthen cyber security with PQC & QKD adoption.
							Develop local quantum ecosystem, startups, and industry partnerships.
							Make Egypt the leading quantum & AI hub in Africa and the Middle East.
CONSIDERATIONS & ISSUES FOR QUANTUM DATA CENTERS IN EGYPT							
 POWER USAGE & RELIABILITY	 SIZE & SCALE	 WATER USAGE	 LOCAL POLITICS & REGULATION	ENVIRONMENTAL CONSIDERATIONS	PUBLIC ACCEPTANCE		
- High power demand: 20-100 MW+ per facility. - Reliance on natural gas and grid stability. - Need for renewable energy (solar, wind). - Cooling systems add significant load.	- Facilities range from 10 MW to 200+ MW. - Large land requirements in desert & coastal areas. - Zoning and land use planning critical. - Space for future expansion.	- Cooling is water intensive. - Use of seawater (Ain Sokhna) or treated wastewater. - Freshwater scarcity is a national concern. - Sustainable cooling technologies needed.	- Strong government support through MCIT & ITIDA. - Need for clear data center regulations & standards. - Incentives for investment in digital infrastructure. - Data sovereignty and national security laws.	- Energy mix affects carbon emissions. - Impact on water resources and marine ecosystems. - E-waste and heat island effects. - Commitment to climate goals (COP27 commitments).	 - Generally supportive when projects bring jobs and infrastructure. - Concerns about water usage, energy prices, and local impact. - Transparency, community engagement and benefit sharing are essential.		
TOP ISSUE: Grid reliability and cost of electricity. 	TOP ISSUE: Land availability and zoning regulations. 	TOP ISSUE: Water scarcity and sustainable usage. 	TOP ISSUE: Regulatory clarity and data sovereignty. 	TOP ISSUE: Environmental impact and sustainability. 	TOP ISSUE: Transparency and community benefits. 		
BENEFITS TO EGYPT		CHALLENGES & RISKS		THE BOTTOM LINE			
- Economic growth and foreign investment. - High-skilled jobs and talent development. - Stronger national security and digital sovereignty. - Leadership in quantum & AI in Africa & MENA. - Advances in healthcare, energy, agriculture, logistics and more. - Attracts global tech companies and R&D centers. 		 HIGH CAPITAL COSTS: Infrastructure, cooling, quantum hardware expensive.  POWER & FUEL DEPENDENCE: Natural gas reliance and grid constraints.  WATER SCARCITY: Competition with agriculture and population needs.  CYBER & PHYSICAL SECURITY: Protecting critical infrastructure from threats.  TALENT SHORTAGE: Need more quantum engineers, scientists, and specialists.  TECH MATURITY: Quantum technology is still evolving.		Quantum technologies in data centers will secure Egypt's digital future, drive innovation, and create high-value jobs. With smart planning, sustainable resources, strong regulation, and community trust, Egypt can become the quantum powerhouse of Africa and the Middle East. 			
KEY TAKEAWAYS	 INVEST IN QUANTUM R&D	 BUILD SECURE & SUSTAINABLE DATA CENTERS	 USE RENEWABLE ENERGY & SMART COOLING	 PROTECT WATER RESOURCES	 STRENGTHEN REGULATION & DATA SOVEREIGNTY	 ENGAGE COMMUNITIES TRANSPARENTLY	

Quantum Technologies in U.S. Data Centers (Part 1 of 2)

QUANTUM TECHNOLOGIES IN DATA CENTERS IN THE UNITED STATES

Building the Quantum Era of Computing, Networking & Security

U.S. data centers are beginning to integrate quantum technologies—quantum computing systems, quantum networking, and post-quantum cryptography (PQC)—to drive breakthroughs in AI, optimization, simulation, and ultra-secure communications.

WHERE QUANTUM DATA CENTERS ARE CURRENTLY OPERATING / PLANNED



- **SEATTLE, WA** – Microsoft Quantum Datacenter (topological qubits research)
- **SILICON VALLEY, CA** – Google Quantum AI Lab & Quantum Cloud Access
- **LOS ALAMOS, NM** – National Quantum Research Center (NNSA/DOE)
- **CHICAGO, IL** – IBM Quantum Data Center & Quantum Hub
- **DALLAS, TX** – IonQ Quantum HQ & Quantum Cloud Region
- **PRINCETON, NJ** – AWS Center for Quantum Networking (CQN)
- **BOSTON, MA** – Harvard/MIT Quantum Network Hub (QuEra & Partners)
- **RALEIGH, NC** – Quantum-Secure Data Center Corridor (QKD Trials)

Planned quantum-capable data centers and networks are expanding across the U.S. through public-private partnerships and cloud providers.

CURRENT & PLANNED QUANTUM TECHNOLOGIES IN DATA CENTERS

COMPANY / ORGANIZATION	LOCATION	TECHNOLOGIES	STATUS	NOTES
Microsoft	Redmond, WA	Topological qubits, Azure Quantum, Quantum networking	Operational (Since 2023)	First topological qubit R&D data center
Google	Santa Barbara, CA	Quantum processors, Quantum AI, Cloud access	Operational (Since 2019)	Quantum AI labs & cloud API access
IBM	Poughkeepsie, NY & Chicago, IL	Qiskit, Gate-based qubits, Quantum cloud	Operational (Since 2016)	IBM Quantum System Two in data center environments
AWS	Princeton, NJ	Quantum networking (QKD), Braket Quantum Service	Operational / Expanding	Center for Quantum Networking (CQN)
IONQ	College Park, MD & Dallas, TX	Trapped-ion quantum computers, Quantum cloud	Operational (Expanding)	Production systems and enterprise partnerships
rigetti	Berkeley, CA	Superconducting qubits, Quantum Cloud	Operational	Hybrid quantum-classical workloads
QUANTINUUM	Broomfield, CO	Trapped ions, Quantum software & HPC integration	Operational	Quantum systems for commercial use
PsiQuantum	Chicago, IL	Photonic quantum computers	Under Construction	Fault-tolerant quantum computers at scale
U.S. DoE / NNSA	Los Alamos, NM	Quantum R&D, Simulation, Quantum sensors	Operational	National labs & secure quantum infrastructure
Multiple Operators	Nationwide	PQC deployment, Quantum-safe networks	Planned / Rolling Out	PQC required for future federal & enterprise systems



Quantum Computing System in Data Center



Dilution Refrigerator (Quantum Processor)



Quantum Networking (QKD Equipment)



PQC-Ready Infrastructure



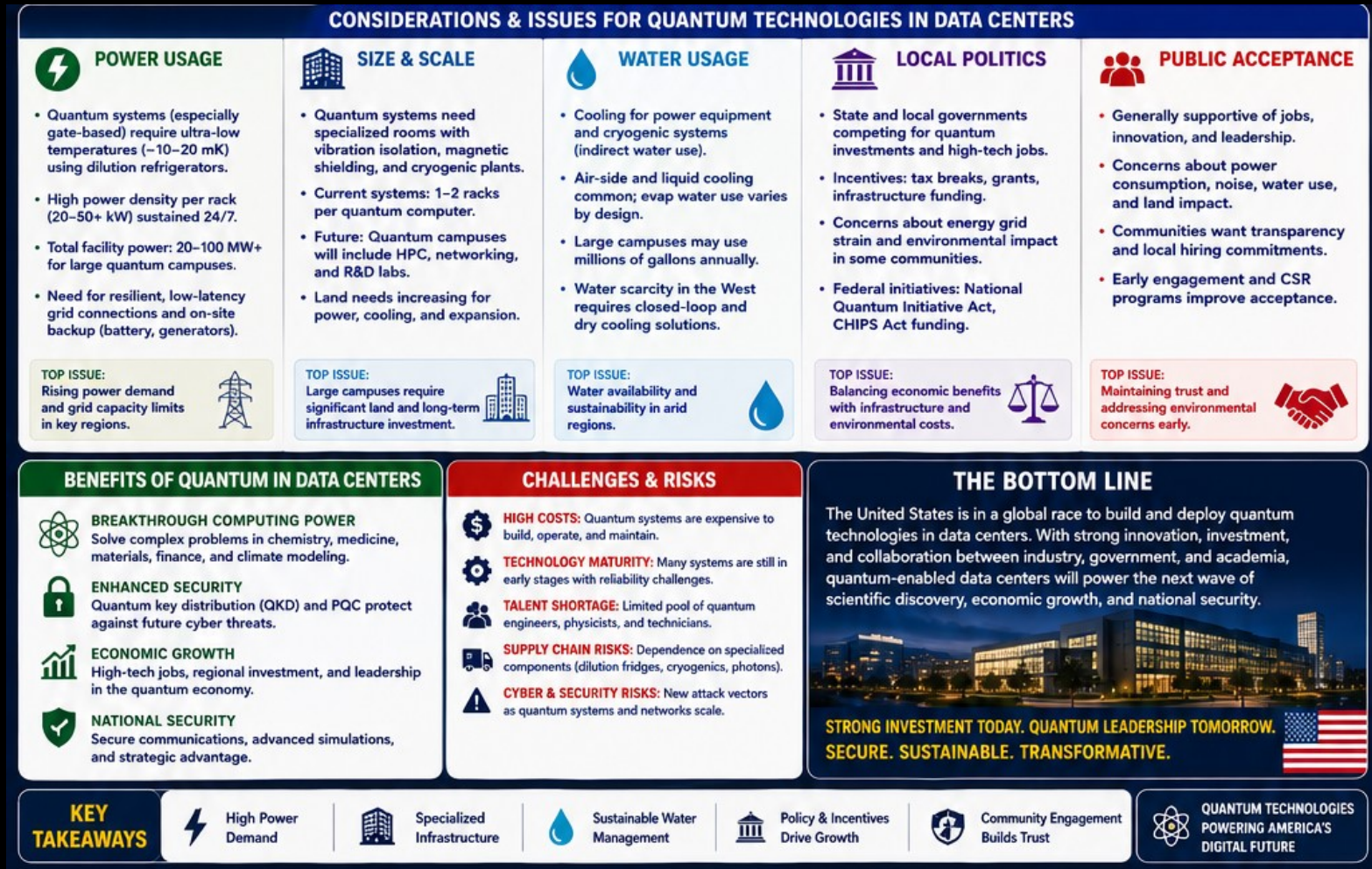
Next-Gen Data Center Design

Projects and capacities are estimates and subject to change. Sources: Company reports, press releases, and industry analysis (2024–2025).

QUANTUM IN DATA CENTERS

- Quantum Computing Systems (Annealers, Gate-based, Neutral Atoms)
- Quantum Networking (QKD, Quantum Repeaters)
- Post-Quantum Cryptography (PQC) for All Systems
- Quantum Sensors (Precision timing, imaging, navigation)
- Hybrid Quantum-Classical Architectures

Quantum Technologies in U.S. Data Centers (Part 2 of 2)



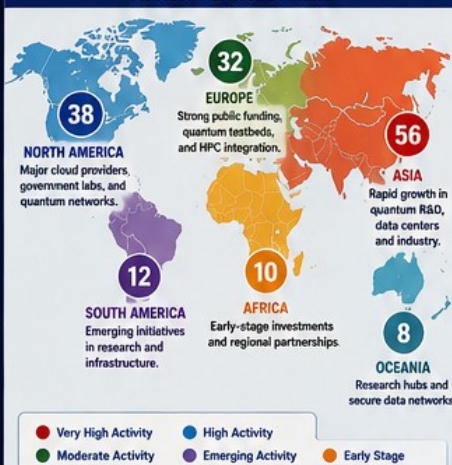
Summary: Quantum Technologies in Data Centers Worldwide (Part 1 of 2)

QUANTUM TECHNOLOGIES IN DATA CENTERS WORLDWIDE

Building Quantum-Ready Infrastructure for a Secure, Sustainable Digital Future

Quantum computing and quantum-safe technologies are transforming data centers. Countries around the world are investing in quantum research, infrastructure, and secure networks—while communities weigh the impacts on power, water, environment, and quality of life.

GLOBAL SNAPSHOT: QUANTUM DATA CENTER ACTIVITY & INVESTMENT



SELECT COUNTRIES: CURRENT & PLANNED INITIATIVES

COUNTRY	CURRENT INITIATIVES	PLANNED PROJECTS	KEY PARTNERS
United States	DOE labs, IBM Quantum Network, DoD QCI, Major cloud quantum services	National Quantum Initiative, Q-safety standards, HPC upgrades	IBM, Google, AWS, Microsoft, Intel, NVIDIA, National Labs
China	National quantum labs, Hefei quantum center, Quantum cloud	Quantum computing megaprojects, QKD networks	Alibaba, Baidu, Tencent, CAS, China Telecom
European Union	EuroHPC JU, Quantum Flagship, QKD testbeds	EuroQCI, pan-European quantum nodes, industry pilots	Atos, IQM, Pasqal, T-Systems, CINECA
Japan	RIKEN, Fugaku integration, quantum R&D	Quantum data center testbeds, Q-Cloud	Fujitsu, NEC, Toshiba, NTT
India	National Quantum Mission, trapped-ion labs	Quantum cloud, secure networks, skill development	TCS, Wipro, LTIMindtree, DRDO, C-DAC
Germany	Quantum computing initiatives, research hubs	Quantum data centers in Frankfurt region	Fujitsu, IBM, DLR, Atos, ParTec
Australia	Quantum Brilliance, CSIRO programs	Quantum data center and cloud pilots	AWS, Silicon Quantum Computing, CSIRO
Canada	Quantum Valley (Waterloo), government strategy	National Q-network, data center upgrades	Xanadu, D-Wave, Rogers, QCI
Brazil	Quantum labs (LNCC), early cloud pilots	Sovereign quantum cloud and networks	Embrapii, LNCC, Huawei, IBM
U.A.E.	Quantum research programs	Quantum park & data center hub	PASQAL, IBM, G42, Microsoft

Activity levels reflect public information as of May 2024.

WHY IT MATTERS

- Quantum computing will solve complex problems beyond classical computers—advancing medicine, climate modeling, logistics, finance, and AI.
- Quantum-safe data centers protect digital infrastructure and critical communications from future quantum attacks.
- Countries that invest today will lead in innovation, economic growth, and national security.
- Sustainable, responsibly sited data centers are essential for long-term public trust.

QUANTUM TECHNOLOGIES ENABLED IN DATA CENTERS

- QUANTUM COMPUTING**
High-performance quantum processors for simulation, optimization & AI.
- QUANTUM COMMUNICATIONS (QKD)**
Ultra-secure key distribution for networks and data transmission.
- POST-QUANTUM CRYPTOGRAPHY (PQC)**
Algorithms to protect data and systems from future quantum attacks.
- QUANTUM SIMULATION**
Model molecules, materials, and systems for science, pharma, and energy.
- QUANTUM SENSING**
Extreme-precision sensing for navigation, geology, weather, and infrastructure.
- HYBRID HPC + QUANTUM**
Integration of classical HPC and quantum systems in secure data centers.

Summary: Quantum Technologies in Data Centers Worldwide (Part 2 of 2)

REGIONAL HIGHLIGHTS: QUANTUM DATA CENTERS & INFRASTRUCTURE					
 NORTH AMERICA - Large hyperscale data centers integrating quantum-ready infrastructure. - Strong government investment in quantum R&D and QCI. - Focus on energy reliability and cybersecurity.	 EUROPE - EuroHPC supercomputers with quantum accelerators. - Cross-border quantum networks for secure communications. - High sustainability standards and regulation.	 ASIA - Rapid expansion of quantum cloud services. - Major investments in quantum chips and networks. - Focus on industrial applications and economic competitiveness.	 SOUTH AMERICA - Growing interest in quantum research and education. - Investments in cloud infrastructure. - Challenges with energy reliability and funding.	 AFRICA - Early-stage quantum research initiatives. - Partnerships with global universities and labs. - Focus on digital sustainable and capacity building.	 OCEANIA - Quantum startups and research centers. - Emphasis on secure communications. - Strong renewable energy opportunities.
CONSIDERATIONS & ISSUES FOR QUANTUM DATA CENTERS WORLDWIDE					
 POWER USAGE & RELIABILITY - Quantum systems and HPC require ultra-stable, high-density power. - Demand: 10–300+ MW per facility (and growing). - Reliance on renewable energy is critical. - Risk of grid strain and outages. TOP ISSUES: Grid capacity, reliability, energy cost, carbon footprint.	 SIZE & SCALE - Facilities range from 10 MW to 1 GW+. - Large land requirements for campuses and expansion. - Zoning, land use, and community impact. TOP ISSUES: Land availability, zoning conflicts, urban sprawl.	 WATER USAGE - Cooling is water-intensive (or uses air/hybrid systems). - Usage: 0.5–5 million liters/day for large facilities. - Water scarcity is a major constraint in many regions. TOP ISSUES: Water scarcity, drought, wastewater, community use.	 LOCAL POLITICS & REGULATION - Incentives and tax breaks drive investment. - Regulations vary widely by country and region. - Need for transparency, permits, and public consultation. TOP ISSUES: Regulatory clarity, tax incentives, public process.	 ENVIRONMENTAL IMPACT - Emissions, e-waste, heat island effect. - Impact on ecosystems and biodiversity. - Importance of sustainable design and operations. TOP ISSUES: Carbon emissions, habitat, waste, heat, noise.	 PUBLIC ACCEPTANCE - Communities want jobs and benefits. - Concerns about water, power, noise, and taxes. - Trust depends on transparency and shared benefits. TOP ISSUES: Community engagement, trust, fairness, quality of life.
BENEFITS OF QUANTUM DATA CENTERS - Accelerates scientific discovery and innovation. - Strengthens national security and cyber defense. - Drives high-skilled jobs and economic growth. - Improves climate modeling, healthcare, logistics, finance. - Promotes digital sovereignty and secure infrastructure. - Positions nations and regions as technology leaders.		CHALLENGES & RISKS HIGH CAPITAL COSTS: Quantum hardware and infrastructure are expensive. POWER & WATER DEPENDENCE: Strain on resources and infrastructure. TECHNOLOGY MATURITY: Systems are still evolving and error-prone. CYBER & PHYSICAL SECURITY: Protecting critical data, hardware, and networks. TALENT SHORTAGE: Need more quantum experts, engineers, and skilled workers. GEOPOLITICAL COMPETITION: Global race for quantum leadership.		THE BOTTOM LINE Quantum technologies in data centers will reshape our world—creating enormous opportunities and significant responsibilities. Success depends on sustainable infrastructure, responsible governance, and the trust of the communities we serve.	
KEY TAKEAWAYS  Quantum is a global priority across all major regions.  Secure, quantum-ready data centers protect our digital future.  Sustainability and responsible siting are essential.  Community engagement and transparency drive acceptance.  Investment today leads to innovation tomorrow.  Quantum will power a more secure, smart, and prosperous world.					

Elsewhere on the African Continent Data Centers



Conclusion

- Egypt entered 2026 with a real but still early-stage quantum ecosystem. The combination of a national-strategy signal, 25-qubit hardware access, expanded university curricula, graduate programs, quantum communications expertise and PQC research materially improves the country's position compared with a purely exploratory phase. The central constraint is commercialization: the country still needs dedicated funding transparency, repeatable industry demand, local venture formation, larger hardware/test infrastructure, and a measurable national workforce pipeline.
- The strongest near-term strategy is not to compete immediately in every QPU modality. Egypt can obtain faster strategic returns by concentrating on quantum-safe cybersecurity, communications/QKD, quantum software and algorithms, photonics, sensing, workforce development and hybrid access to international quantum hardware, while building the research infrastructure needed for deeper hardware localization over time.
- Finally, the smart, talented, well-educated and highly-motivated Quantum Workers and Researchers we find in Egypt make them great and highly-desirable candidates for collaboration on real-world Quantum Projects and Quantum Research.
- As an American Quantum Professional, I can confidently say, “ Welcome to our Quantum Teams! “.

Egypt's Quantum Snapshot 2026

Questions and Answers



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Supplemental Slides

Hardware Development Updates

- Egypt's clearest hardware milestone in 2026 is access to a 25-qubit SpinQ processor through the ERI–Jet In Technology agreement. The arrangement is significant because it gives Egyptian researchers access to non-simulator quantum processing for applied research and training, while also linking the activity to a national strategy framework. [1]
- Domestic quantum processor fabrication at commercial scale was not identified. Egypt's hardware capabilities are better described as enabling capabilities in electronics, photonics, lasers, communications engineering, embedded systems and instrumentation. These disciplines are relevant to control electronics, quantum optics, QKD, sensing and future cryogenic/photonic subsystems.
- 2026 status: imported/accessed quantum processor capability rather than indigenous QPU manufacturing.
- Near-term strength: educational systems, photonics, quantum optics, control/instrumentation and hybrid classical-quantum experimentation.
- Primary gap: national-scale quantum fabrication, packaging, cryogenics and calibration infrastructure dedicated specifically to QPUs.

Software Development Updates

- Egyptian quantum software work is primarily university-led. Cairo University's Spring School emphasizes practical Qiskit use, while Nile University's curriculum includes quantum architecture, distributed quantum computing, quantum implementation technologies, quantum information systems, adiabatic computing and QML. [2][3]
- Research examples include reinforcement-learning-assisted quantum circuit initial mapping and quantum-secure communications work. This points to a software ecosystem centered on research prototypes, circuit design, simulation, optimization, security and education rather than a large commercial quantum software product industry. [3]

Algorithm Updates

- Quantum circuit mapping and optimization: Nile University researchers have published on reinforcement-learning approaches to circuit initial mapping. [3]
- Quantum machine learning: appears in university curricula and current research collaborations.
- Quantum communication/QKD algorithms: a sustained area of Egyptian research, including security analysis and attack resistance. [7][8]
- PQC algorithms: Egyptian researchers are publishing and teaching lattice-, code-, hash- and alternative algebraic post-quantum approaches; implementation work includes hybrid post-quantum IKEv2. [9][10]
- No evidence was identified of an Egypt-origin algorithm being selected as a NIST global PQC standard. Egypt's algorithmic contribution is currently stronger in implementation research, security analysis, communications and academic experimentation.

Quantum in Research

- Research is the core of Egypt's quantum ecosystem. Key nodes include Cairo University and its National Institute of Laser Enhanced Sciences (NILES), Zewail City of Science and Technology, Nile University, Ain Shams University, Alexandria University, Hurghada University, Tanta University, Alamein International University, Misr International University and ERI.

Institution / group	Visible 2026 quantum focus
Electronics Research Institute (ERI)	25-qubit access, national capacity building, quantum computing cooperation. [1]
Cairo University / NILES	Quantum technologies school, photonic entanglement, quantum communication, optics. [2][7]
Zewail City	Quantum communication lab / photonics collaboration. [7]
Nile University	Broad quantum computing curriculum, architecture, QML, distributed QC, cybersecurity. [3]
Ain Shams University	Quantum computing/security courses; PQC and embedded security research. [4][10]
Alexandria University	Alexandria Quantum Computing Group; QKD and algorithms. [11]
Hurghada University	Quantum communication, QML and cybersecurity research affiliations. [8]
Tanta University	Free-space/CV-QKD and optical communications research. [12]
Alamein International University	MSc and professional master's in Quantum Science and Technology. [5]
Misr International University	2026 quantum foundation certificate with hardware/simulator exposure. [6]

Education:

K-12, College, Graduate School, Post-Graduate

Education Level	2026 Priority
K-12	A dedicated national K-12 quantum curriculum was not identified. Quantum outreach is more likely to occur through STEM schools, science clubs, university outreach, coding/AI camps and International Year of Quantum follow-on activities. This remains a significant ecosystem gap.
Undergraduate	Nile University has one of the most explicit undergraduate quantum tracks located in Egypt, with courses spanning introductory quantum computing, architecture, QML, distributed systems, implementation technologies, cybersecurity and quantum information. Ain Shams also offers formal quantum computing/security coursework. [3][4]
Graduate school	Deep specialization in quantum hardware, algorithms, quantum error correction, sensing, materials, communications, and cryptography.
Post-graduate / professional	Executive education, CISO PQC migration training, product management, standards, export controls, and continuing education for classical engineers entering quantum.

Quantum in Industry

- Commercial activity is early. The January 2026 Nile University meeting with Orange Group and Orange Labs specifically identified quantum technology as an area for deeper university-industry collaboration. The ERI/SpinQ partnership similarly creates a bridge between training, research and vendor technology access. [13][1]
- Likely first industry adopters are telecom, cybersecurity, banking/financial services, defense, government research, energy and universities. In the near term, commercial value is more likely to come from quantum-safe security, training, consulting, simulation and cloud access than from domestic ownership of large fault-tolerant quantum computers.

Quantum in Communications

- Quantum communications is one of Egypt's more mature research areas. Salem Hegazy's work at Cairo University and Zewail City spans photonic entanglement, practical quantum cryptography, optical communications and QKD security, including an inventor-linked U.S. patent on a QKD system designed to mitigate intercept-resend and detector-control attacks. [7][14]
- Additional Egyptian research has examined continuous-variable QKD over free-space channels and ground-to-satellite optical links. This is strategically relevant to Egypt because of its telecom infrastructure, geographic position and interest in secure communications. [12]

Quantum Sensors

- Egypt's quantum sensing activity is primarily research-adjacent rather than a clearly measured commercial sector. Relevant capabilities include laser science, photonics, optical instrumentation, metrology, quantum communications and advanced sensing. Applications with potential Egyptian relevance include navigation in GPS-denied environments, oil/gas and mineral exploration, precision timing, magnetic sensing, defense, biomedical sensing and infrastructure monitoring.
- No Egyptian pure-play quantum sensing company with separately disclosed 2025 revenue was identified in the public sources reviewed. Accordingly, the Egypt 2025/2026 sensing revenue figures below are modeled market proxies, not audited company revenue.

Post Quantum Cryptography

- PQC is visible in Egyptian university curricula and research, but a binding national migration mandate comparable to formal U.S. federal PQC deadlines was not identified. Ain Shams explicitly includes post-quantum cryptography in its quantum computing/security courses. Egyptian-affiliated research in 2025-2026 includes post-quantum public-key constructions and hybrid post-quantum IKEv2 on embedded automotive platforms. [4][9][10]
 - Strength: academic cryptography and communications expertise.
 - Near-term opportunity: national cryptographic inventory/CBOM efforts for government, banking, telecom and critical infrastructure.
 - Recommended priority: begin hybrid PQC pilots for TLS, VPN/IKEv2, SSH, PKI and code signing while standards/tooling mature.
 - Policy gap: publish an Egypt-specific PQC transition roadmap with inventory, prioritization, procurement and compliance milestones.

PQC Migration Operating Model

Activity Category	Explanation
Inventory	Discover cryptography in applications, endpoints, servers, network devices, IoT/OT, cloud, APIs, databases, and certificates.
CBOM	Maintain cryptographic bills of materials linked to asset inventory, software ownership, vendor dependencies, and remediation status.
Risk ranking	Prioritize long-lived sensitive data, externally exposed services, brittle embedded systems, and systems with certificate or firmware constraints.
Hybrid architecture	Use hybrid classical/PQC where policy, interoperability, and vendor readiness require staged transition.
Testing	Continuously test performance, handshake size, certificate chains, interoperability, rollback, monitoring, and break-glass procedures.

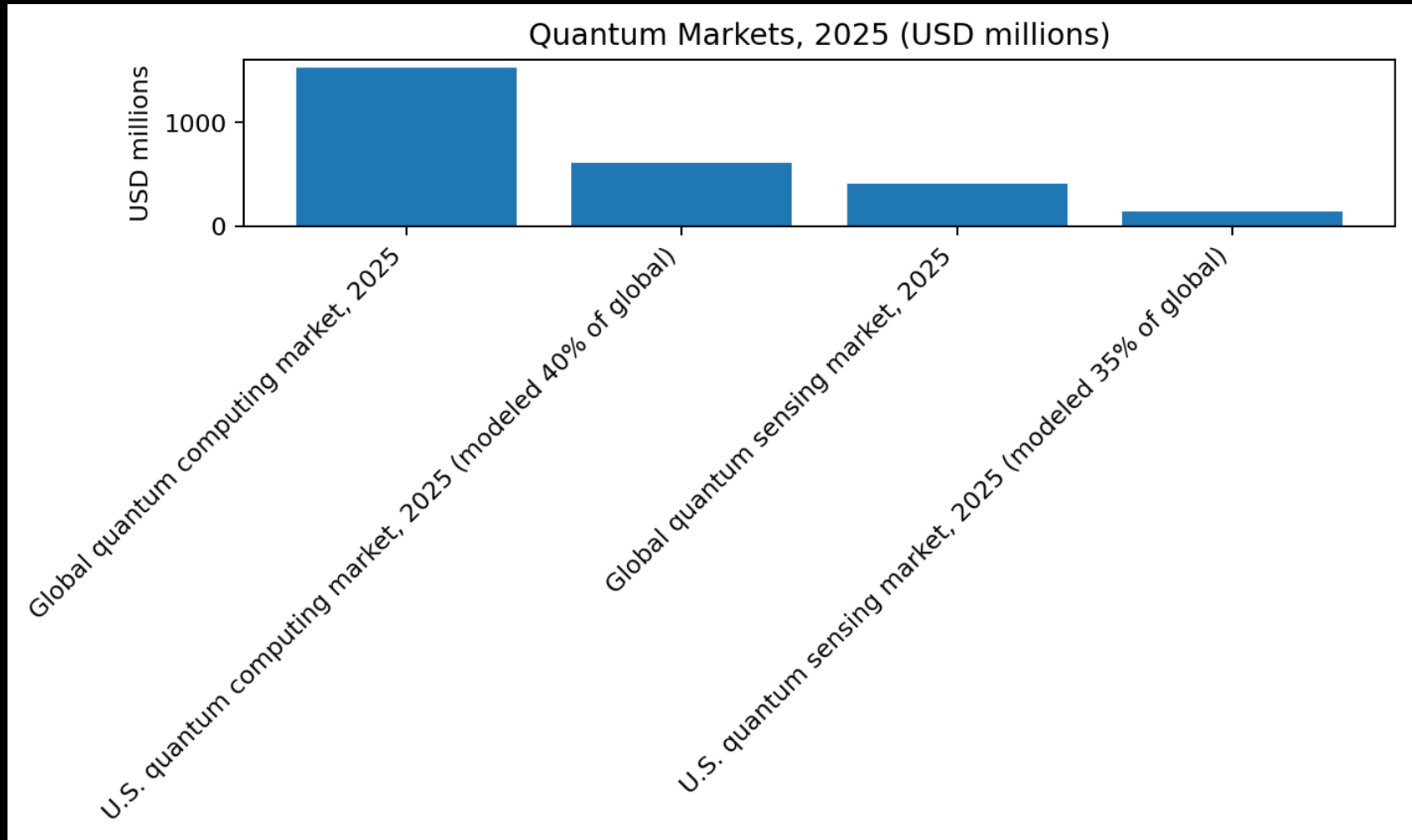
Egypt Quantum Workforce

Role	Estimated people	Share of midpoint
Academic researchers / faculty	120	35%
Graduate <u>students</u> / research assistants	95	28%
Quantum software / algorithms / QML	45	13%
Quantum communications / security / PQC	30	9%
Quantum hardware / photonics	20	6%
Quantum sensing / metrology	12	4%
Policy / program / training	10	3%
Industry <u>product</u> / business / consulting	8	2%

Egypt Quantum Technology Market

Segment	2025	2026	2026 change	Data status
Egypt quantum computing	\$2.7M	\$3.6M	+33%	Modeled central estimate
Egypt quantum sensing	\$1.4M	\$1.9M	+36%	Modeled central estimate
Global quantum computing	\$1.40B	~\$1.82B	~+30%	QED-C baseline + published growth rate [15]
Global quantum sensing	\$470M	~\$620M	~+32%	QED-C baseline + published growth rate [16]

Global Quantum Technology Markets



Egypt Quantum-engaged Organizations and Ecosystem

- The Egypt quantum ecosystem includes pure-play quantum startups, large technology companies, telecom providers, aerospace/defense contractors, semiconductor firms, cybersecurity companies, universities, national labs, federal agencies, state economic-development authorities, standards bodies, and nonprofit consortia

Egypt Quantum-engaged Organizations and Ecosystem

- The ecosystem is university-heavy and government-enabled. Its strongest current connective tissue is education, research collaboration and external vendor/international partnerships. Commercialization, startup formation, indigenous hardware and procurement-scale demand remain comparatively weak.
- Core academic nodes: Cairo University/NILES, Nile University, Ain Shams, Alexandria, Alamein, MIU, Hurghada and Tanta.
- Government enablers: MOHESR, ASRT, ERI and national innovation mechanisms.
- International/industry bridges: SpinQ/Jet In, Orange/Orange Labs, iQafé and MolKet SAS.
- Commercial gaps: few identifiable pure-play Egyptian quantum companies, limited disclosed venture investment and limited disclosed customer revenue.
- Strategic advantage: a large engineering/science education base and strong communications/photonics/cybersecurity adjacency.

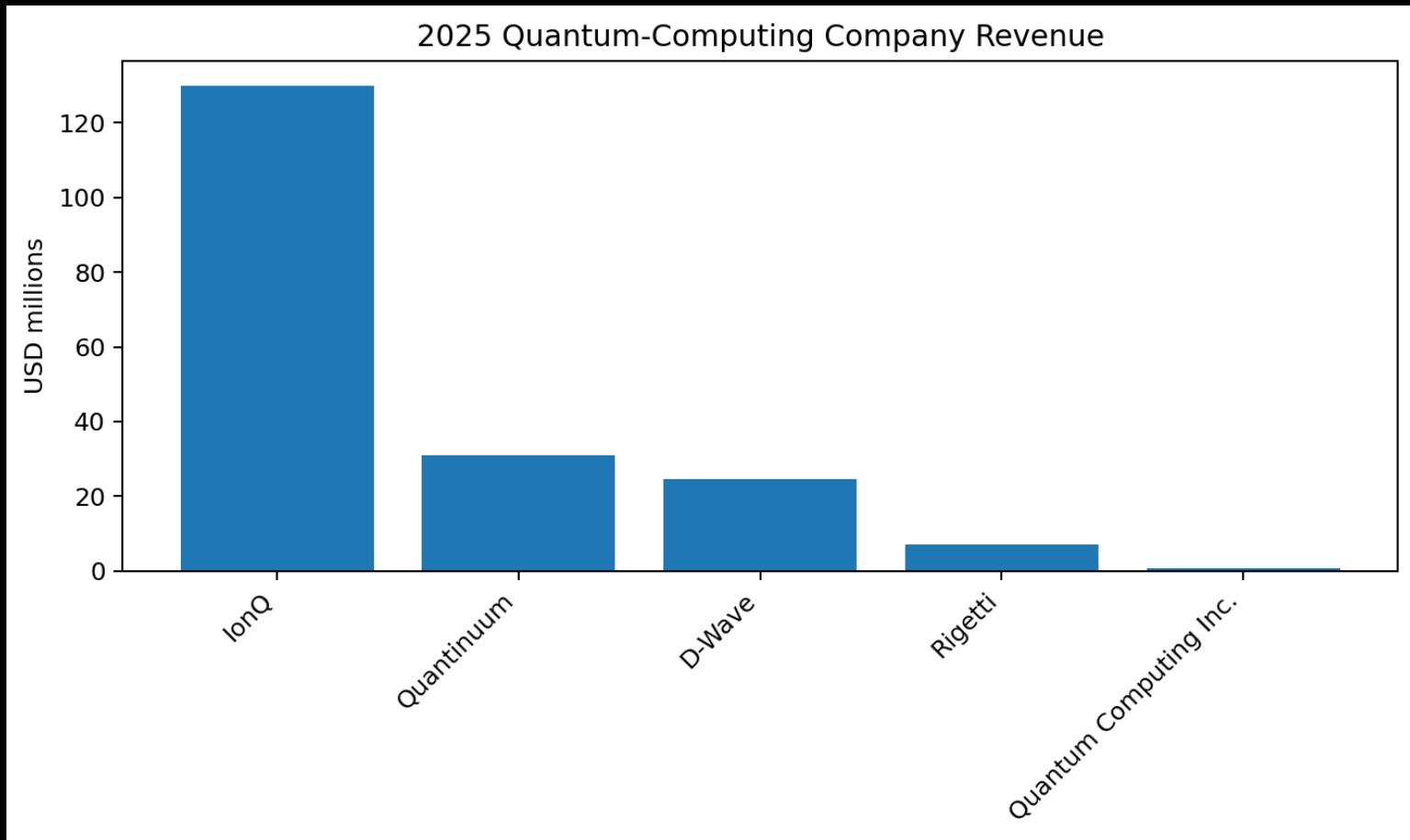
Egypt Quantum-engaged Organizations and Ecosystem

Organization	Type	Quantum engagement
Ministry of Higher Education and Scientific Research	Government	National strategy/capacity-building sponsorship
Academy of Scientific Research and Technology (ASRT)	Government research funding	Research calls, innovation programs
Electronics Research Institute (ERI)	Research institute	25-qubit access, training, applied projects
Cairo University / NILES	University/research	Quantum technologies, optics, QKD
Zewail City of Science and Technology	Research/university	Quantum communication and photonics
Nile University	University	Quantum computing curriculum and research
Ain Shams University	University	Quantum computing, security, PQC
Alexandria University / Alexandria Quantum Computing Group	University/group	Algorithms, QKD
Hurghada University	University	Quantum communication/QML/cybersecurity research
Tanta University	University	Free-space optics and CV-QKD research
Alamein International University	University	Graduate quantum science degrees
Misr International University	University	Quantum foundation certificate
Egypt University of Informatics	University	2026-27 scholarship/study emphasis in quantum computing
Orange Egypt / Orange Labs collaboration	Industry	Research collaboration opportunity
Jet In Technology	Industry	SpinQ agent and ERI partner
SpinQ	International vendor	25-qubit processor access/training ecosystem
iQafé	Quantum community/industry	Cairo University Spring School collaborator
MolKet SAS	Industry/research collaborator	Cairo University Spring School support

Global Quantum Computing Market - 2025

- Third-party market estimates place the global quantum-computing market around \$1.5 billion to \$1.6 billion in 2025, depending on definitions.
- Growth expectations remain high, but practical enterprise adoption is gated by error correction, reliable advantage, skilled users, and integration with classical computing.

2025 Quantum-Computing Company Revenue



2025 Quantum-Computing Company Revenue

 Quantum-Computing Company Revenue Table

Company	2025 Revenue	2026 Projection	Change %	Basis
IonQ	130.0	235.0	80.8	2026 midpoint guidance / outlook
Quantinuum	30.9	41.7	35.0	Modeled +35% growth, equal to 2025 YoY
D-Wave	24.6	35.0	42.3	Modeled from bookings momentum; no official annual guide located
Rigetti	7.1	21.3	200.0	Analyst estimate cited in 2026 reporting
Quantum Computing Inc.	0.682	1.2	76.0	Modeled from low revenue base and Q4 <u>run-rate</u>

Quantum-Computing Company Projected Revenue Change, 2025 to 2026

Company	2025 revenue	2026 estimate/guidance	Change	Basis
IonQ	\$130.0M	\$285M	+119%	2026 guidance midpoint of \$280M-\$290M. [21]
D-Wave	\$24.6M	~\$18M	-27%	<u>Analyst</u> estimate; H1 2026 revenue \$5.9M, bookings stronger. [22][23]
Rigetti	\$7.1M	~\$19M	+168%	Analyst <u>run-rate</u> estimate from Q1/Q2 2026. [24][25]
Quantum Computing Inc.	\$0.682M	~\$20M	+2,833%	<u>Run-rate</u> estimate reflecting 2026 acquisitions; Q1 \$3.7M, Q2 \$5.6M. [26][27]
Pasqal	~\$19.5M*	~\$30M	+54%	2025 company/market disclosures; 2026 analyst estimate. [28]

Global Quantum Sensing Market - 2025

- Published 2025 global quantum-sensing estimates vary from roughly \$170 million to more than \$470 million depending on market definition.
- This report uses a \$414.6 million baseline because it captures a broader commercial sensor definition. The market is expected to grow through defense, navigation, timing, healthcare, industrial inspection, and semiconductor

Egypt and Global 2025 Quantum Sensing Company Revenue Estimates Table

Requested-metric	2025	2026	Interpretation
Egypt-quantum-sensing-market	\$1.4M-modeled	\$1.9M-modeled	Research/procurement/services-proxy
Egypt-2025-quantum-sensing-company-revenue	No-named-pure-play-audited-total-found	N/A	Use-market-proxy-cautiously
Global-quantum-sensing-company-revenue	~\$470M-aggregate-market	~\$620M-derived	QED-C-market-level-company-revenue-proxy
Global-projected-revenue-change-2025-26	—	+~32%	Derived-from-QED-C-forecast-rate

Top 10 Companies in Quantum

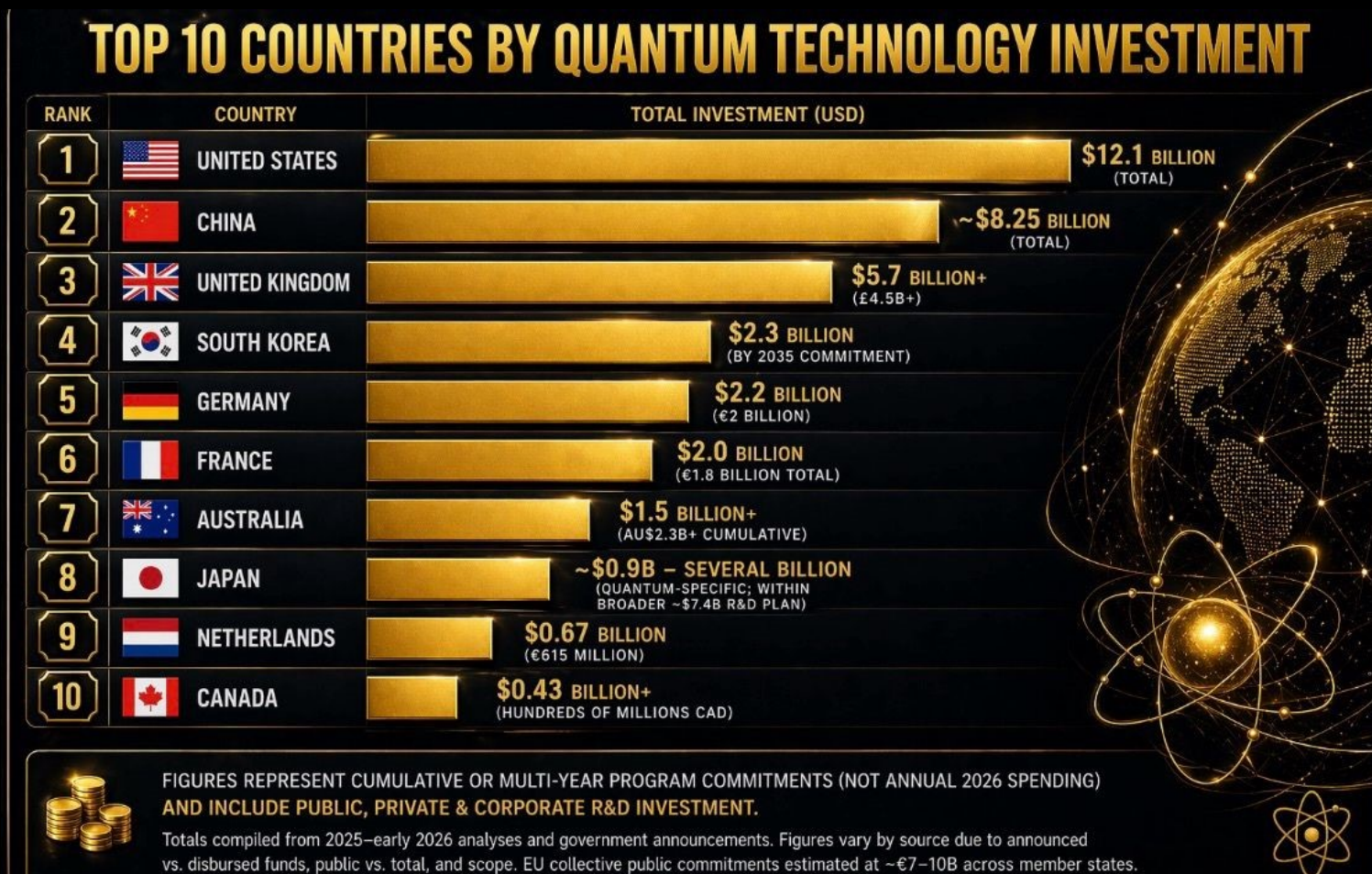
Top 10 Companies in the
Quantum Computing

Leading Providers in Quantum Technologies & Solutions



RANK	COMPANY	CATEGORY/SERVICE
1	IBM (US)	Quantum Computing Solutions
2	Google (US)	Quantum AI Research
3	Microsoft (US)	Quantum Computing & Azure Quantum
4	Amazon Web Services (US) Surfacing Technology	Quantum Cloud Services
5	intel (US)	Quantum Research & Hardware
6	D-Wave Quantum Inc. (CA) D-Wave - The Quantum Computation	Quantum Annealing Solutions
7	Rigetti Computing (US) Rigetti - The Deep Universal Q	Quantum Computing Platforms
8	IonQ (US)	Quantum Computing Hardware
9	Quantinuum (UK) Quantinuum - The Quantum Computing	Quantum Software & Hardware
10	Fujitsu (JP)	Quantum Computing Solutions

Top 10 Countries in Quantum



Egypt Quantum Snapshot 2026

Questions and Answers



Egypt State of Quntum - 2026

About Me

1. E-Mail williamslater @ gmail.com
2. Phone 1-312-342-2626
3. CEO and owner of Slater Technologies, Inc. (since 1989)
4. In Quantum since 2011
5. PQC training and Projects since January 2025
6. Started in Cybersecurity in the U.S. Air Force: 1977.
7. Former U.S. Air Force Computer System Staff Officer who served at Strategic Air Command HQ.
8. Programming Languages: 43
9. 3 Graduate Degrees
 - MS Computer Information Systems
 - MBA
 - MS Cybersecurity
10. 88 Certifications including CISSP, SSCP, CISA, PMP.
11. Certified Project Manager with over 25 years experience.
12. Born and Raised in **Memphis, Tennessee**
13. Lives and works in Chicago, Illinois, USA
14. Published Author: <https://billslater.com/writing>
15. Working with QSECDEF since September 2024.
16. Happily married to Joanna Roguska since December 2000.
17. Actively working on PQC Migration Projects
18. Avid fan of Andreas Vollenweider Music (since 1985), Chess (since 1964), and Judo (since 1968).
19. Voracious Reader with 18,000 physical books and 8000 digital books.
20. Meyers-Briggs: INFP.
21. Non-Denominational Christian (since 1973).



Sunrise, January 1, 2020
Uluru, Australia

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Enter the Quantum Zone

Join Our QSECDEF Group Meeting Every Tuesday
3 PM Paris Time, 2 PM UK, 9 AM New York, 8 AM Chicago, 2 AM Wed. Australia

Event Link on Zoom:

<https://zoom.us/j/91478584384>



FREE Quantum Group Meetings

QSECDEF - Germany & France - Meets Weekly, every Tuesday

Event Link: <https://zoom.us/j/91478584384>

Event Date and Time – Tuesdays

15:00 CEST / 14:00 UK / 09:00 EST / 08:00 CST / 02:00 Wednesday - Australia

Steve Vaile is the Director. steve@qsecdef.com



Washington DC Quantum Meetup - Monthly Meetings

<https://www.eventbrite.com/o/washington-dc-quantum-computing-meetup-33793545445>

Registration required x 2 - Meetup AND EvenBrite.

Do an Internet Search - Washington DC Quantum Meetup. Sometimes they have 3 to 4 meetings per month.

Helen Ma is the Director.



Chicago Quantum Meetup - Monthly Meetings

<https://www.meetup.com/chicago-quantum-computing-meetup-group-revival/>

Registration required - Meetup

Do an Internet Search - Chicago Quantum Meetup. Sometimes they have 1 to 0 meetings per month.

Barry Burd and Ron Schreiner are the Directors.



Philippine Quantum Society

On Facebook, with announced Meetings on Zoom.

<https://www.facebook.com/qcsp.ph>

See the Quantum-Readiness Workshop, Apr 23-24:

<https://quantumreadyph.qcsp.institute>



Alexandria, Egypt - Amsterdam, Netherlands Quantum Group - Monthly Meetings

<https://duckduckgo.com/?q=Alexandria%2C+Egypt+-+Amsterdam++Quantum+Group&atb=v314-1&ia=web>

+Amsterdam++Quantum+Group&atb=v314-1&ia=web

Registration required on LinkedIn

Do an Internet Search - Alexandria Quantum Meetup. Sometimes they have 1 meetings per month, or every other Month.

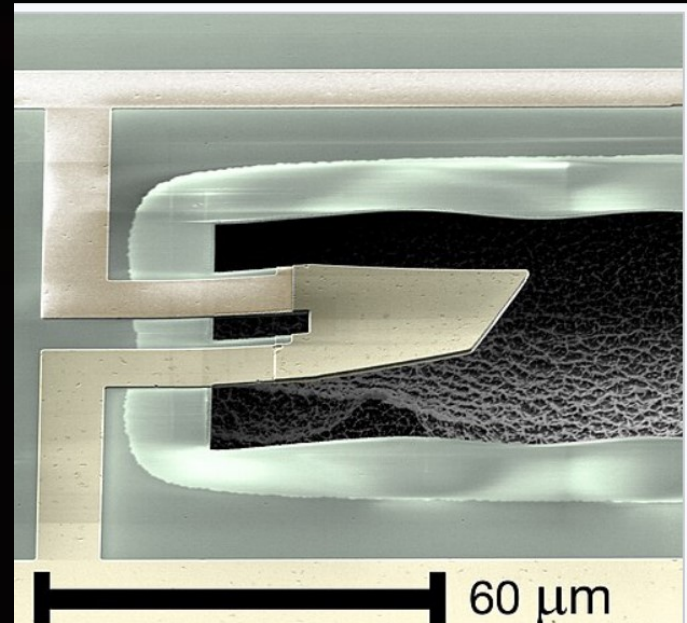
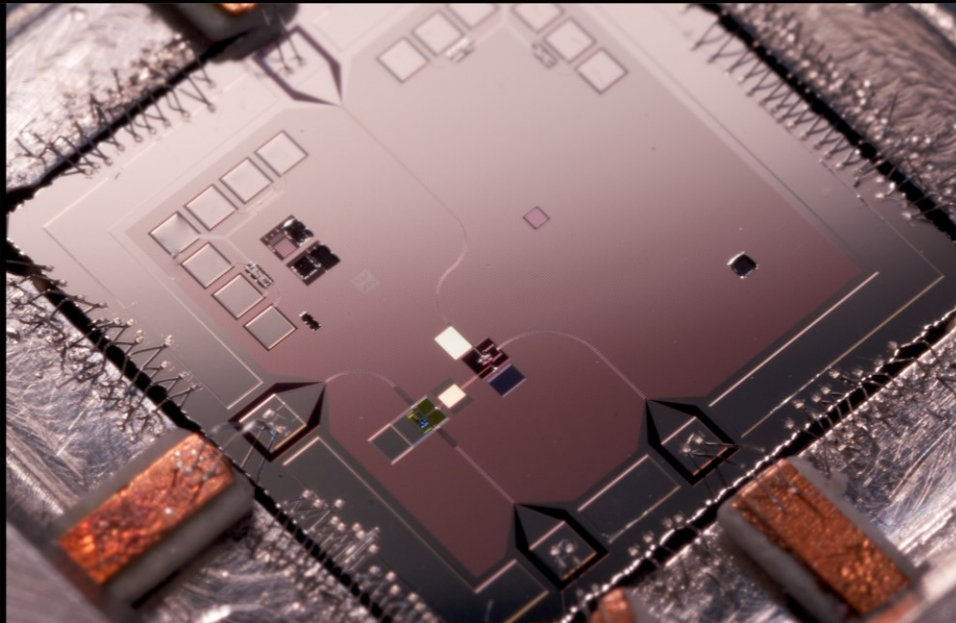
Dr. Taha Selim is the Director.



Egypt State of Quantum - 2026

World's First Quantum Machine, 2010

Wikipedia, 2011 - https://en.wikipedia.org/wiki/Quantum_machine



End of Presentation

THE MAP OF QUANTUM PHYSICS

PRE-QUANTUM MYSTERIES

ATOMIC SPECTRA



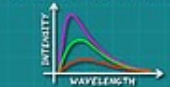
THE STABLE ATOM



RADIOACTIVITY



BLACKBODY RADIATION



PHOTOELECTRIC EFFECT



QUANTUM FOUNDATIONS

THE WAVE FUNCTION



PARTICLE-WAVE DUALITY



THE BORN RULE



INTERFERENCE PATTERN



THE SCHRÖDINGER EQUATION

$$i\hbar \frac{\partial}{\partial t} \Psi = -\frac{\hbar^2}{2m} \nabla^2 \Psi + V(\mathbf{r}) \Psi$$

THE DIRAC EQUATION

$$i\hbar \gamma^\mu \partial_\mu \psi - mc\psi = 0$$

THE HEISENBERG UNCERTAINTY PRINCIPLE



BELL'S THEOREM



ENERGY QUANTIZATION



QUANTUM PHENOMENA

PARTICLE PROPERTIES



QUANTUM NUMBERS



ENTANGLEMENT



QUANTUM TUNNELING



SUPERCONDUCTIVITY



QUANTUM SPIN



SUPERPOSITION



SCHRÖDINGER'S CAT



DECOHERENCE



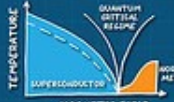
QUANTUM HALL EFFECT



SUPERFLUIDITY



PHASE TRANSITIONS



ZERO-POINT ENERGY



QUANTUM TELEPORTATION

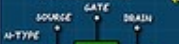


SOLID STATE DEVICES

BAND THEORY OF SOLIDS



TRANSISTORS



SOLAR PANELS



QUANTUM TECHNOLOGY

LIGHT EMITTING DIODES



CHARGE-COUPLED DEVICES



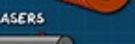
CCD SENSOR



SUPERCONDUCTING MAGNETS



LASERS



ATOMIC CLOCKS



SQUIDS



JOSEPHSON FUNCTION



ELECTRON MICROSCOPES



SCANNING TUNNELING MICROSCOPES



ATOMIC FORCE MICROSCOPES



CONDENSED MATTER PHYSICS

QUANTUM BIOLOGY

PHOTOSYNTHESIS



SENSE OF SMELL



BIRD NAVIGATION

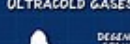


ENZYMES



COLD ATOM PHYSICS

DEGENERATE ULTRACOLD GASES



BOSE-EINSTEIN CONDENSATE



RYDBERG MATTER



QUANTUM THEORY

POSTULATES (PARAPHRASED)

1. WAVE FUNCTION DETERMINES EVERYTHING
2. ALL OBSERVABLES HAVE OPERATORS
3. OBSERVABLES ARE HERMITIAN
4. EIGENFUNCTIONS OF OPERATORS ARE INDEPENDENT
5. EXPECTATION VALUE INTEGRAL
6. TIME DEPENDENT SCHRÖDINGER EQUATION

PATH INTEGRALS



SYMMETRIES



QUANTUM FIELD THEORY

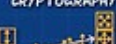


HILBERT SPACE



QUANTUM INFORMATION

QUANTUM CRYPTOGRAPHY



QUANTUM COMMUNICATION



QUANTUM INTERNET



QUBITS



QUANTUM COMPUTING



QUANTUM SIMULATION



QUANTUM COMPLEXITY



INTERPRETATIONS OF QUANTUM MECHANICS

COPENHAGEN



THE MEASUREMENT PROBLEM



PILOT WAVE



MANY WORLDS THEORY



CONSISTENT HISTORIES



QBISM



AND MANY OTHERS...

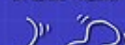


QUANTUM GRAVITY

M-THEORY



STRING THEORY



LOOP QUANTUM GRAVITY

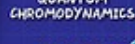


QUANTUM GRAVITY



PARTICLE PHYSICS

QUANTUM CHROMODYNAMICS



STRONG FORCE



ELECTROWEAK INTERACTIONS

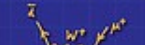


QUANTUM ELECTRODYNAMICS



THE STANDARD MODEL OF PARTICLE PHYSICS

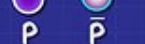
FEYNMAN DIAGRAMS



ANTI-MATTER



PARTICLE ACCELERATORS



NUCLEAR PHYSICS

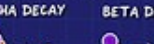
NUCLEAR FISSION



NUCLEAR FUSION



RADIOACTIVE DECAY



GAMMA DECAY



QUANTUM CHEMISTRY

ELECTRONIC STRUCTURE



MOLECULAR DYNAMICS



QUANTUM MONTE CARLO METHODS



BONUS Number 1

- Free Particle Physics Course at CERN

The 16-part course, currently in its pilot phase, is catered to high school students but available to anyone interested in learning about the fundamental questions.

Source: Symmetry Magazine

New CERN course teaches particle physics basics online

<https://search.app/xuVyur9PBCqzULmH7>

<https://ppc.web.cern.ch/chapters-0>

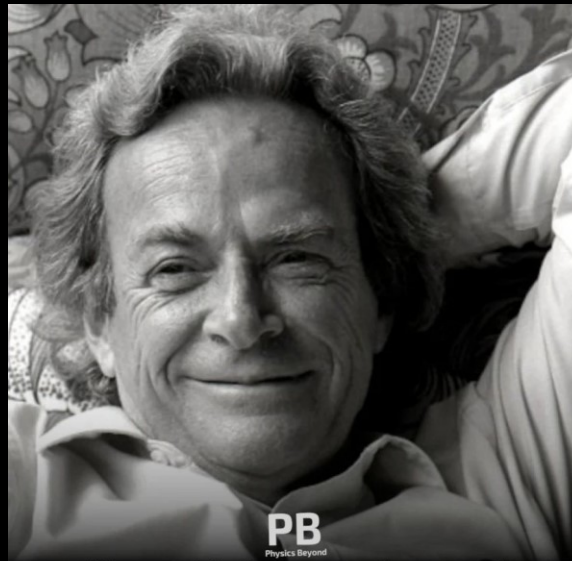
<https://youtu.be/OjrycTZxG4M>

Tip: Be sure to enroll at CERN so you can get your completion certificate.

BONUS Number 2

- Massive Amount of FREE Quantum Resources

<https://tinyurl.com/y85mfc9c>



**If you think you understand
quantum mechanics, you don't
understand quantum mechanics.**

"Richard Feynman"

*I have learned
that people will
forget what you
said, people will
forget what you
did, but people
will never forget
how you made
them feel.*

Maya Angelou
1928-2014



Photo by Michael Collopy



"One of life's most painful moments comes when we must admit that we didn't do our homework, that we are not prepared."

Merlin Olsen

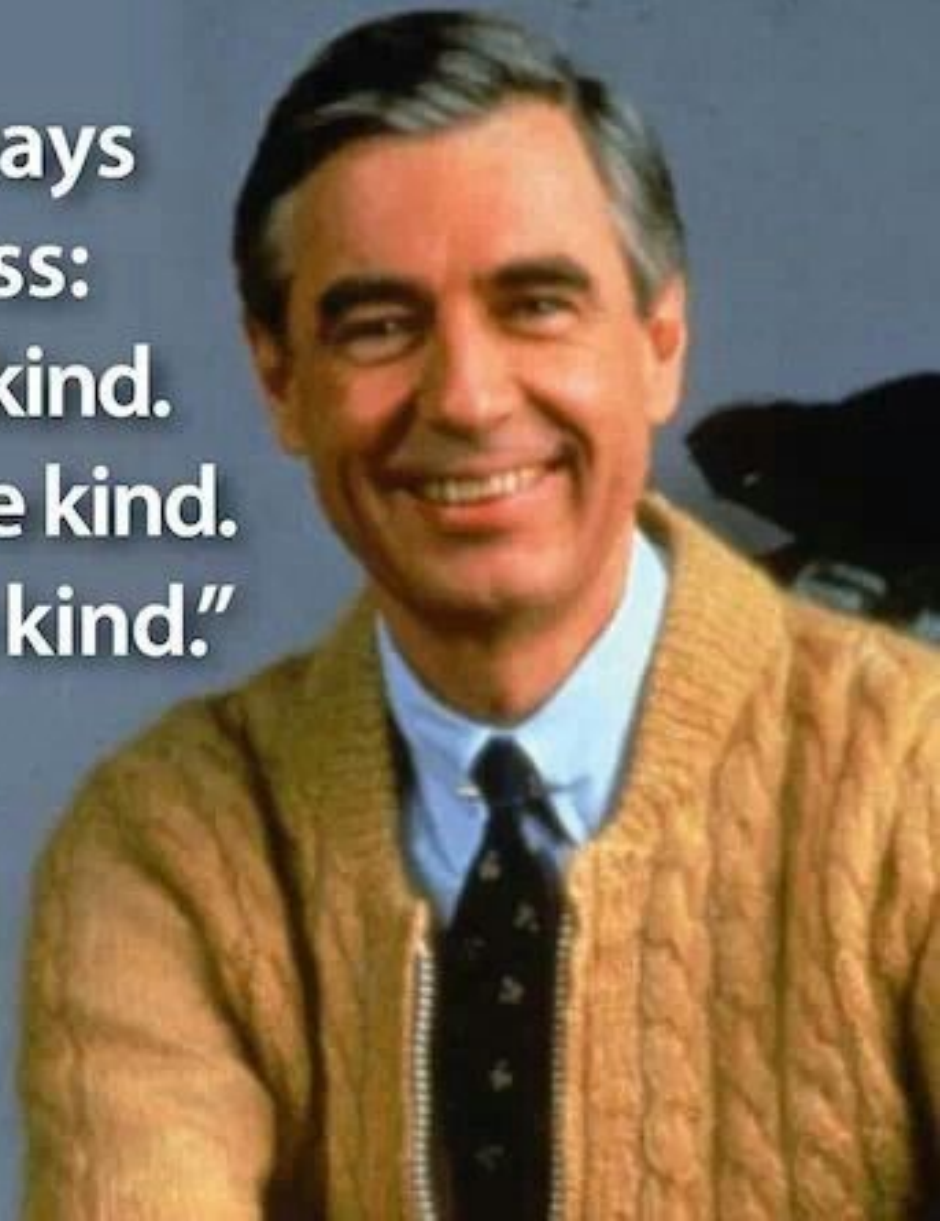


"The true purpose of education is to teach a man to carry himself triumphant to the sunset."

Liberty Hyde Bailey

**"There are three ways
to ultimate success:
The first way is to be kind.
The second way is to be kind.
The third way is to be kind."**

Mr. Rogers









William Slater
Slater Technologies, Inc
August 7, 2026

Seeking Opportunities?

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 - Signal Only, No WhatsApp

