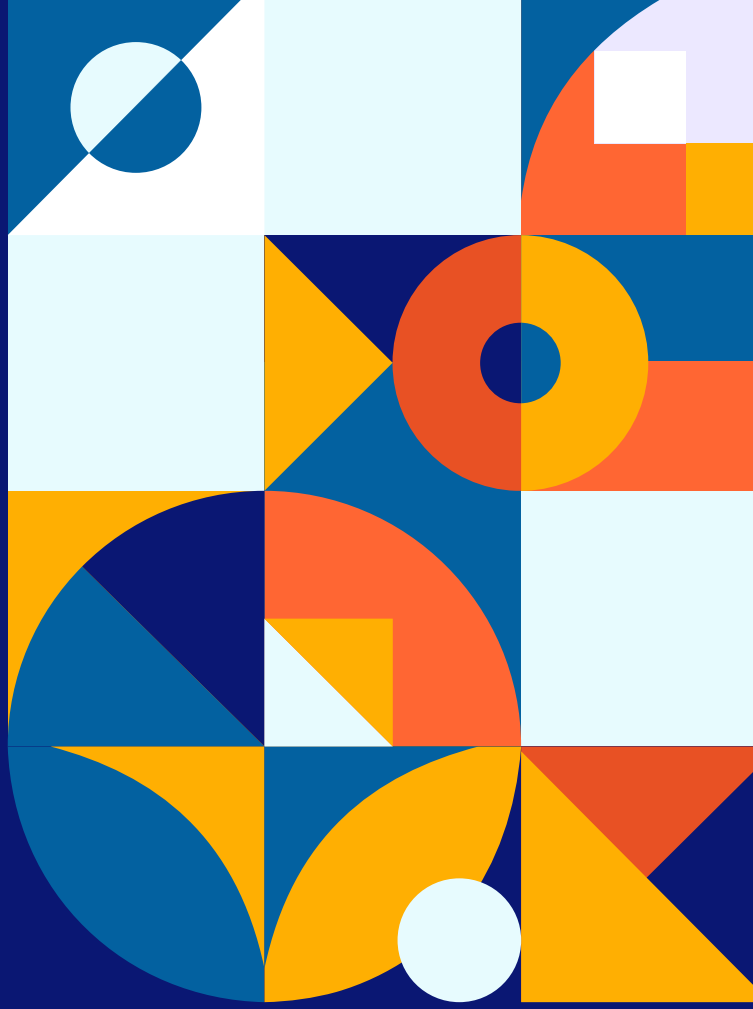
AI & Quantum Sovereignty Lab



ACCELERATING INNOVATION DIPLOMACY:

ISRAEL, THE UAE, AND THE QUEST FOR QUANTUM SOVEREIGNTY

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Caveat: This document is being circulated for the purpose of eliciting comments, suggestions and corrections. Figures, footnote, and bibliography have yet to be fully validated

ABSTRACT

This white paper proposes a strategic model of innovation diplomacy between Israel and the United Arab Emirates centered on frontier technologies such as quantum computing and artificial intelligence. Drawing on Fiona Murray and Phil Budden's Innovation Acceleration Framework, we extend their ecosystem-based theory of innovation beyond domestic economic policy into the realm of international cooperation. We argue that frontier technologies represent what Murray and Budden describe as an "N^2 challenge," requiring breakthroughs across multiple domains including science, infrastructure, capital, talent, and regulation. These challenges exceed the capacity of most small states acting alone. By combining complementary strengths, Israel and the UAE can form a binational innovation ecosystem capable of advancing leadership in emerging computing paradigms while strengthening regional technological sovereignty.

This partnership will draw on the structural advantages that each country contributes to the collaboration. Israel provides deep scientific talent, entrepreneurial agility, and globally connected startup networks, while the UAE offers large-scale research infrastructure, sovereign investment capacity, and strong institutional coordination. We propose a coordinated initiative including joint research governance, shared AI and quantum testbeds, innovation funding mechanisms, talent mobility programs, and harmonized regulatory frameworks to accelerate collaborative technological development. Beyond economic benefits, the partnership can cultivate a regional "prestige economy," in which scientific achievement generates symbolic power and reinforces geopolitical alignment under the Abraham Accords. The Israel–UAE model demonstrates how mid-sized states can pool resources to exercise agency in frontier technologies and transform innovation ecosystems into instruments of regional cooperation, economic resilience, and long-term peace.

EXECUTIVE SUMMARY

This white paper advances a strategic proposal: Israel and the United Arab Emirates (UAE), two small but technologically ambitious states, can jointly build a regional innovation ecosystem capable of advancing quantum computing and artificial intelligence (AI) while strengthening geopolitical alignment, economic resilience, and long-term peace. Drawing on Fiona Murray and Phil Budden's Innovation Acceleration Framework, we extend their ecosystem-based theory of innovation beyond corporate or national economic policy and into the realm of international diplomacy. We argue that innovation ecosystems, when intentionally cultivated across borders, can become instruments of regional sovereignty and soft power.

At the center of our proposal lays a simple but powerful premise: frontier technologies such as quantum computing represent what Murray and Budden describe as an "N^2 challenge," a novel problem requiring a novel solution. These technologies demand breakthroughs across physics, engineering, software, capital markets, regulation, and talent development. No single small country can supply all of these inputs at scale. However, two countries with complementary strengths can combine to form a multinational ecosystem capable of addressing such challenges more effectively than either could alone. Israel and the UAE represent precisely such a complementary pairing.

The N^2 Challenge and the Limits of National Scale

Quantum computing systems sit at the frontier of global technological competition. The United States and China have invested billions of dollars in research, talent, and infrastructure. Europe and Japan are coordinating multinational programs to remain competitive. In this context, small and mid-sized states face a stark choice: either remain peripheral consumers of foreign technology or find creative ways to combine resources and shape niche domains of leadership.

Quantum computing demands deep scientific expertise in quantum physics, materials science, stable regulatory and cybersecurity frameworks. The capital costs of hardware and chip fabrication alone can reach billions. Countries such as Israel and the UAE possess strong scientific and engineering capabilities that enable them to address hardware challenges themselves. However, in the absence of massive financial resources and large-scale industrial manufacturing infrastructure, close

collaboration between them allows both nations to leverage complementary advantages and overcome cost and scale barriers. This collaboration creates leadership potential in scientific development and the opportunity to strengthen regional technological sovereignty.

This paper argues that technological sovereignty does not require every nation to develop and maintain full control over all layers of the technology stack. Countries with advanced scientific and engineering ecosystems—such as Israel and the United Arab Emirates—are fully capable of meeting hardware challenges when supported by adequate capital, partnerships, and enabling policies. At the same time, they can harness their scientific and innovative strengths to shape sovereignty at the application layer: the advanced integration of quantum computing and artificial intelligence into real-world systems. Sovereignty at this layer involves control over standards, deployment architectures, secure cloud access, hybrid classical–quantum workflows, and domain-specific applications in areas such as energy, finance, water, cybersecurity, and logistics. This is a dynamic form of sovereignty grounded in agile innovation, strategic investment, and collaboration between small but coordinated states that view knowledge and technology as engines of regional self-reliance and shared growth.

Israel's Strength: Depth, Talent, and Entrepreneurial Agility

Israel has long cultivated a dense, highly networked innovation ecosystem. Often referred to as the "Startup Nation," Israel combines elite research universities, high R&D intensity, and a vibrant venture capital environment. Its quantum and AI sectors benefit from decades of experience in semiconductor physics, cryptography, cybersecurity, and defense-adjacent technologies.

The Israeli innovation model excels at early-stage experimentation, rapid prototyping, and startup formation. Israeli firms in quantum control systems, algorithm development, and photonics have attracted significant venture funding. Israeli universities produce high-impact research and maintain strong international collaborations. Importantly, Israel has deep experience in commercialization, regularly translating research breakthroughs into venture-backed companies integrated into global markets.

Yet Israel faces structural constraints. Its domestic market is small. Large-scale infrastructure investments compete with national security priorities. Many startups, in order to scale, eventually relocate or sell to larger multinational corporations. These dynamics create a ceiling effect: Israel generates high-quality innovation but lacks the broad shoulders required to grow them into globally dominant industries without external scale.

The UAE's Strength: Scale, Infrastructure, and Strategic Coordination

The United Arab Emirates has adopted a top-down, mission-driven strategy for technological transformation. Seeking to diversify beyond hydrocarbons, the UAE has invested heavily in advanced science and technology platforms, including artificial intelligence, high-performance computing, and quantum research. Institutions such as the Advanced Technology Research Council (ATRC) and the Technology Innovation Institute (TII) demonstrate a commitment to sustained R&D infrastructure and international collaboration.

The UAE's strengths lie in sovereign investment capacity and long-horizon capital, enabling large-scale infrastructure projects such as AI supercomputing clusters. It demonstrates strong executive coordination, allowing rapid alignment between research institutions, regulators, and industry. It also serves as a regional convening hub, attracting global researchers and multinational firms. Finally, it is strategically aligned with U.S.-led technology ecosystems, positioning it within trusted networks of advanced computing collaboration.

Unlike larger powers engaged in direct hardware arms races, the UAE has prioritized mission-driven platforms, particularly in high-performance computing, that align with Israel's strengths in algorithmic design and startup agility. Its emerging talent base and research institutions are expanding rapidly, embedded within a stable political environment conducive to long-term planning.

The Stargate Quantum Initiative

To operationalize this vision, we propose a coordinated binational initiative resting on several pillars:

1. A Joint Innovation Council with representation from academia, industry, and government.
2. A Hybrid AI–Quantum Testbed Network accessible via cloud infrastructure.
3. A Binational Innovation Fund blending government allocations, sovereign wealth, and private capital.
4. Talent mobility programs including fellowships and innovation visas.
5. Regulatory harmonization and shared IP frameworks.
6. Prize mechanisms to steer mission-driven innovation.

The Prestige Economy and Soft Power

Beyond economic gains, this partnership aims to nurture a “prestige economy.” States increasingly compete for status, recognition, and scientific legitimacy. Breakthrough publications and visible technological achievements generate intangible benefits that reinforce national pride and international influence.

For the Gulf states, prestige in science represents symbolic and strategic capital. For Israel, deeper regional integration strengthens geopolitical positioning. Joint scientific achievements can serve as powerful symbols of cooperation under the Abraham Accords.

Innovation diplomacy thus becomes a positive-sum alternative to zero-sum conflict.

Lessons and Broader Implications

Regional Sovereignty Through Collaboration

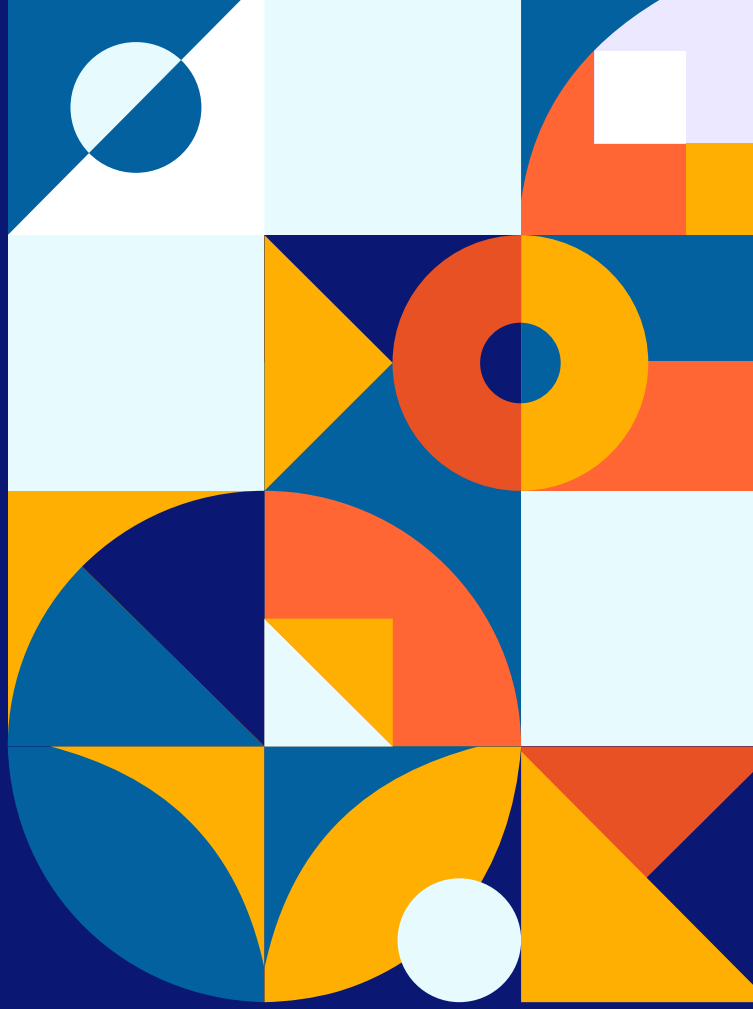
We define regional technological sovereignty as a layered form of autonomy in which allied states pool resources to reduce dependence on external powers while retaining national control. Israel and the UAE, by aligning with trusted technology networks, can strengthen both regional autonomy and global interoperability.

Rather than seeking isolation, this model embraces collaborative self-reliance and positions the partnership as a node within a broader alliance system.

Small states need not compete directly with great powers to exercise agency in frontier technologies. Ecosystem engagement across sectors and borders can multiply capabilities. Innovation diplomacy can reinforce peace when tied to shared economic and prestige incentives. Governance models must be agile, transparent, and insulated from political volatility.

The Israel–UAE partnership is more than a bilateral technology project. It is a prototype for how mid-sized states can collectively shape the future of advanced computing. By focusing on application-layer leadership and mission-driven collaboration, the two countries can build a durable innovation ecosystem that advances prosperity, strengthens sovereignty, and redefines regional cooperation.

In a region historically marked by conflict, this initiative offers an alternative narrative: a shared leap into frontier science as the foundation for enduring peace.



BACKGROUND AND CONTEXT

Accelerating Innovation through Ecosystem Engagement

In their recent book, *Accelerating Innovation: Competitive Advantage through Ecosystem Management,* Phil Budden and Fiona Murray of MIT present a framework for organizations and governments to drive technological advancement by engaging with innovation ecosystems. The authors emphasize that innovation relies on more than isolated R&D efforts; it also requires managing a network of stakeholders, such as entrepreneurs, universities, investors, and government agencies, in a particular locale or sector. The book guides leaders in navigating this external landscape and developing an ecosystem engagement playbook: asking what an organization needs, who the right stakeholders are, and how to structure the engagement. Notably, Budden and Murray's work focuses on economic and organizational contexts (often corporate or national innovation policy) and only briefly engages with geopolitical factors such as international alliances or regional power dynamics. We extend their framework into this new domain, aiming to show its efficacy in a geopolitical context, specifically by applying it to an international partnership for quantum innovation

Figure 1: The MIT five stakeholders model.
Source: Budden and Murray, Accelerating Innovation

The N² Challenge of Quantum Innovation

We focus on quantum computing as a use case because it exemplifies what Budden and Murray call an "N²" (novel problem × novel solution) innovation challenge. N² indicates a challenge that has a *Novel* problem and a *Novel* solution (see figure 2).[1] Quantum computing is a radically new technology requiring breakthroughs in system integration, algorithm design, and hybrid quantum-classical workflows capable of addressing previously intractable problems. It presents problems so novel that researchers must develop entirely new kinds of hardware and software solutions to address them. The complexity of both the problem and the solution demands an entire ecosystem rather than isolated actors. Budden and Murray define innovation as matching a problem to a solution, and the more novel each is, the more challenging the endeavor.[1]

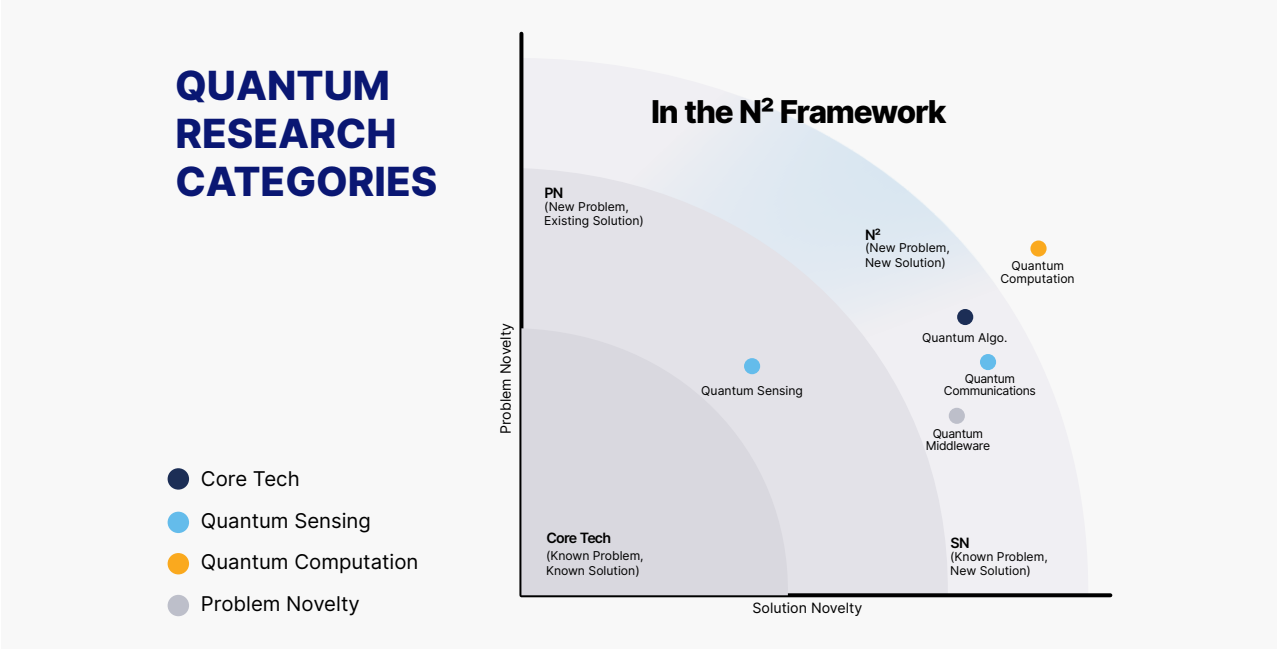


Figure 2: Quantum innovation in the N² framework

Quantum technology fits this description perfectly. Four dimensions are required for success: scientific talent, government support, financial capital, and enabling infrastructure.[3] No single sector or country can supply all four at the scale required. Significant breakthroughs in quantum computing require a mature innovation ecosystem spanning academia, industry, and government.

[1]Phil Budden and Fiona E. S. Murray, *Accelerating Innovation: Competitive Advantage through Ecosystem Engagement, Management on the Cutting Edge* (The MIT Press, 2025), 16-19.

N² challenges contrast with PN (problem-novel, applying an existing solution to a new problem) and SN (solution-novel, applying a new solution to an existing problem) challenges. N² challenges typically indicate emerging technologies where researchers are developing novel solutions to novel problems.

[2]Budden and Murray, *Accelerating Innovation,* 3.

[3]Budden and Murray's framework relies on three dimensions. We have added government support; we argue that nascent industries with large capital needs will require government support in order to thrive.

Various national quantum computing programs acknowledge this reality. These national-level programs typically involve consortia of universities, companies, and government labs working in concert. A national ecosystem in a smaller country may not be broad enough. Instead, a multinational ecosystem might be the key to accelerating innovation. We aim to demonstrate that Israel and the UAE can connect their ecosystems to jointly meet the N^2 challenge of quantum technology, achieving together what neither could alone.

Our Approach

In this white paper, we explore how Israel and the UAE can apply Budden and Murray's ecosystem engagement principles within a geopolitical alliance. We place special emphasis on *regional technological sovereignty:* by pooling innovation resources, countries can achieve a level of autonomy and control over critical technologies that would elude them individually. In the context of AI and quantum computing, there is growing recognition that nations must "own the production of their own intelligence" (to borrow NVIDIA CEO Jensen Huang's phrase) to safeguard their futures[5]. We interpret this as a call for countries to develop local capabilities in key technologies, rather than relying wholly on foreign tech that might be cut off or controlled by others[6]. However, small states like Israel or the UAE will struggle to achieve indigenous capability at a world-class level without collaboration. Thus, regional sovereignty does not imply isolation, but rather a partnership that enables collective self-reliance.

We propose a bilateral Israel–UAE initiative to accelerate innovation in quantum computing via a joint ecosystem. This model will strengthen regional sovereignty in technology, foster a prestige economy in the Middle East, and advance soft-power diplomacy as a durable alternative to cycles of hard-power conflict. We also suggest a novel governance and funding approach that moves beyond small-scale grantmaking to embrace bold, mission-driven investments, consistent with the capital demands of quantum development. In addition to delineating the research and policy rationale, we include an implementation roadmap and a "lessons learned" discussion, looking ahead to the broader implications

[4]For recent developments in technological sovereignty, see:

Committee on Industry, Research and Energy. *Report on European Technological Sovereignty and Digital Infrastructure | A10-0107/2025 | European Parliament. 2025.* https://www.europarl.europa.eu/doceo/document/A-10-2025-0107_EN.html.

ECDPM. "Tech Sovereignty and a New EU Foreign Economic Policy." ECDPM, December 11, 2024. https://ecdpm.org/work/tech-sovereignty-and-new-eu-foreign-economic-policy.

[5]For an example of national-level technological sovereignty, see:

Council for Technological Sovereignty, *Focus on Technological Sovereignty* (2025), https://www.bmftr.bund.de/SharedDocs/Downloads/EN/2025/discussion-paper-focus-on-technological-sovereignty.pdf?__blob=publicationFile&v=2.

[6]See UN Secretary-General António Guterres's call for "international collaboration" in:

World Economic Forum. "Global Leaders Call for Action on AI and Regional Reforms at World Economic Forum Annual Meeting 2025." Accessed September 17, 2025. https://www.weforum.org/press/2025/01/global-leaders-call-for-action-on-ai-and-regional-reforms-at-world-economic-forum-annual-meeting-2025/. for innovation diplomacy.

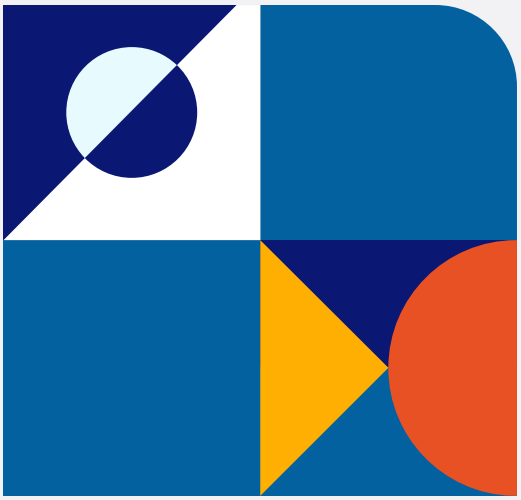
PART I

POLICY RESEARCH AND ANALYSIS

The Global Quantum Race:
Geopolitics and Technology

Global competition in advanced technology has increasingly become entwined with geopolitics. As of 2025, contests in artificial intelligence and quantum computing are shaping international politics, making these domains a key to future economic and military power. Although the Middle East continues to confront persistent security challenges, a complementary path emerges: *soft power*. On the global stage, the United States and China are vying for dominance in AI and quantum computing, a competition often likened to a new Space Race. In late 2024, President Donald Trump announced an AI Action Plan that explicitly aims to export the American technological stack to allies, countering China's Digital Belt and Road Initiative influence.[7] The subtext is clear: Washington wants friendly nations adopting its AI and quantum platforms rather than Chinese ones, making technology collaboration a matter of strategic alignment.

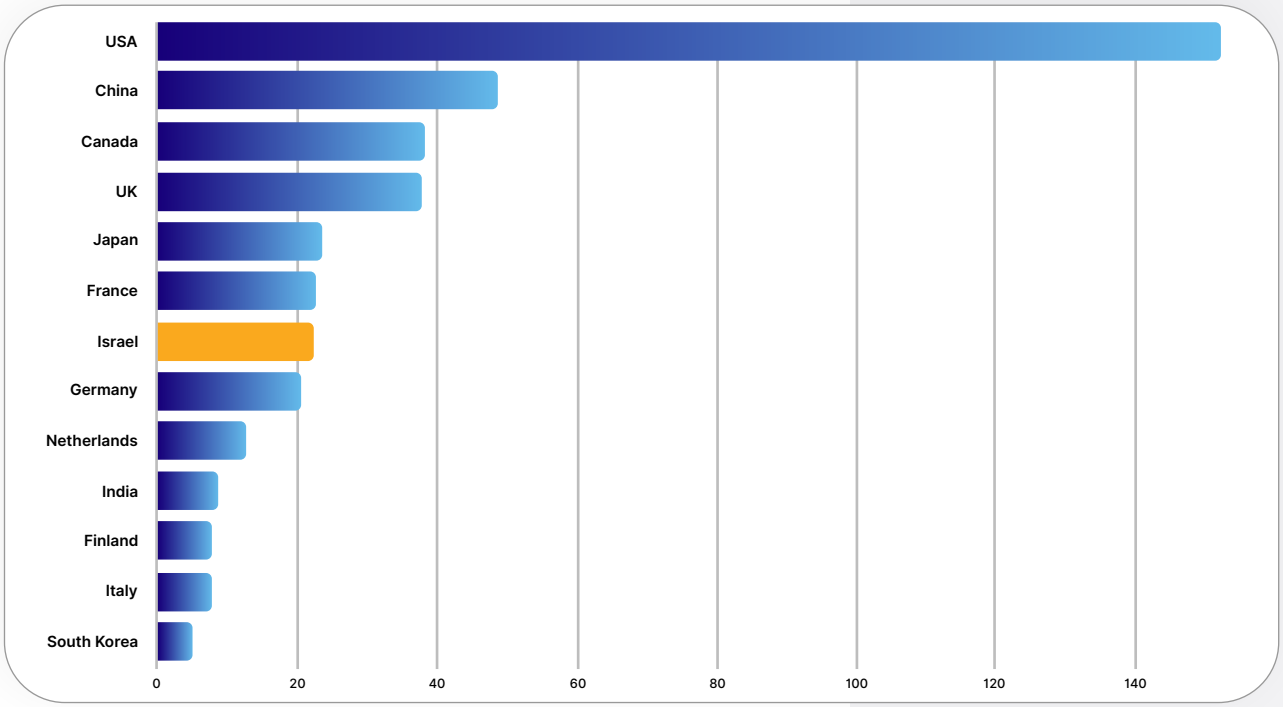
The Global Quantum Landscape



On a global scale, the quantum landscape remains highly uneven. A handful of great powers dominate, while smaller countries strive to find niches or align with larger efforts. China and the United States clearly lead the global quantum race. China has poured enormous public resources into quantum R&D, with over $15 billion in government investments committed[8]. The U.S. combines substantial federal funding (nearly $4 billion in recent years) with an unrivaled private-sector ecosystem: 150+ quantum-related companies backed by venture capital and tech giants (see figure 4)[9]. These two nations are far ahead of other players, which include a mix of midsize powers like Germany, Japan, and the U.K., and regional blocs in Europe trying to coordinate their fragmented programs.

[7]"America's AI Action Plan," July 2025, https://www.whitehouse.gov/wp-content/uploads/2025/07/Americas-AI-Action-Plan.pdf.
[8]Hodan Omaar Makaryan Martin, *How Innovative Is China in Quantum?* (2024), https://itif.org/publications/[...slug]/.
[9]"Quantum Technology Monitor 2025 | McKinsey," June 2025, https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/the-year-of-quantum-from-concept-to-reality-in-2025, 10.

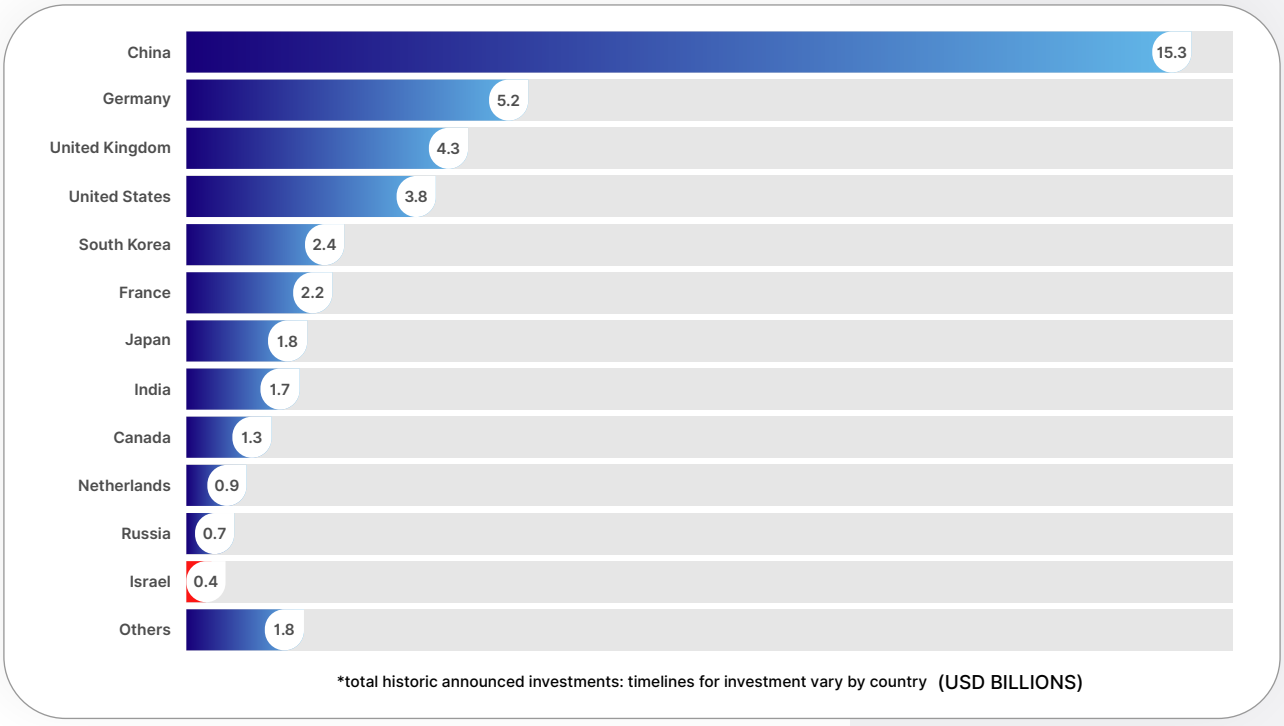
NUMBER OF QUANTUM COMPANIES PER COUNTRY (2024)



*Quantum Technology Monitor 2024 | McKinsey." https://bit.ly/4mgTSkK

Figure 3: Quantum companies per country

GOVERNMENT QUANTUM INVESTMENTS



"Quantum Technology Monitor 2025 | McKinsey." https://bit.ly/45QMloc

Figure 4: Public investments in quantum technology

The Quantum Divide

The global quantum divide is stark. The top two players (the U.S. and China) enjoy orders-of-magnitude more funding and far larger talent pools than any small country can muster (see figure 3).[10] Middle-tier countries in Europe and Asia are collectively trying to stay relevant through consortia and niche specialization[11]. For countries like Israel or other countries in the Gulf, the implication is clear: they will not catch up through isolated efforts. If they aspire to be significant players in quantum technology, they must strategically leverage alliances and focus their investments. The quantum divide is a textbook case for applying the innovation ecosystem mindset—thinking beyond national borders and sector silos to assemble the critical mass needed for breakthrough innovation.

Regional Dynamics and Emerging Hubs in the Middle East

Within the Middle East, a regional race in science and technology is quietly taking shape, driven by economic transitions and national ambitions. The wealthy Gulf states—led by the UAE, Saudi Arabia, and Qatar—have embarked on aggressive programs to transform their economies from a fossil-fuel base to a knowledge economy built on science, research, and high-tech industry. These efforts are often explicitly framed as attempts to recapture the region's scientific dominance during the Islamic Golden Age. [12] The statistical reality is indeed sobering: of all the Nobel Prizes for the sciences handed out since 1901, only two have gone to recipients from the Gulf region. With the pressing need to diversify economies away from oil, Gulf governments are determined to improve their record, investing heavily in R&D and infrastructure. For example, the UAE launched a national policy for Advanced Science and opened new research-focused universities; Saudi Arabia has revamped King Abdullah University of Science and Technology (KAUST) to align with its Vision 2030 economic plan. Qatar has its national research strategies and is boosting funding for science through the Qatar Foundation. These initiatives share a common aim: to position the Gulf as a credible contributor to global science and thereby earn a seat at the table of advanced nations.

[10]Brian Moscioni, *Another Technology Race: US-China Quantum Computing Landscape | The Belfer Center for Science and International Affairs*, May 13, 2025, https://www.belfercenter.org/research-analysis/another-technology-race-us-china-quantum-computing-landscape.
[11]Matt Swayne, "What's Europe's Quantum Strategy? Breaking Down Europe's Coordinated Plan For Global Quantum Leadership," *The Quantum Insider*, July 3, 2025, https://thequantuminsider.com/2025/07/03/whats-europes-quantum-strategy-breaking-down-europes-coordinated-plan-for-global-quantum-leadership/.
[12]"How the Gulf's Rulers Want to Harness the Power of Science," *The Economist*, January 7 2025, accessed September 1, 2025, https://www.economist.com/science-and-technology/2025/01/07/how-the-gulfs-rulers-want-to-harness-the-power-of-science.

Underneath the economic rationale lies an intangible motive: the pursuit of prestige. In what we term a burgeoning *prestige economy*, value is placed on the recognition and status that come from scientific and cultural achievements, not just on direct monetary rewards.[13] The Gulf's rulers are investing in James English argues that prizes and honors form their own kind of economy of influence in the arts. We took inspiration and applied his framework to international cooperation in scientific research. The Gulf's rulers are investing in mega-projects (such as museums, art biennales, space missions, and scientific research centers)

SNAPSHOT OF QUANTUM ECOSYSTEM

Israel and the Gulf States

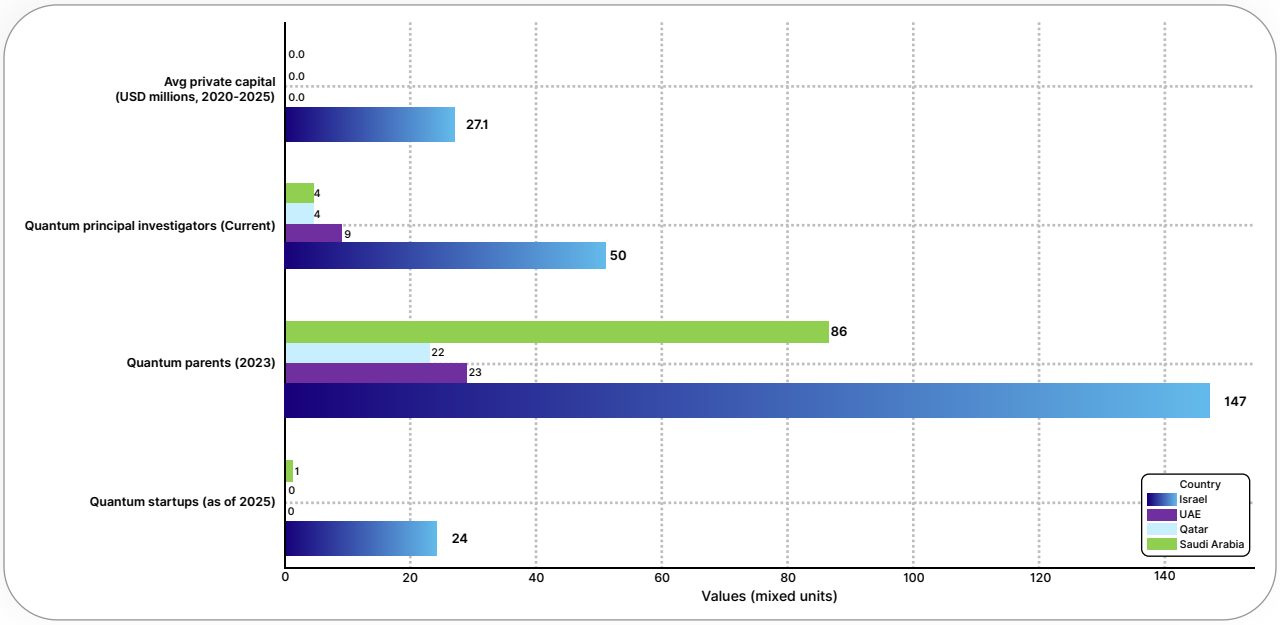


Figure 5: Quantum innovation in Israel and the Gulf States

to gain soft power and international respect. Prestige, of course, also inspires national pride domestically. We see Gulf countries actively trying to enter that economy by hosting global events and excelling in fields that confer admiration. Science is a prime avenue for this, as a Nobel Prize or a world-class discovery brings a halo effect to the nation that produced it.

Amidst these changing tides, Israel emerges as the clear regional leader in science and innovation. Often dubbed the "Startup Nation," Israel has an extensive innovation ecosystem

[13]James F. English, *Economy of Prestige: Prizes, Awards, and the Circulation of Cultural Value* (Harvard University Press, 2009).

that includes top-tier universities, a high number of researchers per capita, and a robust venture capital industry. Israeli R&D spending is around 4–5% of GDP, one of the highest in the world.[14] While much of the spending is in defense and ICT, it has given Israel expertise in areas like microelectronics, cryptography, and now quantum information science. In quantitative terms, Israel produces more scientific publications (figure 7, below) and patents (figure 5, above) annually than all the Gulf Cooperation Council (GCC) countries combined.[15] Its average citation impact in quantum science far outstrips that of its neighbors, as shown in figure 6 below. It has also spawned dozens of startups in frontier tech fields, including quantum computing, whereas large-scale tech entrepreneurship in most Arab states is still in early stages.

This asymmetry creates both opportunity and tension. Opportunity comes from Israel's know-how, which can significantly accelerate its neighbors' development if harnessed

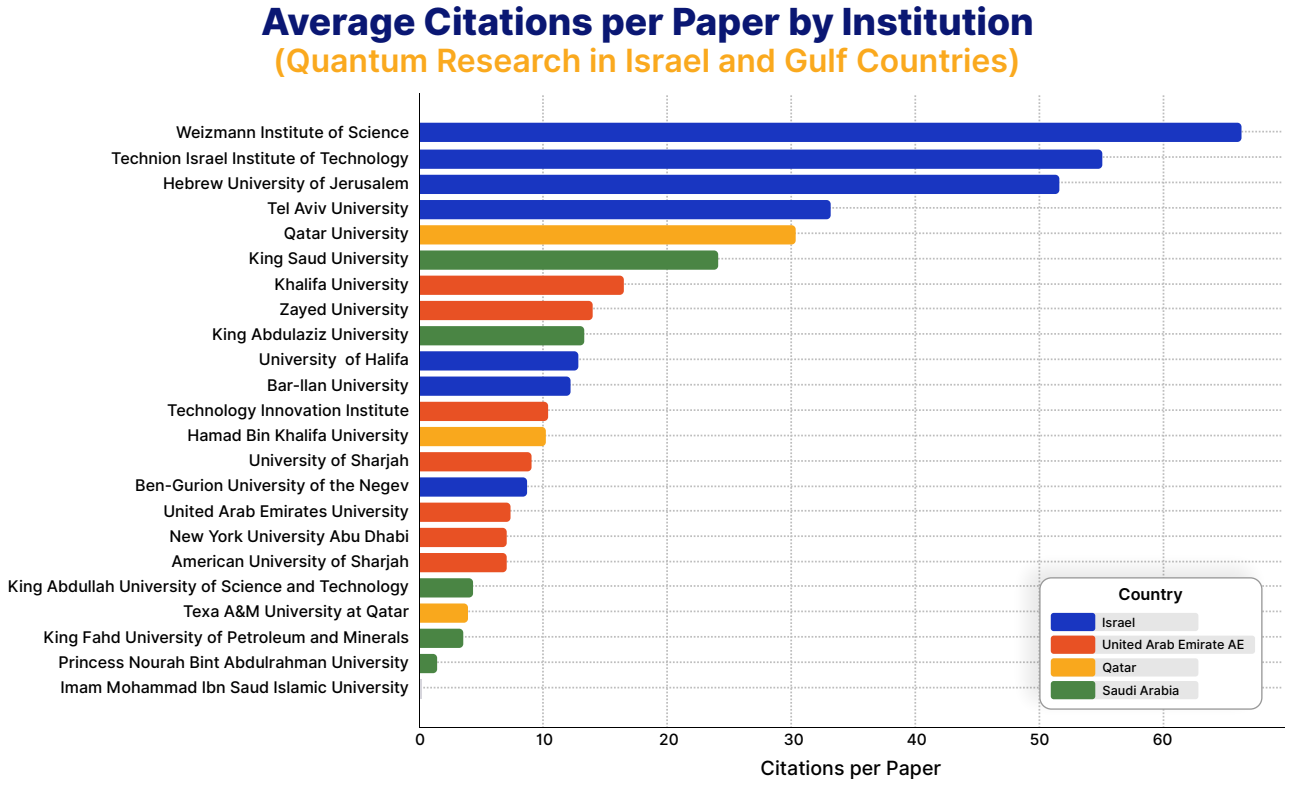


Figure 6: Average citations per quantum paper, grouped by institution

[14]"End of Year Edition: Against All Odds, Global R&D Has Grown Close to USD 3 Trillion in 2023," Global-Innovation-Index, accessed September 1, 2025, https://www.wipo.int/web/global-innovation-index/w/blogs/2024/end-of-year-edition.

[15]For a discussion of the correlation between patents and innovation in an international context, see: "The Rise of Cross-Border Patenting: Trends and Implications," accessed September 17, 2025, https://www.stlouisfed.org/on-the-economy/2024/jun/rise-cross-border-patenting-trends-implications.

cooperatively. Tension could emerge because Israel's scientific prowess has been viewed with suspicion by hostile neighbors, and political barriers kept collaboration off the table. The Abraham Accords of 2020 began to alleviate the tension by normalizing relations between Israel and several Arab states, notably the UAE and Bahrain. For the first time, significant open collaboration in technology and science became possible.[16] The UAE, has been quick to seize this opening by taking concrete steps to further develop an already-impressive knowledge economy. In 2021, the UAE's embassy in Israel co-hosted a first-of-its-kind innovation and business forum in Jaffa, bringing hundreds of Emirati and Israeli tech leaders together. Topics ranged from fintech to medtech, and the message was clear: the UAE sees Israeli tech not as a rival to exclude, but as a resource to integrate.

The stage is thus set in the Middle East for emerging hubs to collaborate. Israel is a natural scientific hub; the UAE is positioning itself as a regional technology and investment hub. Rather than compete, these two will form a complementary pair. The logic is analogous to a business partnership: one partner (Israel) has the technical expertise and renowned startup culture, the other (UAE) has the supply chain knowledge to rapidly deploy domestic

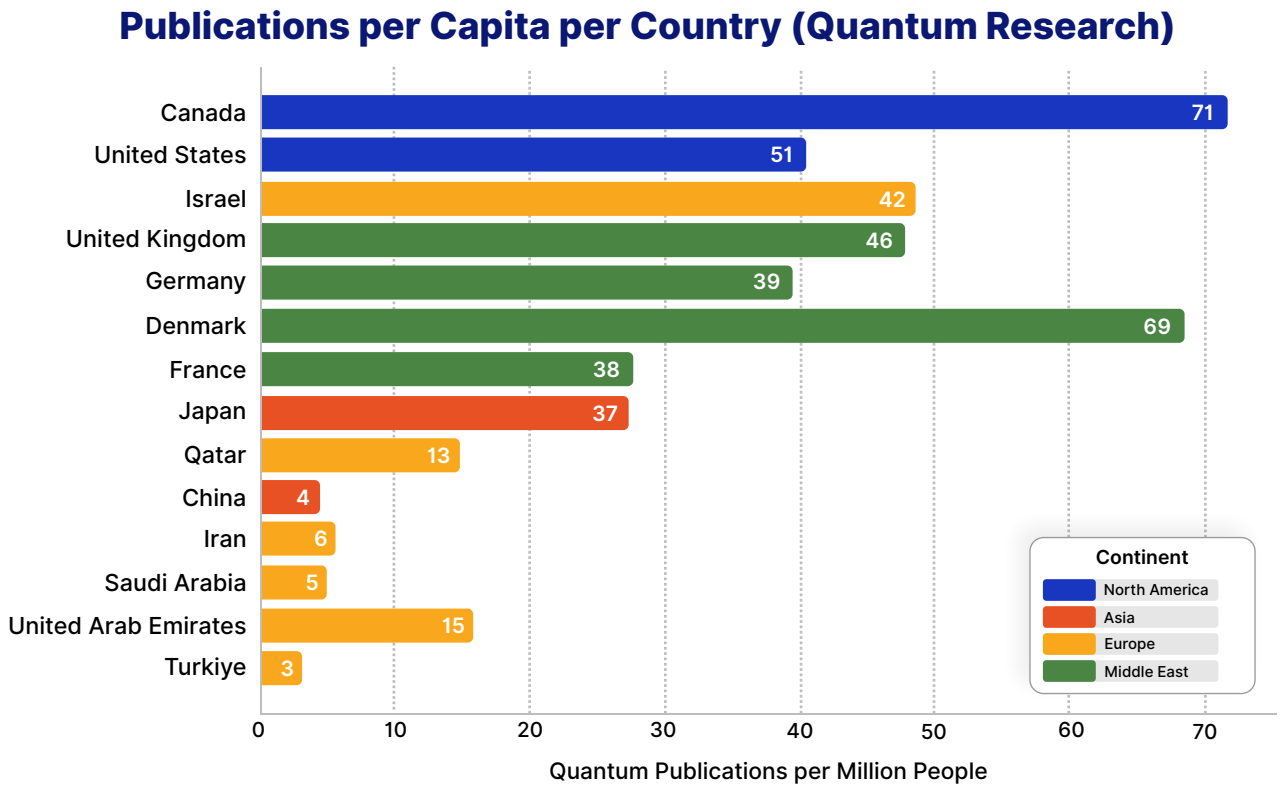


Figure 7: Quantum publications per capita

[16]"3 Years of Abraham Accords Innovation Cooperation: Progress and Unrealized Potential," accessed September 16, 2025, https://www.aapeaceinstitute.org/latest/3-years-of-abraham-accords-innovation-cooperation-progress-and-unrealized-potential

world-class research facilities at scale. If joined, they can create significantly more value. In the next sections, we delve into each country's strengths and weaknesses in quantum innovation, reinforcing why a partnership is not only logical but perhaps necessary for either to truly succeed in the global quantum arena.

Quantum Computing in Israel: A Deep Startup Ecosystem

Israel's ascent in quantum technology builds on its unique innovation ecosystem and decades of success in related fields, such as semiconductor physics, cryptography, and optical engineering. This model contains strong academic research, a vibrant startup scene, and limited but strategic government support. Figure 8 describes the structure of governmental support for both AI and quantum computing. Since 1997, the Telem Forum has supported large research infrastructures by facilitating partnerships between national agencies.[17] Israel's National Quantum Initiative, a government-backed quantum initiative of roughly $400 million over five years, ended in 2025.[18]

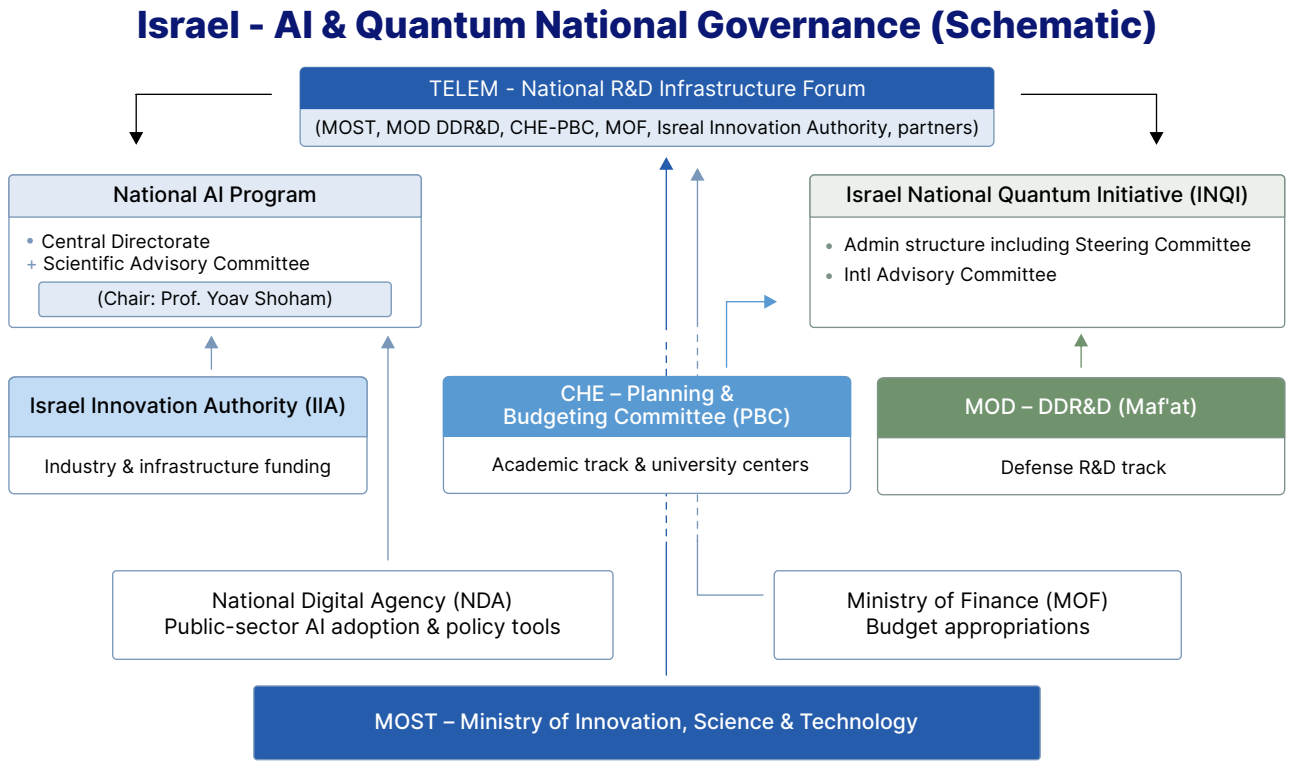


Figure 8: AI and Quantum governmental organizations in Israel and their relationships

"האקדמיה הלאומית הישראלית למדעים The Israel Academy of Sciences and Humanities - TELEM Forum," accessed November 3, 2025, https://www.academy.ac.il/RichText/GeneralPage.aspx?nodeId=859.
"Israel's Outsize Global Footprint in Quantum Science and Technology - Inside Quantum Technology," accessed November 3, 2025, https://www.insidequantumtechnology.com/news-archive/israels-outsize-global-footprint-in-quantum-science-and-technology/.

Traditionally, Israel scores among the top countries for overall R&D intensity, but a large proportion of that R&D has come from the private sector and defense interests, with government civilian science budgets relatively modest. In the late 2010s, recognizing the strategic importance of quantum computing, the Israeli government launched a National Quantum Initiative. This five-year program (2018–2023) allocated approximately $400 million to boost quantum research and workforce development.[19] Through this initiative, Israel established new quantum research centers and funded dozens of projects. A notable milestone was the creation of the Israel Quantum Computing Center (IQCC) at Tel Aviv University, backed by about $27 million in government and industry funds. Simultaneously, a consortium led by Israeli defense companies was tasked with building a homegrown quantum computer. About $60 million was earmarked for this effort, which by 2025 has yielded a prototype 5-qubit superconducting quantum computing platform. While modest in comparison to Google's or IBM's multi-billion-dollar quantum programs, these steps signaled Israel's intent to remain at the cutting edge.

Israel's venture capital and startup engine have dwarfed government investments. In 2021, an Israeli startup (Quantum Machines) raised $50 million to develop quantum control hardware; in 2022, another (Classiq) raised $33 million for quantum software tools. By 2025, the cumulative VC

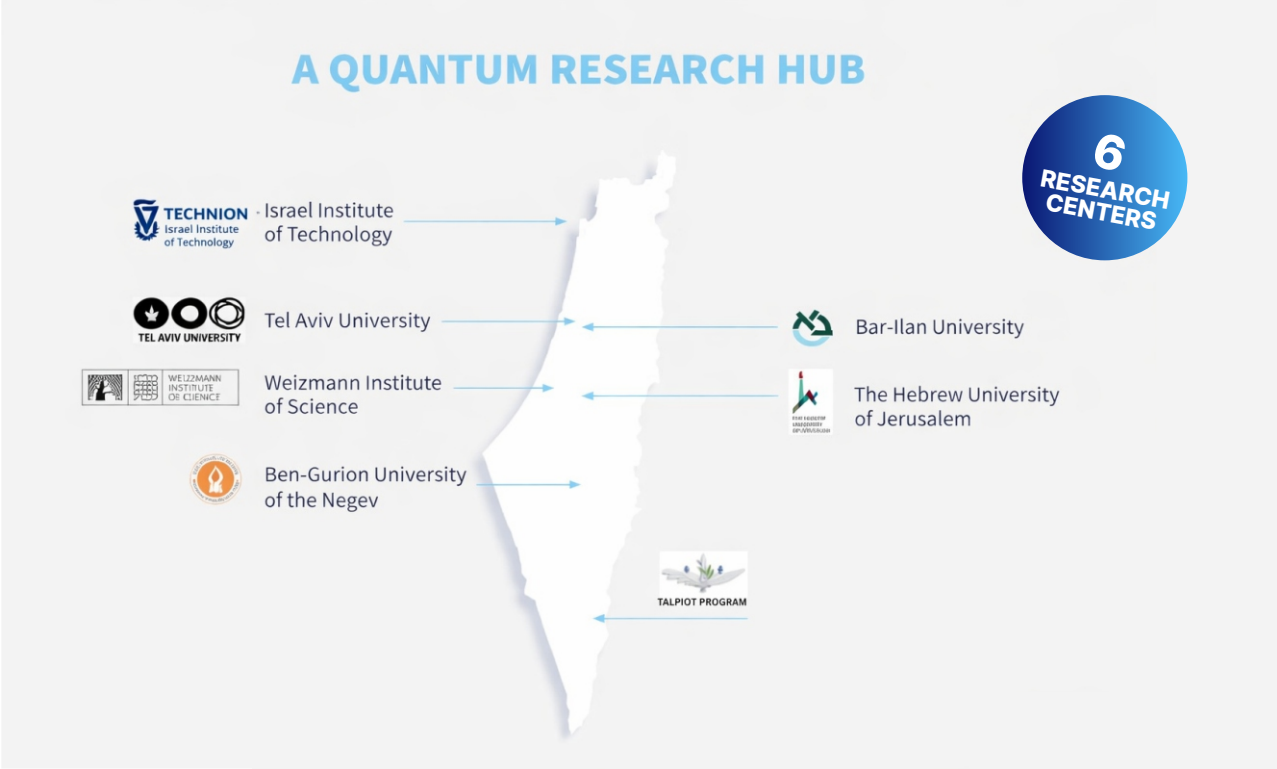


Figure 9: Key quantum research centers in Israel

[19]Bob Sorensen and Tom Sorensen, "Israeli Government Launches Comprehensive Quantum Computing Development Program," *Hyperion Research*, March 2022.

investment into Israeli quantum startups surged further: in that year alone, roughly $300 million in venture funding flowed into quantum-related companies, an astonishing figure that nearly doubled the government's five-year budget in a single year[20]. These startups span various niches: Quantum Machines provides classical hardware and software for controlling quantum processors, Classiq develops platforms to write quantum algorithms, Quantum Source is working on photonic quantum computing, and there are others focusing on quantum encryption, sensing, and materials. The diversity of the startup scene attests to Israel's broader high-tech strengths: entrepreneurial culture, deep tech talent, and strong linkages between academia and industry. Many founders are alumni of elite research universities or the Israeli military's technological units, bringing a mix of scientific and applied expertise.

Israel's academic base in quantum science is significant, given the country's size. It has multiple universities with quantum research groups exploring areas like quantum communication, quantum optics, and condensed matter physics (see figure 10). Israeli scientists regularly publish in top journals. These universities have close partnerships with the US-Israel Binational Science Foundation (BSF), which already funds US-Israel joint quantum initiatives. This paper expounds on the power of applying the BSF model to an Israel-UAE partnership in Part II.

Israel also has a vibrant startup scene of about 21 quantum-related companies—extraordinary per capita, yet tiny next to the U.S. or China. The oil-rich Gulf states, including the UAE and Saudi

AVERAGE CITATIONS PER COUNTRY & CAPITA

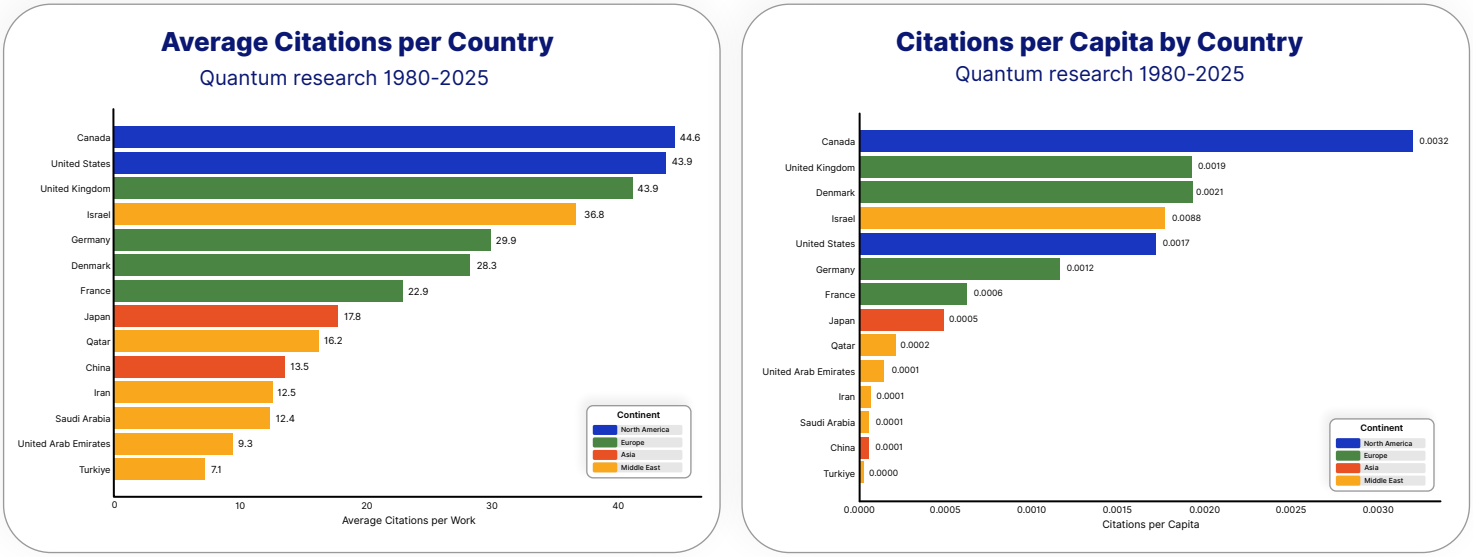


Figure 10: Average citations and citations per capita, quantum research

[20]"Israeli Top Quantum Startups Raised $300m in 2025: Report," Tech in Asia, July 7, 2025, https://www.techinasia.com/news/israeli-top-quantum-startups-raised-300m-in-2025-report.

Arabia, until recently had negligible quantum research output or companies. They are now beginning to mobilize, leveraging sovereign wealth to import technology and expertise. This dynamic is reflected in quantitative indicators: Israel stands out for its disproportionate productivity, whereas the Gulf countries are only starting to register on the map.

Israel's research output stands out as well. When measuring research impact, we often turn to citation count: the number of other peer-reviewed papers that cite the research. Citation count gives us a useful yet imperfect measurement of importance for research works.[21] The average citations per quantum research paper from Israel is about 37, surpassing Germany and not far behind the U.K. (~41), while papers from Saudi Arabia average ~12 citations, the UAE ~9, and Qatar ~16 (See figure 10). Such metrics highlight Israel's strong scientific base compared to the nascent stage of quantum computing research among its Gulf neighbors.

Israel's quantum ecosystem, like its constituent funding programs, faces a constraint of scale. The country is small, and while it produces top-notch talent, alone it cannot sustain the hundreds or thousands of quantum engineers needed to run a full industry. There is also the matter of capital for large infrastructure: building a state-of-the-art quantum fabrication facility or a network of quantum communication nodes can cost hundreds of millions of dollars, expenditures that Israel's government has been hesitant to make in peacetime, given other priorities.[22] Moreover, Israel's startups inevitably look outward for markets; the local market is tiny, so their business models depend on penetrating the U.S., Europe, or Asia. This means many Israeli startups end up relocating or selling to larger foreign companies for access to scale-up resources, which in turn can drain some of the economic benefit away from Israel. There is a risk that the same pattern could repeat in quantum hardware. However, developing a regional quantum application layer, including secure communication standards, cloud-based quantum access, and domain-specific optimization tools, requires coordination more than fabrication, opening the door to highly beneficial cross-border partnerships.

Israel has positioned itself as a quantum innovation hotbed through its agile startups and strong science, but it lacks the broad shoulders (infrastructure, capital, domestic market) to become a

[21]For more about the nuances of measuring scientific impact and credit, see:

Joshua S Gans and Fiona Murray, *Credit History: The Changing Nature of Scientific Credit* (2013), https://www.nber.org/system/files/working_papers/w19538/w19538.pdf.

[22]For examples of capital investments in fabrication facilities, see:

"New Mexico to Invest $315 Million in Quantum Computing Drive | Reuters," accessed September 18, 2025, https://www.reuters.com/business/new-mexico-invest-315-million-quantum-computing-drive-2025-09-02.

Matt Swayne, "A Quantum Manhattan Project in Chicago: Media Reports on '$20 Billion' Quantum Computing Campus," *The Quantum Insider*, May 6, 2024, https://thequantuminsider.com/2024/05/06/a-quantum-manhattan-project-in-chicago-media-reports-on-20-billion-quantum-computing-campus/.

Figure 11: Israel's quantum computing 2025 snapshot

system-level leader in deploying quantum-enhanced applications across energy, finance, and cybersecurity. It has essentially created quantum saplings; the question is how to grow them into a forest that can compete with the redwoods. One answer, which we explore, is to partner with a country that has complementary resources and a shared strategic interest in succeeding in this domain.

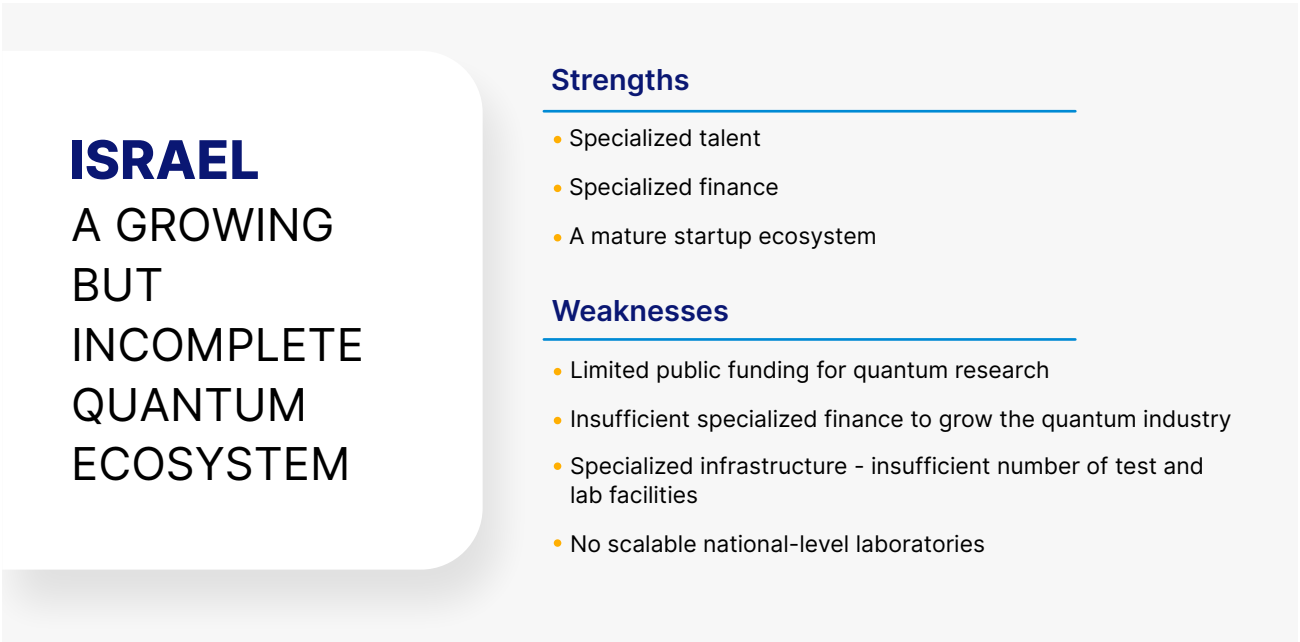


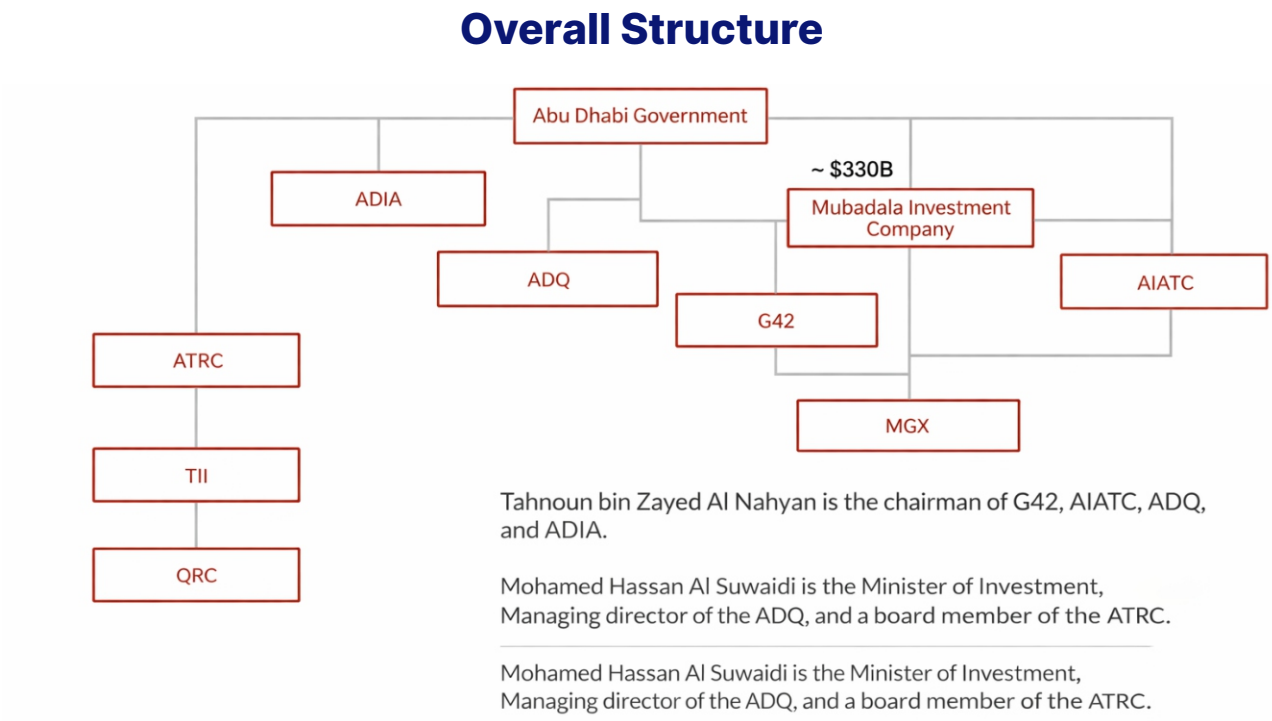
Figure 12: Israel's quantum ecosystem strengths and weaknesses

[23]CTech, "Mapping Israeli Quantum Computing: $650 Million Raised as Global Race Intensifies," *Calcalistech*, July 6, 2025, https://www.calcalistech.com/ctechnews/article/hyqbeowsge.

Quantum Ambitions in the UAE:
Sovereign Investment and Emerging Infrastructure

In the United Arab Emirates, the drive toward advanced technology has been top-down, strategic, and backed by substantial financial muscle. Over the past decade, the UAE has made technology innovation a pillar of its national development strategy.[24] Quantum computing has captured the attention of its leadership as part of a broader emphasis on emerging technologies. The UAE's approach leverages its strengths: quick decision-making at the highest levels of government, massive world-class research facilities, and an ample supply of global talent and partnerships.

A defining feature of the UAE's innovation ecosystem is the network of government funds and agencies orchestrating progress(see figure 13). Abu Dhabi has created the Advanced Technology Research Council (ATRC) to oversee and consolidate R&D efforts across the emirate. Under ATRC's umbrella sits the Technology Innovation Institute (TII), which hosts dedicated research centers in high-priority research fields. The Quantum Research Centre (QRC) is one such research center, established in 2020.[25] The QRC has gathered an international team of more than 100 researchers led by Chief Researcher Dr. Najwa Al-Araj, working on areas such as quantum cryptography, quantum sensors, and quantum computing hardware. The QRC has active



Mohamed Hassan Al Suwaidi is the Minister of Investment, Managing director of the ADQ, and a board member of the ATRC.

Figure 13: Mapping UAE's Innovation Ecosystem

[24]"Operation 300bn, the UAE's Industrial Strategy | The Official Portal of the UAE Government," accessed September 1, 2025, https://u.ae/en/about-the-uae/strategies-initiatives-and-awards/strategies-plans-and-visions/industry-science-and-technology/the-uae-industrial-strategy.
[25]"Quantum Research Center | Quantum Technologies Research | QRC | TII," accessed September 16, 2025, https://www.tii.ae/quantum.

collaborations with foreign institutions, including a project with Israel's Bar-Ilan University.

Alongside pure research efforts, the UAE is also pursuing big flagship projects that can anchor an ecosystem. The most prominent is the "Stargate" AI Initiative, a plan to build massive AI supercomputing infrastructure in the UAE in partnership with U.S. companies.[26] Announced in 2025, Stargate UAE will be housed in a new 5-gigawatt technology campus in Abu Dhabi. This project is being executed by a consortium including Abu Dhabi's Group 42 (G42), MGX (a newly established UAE fund targeting $100B in tech assets), and global players like OpenAI, NVIDIA, Oracle, and SoftBank.[27] In effect, the UAE has enticed some of the world's leading AI firms to establish a computing facility on its soil by offering a combination of capital, energy resources, and favorable policies. The first phase of Stargate is expected to go live in 2026.[28] Such an infrastructure serves immediate needs (AI computing for government and industry) and bolsters the UAE's strong reputation as a hub for cutting-edge work. It's a clear statement of intent: the UAE wants to work with top global firms to further develop its knowledge economy.

Hybrid Classical and Quantum Systems

Stargate AI provides an applicable template for quantum. We can imagine the UAE agreeing to invest in a world-class quantum computing application hub to provide secure cloud access and teams of industry experts in partnership with a leading quantum hardware company. In fact, the UAE is already laying the groundwork. G42, the UAE's premier AI company, has a division focusing on quantum computing and has reportedly invested in quantum hardware startups overseas. Additionally, the UAE has funded academic programs to train students in quantum science. Through its sovereign wealth funds (like Mubadala and ADIA), the UAE has also taken stakes in foreign tech companies. This outward investment strategy secures relationships and know-how that can grow domestic research facilities.

Nvidia hosted the 2025 edition of its GPU Technology Conference (GTC) in Washington, D.C. At this event, Jensen Huang announced "NVQLink," an architecture that connects supercomputers with quantum processors.[29] Nvidia's investment in NVQLink indicates dedication to the convergence of quantum computing and AI infrastructure. Figure 14 shows how the UAE's compute ecosystems are uniquely enabled to take advantage of this new trend of expanding the AI technology stack.

[26]"Invent a Better Everyday | Abu Dhabi, UAE | G42 | Global Tech Alliance Launches Stargate UAE," Invent a Better Everyday | Abu Dhabi, UAE | G42, accessed September 17, 2025, https://www.g42.ai/resources/news/global-tech-alliance-launches-stargate-uae.
[27]Ina Fried, "OpenAI, UAE Will Build Massive Stargate AI Center in Abu Dhabi," Axios, May 22, 2025, https://www.axios.com/2025/05/22/uae-openai-stargate-deal.
[28]"'Stargate UAE' AI Datacenter to Begin Operation in 2026 | Reuters," accessed September 16, 2025, https://www.reuters.com/business/media-telecom/stargate-uae-ai-datacenter-begin-operation-2026-2025-05-22.
[29]Alex Knapp, "Nvidia Expands Into Quantum Computing And Fusion Power," Forbes, accessed November 4, 2025, https://www.forbes.com/sites/the-prototype/2025/10/31/nvidia-expands-into-quantum-computing-and-fusion-power/.

AI & QUANTUM ECOSYSTEM IN ABU DHABI

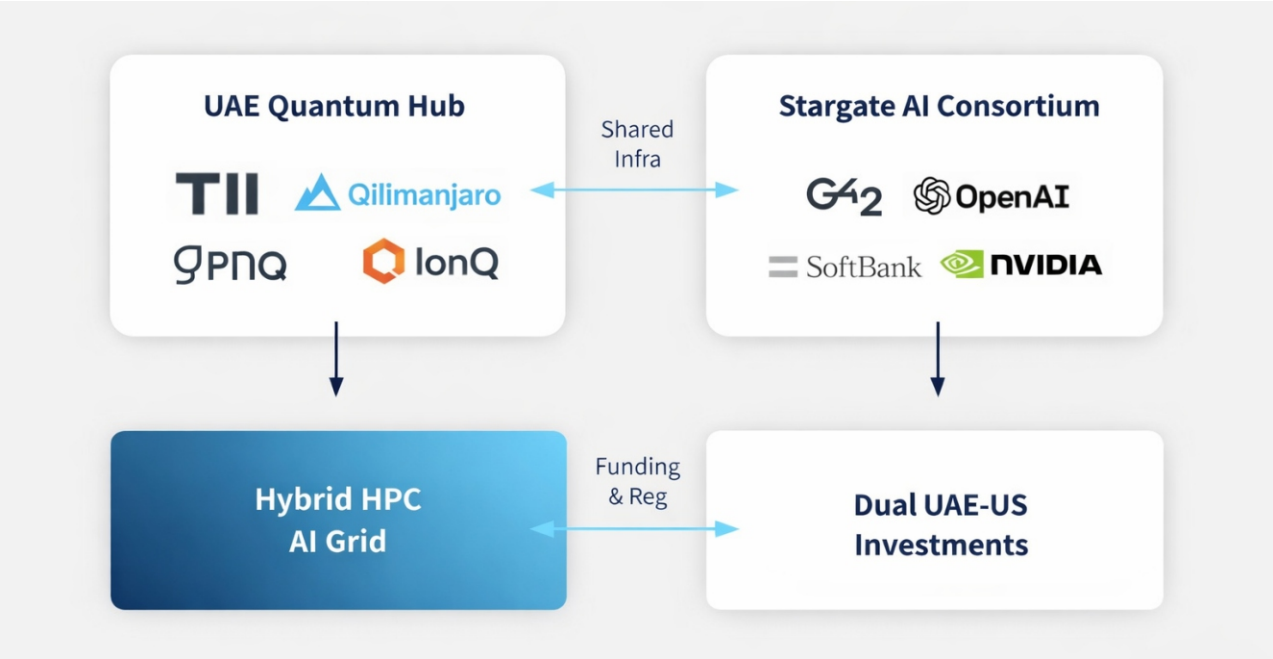


Figure 14: The AI & quantum ecosystem in Abu Dhabi

The UAE's innovation model also faces challenges, most saliently the human capital gap. The UAE has a limited number of native quantum scientists and STEM researchers from other fields.[30] Its young universities continue to navigate the learning curve toward increased research output. These institutions largely rely on imported talent as a medium-term strategy.[31] For long-term sustainability, the UAE recognizes it must cultivate its own talent pipeline. Another challenge is the top-heavy nature of the innovation ecosystem. Being government-driven can sometimes lead to a mismatch with the fast-paced, failure-tolerant culture needed for breakthrough innovation. The UAE mitigates this by creating relatively autonomous entities like the ATRC/TII and by partnering with agile foreign startups. Still, integrating the spontaneity of innovation with the structure of state planning is an ongoing balancing act.

The UAE can provide scalability in several key dimensions lacking in Israel. The UAE has *supply chain* scale, with the ability to build and maintain research facilities on a large scale when the leadership prioritizes a sector. It also has *infrastructural* scale: the willingness to build big,

[30]Ghadah Almurshidi, "STEM Education in the United Arab Emirates: Challenges and Possibilities," *International Journal of Learning, Teaching and Educational Research* 18, no. 12 (2020), https://www.ijlter.org/index.php/ijlter/article/view/1842.
[31]Dr Kristian Alexander and Dr Mouawiya Alawad, *Social Impact of Reliance on Expatriates in Daily Life in UAE*, October 2012.

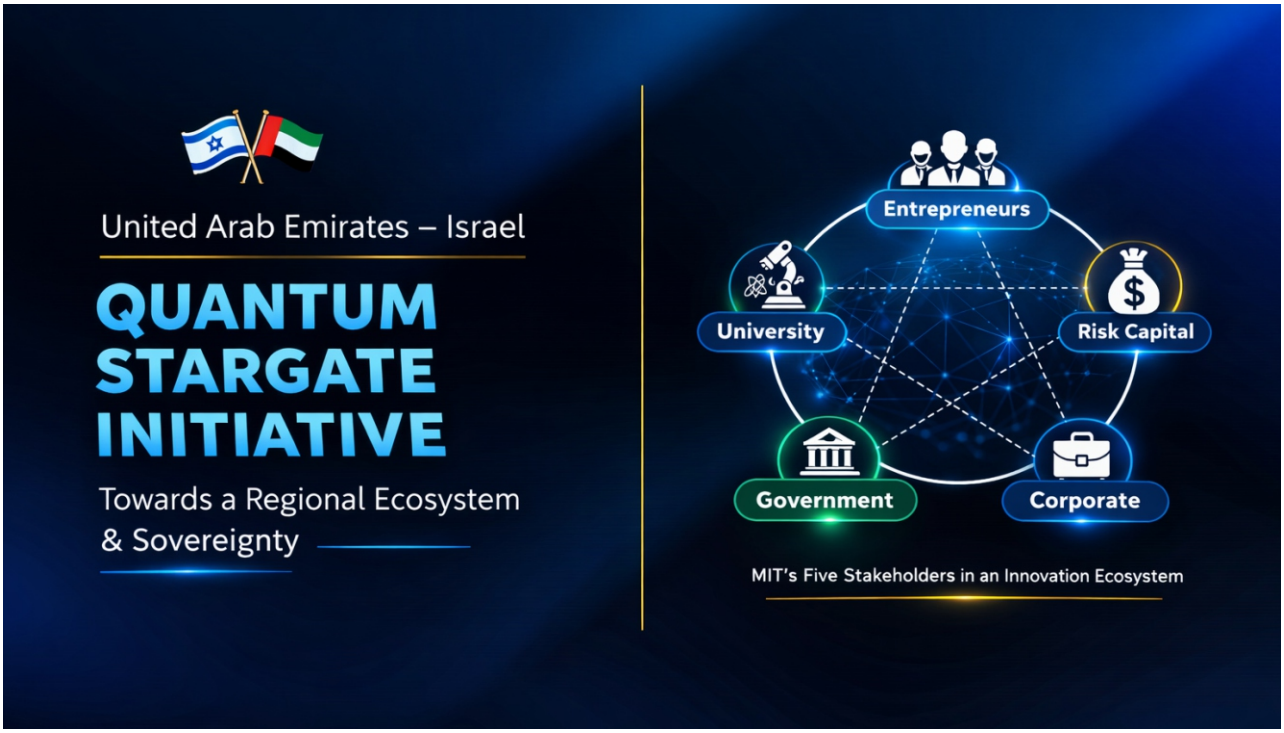
whether it's the world's largest solar farm or an AI data center campus. The UAE can provide *market* scalability via its connections to the Gulf region's enterprises. For example, if the UAE develops a quantum-secure communication system for its government, it can later export that to other Gulf states, many of which follow the UAE's lead in technology adoption. And crucially, the UAE has political will at the highest echelons to become a leader in technology. This high-level backing means a joint Israel–UAE initiative will enjoy a strong mandate from the UAE side to succeed and the resources to back it.

The UAE's quantum/tech ecosystem is broadening fast: it has new institutions, a few nascent research wins, lots of money in play, and global connections. But it lacks the entrenched culture of research and native talent base that Israel has. This sets up a classic complementary partnership potential: Israel's depth can complement the UAE's breadth.

PART II

POLICY RECOMMENDATIONS – THE STARGATE QUANTUM INITIATIVE

Building on the analysis from Part I, we propose a blueprint for a Stargate Quantum Initiative: a coordinated set of policies and programs, backed by concrete financial agreements, for Israel and the UAE to accelerate their joint innovation ecosystem in quantum computing and AI. The name "Stargate" evokes the idea of a portal to the future and deliberately nods to the Stargate AI infrastructure project, suggesting that a similar approach can be applied to quantum. The initiative is multi-faceted, addressing ecosystem development from human capital to infrastructure and governance. Crucially, it is designed with Murray and Budden's acceleration framework in mind, ensuring that it's not just a collection of projects but a cohesive ecosystem strategy. Below, we outline the key components of this initiative and the policy measures to realize them, while also discussing the diplomatic and organizational considerations that accompany each.



The Case for Partnership: Joining Forces to Bridge the N^2 Gap

Bringing together the domestic innovation ecosystems of Israel and the UAE will create a whole greater than the sum of its parts. Our analysis identifies a compelling alignment of interests and resources: Israel's challenge is one of scale, whereas the UAE's challenge is one of depth, and thus a partnership directly addresses each side's needs. In Budden and Murray's ecosystem terms, all the essential inputs—talent, ideas, capital, infrastructure—will be assembled by uniting the two countries' contributions.

Israel risks hitting a ceiling in quantum technology despite its flourishing startup scene and strong research output, especially as it is in its last year of its governmental allocation. Its market size and public capital commitments are relatively small.[32] Without access to much larger pools of funding and a broader market, Israel's quantum efforts might remain confined to prototypes and pilot projects, never achieving the scale required for global impact. The country could excel in niche subfields but never deploy quantum technology at scale. In the absence of large domestic projects, Israel's best and brightest quantum researchers could be lured away by offers from Silicon Valley or big multinational labs. A partnership with the UAE will give Israel access to a second "domestic" market and an evolving infrastructure, allowing its startups and research projects to grow larger and aim higher than they could with only Israeli support. The pooling of finance, talent, and infrastructure will prevent stagnation or brain drain in Israel's quantum sector and accelerate the development of the UAE's knowledge economy.

Despite the UAE's financial and political commitment to new research centers, it faces a classic capacity-building dilemma. A state can import hardware and pour money into infrastructure, but cannot instantly create a home-grown cadre of experts. The UAE's ecosystem is still reliant on importing talent, technology, and equipment. Without strong domestic pipelines, it will struggle to translate heavy investments into sustainable innovation. By partnering with Israel, the UAE will inject a dose of proven innovation DNA into its ecosystem. Israeli universities and companies can help staff joint projects, mentor Emirati students, and co-develop curricula and training programs. Israel can serve as an accelerator for the UAE's human capital development. Moreover, Israel's presence as a stakeholder ensures that projects have experienced leadership and are less likely to flounder. The partnership will also increase the UAE's credibility in the eyes of other global tech players. For these two countries together, a successful partnership will achieve regional quantum sovereignty: a Middle Eastern capability in quantum tech that is not wholly dependent on external powers.

The Israel–UAE quantum partnership provides a working model for strategic alignment with the U.S. technology stack. Neither country can develop a fully sovereign quantum ecosystem alone, but both can choose the platform on which to build. By embedding their research, hardware, and standards within the U.S. quantum and AI ecosystem, Israel and the UAE strengthen interoperability, market access, and cybersecurity. Regional sovereignty, in this framework, relies on partnerships within a trusted network of allies. This trilateral approach offers a replicable template for small and mid-sized states seeking to maintain autonomy while securing their place in the emerging quantum economy .

[32]"Quantum Technology Monitor 2025 | McKinsey," June 2025, https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/the-year-of-quantum-from-concept-to-reality-in-2025.

Budden and Murray's N² framework provides a powerful conceptual framework for the cooperation between Israel and the UAE. Quantum computing is an N² problem, and tackling N² problems often requires assembling an equally novel coalition of actors. An Israel–UAE partnership is exactly that: a fresh approach that addresses a frontier challenge. The partnership checks the boxes that Budden and Murray suggest: engagement across different sectors, a shared mission to focus efforts, and leveraging each party's unique contributions to fill ecosystem gaps (see figure 15).[33] In fact, one might argue the partnership itself becomes a sort of mini-ecosystem – a cross-border innovation cluster spanning Tel Aviv and Abu Dhabi.

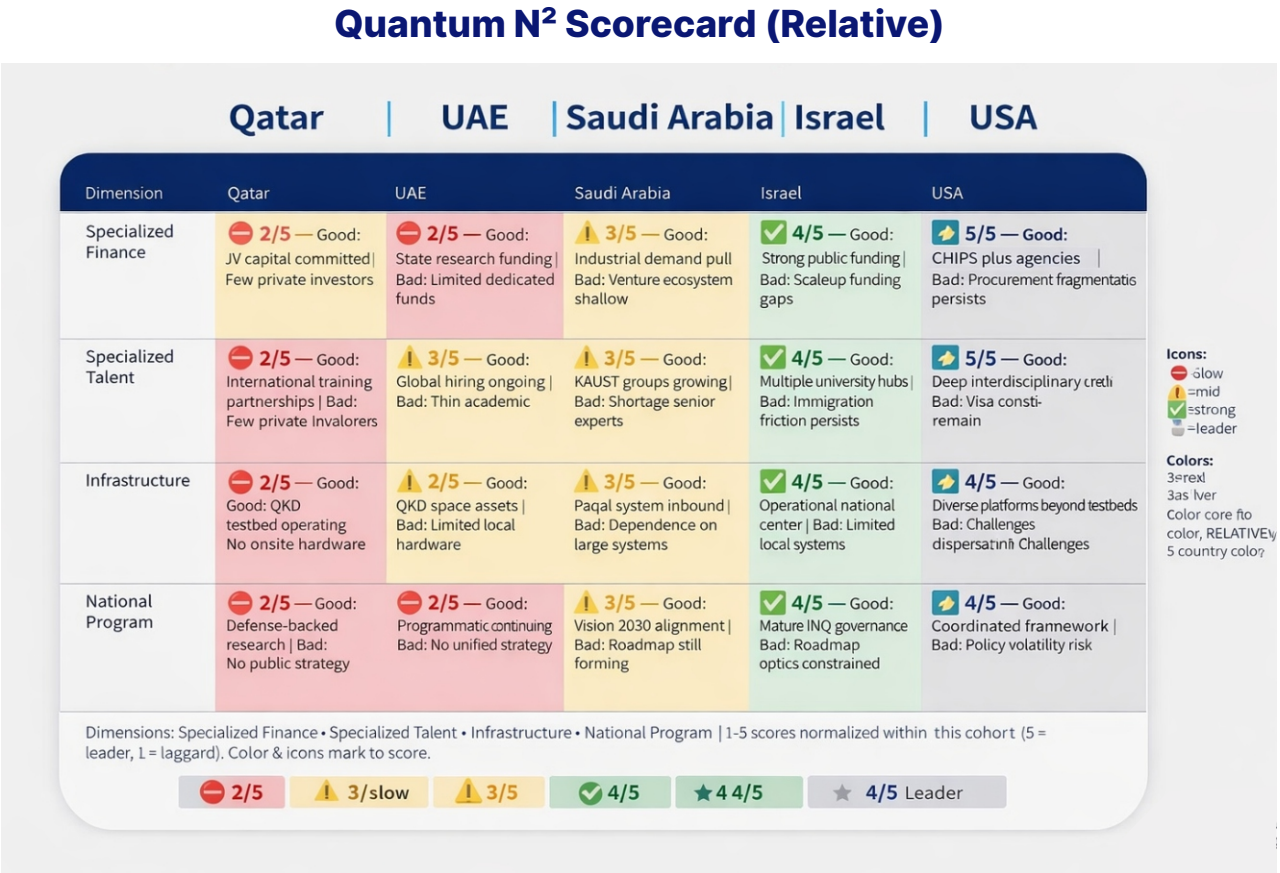


Figure 15: The quantum N² scorecard for Israel, the USA, and select Gulf countries

Israel will contribute top-tier scientific know-how, a pipeline of innovative startup projects and intellectual property, experience in managing tech commercialization, and existing collaborative links to Western tech hubs. UAE will contribute rapidly expanding research institutes, cutting-edge facilities, leadership in large-scale computing infrastructure and management, a convening

[33]Phil Budden and Fiona E. S. Murray, *Accelerating Innovation: Competitive Advantage through Ecosystem Engagement, Management on the Cutting Edge* (The MIT Press, 2025), 70-71.

location where international partners can work, and connections to markets in the Arab world and developing economies where it has influence. Together, they will co-create joint intellectual property, share in the training of personnel, and jointly approach third-party partners. This coalition-building aspect is notable: an Israel–UAE partnership could serve as the core of a wider network. The partnership can have a magnetic effect, drawing in additional collaborators and resources, further reinforcing the ecosystem's robustness.

The case for partnership rests on the parties' complementary strengths working together toward a shared strategic goal. Both Israel and the UAE understand that quantum technology will have a transformative role and that they cannot lead in it alone. Both also share broader goals of economic diversification, regional stability, and using innovation to raise their global standing. By acting together, they can take on projects whose scale and scope put them in the global top league. They also set a powerful example of innovation diplomacy: showing how two nations can overcome political differences and historical distance by focusing on a forward-looking enterprise that benefits both.

Strengthening Regional Technological Sovereignty

Regional technological sovereignty forms the core of our recommendation. As discussed in Part I, this term refers to a group of allied states achieving autonomy in critical technologies by pooling their resources and coordinating their efforts. It is a layer above national sovereignty: each country remains fully sovereign, but they create a shared framework that enables collective self-reliance for their region. We recommend that Israel and the UAE formalize their intent through a high-level agreement or memorandum of understanding tailored to technological cooperation and backed by joint investments. This agreement will articulate goals such as the development of a jointly owned quantum computing capability or the establishment of a regional supply chain for quantum technology.

As a reference point, NATO's Defence Innovation Accelerator for the North Atlantic (DIANA) initiative explicitly frames its mission in terms of strengthening collective "regional sovereignty" for allied nations by co-developing emerging technologies and reducing dependency on adversaries.[34] The Israel–UAE partnership can adopt similar language by positioning their collaboration as a means to ensure that the Middle East does not become wholly dependent on foreign quantum systems. This framing has domestic advantages as well, appealing to patriotic

[34]Catherine Stupp, "NATO Funds Startups Aiming to Solve Cyber Problems in Infrastructure," WSJ Pro, *Wall Street Journal*, July 10, 2024, https://www.wsj.com/articles/nato-funds-startups-aiming-to-solve-cyber-problems-in-infrastructure-2b6aaf24.

sentiment in each country, and can help rally stakeholders who might otherwise question why they should help another country. This proposal answers this hypothetical question: doing so actually increases our security and autonomy collectively. In practice, measures to foster regional sovereignty will include jointly funding certain critical infrastructure projects so that both countries have guaranteed access, and agreeing on data-sharing arrangements that keep sensitive research results within agreed boundaries.

The Quantum Divide and Why the UAE Fits

We focus on the UAE for several reasons: it is part of the Abraham Accords, it has a track record of effective cooperation (as seen in the Bar-Ilan–TII project on superconducting qubits and other exchanges), and it has the necessary attributes (capital, will, stability) to engage in a reliable long-term partnership.[35] Other regional states like Saudi Arabia or Qatar are either not yet diplomatically amenable to cooperating openly with Israel or are pursuing separate strategies. The UAE-Israel pairing is, at present, the path of least resistance for a pioneering partnership. It can later serve as a blueprint for success that will attract other stakeholders.

Envisioned Outcomes and Mutual Benefits

A well-designed partnership will allow both countries to maintain their own quantum sovereignty while gaining regional sovereignty. This means each will continue developing technology domestically, with the regional layer adding a collaborative framework to share certain assets and coordinate strategy. We foresee the following outcomes: jointly built quantum computing capabilities, a pool of talent that circulates between Israel and the UAE, shared wins on the global stage, such as jointly winning research grants or co-authored papers that earn prestigious awards, and the partnership serving as a foundational pilot for future Abraham Accords cooperation.

Our policy recommendation argues for the creation of an ecosystem alliance backed by formal agreements, both strategic and financial, and an institutional framework to implement them. It should explicitly aim for regional tech sovereignty and prestige, drawing on Budden & Murray's ecosystem management techniques to engage all stakeholders and align efforts. By doing so, Israel and the UAE can mitigate the risks and amplify the rewards of collaboration.

[35]"The Abraham Accords One Year On," Middle East Institute, accessed September 1, 2025, https://www.mei.edu/publications/abraham-accords-one-year.

Of course, realizing this vision will require navigating political, cultural, and regulatory hurdles, which we address next.

Navigating Political and Cultural Lenses

Any international partnership will face political and cultural challenges. Budden and Murray remind leaders to examine projects through three lenses: strategic design, political, and cultural. We have covered strategic design. We now discuss the political and cultural aspects.

On the political front, one challenge is ecosystem integration, given the differing innovation models of Israel and the UAE. Israel's innovation ecosystem is highly organic and decentralized, whereas the UAE's is more orchestrated and centralized. Merging these requires careful handling. These differences need to be reconciled in the partnership's governance. We recommend creating hybrid management teams for joint projects, pairing an Israeli lead and a UAE lead, so that both perspectives are represented in decision-making. We also suggest alternating management approaches depending on project type. Recognizing and explicitly discussing these differences is important; the council can even commission cross-training workshops. By anticipating friction points, like procurement processes and IP ownership norms, we can design procedures that satisfy both.

Culturally, the Israel–UAE collaboration will have to overcome differences in communication and trust-building. Israelis are famously direct, fast-moving, and informal in business, whereas Emirati culture places more emphasis on formal respect and patience in relationship building. Both sides will require adaptation. Early successes, even small victories, will do wonders for cultural bonding. Storytelling should be part of the initiative: internal newsletters and joint social media campaigns will continuously build a sense of one community. Budden and Murray mention that shared identity and mission can be a powerful component of ecosystem success. Here, we must cultivate a shared identity between the two countries' ecosystems.

Our policy recommendations rely on addressing organizational culture and political context in addition to technical goals. A brilliant strategic plan can fail if politics intrude or if cultural frictions alienate participants. Conversely, with political will and cultural respect underpinning it, even a less-than-perfect plan can adapt and thrive. We have incorporated this wisdom from Murray & Budden: recognizing that change often fails not from poor design alone but from neglecting the political and cultural barriers that inevitably arise.

The US–Israel Binational Science Foundation (BSF), established in 1972, has long funded cooperative basic research between Israeli and American scientists, including in physics and computer science. The programs are limited by scale: BSF's endowment of about $100 million only yields ~$16 million in research grants per year, which is simply not enough to drive significant

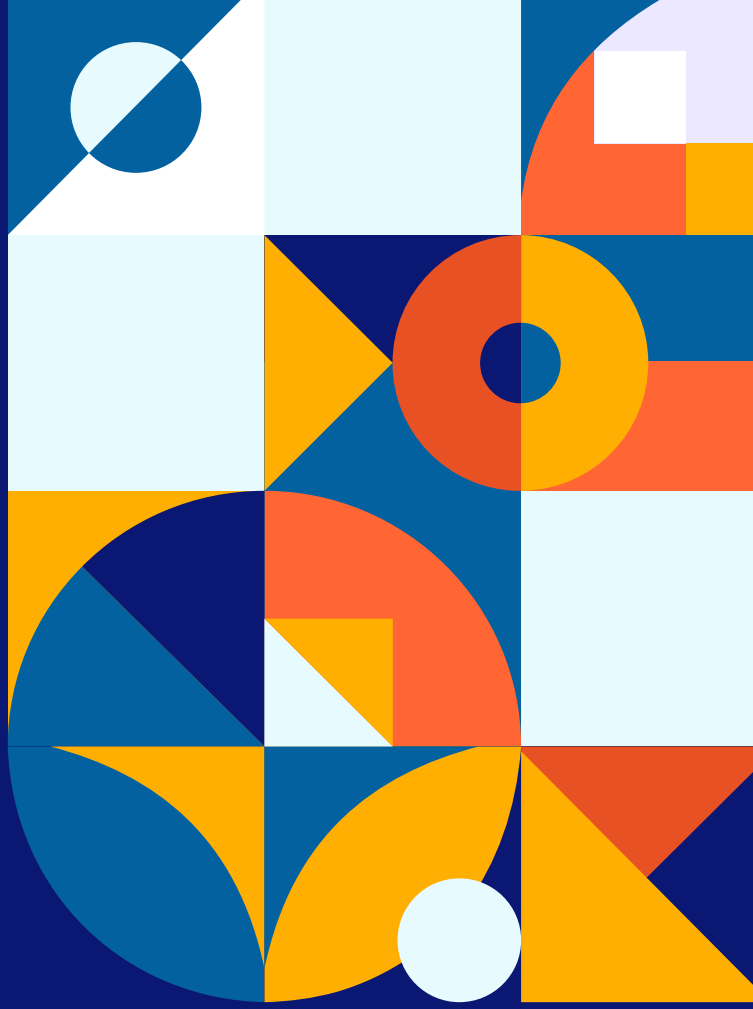
quantum research or industrialization. This underscores the necessity for ecosystem management, which will make the partnership members competitive in the Gulf and among other countries in the world. Yet, as can be seen in figure(16), this model has yielded many successes between 1975-2025.

Figure 16: Fifty years of successful U.S.-Israel scientific collaborations

We propose an extension to Budden and Murray's model of prize-driven innovation. In *Accelerating Innovation,* the authors discuss prizes in an enterprise setting. However, prizes in a government context can become a strategic tool for steering national R&D toward missions of public value. Rather than relying solely on grants or procurement, governments can use prizes to set ambitious targets that mobilize research in universities and private companies. Prizes thus allow governments to act as *architects of directionality:* defining the problem space, lowering the cost of entry for unconventional innovators, and accelerating learning across the ecosystem. By rewarding outcomes instead of processes, prize mechanisms help the state coordinate innovation without dictating its pathways, fostering both accountability and creativity.

The Israel Innovation Authority (IIA) exists as a standalone governmental authority under the Ministry of Science, Technology and Innovation. The IIA has long treated bilateral partnerships as a cornerstone of its innovation strategy, using joint funding mechanisms to expand Israel's technological reach while reinforcing diplomatic and economic ties. These initiatives function as mission-oriented instruments of science diplomacy, allowing Israel to link its domestic innovation ecosystem with global research networks and attract foreign investment into high-impact

sectors. Examples include collaborations with Hong Kong, South Korea, New Jersey (USA), and Cyprus. Each partnership provides matched funding and emphasizes industrial research, commercialization, and shared intellectual-property agreements.



PART III

IMPLEMENTATION, FROM BLUEPRINT TO REALITY

To translate the Stargate Quantum vision into practice, implementation should proceed in three stages, moving from fast-start project collaboration to formal bilateral instruments, and finally to a fully institutionalized binational platform. This sequencing reflects the paper's core implementation logic: bring the right stakeholders together, build enabling structures, and deploy resources + incentives that accelerate innovation.

Stage 1: "Quantum Mission" – Immediate cooperation with TII/QRC

Objective

Launch a near-term, action-oriented "Quantum Mission" from Israel to Abu Dhabi—hosted by TII and specifically anchored in the Quantum Research Centre (QRC)—to stand up immediate joint projects and socialize them across the wider ecosystem (academia, startups, corporates, investors, and relevant government/regulatory stakeholders). QRC is already positioned for this role, with a substantial research team and active international collaborations, including with Israeli partners.

Core activities (mission week format).

A) Problem–solution framing workshops ("what–who–how").

Use the paper's ecosystem-engagement logic to move quickly from priority problems to who must be involved and how they will work together—turning abstract cooperation into executable workstreams.

B) Rapid project formation ("seed collaborations").

Facilitate matchmaking sessions across sectors to form 4–8 joint "seed teams" (each with Israeli + Emirati participation) tied to near-term deliverables (e.g., pilots, datasets, benchmarking, proof-of-concepts).

Immediate pathway to pilots. End the mission with (a) a short list of prioritized pilots, (b) designated co-leads (Israel/UAE), (c) target resources needed (compute, lab access, data, regulatory touchpoints), and (d) a 90-day execution calendar.

C) Outputs by Day 90.

A joint mission portfolio of pilot-ready projects (with owners, timelines, and resource asks).

A first-pass N^2-oriented project map so that the partnership does not default only to incremental work, but reserves capacity for frontier initiatives.

A lightweight interim steering group (TII/QRC + Israel counterparts) to carry Stage 1 pilots into Stage 2 instruments.

Stage 2: IIA–TII Bilateral Agreement: the operational "bridge" (prizes, talent, micro-grants, fund pilot)

Objective

Convert Stage 1 momentum into a formal bilateral operating agreement between the Israel Innovation Authority (IIA) and TII, designed to fund and scale joint activity while testing the mechanisms needed for a future binational fund. The agreement should explicitly combine direction-setting tools (prizes) with capacity-building tools (talent + micro-grants) and a fund pilot that proves feasibility before full institutionalization.

A) Prize-driven quantum challenges

Prize mechanisms should be used as a mission-setting instrument—defining problems clearly, widening participation, and rewarding outcomes rather than process. The paper already frames prizes (in a government context) as a way to set ambitious targets, mobilize universities and companies, and accelerate learning across the ecosystem.

Design features

2–3 annual challenges aligned to jointly selected priorities (security, communications, logistics, energy/water, health).

Multiple award tiers (prototype / field trial / deployable solution).

Judging that reflects cross-sector needs (science, engineering, deployment, compliance).

B) Cross-border academic talent exchanges

Stand up structured exchanges that create a durable binational community: fellowships, visiting professorships, joint workshops, and summer schools—explicitly framed as building a cohort of "ambassadors" for the partnership.

C) Micro-grants to academics and startups

Create a fast-track micro-grant line (small checks, fast decisions) for:

joint academic collaborations that emerged from Stage 1 pilots, and

early-stage startup/SME prototyping tied to the prize challenges and testbed needs.

D) Pilot to operationalize the previously envisioned UAE–Israel joint fund

Use the IIA–TII agreement to run a time-boxed pilot (e.g., 12 months) that tests the legal, governance, and compliance plumbing required for the larger "Stargate Quantum" vehicle. The pilot should mirror the eventual fund's logic: blend grant-making with venture-style support and milestone-based funding, so the partnership can validate what works before scaling.

Stage 3: Launch "Stargate Quantum": a Binational Quantum Innovation Fund + institutional platform

Objective
Move from "programs" to an enduring binational institution that can coordinate stakeholders, finance projects at meaningful scale, and build shared infrastructure for hybrid AI–quantum development.

A) Quantum and AI testbed network with shared infrastructure
Build a shared network of experimental platforms accessible to researchers and companies in both countries, including a quantum cloud access layer, plus agreed IP/data-sharing rules for work conducted on shared infrastructure.

Because the initiative explicitly links AI and quantum, the paper recommends earmarking relevant compute capacity (e.g., from UAE AI infrastructure) and enabling structured data-sharing arrangements where appropriate.

B) Establish a joint Israel–UAE Council (governing "center of gravity")
Form a formal coordinating body as a not-for-profit entity with joint bylaws and binational leadership, designed to oversee the initiative with durable multi-stakeholder buy-in.

Within its first year, the council should deliver:
a Joint Innovation Agenda,
a Resource Map, and
a governance/IP framework for project selection and benefit-sharing, supported by an N^2 Working Group to keep the portfolio balanced toward frontier opportunities.

C) Program offices in both countries
Create Program Offices (Israel + UAE) that function as the execution layer for calls for proposals, testbed access, partner onboarding, project tracking, and external collaboration management—roles already described as core to the council's coordinating mission.

D) Regulatory harmonization to secure international support
Treat regulatory alignment as a first-class workstream, since mismatched export controls, IP regimes, and investment screening can derail joint projects.

Key components to institutionalize:
aligned export-licensing approaches to avoid chokepoints,
faster cross-border IP pathways (e.g., accelerated patent recognition),

shared data-protection protocols for sensitive results, and
standards alignment with international bodies to ensure interoperability and credibility with global partners.

The paper also recommends proactively structuring U.S. alignment/assurances and framing the initiative as a trusted ally-driven program to widen Western support.

E) New governance model: accountability + agility
Adopt a governance posture closer to a high-performing innovation organization than a traditional bureaucracy—clear milestones, transparent annual reviews, and the ability to pivot resources toward breakthroughs while terminating underperforming projects.

To reinforce legitimacy and continuity, publish an annual "Quantum Sovereignty Report" (benchmarked globally) and institutionalize independent audits.

Build resilience via multi-year funding commitments, diversified capital (public + sovereign wealth + private), and legal protections that insulate the binational institution from political volatility.

Positioning the Partnership as a Flagship of Innovation Diplomacy

The partnership should be communicated as more than an R&D collaboration: it is a regional model of innovation diplomacy—a visible, prestige-generating demonstration that cooperation produces strategic and societal dividends. The paper proposes doing this through joint public engagement, an annual Israel–UAE innovation summit, and "prestige economy" mechanisms (e.g., awards, high-visibility recognition), including the option to establish an Abraham Innovation Prize.

Finally, the initiative should be "networked outward" by integrating with complementary diplomatic frameworks (e.g., I2U2 / Negev Forum) to expand legitimacy, resources, and replication potential—without diluting the bilateral core.

CONCLUSION

LESSONS LEARNED AND BROADER IMPLICATIONS

The Israel–UAE quantum technology partnership is more than just a bilateral project; it is a test case for a new paradigm of "innovation diplomacy" in the 21st century. By applying Murray and Budden's ecosystem logic to a geopolitical context, we see how nurturing a collaborative innovation ecosystem can serve strategic and diplomatic ends alongside generating economic and scientific benefits. We summarize the key anticipated outcomes, distill the lessons learned from this use case, and reflect on what it could mean for the region and the world.

Outcomes and Benefits

If successfully implemented, the Stargate Quantum Initiative will yield both tangible and intangible benefits. Tangibly, the two nations will expect accelerated development of quantum and AI technologies that neither would have achieved alone. These will contribute to economic growth and high-skilled job creation in both countries, helping them transition into the knowledge economy era. Regionally, as these countries prosper through cooperation, it sets a precedent of stability: prosperity born of partnership is a formula that other states will want to emulate.

Intangibly, the initiative will fulfill a deeper purpose of the Abraham Accords by translating warm diplomatic ties into a shared societal project. Israel and the UAE will see concrete proof that peace and cooperation deliver results that isolation and conflict never could. This will help legitimize governments and policies on both sides. One especially valuable outcome is the bolstering of what we termed the prestige economy. As the partnership yields scientific publications, patents, or even prize-winning innovations, it elevates the status of Middle Eastern science on the world stage. More systemically, it creates role models: young students in Abu Dhabi or Tel Aviv will see scientists and entrepreneurs celebrated like sports heroes, making STEM careers more appealing and socially valued. [36]

Crucially, the initiative will forge a shared identity and mission among its participants. Israelis and Emiratis working together will, over time, develop a sense of "we." This is the glue of people-to-people peace. Advancing the Abraham Accords through this project could thus be groundbreaking in terms of advancing peace beyond treaties.

"How the Gulf's Rulers Want to Harness the Power of Science," *The Economist*, January 7, 2025, https://www.economist.com/science-and-technology/2025/01/07/how-the-gulfs-rulers-want-to-harness-the-power-of-science.

Lessons for Innovation Diplomacy

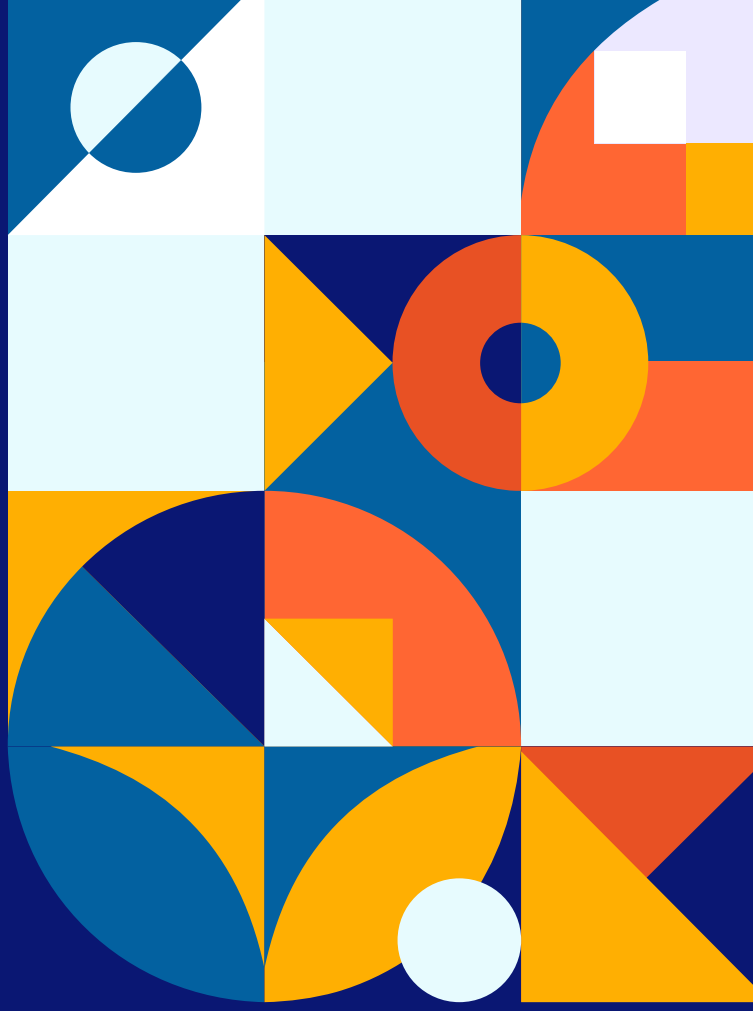
From this case study, several lessons stand out. First, tangible and intangible benefits go hand in hand. Second, regional sovereignty can be achieved through collaboration. Third, a compelling shared mission can unite former adversaries. Fourth, new governance models are needed for frontier tech, including prize-driven challenges and active investment. Finally, soft power through science and technology is potent: the "Ring of Wisdom" concept metaphorically encapsulates the idea of encircling the region with knowledge and solutions.

Implications for the Middle East and Beyond

The immediate implication is for the Middle East: if Israel and the UAE can succeed in building a joint innovation ecosystem, it sets a precedent that could redraw the innovation map of the region. Other states will want to join or replicate it. For the world, it offers a model of how small countries can band together to benefit from joint innovation. As advanced technologies become crucial to economic and military strength, those who lack scale must find ways to innovate collectively or risk irrelevance. The Israel–UAE partnership will demonstrate that small states, by combining strengths and focusing on niches, can produce outputs greater than the sum of their parts. Small countries require such partnerships to effectively compete for AI and quantum supremacy with larger powers.

All these factors set the stage for an Israel–UAE tech partnership as part of a larger East–West tapestry of alliances. Indeed, joint innovation can be a form of diplomacy: by investing together in AI and quantum ecosystems, countries create interdependence and goodwill. Traditional reliance on military force alone has yielded cycles of instability, but soft-power diplomacy through innovation offers a peaceful, net-positive alternative. Joint tech initiatives create jobs, retain talent, and legitimize governments through shared prosperity rather than through military might. Instead of framing regional competition in zero-sum terms, innovation diplomacy reframes it as a race to the top: who can collaborate most effectively to produce breakthroughs that benefit everyone.

The proposed Israel-UAE partnership illustrates a core insight of Murray and Budden's framework: innovation is a team sport, and the team can extend beyond one's own borders. When ecosystems engage on a state level, rather than just company to company, the potential for acceleration multiplies. We have applied this insight to a unique geopolitical pairing and found it sound. The "Accelerating Innovation" playbook, when applied to states, becomes a playbook for accelerating peace and mutual prosperity. In a region long defined by what divided its peoples, Israel and the UAE are showing what can unite them: a shared leap into the unknown, harnessing the power of science for the benefit of all. This is the essence of innovation diplomacy, and it may well prove to be one of the Middle East's most important innovations of all.

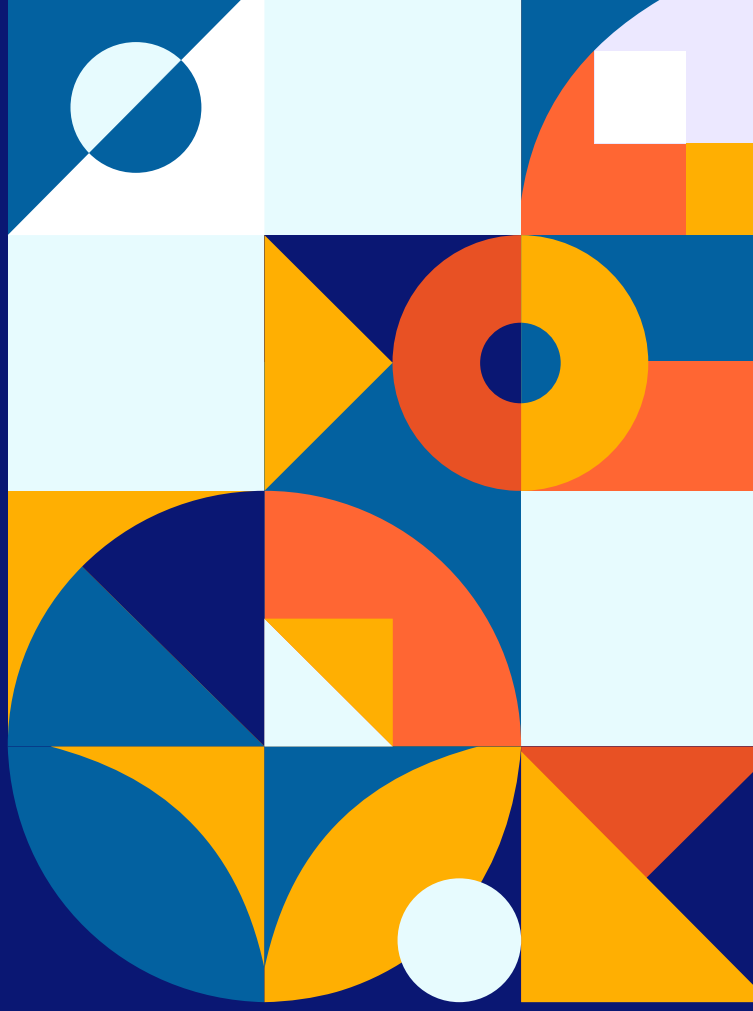


ABOUT US

Dr. Smadar Itskovich is the founder and CEO of the Artificial Intelligence Quantum Sovereignty Lab (AIQ), a mission-driven non-profit dedicated to enabling nations to independently govern and shape their AI and quantum futures. By drawing on successful models worldwide, AIQ empowers governments to take control of their technological sovereignty, guided by the principle "Own your own Intelligence."

Dr. Itskovich is an innovator whose diverse and accomplished career spans technology, public service, and education. She holds multiple degrees, including a PhD in Economics and Business Management, an LL.M in Law, a BA in Management and Physics, as well as advanced training from MIT's REAP Sloan Business School Media Lab. Her multidisciplinary expertise has enabled her to bridge academic research with practical applications in various sectors. Before serving as Head of Industry Development and Innovation for the Ashdod Municipality, Dr. Itskovich contributed to research and development in physics for a leading high tech company. Her educational programs have been implemented across 52 cities in Israel and have earned prestigious awards such as the Dan David Prize. Dr. Itskovich is also recognized as an invited speaker at prominent international forums like Davos.

Ethan Cowan is a Hagley Scholar and doctoral student in the History of Capitalism, Technology, and Culture at the University of Delaware. His research examines the history of computing, technological innovation, business, and public policy in Israel and the broader Middle East. Previously, he worked in the Harvard computer science department, where he developed novel data analysis tools. He is also the co-author of *Hands-On Differential Privacy* (O'Reilly, 2024), a textbook used in computer science courses. He worked as a teaching fellow for a graduate-level data science course from 2020 to 2022, partnering with faculty to guide students on their research projects. Ethan holds a master's degree in software engineering and a master's of theological studies (MTS) from Harvard.



GLOSSARY

Abraham Accords – The 2020 normalization agreements between Israel, the UAE, and other Arab states that opened the door to unprecedented scientific, technological, and economic cooperation.

Advanced Technology Research Council (ATRC) – Abu Dhabi government entity that oversees R&D efforts across the emirate, including the Technology Innovation Institute (TII).

Artificial Intelligence (AI) – Computer systems capable of performing tasks that typically require human intelligence, such as learning, reasoning, and problem-solving. AI is a strategic domain alongside quantum computing.

Ecosystem Engagement – A framework by Budden and Murray emphasizing collaboration between entrepreneurs, universities, investors, and government to accelerate innovation.

Innovation Diplomacy – The use of scientific and technological cooperation as a tool of international relations, offering positive-sum alternatives to conflict.

Israel Quantum Computing Center (IQCC) – A national research facility established at Tel Aviv University with government and industry support to advance quantum technologies.

N^2 Challenge (Novel Problem × Novel Solution) – A concept from Budden and Murray defining the most complex type of innovation, where entirely new problems require entirely new solutions. Quantum computing is a prototypical N^2 challenge.

National Quantum Initiative (Israel) – A five-year, $400 million program launched in 2018 to expand Israel's quantum research capacity and workforce.

Prestige Economy – An economy where value is derived not only from financial gains but from intangible benefits such as scientific reputation, international status, and cultural achievement.

Quantum Computing – A new computing paradigm based on quantum mechanics that can perform calculations infeasible for classical computers.

Quantum Research Center (QRC) – A division of Abu Dhabi's TII, established in 2020, focusing on quantum cryptography, sensing, and computing with an international team of scientists.

Regional Sovereignty – A layered form of sovereignty in which allied states achieve technological autonomy by pooling resources and coordinating strategies, while maintaining national sovereignty.

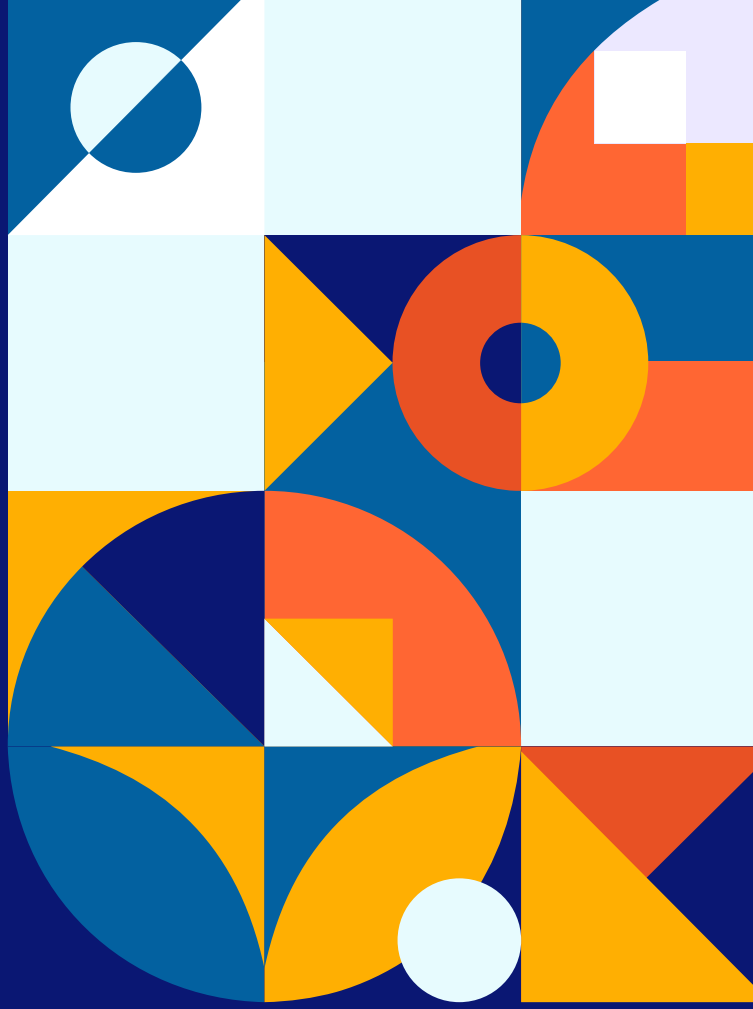
Ring of Wisdom – A metaphor introduced in this paper for a scientific and technological alliance that counters Iran's “ring of fire” of militant proxies with regional achievements in knowledge and innovation.

Stargate AI Initiative – A UAE-led mega-project to establish world-class AI supercomputing infrastructure in Abu Dhabi, serving as a model for similar quantum initiatives.

Stargate Quantum Initiative – The proposed Israel–UAE partnership outlined in this white paper, aimed at building a shared ecosystem for quantum innovation and advancing regional sovereignty.

Technological Sovereignty – The ability of a nation or region to maintain autonomous control over critical technologies rather than relying on foreign providers.

Technology Innovation Institute (TII) – Abu Dhabi's applied research center under ATRC, which houses specialized institutes including the QRC.



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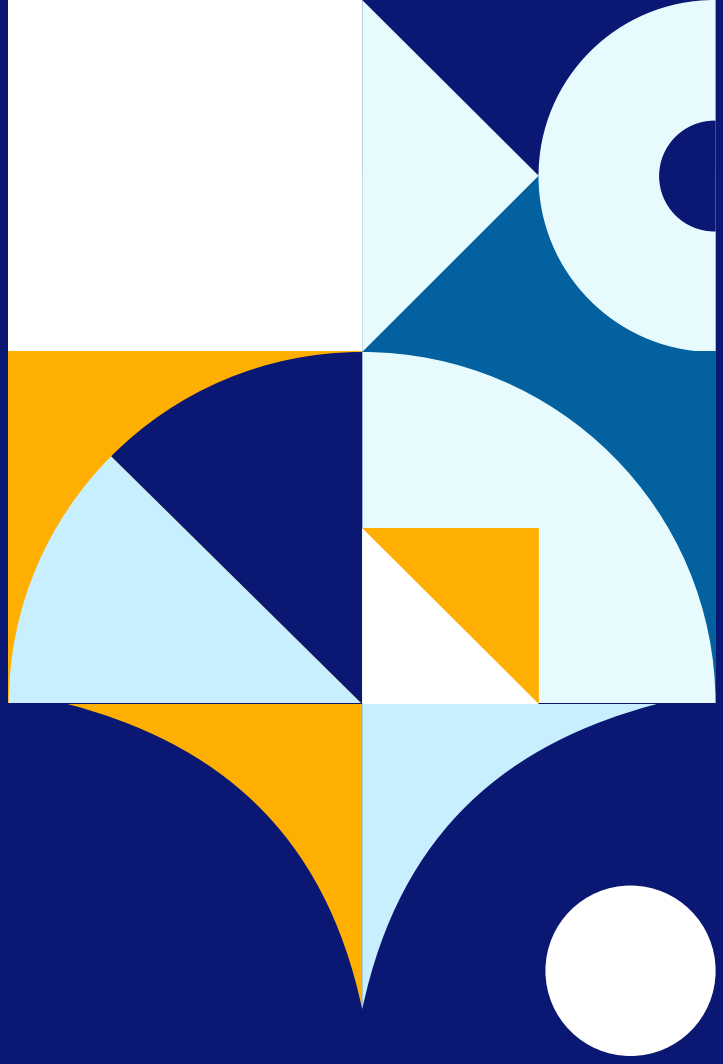

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