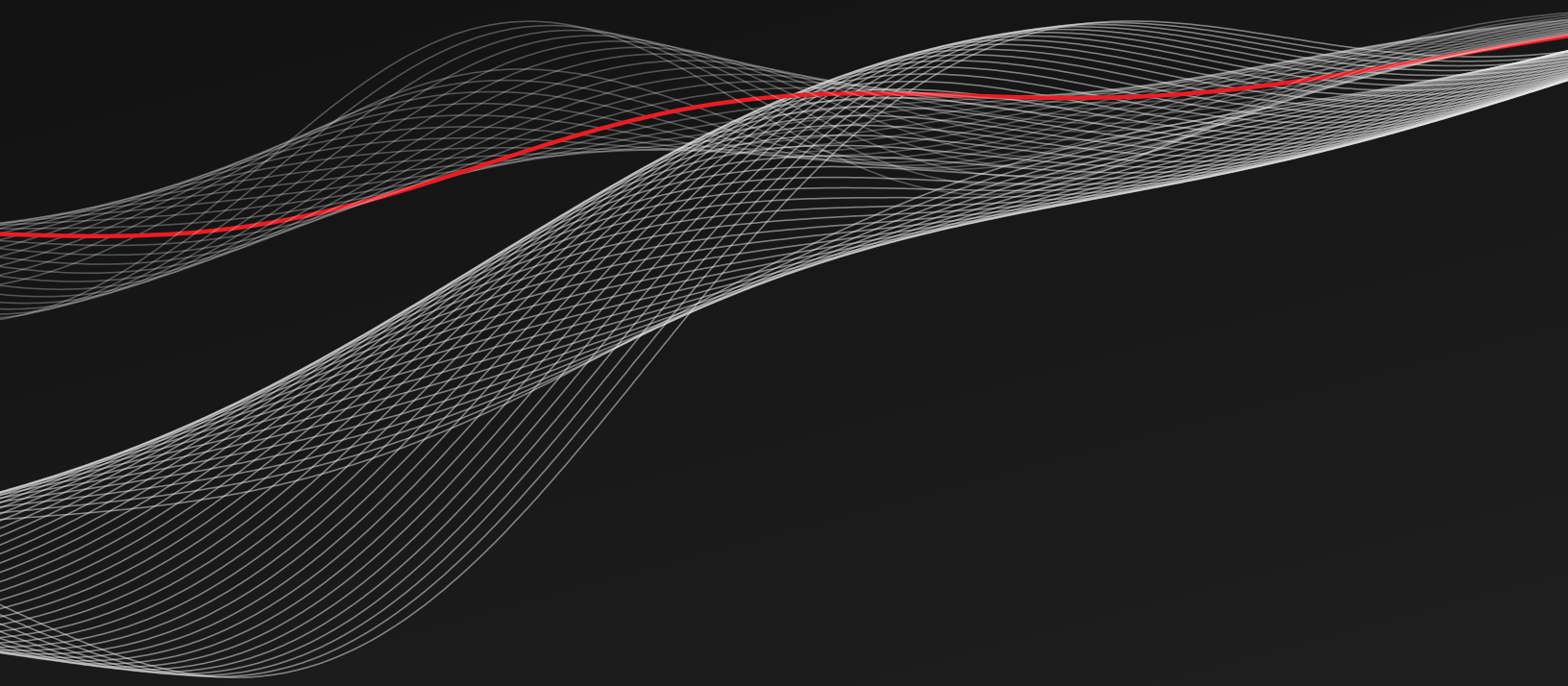


1 | Patents

The rising trajectory of quantum patent filings serves as an indication of innovation and demonstrates the maturation of research efforts and intensifying geopolitical and institutional competition. Intellectual property assets have become pivotal to establishing competitive advantage as quantum technologies progress from experimental research to commercialization.

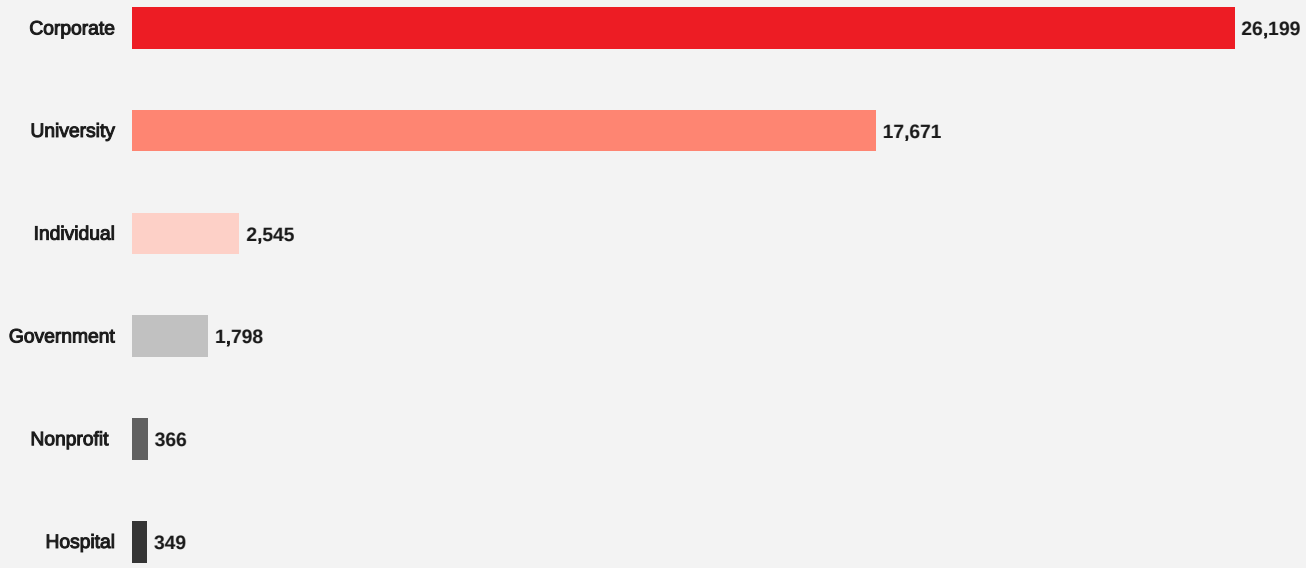
This report follows a standardized framework for analyzing global innovation trends by tracking patent data based on patent families, which consist of multiple patent applications covering the same fundamental invention. By accounting for cross-border filing variations and normalizing discrepancies between regional patent systems, patent families offer a more robust metric for evaluating technological advancement than individual patent counts. As a result, this approach enables researchers to evaluate the global scope of innovation, track international intellectual property protection, and detect geographic market diffusion.

The data for this chapter was sourced from Accenture Research and The Quantum Insider.

1.1 | Patents by entity

Fig. 1.a | Quantum computing patent families by origin, 1999–2025

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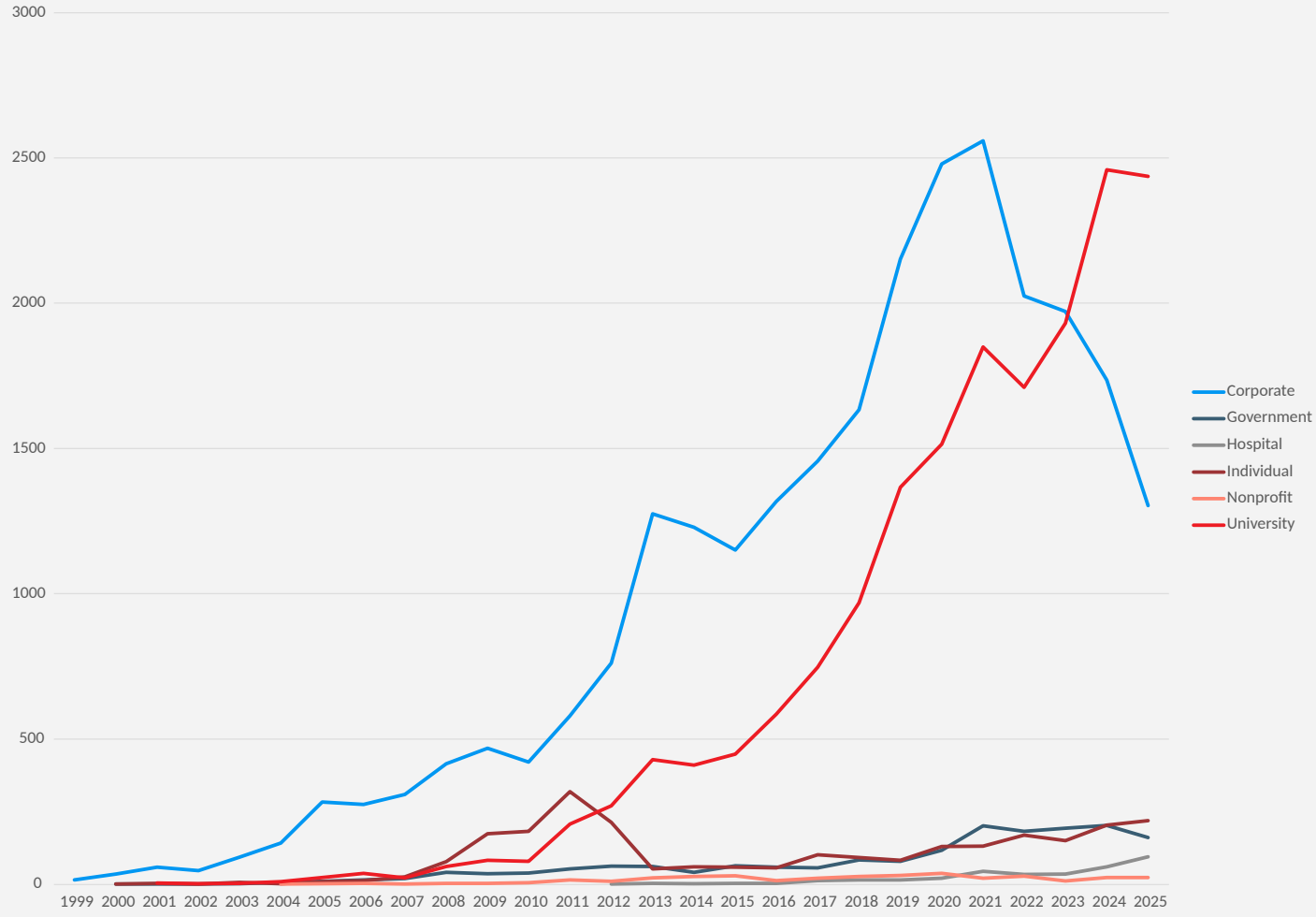


Corporations have emerged as the dominant force in quantum computing patent development, demonstrating significant investment in intellectual property protection. Corporate entities lead the landscape with 53.5% of total patents (26,199), followed by universities with 36.1% (17,671). Together, these two sectors account for nearly 90% of all quantum computing patents, underscoring a high concentration around these two categories. Individual inventors hold the third position with 5.2% (2,545), followed by government institutions at 3.7% (1,798). Nonprofit organizations contribute a modest 0.7% (366), while hospitals show the least participation at 0.7% (349), trailing only marginally behind nonprofits.

The disparity between the top two sectors and the remaining four highlights a pronounced divide in the patent landscape: corporate and academic institutions operate at a scale roughly seven to ten times larger than individual inventors and government bodies, while nonprofits and hospitals remain peripheral contributors. This distribution suggests that meaningful entry into quantum computing patent development still requires the substantial R&D infrastructure and capital that corporations and universities are uniquely positioned to provide.

Fig. 1.b | Quantum computing patent families by origin, 1999–2025

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While universities have recently led annual patent family filings, corporations remain the primary driver of total historical volume across the entire period.

The transition period from 2005 to 2012 marked a significant shift in patent activity across nearly every sector.

Beginning in 2005, corporate patents jumped notably, doubling from 142 filings in 2004 to 284, and then continuing a steady upward march through the decade to reach 762 by 2012, an over fivefold increase in just eight years. This early surge established corporations as the clear engine of quantum computing innovation during the field's formative years. Individual inventors began making more substantial contributions after 2008, when filings nearly tripled from 26 to 78, then surged again to 174 in 2009 before settling into the 180–320 range through 2011–2012, establishing individuals as a consistent, if secondary, presence in the landscape. Government participation also strengthened during this window, rising from just 20 patents in 2007 to 41 in 2008 and climbing further to 63 by 2012, while hospitals made their first tentative appearance in 2006 with a single filing, followed by a second isolated filing in 2012, underscoring how peripheral clinical involvement remained at this stage. Universities, meanwhile, grew from a mere 10 patents in 2004 to 270 by 2012, a twenty-sevenfold expansion that quietly laid the groundwork for academia's eventual dominance.

The years 2013 to 2020 represent a period of accelerated growth and sectoral diversification. Corporate filings climbed sharply, jumping 67% from 762 in 2012 to 1,275 in 2013, and continued an upward trajectory, with only a brief dip in 2014–2015, to reach 2,479 by 2020, more than triple the 2012 figure. Universities mirrored this expansion even more dramatically, growing from 270 patents in 2012 to 430 in 2013 alone, and eventually surpassing 1,500 annual filings by 2020, a nearly sixfold increase over the period that signaled academia's rapidly deepening involvement in quantum computing research. Government filings roughly doubled again, moving from 62 in 2013 to 118 in 2020, while nonprofit activity, though consistently small, peaked at 38 filings that same year. Hospitals began contributing more consistently from 2017 onward, moving from occasional single-digit filings to double digits by 2018 and reaching 21 by 2020, a modest but telling sign of clinical and applied interest entering the field for the first time on a sustained basis.

Government patent activity grew more than tenfold in under two decades, rising from 20 filings in 2007 to a peak of 202 in 2021, making it, alongside universities, one of the fastest-growing categories even though it remains a small share of the overall total.

The most recent period, from 2021 to 2025, reveals a notable inflection point in the overall structure of the patent landscape. Corporate patents peaked in 2021 at 2,559 filings before entering a decline, falling every year thereafter to just 1,304 by 2025, a drop of roughly 49% from their peak. Universities, by contrast, continued to expand through this window even as corporate activity retreated, reaching 2,459 filings in 2024 and 2,436 in 2025, meaning that for the first time, annual university patent activity exceeded corporate activity in two consecutive years, both 2024 and 2025. Hospitals also saw their strongest growth during this stretch, climbing from 34 filings in 2022 to 95 in 2025, nearly tripling in just three years and marking the fastest proportional growth of any sector in the most recent period. Individual inventors likewise reached their highest recorded levels in 2025 at 220 filings, suggesting renewed grassroots engagement even as corporate momentum cooled. Government filings, after peaking at 202 in 2021, have since moderated but remain well above pre-2020 levels.

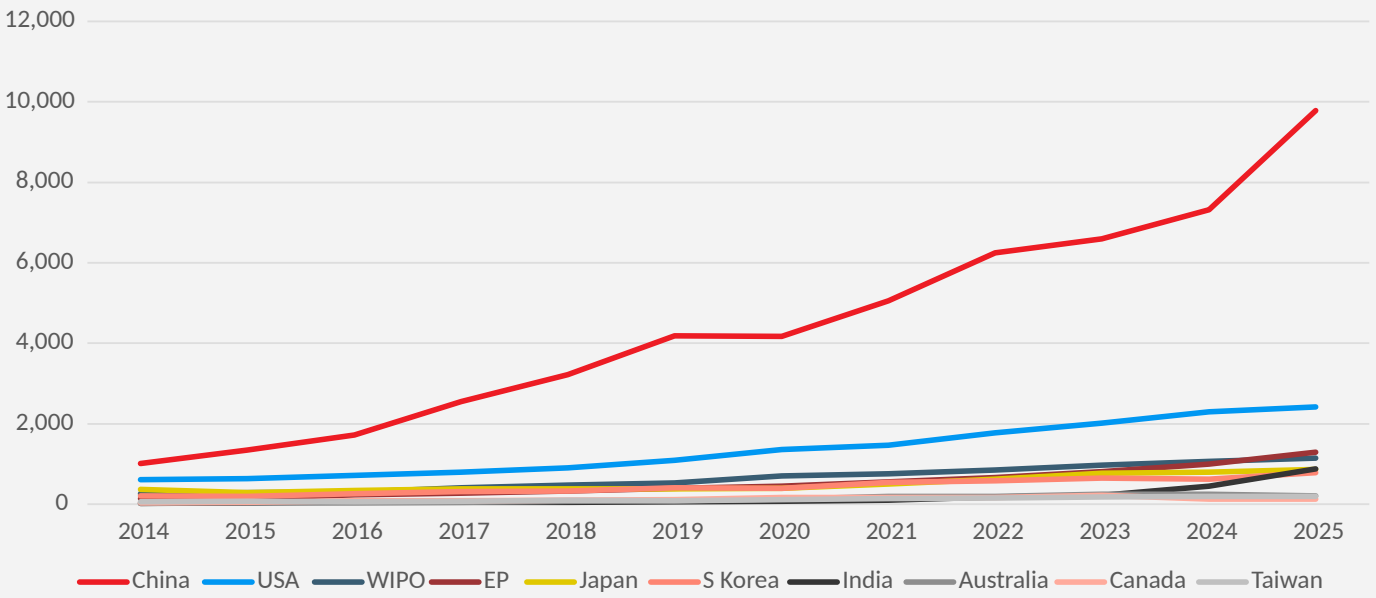
The corporate-to-university ratio has essentially inverted, which might pave the way for increased cooperation in patent applications between companies and universities[1]. In 2013, corporations filed nearly 3 times as many patents as universities (1,275 vs. 430); by 2025, universities filed nearly 2 times as many patents as corporations (2,436 vs. 1,304), a significant reversal in relative position over just twelve years. Part of this shift may be compositional, as China’s share of total filings has grown sharply (see 1.2) and some of its leading filers, such as the Chinese Academy of Sciences, sit at the boundary between state research institutions and commercial entities.[2] Another potential driver is a shift by corporations toward protecting certain research as trade secrets rather than filing patents, as the field matures and disclosure becomes more strategically costly. We were unable to test for either of these explanations in our data.

Together, these patterns point to a maturing field whose visible innovation is increasingly academic in origin. Whether this reflects a genuine slowdown in corporate activity, a shift in how and where that activity is disclosed, or changes in who is doing the filing in the first place is a question the data cannot yet answer.

1.2 | Patents by country

Fig. 1.c | Quantum technology patents by country, 2014–2025

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The global distribution of patent filings from 2014 to 2025 tells a story of increasingly lopsided growth, with China's rise reshaping the competitive landscape almost entirely on its own.

In 2014, China led the field with 1,013 patents, already ahead of the United States' 613, but the gap was still relatively contained, with China having roughly 1.65 times as many patents as the U.S. Over the following decade, that gap widened dramatically. China's patent numbers grew nearly tenfold, reaching 9,790 by 2025, while the U.S. grew at a comparatively modest pace, nearly quadrupling to 2,423. As a result, China now shows roughly four times as many patents annually as the United States, a decisive shift from the 2014 ratio and a clear signal of China's increasing importance in intellectual property across this space.[3]

9,790

In China, more quantum technology patents were filed than in the rest of the world's top five combined: China's 9,790 filings in 2025 exceed the combined total of the U.S., WIPO, EP and Japan, demonstrating a strong contrast.

The 2014–2018 period saw steady, broad-based growth across most major players. China's patents grew from 1,013 to 3,224, more than tripling in five years, while the U.S. grew more gradually from 613 to 913. WIPO and EP filings also expanded steadily, with EP more than doubling from 150 to 331 and WIPO growing from 265 to 476. Japan, by contrast, remained relatively flat during this window, dipping slightly in 2015 before recovering to 380 by 2018, suggesting a period of consolidation rather than expansion. South Korea showed modest but consistent gains, rising from 210 to 330, while countries like India and Taiwan grew from a low base but had not yet entered a phase of rapid acceleration.

The 2019–2022 period marks the beginning of China's most explosive growth phase. Patent numbers jumped from 4,184 in 2019 to 6,255 in 2022, an increase of 50% in just three years, while the global total grew more slowly by comparison, indicating China was capturing a rapidly increasing share of overall patent activity.

The U.S. also grew meaningfully during this stretch, climbing from 1,095 to 1,772, but its growth rate remained well below China's. This period also saw South Korea briefly overtake Japan for the first time, a notable reversal after years of Japan holding a consistent lead. India's growth began accelerating sharply as well, more than doubling from 79 filings in 2020 to 181 in 2022, foreshadowing the dramatic gains still to come. During this period, Canada and Australia both showed an early high around 2021, with Canada at 176 and Australia climbing steadily toward 198, before both showed a small decline in the subsequent year.

The most recent period, 2023–2025, has been defined by China's continued acceleration even as several other filers plateaued or pulled back. China surged from 6,603 in 2023 to 9,790 in 2025, adding nearly 3,200 patents in just two years. India's growth during this window has been noticeable, nearly doubling from 226 in 2023 to 449 in 2024, then almost doubling again to 883 in 2025, making it the fastest-growing location by a wide margin. Japan and South Korea have continued their close competition, with Japan retaining a narrow lead, including in 2025 (874 vs. 792), reversing South Korea's brief lead from the previous period. Meanwhile, Canada and Australia both show signs of contraction, with Canada falling from a peak of 220 in 2023 to just 127 by 2025, and Australia dropping from 246 to 210 over the same period, the only two countries to show declines from their respective peaks.

2×

In the 2023–2025 period, India was the fastest-growing country, nearly doubling from 226 in 2023 to 449 in 2024, then almost doubling again to 883 in 2025, while Canada and Australia were the only two players to shrink from their peak levels.

Looking at the landscape as a whole, global patent totals for the top 10 grew from 2,773 in 2014 to 17,749 in 2025, marking a more than sixfold increase over the eleven-year span, but this growth was not evenly distributed.

China alone accounted for roughly 37% of the 2014 total and had grown to account for over 55% of the 2025 total. The U.S. share, by contrast, actually shrank over the same period, from about 22% of the global top 10 total in 2014 down to roughly 14% in 2025, despite growing in absolute terms, illustrating that China’s expansion has outpaced even the next-largest filer.

1.2.1 | Leading organizations in quantum patents

Fig. 1.d | Top 3 quantum technology patent filing organizations by country (Patent Landscape 2024–2025)

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Country	1ST PLACE	2ND PLACE	3RD PLACE
Australia	1 Alphabet	2 IBM	3 Terra Quantum
Canada	1 Alphabet	2 Terra Quantum	3 Northrop Grumman
China	1 Origin Quantum	2 Chinese Academy of Sciences	3 State Grid Corp
India	1 Vellore Institute of Technology	2 Saveetha Institute of Medical and Technical Sciences	3 IBM
Japan	1 IBM	2 NEC Corp	3 Fujitsu
S Korea	1 Samsung	2 National Research Council of Science and Technology	3 Korea University
Taiwan	1 Fujifilm	2 Shin-Etsu Chemical	3 Photonic
USA	1 IBM	2 Alphabet	3 IonQ

Note: There is an approximately 18-month lag in patent publication data; therefore, recent years' data may be subject to change.

IBM and Alphabet show a similar cross-border pattern, with IBM leading in the United States and Japan, and Alphabet leading in both Australia and Canada. China stands out as a major market where a domestic specialist, Origin Quantum Computing Technology (Hefei), leads, consistent with China's broader push for self-reliance in strategic technologies and quantum in particular. India is the only country where the patent filings in this recent period were led by an academic institution, Vellore Institute of Technology, rather than a corporation, which might suggest a market where research output is translating into practice-oriented IP.

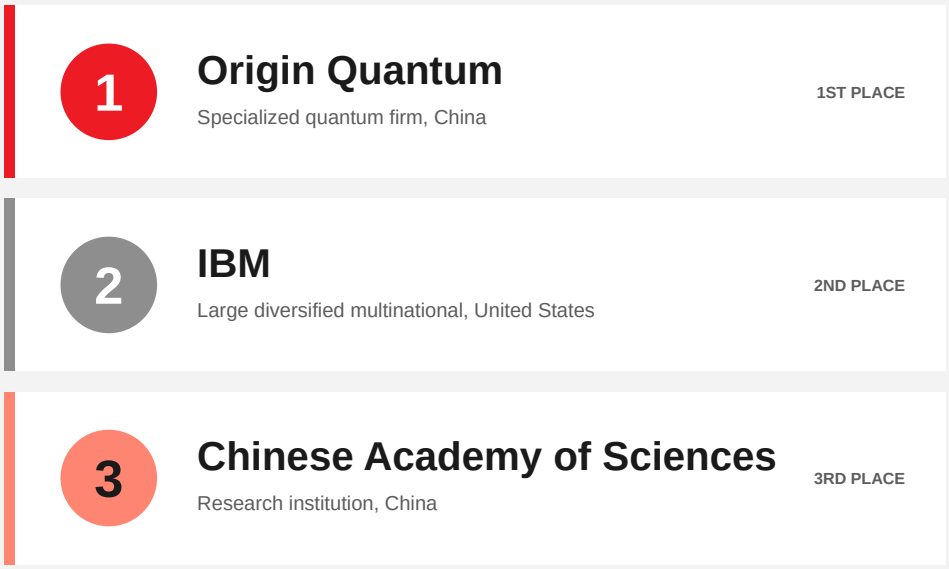
It is also worth noting that IBM is listed most frequently in the top 3, appearing 4 times (Australia #2, India #3, Japan #1, USA #1), followed by Alphabet with 3 appearances (Australia #1, Canada #1, USA #2), and Terra Quantum with 2 (Australia #3, Canada #2).

Australia, Canada, India, and Japan have IBM, Alphabet, or both somewhere in their top 3, whereas China, South Korea and Taiwan do not have an American company appear in their top 3 rankings, which are instead mostly populated by domestic or regional players. This shows that quantum/IP landscapes in East Asia reflect strong national R&D ecosystems and a degree of patent self-sufficiency, versus other regions where global tech incumbents extend their patent footprint internationally rather than being crowded out by local competitors.

In the U.S., Japan, Australia and Canada, every single company in the top 3 is a corporation. But in India, China and South Korea, academic and research institutions crack the top 3, suggesting more university-driven quantum patent activity than commercially driven, unlike the more corporate-dominated landscapes elsewhere.

Fig. 1.e | Global leaders in quantum technology patents, 2024–2025

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Note: There is an approximately 18-month lag in patent publication data; therefore, recent years' data may be subject to change.

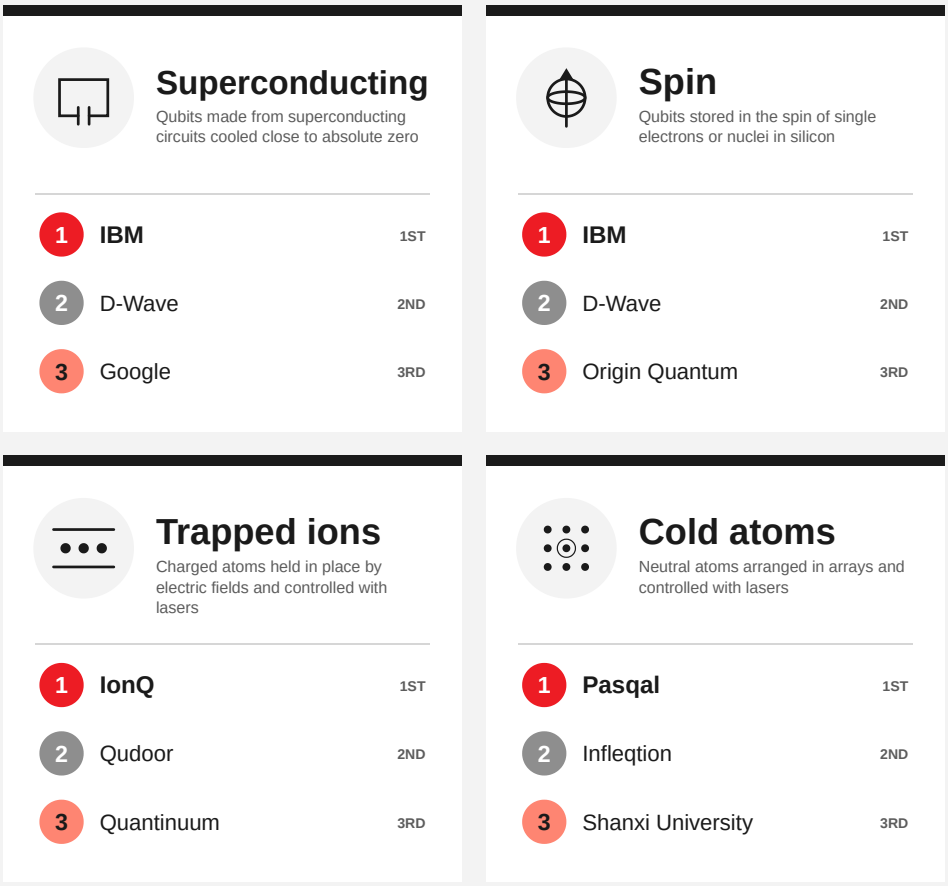
The global top three show that quantum patent leadership is currently shared by a mix of a specialized quantum firm, a large diversified multinational and a research institution, indicating there are different organizational models at the frontier of this technology. Origin Quantum leads globally, followed by IBM, with the Chinese Academy of Sciences in third. With Origin Quantum in the top spot worldwide and the Chinese Academy of Sciences in third place, China holds two of the top three global positions. It might shed some light on China's deliberate two-track strategy: state-funded fundamental research feeding into commercialization vehicles, such as Origin Quantum, which was incubated out of the Chinese Academy of Sciences[4]. IBM's second-place global ranking is notable given its scale and breadth as a diversified technology company rather than a firm solely focused on quantum research.

Its consistent lead in both the U.S. and Japan further points to a substantial and sustained quantum patent success running across multiple markets simultaneously.

For a more granular analysis, an extensive research report[5] by the European Quantum Industry Consortium (QuIC) looks into patent applications between 2015 and 2023, and maps the leading organizations for the four major qubit platforms for quantum computing applications based on the number of active patent families.

Fig. 1.f | Leading organizations by qubit modality (patent landscape ranking)

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Note: There is an approximately 18-month lag in patent publication data; therefore, recent years' data may be subject to change.

IBM, D-Wave and Google form the top three in active patents on superconducting qubits; IBM and D-Wave also keep their relative positions in spin qubits where Origin Quantum ranks third. IonQ, Qudoor and Quantinuum are placed in the top three for most patents regarding trapped ions, while Pasqal, Infleqtion and Shanxi University form the top three in cold atoms.

1.3 | Future research

We aim to keep the community updated on the rapidly shifting quantum patent landscape. This involves tracking where patent activity is concentrating globally, as well as identifying new technology hubs and their areas of expertise. Moving forward, we plan to analyze these patents by specific quantum subfields and classification categories. We welcome any stakeholders interested in contributing data or insights to collaborate with us.

You can reach us at contact@qir.mit.edu

Footnotes

[1] Matt Swayne, 'Penn State Files Three Patent Applications Related to Delta Sponsored Research' (The Quantum Insider, 1 June 2026) <https://thequantuminsider.com/2026/06/01/penn-state-files-three-patent-applications-related-to-delta-sponsored-research/> accessed 13 June 2026.

[2] This dynamic is also observable globally, for example, some of China's leading filers, such as the Chinese Academy of Sciences, sit at the boundary between state research institutions and commercial entities. See: Hideki Tomoshige and Phillip Singerman, 'Understanding China's Quest for Quantum Advancement' <https://www.csis.org/analysis/understanding-chinas-quest-quantum-advancement> accessed 26 August 2026.

[3] Although a more granular approach might demonstrate different results, a June 2026 report by Special Competitive Studies Project looks into patent impact and finds that regarding quantum error correction 55% of the most cited patents are U.S.-affiliated, compared to 18% for China. 'Quantifying the Competition: Assessing Leadership in Quantum Technologies' (SCSP 2026).

[4] Matt Swayne, 'China's Origin Quantum Ships First Quantum Computer' (*The Quantum Insider*, 3 February 2023) <https://thequantuminsider.com/2023/02/03/chinas-origin-quantum-ships-first-quantum-computer/> accessed 26 August 2026.

[5] 'A Portrait of the Global Patent Landscape in Quantum Technologies' (QuIC 2026).

