



THE INNOVATION INSTITUTE  
at the MassTech Collaborative

# Massachusetts Quantum Ecosystem Update

January 2026

## Massachusetts has strengthened its position as a leading U.S. quantum ecosystem since 2023

Progress is strongest in research, company formation, and capital, with workforce depth and enterprise demand at earlier advancing stages

Ecosystem metric <sup>1</sup>	2023 baseline	2025 update	Progress and Key Takeaways
Academic Research Groups	131	138	<b>Seven net new academic research groups</b> have strengthened the ecosystem, with growth concentrated in optics, photonics, neutral-atom systems, and algorithmic research.
Quantum Companies	59	76	Massachusetts' quantum company base expanded materially, with the <b>number of operating firms increasing from 59 to 76 since 2023.</b>
Quantum Company Workforce	~1,400 FTEs	~1,550 FTEs	<b>Quantum company employment has expanded</b> , with growth concentrated among small and scaling firms supporting commercialization efforts.
Enterprise users	11	14	<b>Industry demand is emerging</b> in targeted verticals, with life sciences and telecom firms increasingly engaging through pilots and early-stage quantum-enabled applications
Private capital	~\$159M	~\$391M	<b>Private capital activity increased substantially since 2023</b> , driven by a small number of large financings, alongside strategic acquisitions of Massachusetts-based companies by global quantum firms.

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# Massachusetts' quantum ecosystem has advanced across six pillars since 2023

Public funding, infrastructure, research, industry, users, and capital have all advanced since 2023

Ecosystem Pillar		Development since 2023	Progress indicators	Example organizations (non-exhaustive)
1	Public funding	<ul style="list-style-type: none"> <li>Quantum is a stated Massachusetts priority, backed by coordinated programs and meaningful public commitments</li> <li>Federal validation has strengthened: Massachusetts institutions are winning/renewing major NSF/DOE/DoW-backed efforts, pulling the ecosystem towards application development</li> </ul>	<ul style="list-style-type: none"> <li>Level of funding</li> <li>Pace of state /federal quantum initiatives</li> </ul>	
2	Infrastructure	<ul style="list-style-type: none"> <li>Expansion of shared infrastructure including a Quantum Computing Complex and planned packaging and test facilities</li> <li>Private infrastructure announced in March 2025 with NVIDIA Advanced Quantum Research Center.</li> </ul>	<ul style="list-style-type: none"> <li>Infrastructure</li> <li>Geographic distribution</li> </ul>	
3	Academia and research	<ul style="list-style-type: none"> <li>Increased university quantum groups and centers have secured state and federal grants</li> <li>Research expanded from materials focus to optical, atomic and algorithms</li> </ul>	<ul style="list-style-type: none"> <li>Research base</li> <li>IP impact</li> </ul>	
4	Quantum Companies	<ul style="list-style-type: none"> <li>Number of companies has increased to 76 with diverse portfolio across quantum hardware, networking and software</li> <li>Estimated 10% increase in size of quantum workforce</li> </ul>	<ul style="list-style-type: none"> <li>Number of Companies</li> <li>Workforce size</li> </ul>	
5	Enterprise Users	<ul style="list-style-type: none"> <li>Rising uptake by life sciences, telecoms, and advanced materials, with pilots at companies like Moderna, Biogen, and RTX</li> <li>Regional enterprise engagement programs are connecting end users to academic and startup expertise</li> </ul>	<ul style="list-style-type: none"> <li>Number of Enterprise Users</li> </ul>	
6	Private capital	<ul style="list-style-type: none"> <li>Private investment, mergers and acquisitions activity have increased since 2023 most notably with QuEra's series B raise and the acquisitions of Atlantic Quantum by Google and Lightsynq by IonQ</li> <li>Active state capital with MassVentures investment in Atlantic Quantum</li> </ul>	<ul style="list-style-type: none"> <li>Total invested in Massachusetts quantum companies</li> <li>Investor base</li> </ul>	

## Federal awards validate Massachusetts’ research leadership and applied pathways

DARPA, DOE, NSF awards anchor Massachusetts institutions in national quantum priorities

### Selected examples of Federally-supported initiatives involving Massachusetts institutions

Federal Initiative	Date	Funding <sup>1</sup>	Description
<b>QBI</b> (DARPA <sup>2</sup> )	Dec 2025	Potential up to \$15M	<ul style="list-style-type: none"> <li>• QuEra selected for Stage B of DARPA’s Quantum Benchmarking Initiative (QBI)</li> <li>• Federal validation pathway of the platform’s potential to achieve utility-scale operation by 2033</li> </ul>
<b>NQISRC</b> (DOE Office of Science)	Nov 2025	\$625M for five centers	<ul style="list-style-type: none"> <li>• DOE renewed funding for its five National Quantum Information Science Research Centers (NQISRCs)</li> <li>• Massachusetts institutions (MIT, Harvard, Lincoln Lab, Tufts, UMass Amherst) contribute to four centers (Quantum Systems Accelerator, Co-design Center for Quantum Advantage, Q-NEXT, Quantum Science Center)</li> </ul>
<b>SCALE Capital Program</b> (NEMC/DoW-backed)	Oct 2025	\$10.2M	<ul style="list-style-type: none"> <li>• \$10.2M awarded to 10 microelectronics projects across Massachusetts through NEMC’s Supporting Chip Advancement from Lab to Enterprise (SCALE) Capital Program</li> <li>• Quantum-relevant Massachusetts awardees include Harvard Centre for Nanoscale Systems (\$1.4M), MITRE (\$420K), and Bridgewater State (\$1.2M)</li> </ul>
<b>National Quantum Virtual Laboratory</b> (NSF <sup>3</sup> )	Sept 2025	\$16M (\$4M per team over two years)	<ul style="list-style-type: none"> <li>• NSF NQVL selected four design-phase teams to plan shared national quantum R&amp;D testbeds</li> <li>• Massachusetts institutions are involved in two of the four design teams:                             <ul style="list-style-type: none"> <li>- Open-Stack Rydberg Atom Quantum Computing Laboratory (ORAQL) is led by MIT</li> <li>- Quantum Advantage Class Trapped Ions System (QACTI) is led by Duke with participation from Tufts</li> </ul> </li> </ul>
<b>OASIC</b> (DARPA <sup>2</sup> )	June 2025	Phase I: \$200K Phase II: \$1.8M	<ul style="list-style-type: none"> <li>• Optical-Atomic System Integration and Calibration (OASIC) is a Small Business Technology Transfer (STTR) program</li> <li>• The first phase (early 2024) selected three small business–university teams. The qubits testbed is led by QuEra, Harvard University, MIT, and Montana State University</li> </ul>
<b>PROPEL Program</b> (NEMC/CHIPS-backed)	Launched 2024	Up to \$4M (\$200K per company)	<ul style="list-style-type: none"> <li>• NEMC’s Powering Regional Opportunities for Prototyping Microelectronics (PROPEL) program supports applied R&amp;D and early hardware prototyping collaborations between startups and universities</li> <li>• Quantum-relevant Massachusetts awardees include Qunett (\$94K), Quantum Microwave Components (\$96K), Millimeter Wave Systems (\$73K), Brightlight Photonics (\$113K), and Quantum Essentials (\$99K)</li> </ul>
<b>MIT-Harvard CUA</b> (NSF)	Oct 2023	\$76M (for six years)	<ul style="list-style-type: none"> <li>• NSF renewed funding for the MIT-Harvard Center for Ultracold Atoms (CUA) to advance experiments in quantum gases, Rydberg atom arrays, and light–matter coupling</li> <li>• CUA is one of four U.S. centers sharing the \$76 million under the NSF Physics Frontiers Centers program</li> </ul>

## State investments are catalyzing shared quantum infrastructure and workforce capacity

Targeted programs focus on compute access, hardware development, and applied training

### Selected examples of recent Massachusetts quantum-related initiatives

State Initiative	Date	Amount	Description
<b>Quantum Supply Chain Accelerator – Feasibility study</b> (STCC; Western Massachusetts EDC <sup>1</sup> )	Nov 2025	\$1M	<ul style="list-style-type: none"> <li>Assess feasibility of a Quantum Supply Chain Accelerator led by Springfield Technical Community College, focused on in-state prototyping, packaging, and test capabilities.</li> </ul>
<b>Hardware and Commercialization Network</b> (UMass Boston; WNE)	Oct 2025	\$3.8M	<ul style="list-style-type: none"> <li>Expand a statewide quantum hardware development and commercialization network, including seed grants, new packaging and assembly capacity, and core-facility upgrades.</li> </ul>
<b>Quantum Technologies Capital Equipment Award</b> (Bridgewater State University)	Sept 2025	\$400K	<ul style="list-style-type: none"> <li>Enable hands-on undergraduate quantum training through new capital equipment supporting physics, engineering, and cybersecurity programs.</li> </ul>
<b>Advanced Optics and Coatings Manuf. And Characterization</b> (UMass Amherst)	Oct 2023	\$5M	<ul style="list-style-type: none"> <li>Establish a publicly accessible facility to support testing, research, and production of advanced optical technologies.</li> </ul>
<b>Quantum Computing Complex</b> (MGHPCC, QuEra)	Oct 2024	\$16M (\$5M + \$11M match)	<ul style="list-style-type: none"> <li>Establish a Quantum Computing Complex at MGHPCC to provide open-access quantum compute, support hardware innovation, and enable applied workforce training.</li> </ul>
<b>Springfield Quantum Training Academy</b> (PVPC <sup>3</sup> ; STCC)	Jun 2024	\$500K	<ul style="list-style-type: none"> <li>Launch the Springfield Quantum Training Academy to build applied and technician-level quantum training pathways in Western Massachusetts.</li> </ul>

## Massachusetts' shared quantum infrastructure has expanded significantly since 2023

New private and public facilities strengthen in-state capacity for hardware development, testing, and applied R&D

### Selected examples of new and expanded physical infrastructure and ecosystem hubs

#### FEDERAL and DEFENSE R&D

##### MIT Lincoln Lab

Lexington  
FFRDC, DoW. Superconducting qubits, PQC, networking

##### DARPA INSPIRED and QuANET: RTX / BBN

Cambridge  
Quantum sensing and networking

##### BARQNET Testbed

Cambridge, Boston  
MIT / MIT-LL / Harvard

#### COMPUTING and R&D

##### MGHPCC Quantum Computing Complex

Holyoke  
Neutral-atom quantum computer + HPC, open-access R&D.

##### UMass Amherst Adv. Optics Mfg and ACQuRe Lab

Amherst  
Open-access nanoimprint patterning and fabrication, NSF CQN ERC

##### MIT.nano

Cambridge  
Cleanroom and analysis facilities for quantum materials fabrication

#### CORPORATE INNOVATION

##### NVIDIA Accelerated Quantum Research Center

Boston  
Hybrid quantum-classical, HQI and EQuS collaboration

##### AWS Center for Quantum Networking

Cambridge  
Repeaters, secure data distribution

#### ACADEMIC RESEARCH CENTERS

##### MIT CQE and Quantum Ecosystem

~130 groups, ORAQL NQVL lead

##### Harvard Quantum Initiative (HQI)

~40 groups. Neutral atom arrays, optics, condensed matter

##### Northeastern EQUAL Laboratories

Sensing, metrology, materials research

##### UMass Boston DataQS and Hardware Core

Cryogenic testbeds, dilution refrigerators. \$5M NSF EQUIP-UMB

##### MIT-Harvard CUA / CIQM / MPHQ

NSF Physics Frontier Center, quantum materials, quantum gases and control

##### BU Quantum Science and Engineering Consortium

University-wide initiative (2024). Quantum comms, sensing, photonics

#### PACKAGING and PROTOTYPING

##### WNE Center for Quantum Hardware Dev.

Springfield / Hatfield  
Packaging, assembly, device testing.

##### BU Photonics Center

Boston  
Quantum communication and measurement labs, nanophotonic fabrication

##### Quantum Hardware Packaging and Assembly

Hatfield  
New 2025 via award to UMass Boston and WNE. Lab prototypes to fabrication-ready components

#### WORKFORCE and SUPPLY CHAIN

##### STCC Springfield QSCA

Feasibility study launched, 1Q2026

##### Bridgewater State Quantum Training

Undergraduate: physics, engineering, cybersecurity

##### Springfield Cybersecurity Center

\$5M facility. Cybersecurity training and SOC (adjacent)

##### Berkshire Innovation Center

Pittsfield  
Advanced Optics TechHub. Accelerator, manufacturing academy, AR/VR sim lab

## Massachusetts’ quantum research base continues to expand across leading institutions

New groups since 2023 strengthen optics, atom arrays, and algorithmic research

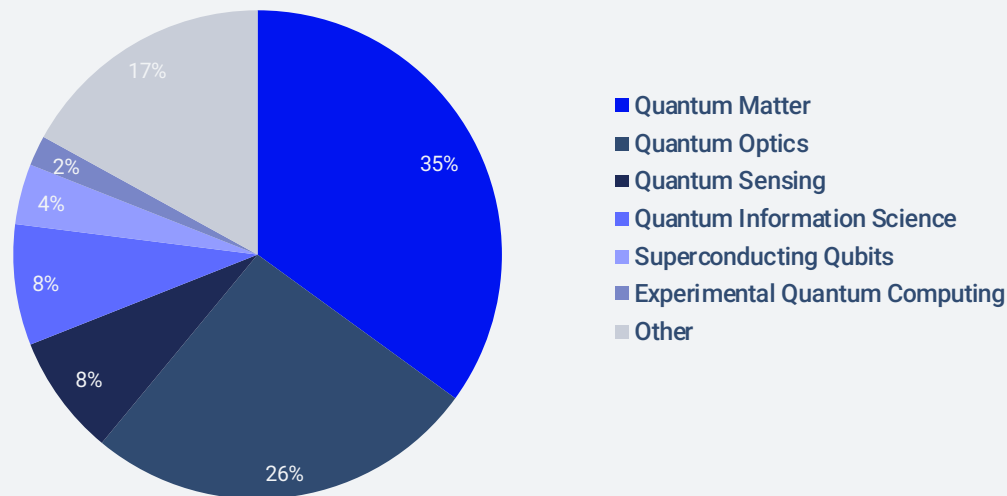
Quantum research groups by institution, 2023 study vs 2025 refresh

University	Example Groups and Centers	2023 study	2025 refresh	Key movements
HARVARD UNIVERSITY	Harvard Quantum Initiative  Harvard Edge  Psi Group  Yao Group	38	41	<ul style="list-style-type: none"> <li>+4 groups: Lee Group, Semeghini Lab, Photonics Systems Lab, Yao-Group</li> <li>- 1 group: Narang Lab moved to UCLA</li> </ul>
Massachusetts Institute of Technology	QUANTA  EQUS  WINSLOW LAB  QMIT MIT Quantum Initiative	29	30	<ul style="list-style-type: none"> <li>+ 1 center: Quantum @MIT Initiative</li> </ul>
BOSTON UNIVERSITY	Laboratory for Surface Physics and Electron Spectroscopies  Diamond	20	20	<ul style="list-style-type: none"> <li>No change</li> </ul>
BOSTON COLLEGE	TAFTI LAB  Q	9	9	<ul style="list-style-type: none"> <li>No change</li> </ul>
Northeastern University	Northeastern University Quantum Materials and Sensing Institute  EQUAL  Stevenson Group	7	8	<ul style="list-style-type: none"> <li>+1 center: Quantum Materials and Sensing Institute (QMSI)</li> <li>Graphene Research Lab renamed and expanded into 2D Quantum Materials lab</li> </ul>
UMass Boston	Quantum Theory Group  QBism Group $\langle \text{Data}   Q \rangle_S$	7	7	<ul style="list-style-type: none"> <li>No change</li> </ul>
UMASS AMHERST	Center for Quantum Networks	6	9	<ul style="list-style-type: none"> <li>+ 3 groups: Niffenegger Lab; Quantum Information Lab; ACQuiRE</li> </ul>
University of Massachusetts UMASS Lowell	QUEST  Multiscale Electromagnetics Group	4	3	<ul style="list-style-type: none"> <li>-1 group: Quest Group’s PI moved to Northwestern</li> </ul>
WPI	AFMLab	4	4	<ul style="list-style-type: none"> <li>No change</li> </ul>
Tufts UNIVERSITY	Tufts QIQC Group	4	4	<ul style="list-style-type: none"> <li>Peter Love Group expanded its trapped-Ion QC work but remains one group</li> </ul>
CLARK UNIVERSITY	Clark University Quantum Lab	2	2	<ul style="list-style-type: none"> <li>No change</li> </ul>
Brandeis UNIVERSITY	Quantum and Gravitational Theory Group	1	1	<ul style="list-style-type: none"> <li>No change</li> </ul>
		131	138	

## Massachusetts' quantum research portfolio is diversified across high-impact domains

Strength spans quantum matter, optics, sensing, and computing, supporting multiple commercialization pathways

### Research focus areas (based on groups and centers)



- Quantum Matter remains dominant since 2023, reflecting deep condensed-matter and device-physics expertise.
- Quantum Optics maintains a consistent and complementary role anchored by photonics, atom-array, and ion-trap groups
- Quantum Sensing sustains steady activity through NV-diamond and measurement-engineering labs

### Strategic Implications for the Ecosystem

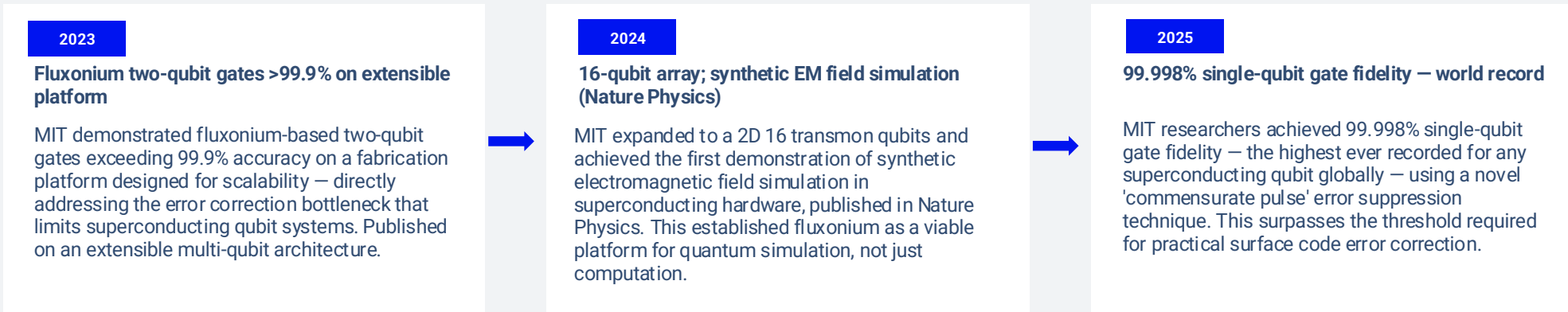
<b>Platform Resilience</b>	<ul style="list-style-type: none"> <li>• Diversification across qubit modalities reduces dependence on any single technical pathway as the field evolves.</li> </ul>
<b>Commercial Opportunity</b>	<ul style="list-style-type: none"> <li>• The research mix supports multiple commercialization pathways across sensing, networking, and computing.</li> </ul>
<b>Scale Alignment</b>	<ul style="list-style-type: none"> <li>• Strong device-level and systems research aligns with near-term scale-up and supply-chain development.</li> </ul>
<b>Ecosystem Durability</b>	<ul style="list-style-type: none"> <li>• Breadth across platforms and applications increases long-term adaptability as market demand crystallizes.</li> </ul>

## Massachusetts-based research is setting global benchmarks in quantum computing hardware

Multiple modalities of qubit systems demonstrate scale, fidelity, and error-correction progress

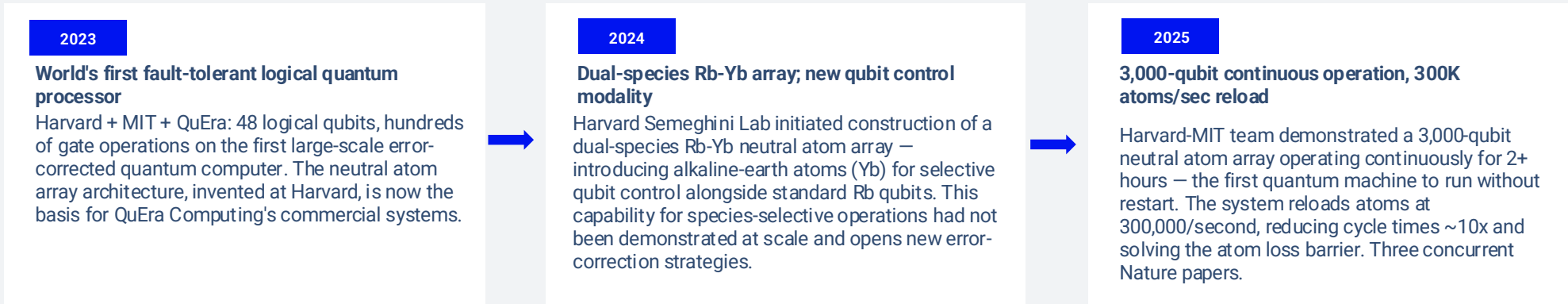
CASE STUDIES NON-EXHAUSTIVE

Superconducting Qubit Error Correction  
MIT Engineering Quantum Systems · MIT Lincoln Laboratory



Massachusetts-based research is setting important performance benchmarks in superconducting qubit fidelity and error correction.

Neutral Atom Quantum Computing  
Harvard · MIT · QuEra Computing



Massachusetts is a primary center for the development and scaling of programmable neutral-atom quantum architectures.

## Massachusetts institutions are originating and deploying quantum sensing and networking platforms

Work spans fundamental NV-diamond physics through applied network infrastructure and testbeds

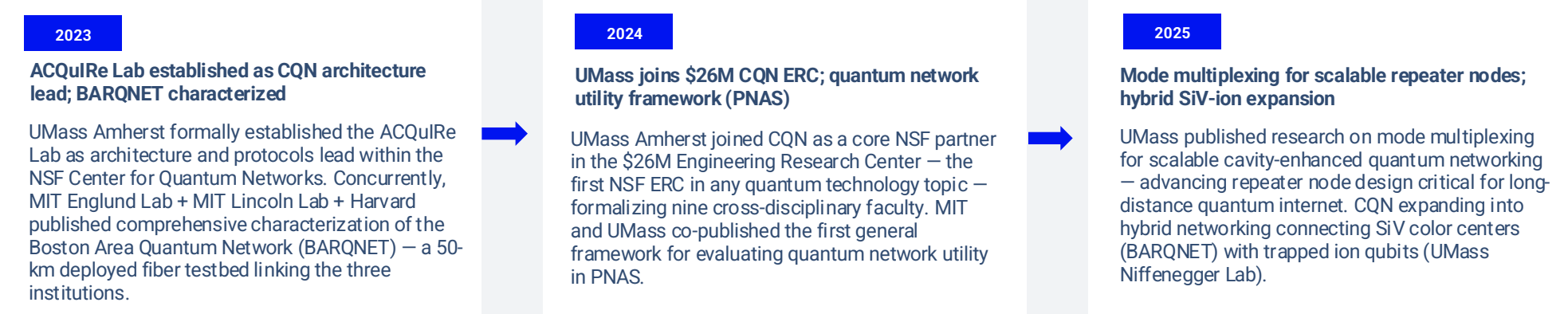
CASE STUDIES NON-EXHAUSTIVE

**Quantum Sensing with Diamond Defects**  
**MIT Quantum Engineering Group (Cappellaro Lab)**



Massachusetts hosts a mature quantum sensing research base spanning fundamental NV-diamond physics through applied sensing platforms.

**Quantum Network Infrastructure**  
**UMass Amherst (ACQuIRE Lab / CQN)**  
 · MIT · MIT Lincoln Lab · Harvard

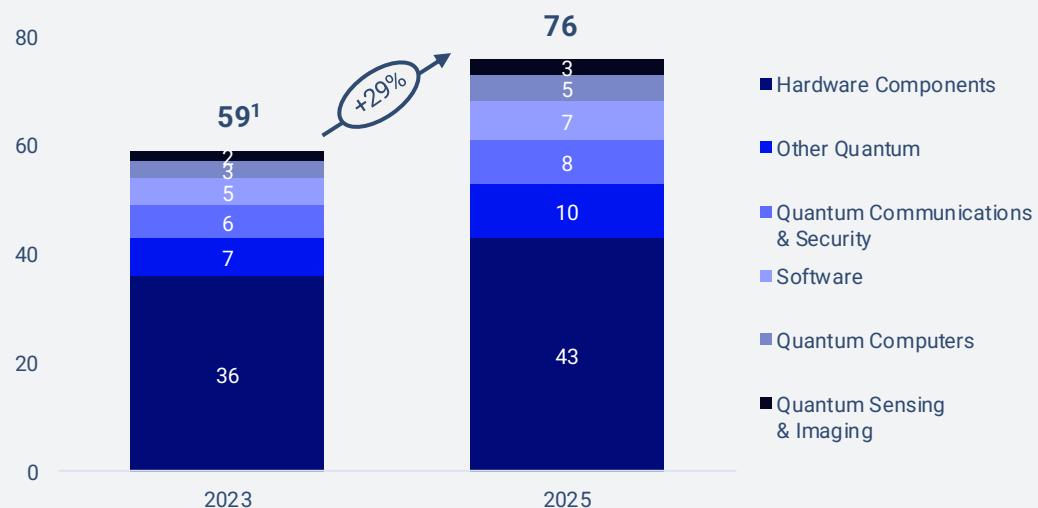


Massachusetts hosts a leading quantum networking research base spanning architecture, deployed fiber testbeds, and next-generation repeater nodes.

## Massachusetts quantum company base has expanded materially since 2023

Growth driven by hardware components and diversified platform activity

Number of quantum companies, 2023<sup>1</sup> v 2025



- There are 76 quantum or quantum-related companies operating in Massachusetts, an increase of 29% since 2023.
- Of these firms, 59 are headquartered in Massachusetts, with an additional 17 maintaining significant in-state operations.
- Hardware components represent the largest segment of the ecosystem, accounting for over half of identified firms.
- New company formation since 2023 has been strongest in enabling technologies, strengthening the quantum supply-chain layer.

New quantum companies in Massachusetts

### Startups



### New Entrants

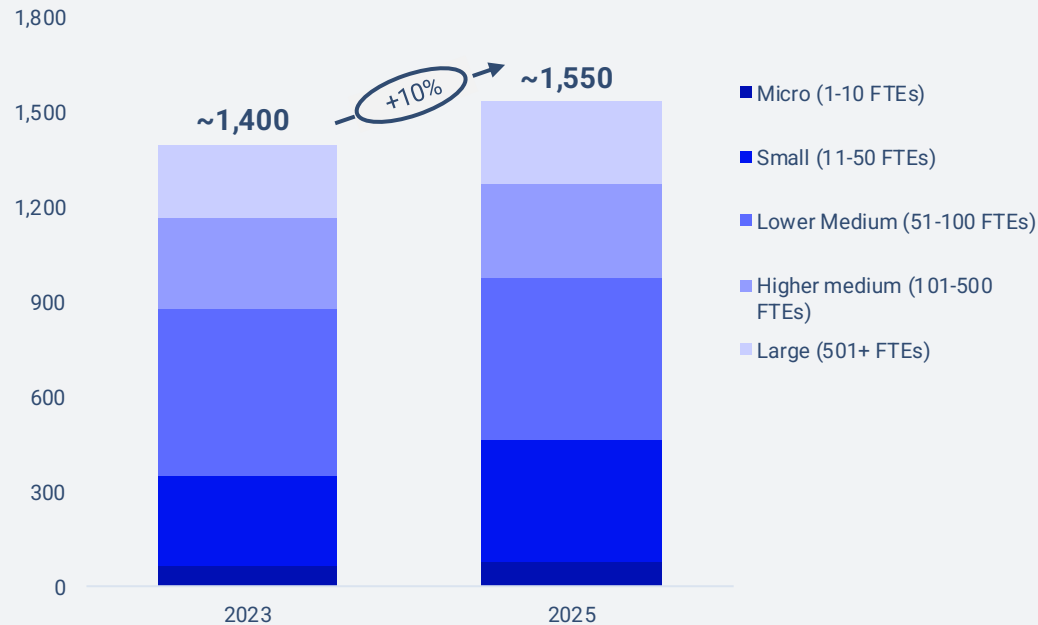


Logos shown are illustrative examples and do not represent an exhaustive list of Massachusetts-based quantum companies.

## Massachusetts quantum company employment is expanding, led by small and scaling firms

Available data indicate workforce growth among firms with fewer than 50 employees

Number of FTEs at Massachusetts quantum companies active in 2023<sup>1</sup>



- Quantum companies active in 2023 expanded their collective workforce by ~10%
- Small companies with 11-50 FTEs were the fastest growing segment with growth of ~35%

Example companies expanding their workforces



- QuEra had a workforce of ~60 FTEs in 2023 which it has now doubled to ~130
- QuEra has also acquired a second building in Boston, doubling its HQ footprint



- Expanded operations to accelerate production of integrated photonics components for quantum and telecom applications
- Increased FTEs by ~30 from 2023 to 2025
- Attracted new investment and partnerships for ultrafast modulators and nonlinear materials



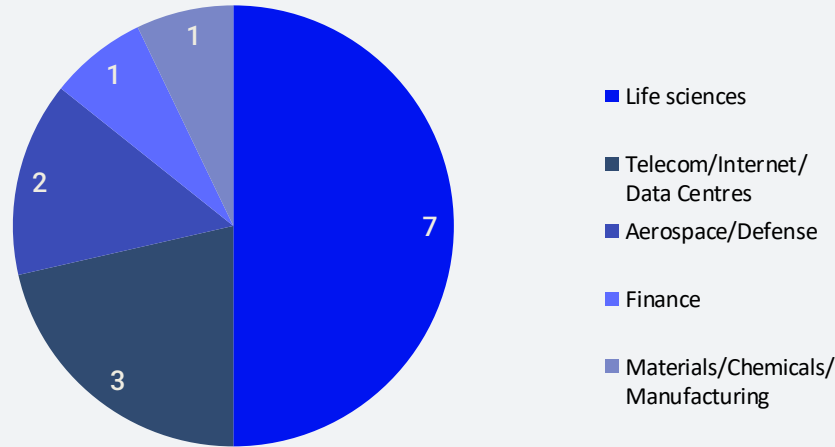
- Developing next-generation dilution refrigerator for quantum computing through ULVAC and subsidiary ULVAC Cryogenics
- Added nearly 20 FTEs to its workforce over the past two years

Example companies shown; not an exhaustive list of Massachusetts-based quantum employers.

## Enterprise engagement with quantum technologies is emerging in specific sectors in Massachusetts

Identified enterprise users reflect early pilot and exploratory engagement across key sectors

Sample of identified enterprise users engaging with quantum, by sector, 2025



- Enterprise engagement is emerging in targeted sectors, led by life sciences, telecoms, and defense organizations.
- Most activity remains at the pilot and exploratory stage, typically through R&D partnerships and early quantum-enabled applications.
- Defense-related engagement is increasing through coordinated state and federal initiatives supporting quantum-security and sensing use cases.

### Enterprise Users



# Early quantum adopters in Massachusetts are advancing from pilots toward initial applications

Selected examples span life sciences, finance, telecom, and defense applications

CASE STUDIES

NON-EXHAUSTIVE

LIFE SCIENCES



## Moderna

- 2023** Partnered with IBM Quantum; joined Accelerator Program and Quantum Network for mRNA research
- 2024** Used 80-qubit IBM Heron chip to simulate 60-nucleotide mRNA folding, a record for quantum biosimulation
- 2025** Scaled to 156 qubits / 950 non-local gates; developing IQP circuit-based quantum optimization pipeline

*Building a near-term quantum-enabled biotechnology pipeline, augmenting classical workflows*

FINANCE



## Fidelity (FCAT)

- 2021** Demonstrated quantum ML for finance: copula-based models outperformed classical in stress testing
- 2023** Developed first-of-its-kind scalable quantum state preparation for Monte Carlo on IonQ (20 qubits)
- 2025** Active PQC implementation program; researching quantum-classical hybrid workflows for risk analysis

*FCAT team now spans quantum algorithms, QML, and post-quantum cybersecurity readiness*

AEROSPACE / DEFENSE



## RTX (BBN Technologies)

- 2024** Won \$9.3M DARPA INSPIRED contract for chip-scale quantum photonic sensors (Cambridge, Massachusetts)
- 2024** Awarded \$7.5M DARPA QuANET contract for hybrid quantum-classical secure networking
- 2025** Partnered with Xanadu to build INSIGHT squeezed-light detector: 16 dB below shot noise limit (target)

TELECOM / INTERNET



## Akamai Technologies

- 2024** Announced phased PQC rollout plan; began beta-testing PQC modules for each data flow step
- 2025** Launched PQC for Akamai-to-origin (Jun) and client-to-edge (Sep) using ML-KEM hybrid key exchange
- 2026** PQC enabled by default for all Enhanced TLS customers (Q1); end-to-end quantum-safe delivery

These examples reflect the range of early enterprise engagement observed across sectors in Massachusetts.

## Private investment in Massachusetts quantum ecosystem companies reached a record high in 2025

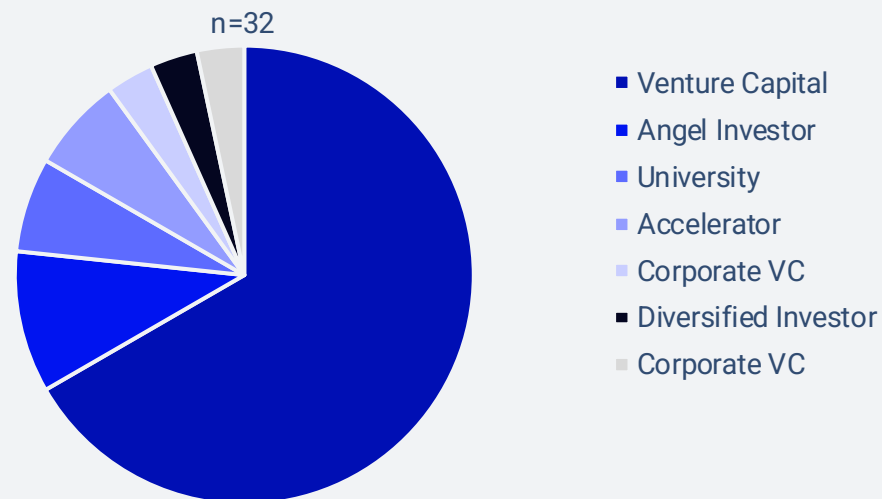
Activity driven by a small number of large investments alongside a growing local investor base

Private investment, (millions USD) 2020-2025 YTD



- Funding in Massachusetts reached an all-time high in 2025, driven primarily by QuEra Computing’s \$230 million raise and smaller raises by Zapata and Qsimulate.
- Additional value creation occurring through strategic acquisitions not reflected in these totals.

Private investors, 2025<sup>1</sup>



- There are now 32 private quantum investors based in Massachusetts, 20 of whom are Venture Capital firms
- Examples of investment firms active in the Massachusetts Quantum Ecosystem. See Appendix A for more detail.





FLYBRIDGE



F-PRIME

## Strategic acquisitions highlight the value of Massachusetts-based quantum hardware capabilities

Investments involve core hardware and networking technologies originating from Massachusetts institutions and startups

	IonQ acquisition of Lightsynq	Google acquisition of Atlantic Quantum
Acquirer		
Target		
Date announced	May 2025	October 2025
Deal value	Not disclosed. Estimated at ~\$400M <sup>1</sup>	Not disclosed
Target overview	<ul style="list-style-type: none"> <li>• Boston-based startup building optical quantum interconnects to link QPUs for modular scaling; founded by Harvard quantum-networking experts and former AWS Center for Quantum Networking leads.</li> <li>• Portfolio includes quantum-memory/repeater technology and 20+ patents/patent applications.</li> </ul>	<ul style="list-style-type: none"> <li>• MIT- and Chalmers-rooted superconducting-hardware startup; known for fluxonium-based qubits and a modular chip stack that combines qubits with superconducting control electronics in the cryogenic (“cold”) stage.</li> </ul>
Rationale	<ul style="list-style-type: none"> <li>• Accelerates modular scaling of IonQ’s trapped-ion systems via photonic interconnects enabling high-fidelity multi-node operation.</li> <li>• Advances IonQ’s quantum-networking/“quantum internet” roadmap by adding repeater and memory IP and the founding engineering team.</li> </ul>	<ul style="list-style-type: none"> <li>• Strengthens Google’s superconducting roadmap by bringing in Atlantic’s integrated chip-stack approach to scale devices faster and push toward error-corrected quantum computing.</li> </ul>
Other notable features	<ul style="list-style-type: none"> <li>• Company is Boston-based; integration shifts work from bulk optics toward chip-scale photonics inside IonQ’s stack</li> </ul>	<ul style="list-style-type: none"> <li>• Early public-private investments, backed by Glasswing Ventures, Engine Ventures, and MassVentures culminate in acquisition by Google Quantum AI.</li> <li>• Illustrates role of Massachusetts universities as sources of full-stack hardware ventures</li> <li>• Reflects value of Massachusetts startups to global quantum firms</li> </ul>

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Ecosystem Development

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4. Global Company Attraction

Strategic Positioning and Priorities

Appendix

## Massachusetts converts research strength into applied quantum capability through four key mechanisms

Integrated capital, infrastructure, talent, and partnerships drive industrialization of quantum in the state

1

### Research to startup pipeline

- Translating deep-tech research and IP into high-growth ventures



2

### Shared infrastructure

- Broadening access to state-of-the-art compute and validation facilities



3

### Collaborative networks for innovation

- Connecting talent and accelerating the quantum supply chain



4

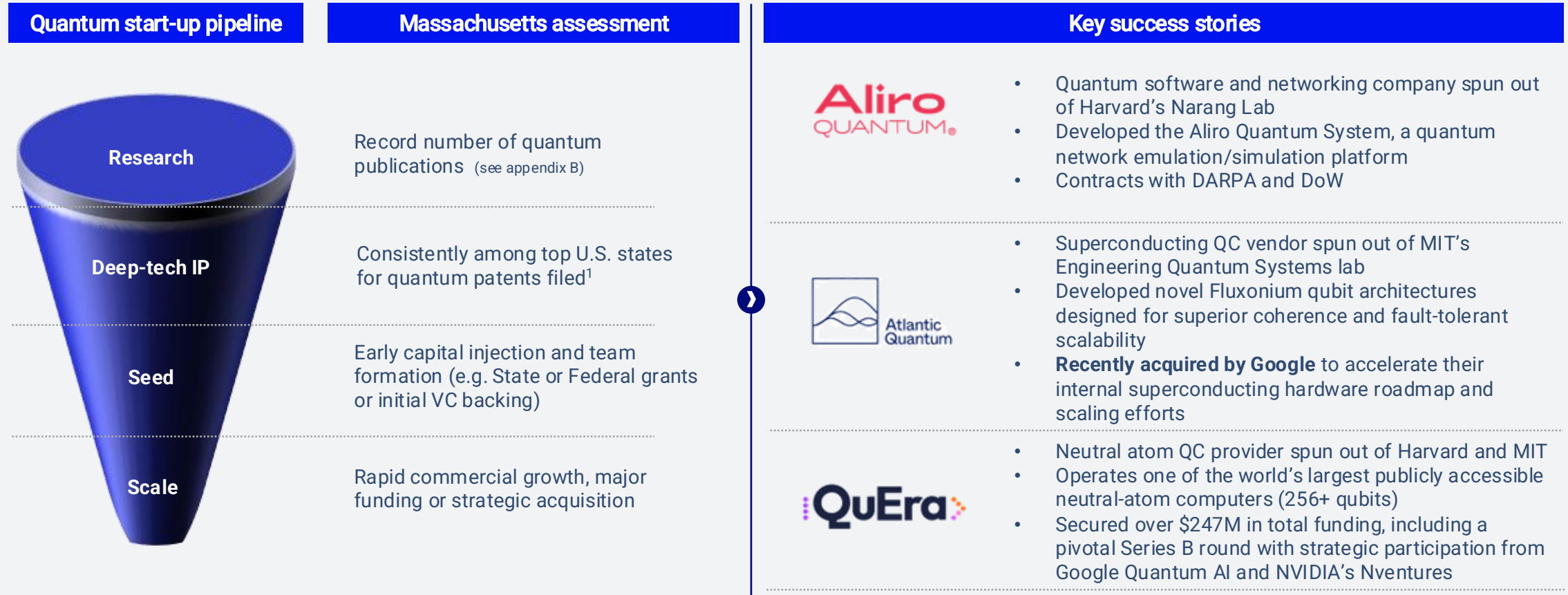
### Global company attraction

- Attracting global technology companies for hybrid R&D and strategic investment



# Massachusetts' research-to-startup pipeline consistently generates high-value quantum ventures

World-class institutions translate research into globally competitive spin-outs



## State-supported university-anchored facilities enable applied quantum development

Public-private partnerships provide facilities for prototyping, testing, and validation capacity for startups and industry

Examples of State-supported Academic Facilities in Massachusetts

	Quantum Computing Complex (MGHPCC)	Quantum Hardware Development and Commercialization Core Facilities	Advanced Optics Manufacturing and Characterization Facility	EQUAL <sup>1</sup> Laboratories
Focus	Hybrid quantum/HPC computing, shared compute and applied R&D access	Quantum device development, fabrication, packaging and measurement	Quantum-enabling nano-patterning with advanced optics manufacturing and characterization	Quantum sensing and metrology, materials, lab-to-market collaboration
Institution	MGHPCC (Holyoke)	UMass Boston Western New England University RTX-BBN Quantum Microwave	UMass Amherst	Northeastern
Investment	\$5M State / \$16M total	>\$4.8M State Grants	\$5M matching Grant	\$3.5M State / \$10M Total
Strategic value	<ul style="list-style-type: none"> <li>Provides a shared testbed for utility-scale experimentation</li> <li>Convening point for cross-sector collaboration</li> </ul>	<ul style="list-style-type: none"> <li>Removes a major bottleneck in packaging/assembly and validation</li> <li>Accelerates translation through industry engagement</li> </ul>	<ul style="list-style-type: none"> <li>Adds shared nano-fabrication/patterning and metrology capacity</li> <li>Supports faster component prototyping relevant to quantum systems</li> </ul>	<ul style="list-style-type: none"> <li>Strengthens sensing/metrology capability and partner pipeline</li> <li>Enables lab-to-market pathways with industry partners</li> </ul>
Feasibility study	Early 2026, Springfield Technical Community College launched a study to assess feasibility of a sustainable industry-facing Quantum Supply Chain Accelerator facility in Springfield, Massachusetts.			

## Collaborative networks accelerate translation from academic research to commercial activity

Four mechanisms form the foundation for collaboration and call for greater integration as the ecosystem scales

Component	Function	Massachusetts examples in practice
<b>Federal consortia and testbeds</b>	<ul style="list-style-type: none"> <li>Federally backed consortia formalize collaboration, attract funding, and create shared roadmaps/test environments</li> </ul>	<ul style="list-style-type: none"> <li>DARPA OASIC testbed (QuEra/Harvard/MIT)</li> <li>Massachusetts institute participation in four of five DOE NQISRCs</li> <li>NSF Quantum Leap Challenge Institutes: Harvard, MIT, BU</li> </ul>
<b>Talent pipeline</b>	<ul style="list-style-type: none"> <li>Developing curricula and hands-on training pathways aligned to industry roles</li> </ul>	<ul style="list-style-type: none"> <li>University of Massachusetts expanding curricula and workforce training at multiple campuses.</li> <li>MIT's iQuISE interdisciplinary program to train quantum researchers with industry partnerships</li> <li>Springfield Quantum Training Academy (technician/applied skills pathway)</li> <li>Statewide LEAP (Lab for Education and Application Prototype) Lab network features training in photonics and manufacturing.</li> </ul>
<b>Spin-out and early-stage commercialization support</b>	<ul style="list-style-type: none"> <li>Fund and accelerate early prototyping and validation, and connect spin-outs to VC for follow-on capital</li> </ul>	<ul style="list-style-type: none"> <li>NEMC Propel grants supporting applied R&amp;D and early hardware prototyping collaborations between startups and universities</li> <li>Quantum Jumpstart Program at UMass Boston (launched in October 2025) to accelerate product development and validation</li> <li>VC engagement: investor access via demo days and spinout support (e.g. Engine Ventures, MassChallenge, MassVentures)</li> </ul>
<b>Industry-academic partnerships</b>	<ul style="list-style-type: none"> <li>Joint projects that shorten R&amp;D cycles, share specialised equipment/know-how, and accelerate commercial validation</li> </ul>	<ul style="list-style-type: none"> <li>QuEra collaborations with Harvard and MIT (joint R&amp;D programs)</li> <li>IBM Quantum Innovation Hub at MIT linking industry quantum systems with academic research</li> <li>NVIDIA Accelerated Quantum Research Center partnering with Harvard's HQI and MIT's EQuS to advance hybrid quantum-classical computing</li> </ul>

## Global quantum companies established Massachusetts operations across the quantum stack

External firms integrate Massachusetts-originated technologies into US and global quantum development strategies

Company	What they're doing in Massachusetts	What is their focus
 IONQ	<ul style="list-style-type: none"> <li><b>Modular scaling / quantum networking for trapped-ion systems</b> using photonic interconnects and memory/repeater tech <b>added via LightSynQ</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Trapped-ion, full stack quantum systems.</b> Scaling trapped-ion architectures across quantum compute, sensing and networking</li> </ul>
	<ul style="list-style-type: none"> <li><b>Superconducting hardware integration.</b> Acquired Atlantic Quantum to integrate modular chip stack technology and advance error-corrected quantum systems</li> </ul>	<ul style="list-style-type: none"> <li><b>Superconducting QC, scalability, and hybrid systems.</b> Building large-scale error-corrected quantum computers and integrating quantum-classical workflows</li> </ul>
	<ul style="list-style-type: none"> <li><b>Research center.</b> Establishing the NVIDIA Accelerated Quantum Research Center (NVAQC) in Boston (announced in March 2025)</li> </ul>	<ul style="list-style-type: none"> <li><b>Hybrid computing.</b> Developing hybrid quantum-classical computing, integrating QPUs with NVIDIA's AI and GPU platforms</li> </ul>
	<ul style="list-style-type: none"> <li><b>Research Center.</b> Dedicated research center for quantum networking in alliance with Harvard</li> </ul>	<ul style="list-style-type: none"> <li><b>Quantum Networking and Communications.</b> Collaborative research on quantum repeaters, secure data distribution, and future quantum internet protocols</li> </ul>
 	<ul style="list-style-type: none"> <li><b>North American HQ.</b> Opened North American HQ in June 2025 for sales and support of US/Canadian clients</li> </ul>	<ul style="list-style-type: none"> <li><b>Quantum control hardware.</b> Strengthening the supply chain for superconducting partners in the region</li> </ul>
  (France)	<ul style="list-style-type: none"> <li><b>US office.</b> Opened Cambridge office to lead North American bus dev and accelerate technology advancements</li> </ul>	<ul style="list-style-type: none"> <li><b>Quantum computing.</b> Accelerating the commercialization and R&amp;D for their Cat Qubit technology</li> </ul>

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## Strategic Positioning and Priorities

1. Strategic Positioning
2. State Actions

Appendix

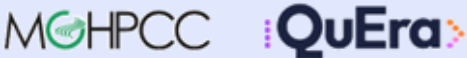


## Massachusetts’ quantum ecosystem is differentiated by a distributed, university-anchored model

This model contrasts with more centralized or platform-anchored initiatives in other US hubs

Ecosystem Pillar		Massachusetts positioning	Other US hubs positioning <sup>1</sup>
1	Public funding	<ul style="list-style-type: none"> <li>• <b>Coordinated, leveraged funding</b> formalized as a state priority, using matching and program-based investments to build shared ecosystem capacity.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Large but varied coordination</b>, with major investments distributed across states through federal programs, often anchored by DOE laboratories and related agencies.</li> </ul>
2	Infrastructure	<ul style="list-style-type: none"> <li>• <b>Distributed, university-anchored applied infrastructure</b>, enabled through public–private partnerships, supporting prototyping, testing, and early system integration.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>More centralized infrastructure</b> anchored at national laboratories or large corporate facilities.</li> </ul>
3	Quantum companies	<ul style="list-style-type: none"> <li>• <b>Strong research-to-startup conversion</b>, particularly in hardware components and enabling technologies, supporting early commercialization.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Larger absolute company counts</b> with more varied specializations, often anchored by major cloud and platform companies and/or national laboratory ecosystems.</li> </ul>
4	Academia and Research	<ul style="list-style-type: none"> <li>• <b>Dense, multi-institution research base</b> spanning hardware platforms, computing, sensing, and networking.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Strong research capacity</b>, often anchored by one or two dominant institutions or national laboratories.</li> </ul>
5	Enterprise Users	<ul style="list-style-type: none"> <li>• <b>Enterprise engagement emerging through sector-specific verticals</b>, led by life sciences, telecom, and defense organizations.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Deeper and more varied demand</b>, particularly in hubs with large federal end users or large-scale commercial adopters.</li> </ul>
6	Private Investment	<ul style="list-style-type: none"> <li>• <b>Capital validation strong and targeted</b>, with activity driven by growth-stage financing and strategic acquisitions.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Larger aggregate capital pools</b>, with major deals more broadly distributed and broader early-stage venture inflows in more mature venture ecosystems.</li> </ul>

## State actions reinforce Massachusetts' distributed model to support industrialization of quantum

Targeted investments focus on shared compute, supply-chain capacity, and workforce pathways

	Quantum computing complex	Quantum Supply Chain Accelerator	Quantum Workforce Pathways
Strategic investment	<ul style="list-style-type: none"> <li>Integrate a pioneering “<b>Quantum Computing Complex</b>” with an existing high performance computing center MGHPCC located in Holyoke, Massachusetts</li> </ul>	<ul style="list-style-type: none"> <li>Establish a first-of-its-kind industry-facing “<b>Quantum Supply Chain Accelerator</b>”</li> </ul>	<ul style="list-style-type: none"> <li>Launch a “<b>Quantum Workforce Pathways</b>” program with universities, community colleges, and employers.</li> </ul>
Objective	<ul style="list-style-type: none"> <li>Enable application development and industry-academic collaboration through shared quantum compute resources</li> </ul>	<ul style="list-style-type: none"> <li>Expand in-state prototyping and fabrication capacity to support commercial hardware production</li> </ul>	<ul style="list-style-type: none"> <li>Develop technician, operator, and system-integration talent needed for quantum commercialization</li> </ul>
Select partners			
Recent developments	<ul style="list-style-type: none"> <li>\$16M project announced October 2024 incl. \$5M from state and \$11M match from QuEra.</li> </ul>	<ul style="list-style-type: none"> <li>\$1M feasibility study launched in November 2025 to be completed during 2026</li> </ul>	<ul style="list-style-type: none"> <li>Springfield Quantum Training Academy launched</li> <li>Bridgewater State University expanding undergraduate training in quantum</li> </ul>

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## Private capital – examples

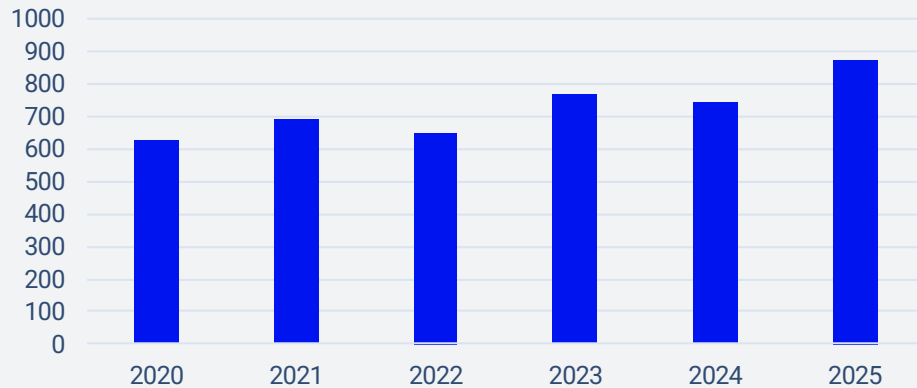
Example Massachusetts-based investors backing quantum companies – representing a growing pool of in-state capital for founders commercializing quantum technology.

#	Firm	Activity
1	<b>Safar Partners</b> Est. 2018	Active quantum VC in Massachusetts by deal count. Backed three quantum companies – QuEra Computing, CavilinQ, and Lightsynq (acquired by IonQ, June 2025) – drawing directly from the MIT and Harvard research pipeline.
2	<b>Flybridge Capital Partners</b> Est. 2002	A long-standing Boston seed-stage firm that backed Aliro Quantum, a Harvard-spun quantum networking software company. A consistent participant in the local deep tech ecosystem.
3	<b>Glasswing Ventures</b> Est. 2016	Boston-based frontier tech investor whose early bet on Atlantic Quantum (MIT/Chalmers-spun) resulted in an acquisition by Google in Q4 2025 – one of the most notable quantum exits from the Massachusetts ecosystem.
4	<b>F-Prime Capital</b> Est. 1969	Fidelity's Cambridge-based venture arm backed Quantum Circuits Inc., a Yale-spun superconducting quantum company acquired by D-Wave in January 2026.
5	<b>Battery Ventures</b> Est. 1983	Globally recognized technology VC with Boston roots, holding quantum positions in Quantum Machines and Quantum Art. Broad tech M&A, but scale and continued Boston presence keep it relevant to the regional quantum landscape.
6	<b>Gutbrain Ventures</b> Est. 2015	Boston-based venture firm. Led Aliro Quantum's \$15M Series B in February 2026, demonstrating active commitment to quantum networking and Harvard-spun ventures.
7	<b>PSG Equity</b> Est. 2014	Boston-based growth equity firm that led Quantum Machines' \$170M Series C in February 2025, one of the largest quantum control system funding rounds to date. Active in scaling deep tech companies.

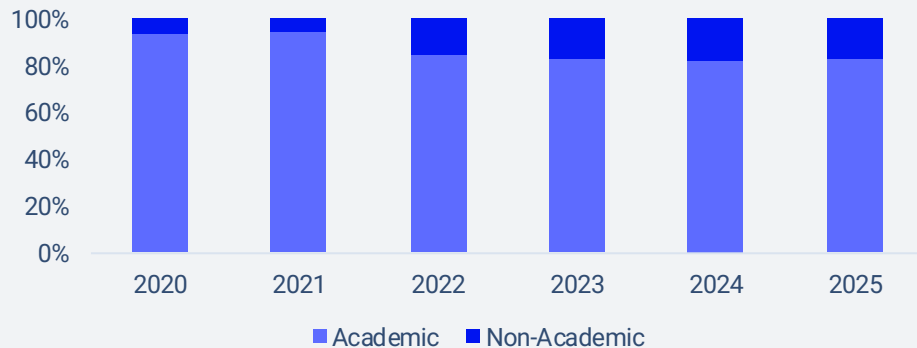
## Academic output: 2025 saw record quantum related academic paper output

Massachusetts continues to be a leader in quantum research

Quantum related academic paper output



Quantum Papers by Sector (2020–2025)



### Insights

- Massachusetts continues to demonstrate strong and growing quantum academic output
- Non-academic organizations accounting for an increasing share of this output as commercialization ramps up

### Key methodology points

- Scholarly papers sourced through Quantum Insider Intelligence Platform
- 37 Massachusetts organizations analyzed across universities, quantum startups, defense labs and equipment/photonics vendors
- Comprehensive quantum taxonomy applied: 100+ search terms covering hardware, algorithms, applications and emerging areas. Exclusions applied to filter false positives: e.g., "quantum healing."

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	Standing Sources	<ul style="list-style-type: none"> <li>MassTech Innovation Institute / Resonance. "Massachusetts Quantum Computing Ecosystem Study 2023." MassTech, 2023. <a href="https://innovation.masstech.org/quantum-computing-study/">https://innovation.masstech.org/quantum-computing-study/</a></li> <li>The Quantum Insider. Intelligence Platform. The Quantum Insider, ongoing. <a href="https://thequantuminsider.com/intelligence-platform/">https://thequantuminsider.com/intelligence-platform/</a></li> <li>MassTech. Procurements and Grants. MassTech, ongoing. <a href="https://masstech.org/procurements-and-grants">https://masstech.org/procurements-and-grants</a></li> <li>U.S. Department of Energy. National Quantum Information Science Research Centers — Program Overview. Energy.gov, ongoing. <a href="https://www.energy.gov/science/doe-explains-national-quantum-information-science-research-centers">https://www.energy.gov/science/doe-explains-national-quantum-information-science-research-centers</a></li> <li>DARPA. Quantum Benchmarking Initiative — Program Page. DARPA.mil, ongoing. <a href="https://www.darpa.mil/program/quantum-benchmarking-initiative">https://www.darpa.mil/program/quantum-benchmarking-initiative</a></li> </ul>

## Ecosystem Update Project Summary

- This update **assesses how the Massachusetts Quantum ecosystem has evolved since the most recent report in 2023** – highlighting areas of meaningful progress and identifying near-term priorities for coordination and investment as Massachusetts moves from research strength toward applied development, commercialization, and workforce readiness.
- The report is structured as follows:
  - **Quantum Massachusetts Snapshot** – Show developments in the quantum ecosystem since the last report
  - **Ecosystem Development since 2023** – an evidence-based assessment of how activity has evolved across public funding, infrastructure, academia and research, quantum companies, enterprise users, and private capital.
  - **Ecosystem Progress in Practice** – an examination of how progress is translating into applied capability and commercial activity through repeatable structures and institutional arrangements.
  - **Strategic Positioning and Near-term Priorities** – an objective view of Massachusetts’ position relative to other leading U.S. hubs and the priorities required to sustain momentum.
- The analysis draws on **desktop research** conducted by Resonance in Q4 2025 and Q1 2026, supplemented by **input and validation from the Innovation Institute**. This included targeted review of organization-level developments (research groups, companies, investors, and enterprise users), funding announcements, facility expansions, hiring data, and partnership activity.
- This 2026 update has been prepared by **Resonance** to support the **Massachusetts Technology Collaborative’s Innovation Institute** in tracking and guiding the Commonwealth’s progress in building a globally competitive quantum technology ecosystem. It builds on the **2023 Massachusetts Quantum Computing Ecosystem Study**, which established the first comprehensive baseline of the state’s research, industry, and workforce assets. This update is intended to function as both a **progress report and a planning tool**, providing a shared factual foundation for stakeholders across government, academia, and industry as the quantum landscape continues to mature.

## Transmittal

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