Quantum Technology in Washington State

A Moonbeam Exchange Technology Landscape Report

Prepared for the Washington State Department of Commerce, *Washington Technology Industry Association (WTIA), and Northwest Quantum Nexus (NQN)*

July 2026

Washington State Department of Commerce

WTIA

NORTHWEST QUANTUM NEXUS

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Washington's quantum economy is taking shape — the foundation is strong but the scaffolding lags.

Since the January 2023 baseline, Washington's quantum ecosystem has grown denser, more visible, and physically larger. Yet the state has fallen behind peers on the coordinated public investment that converts assets into a resilient cluster.

- **Gained:** IonQ's Bothell manufacturing hub, Quantum Technologies Training and Testbed Lab (QT3) and two NSF quantum materials centers at UW, iQ@WSU, Microsoft Majorana 1/2, growth in Amazon Web Services (AWS) Amazon Braket, Pacific Northwest National Lab's (PNNL) cryogenic testbed
- **Lost:** almost nothing significant
- **Missing:** a funded cluster organization, a technician pipeline, any share of the $2B federal CHIPS quantum portfolio, and a cohesive narrative of where the region's quantum industry is going

BY THE NUMBERS

$12.6B
Global private quantum investment in 2025 — a 6.3× jump

Top 3
Washington rank, U.S. QC patents

$0
of $2B CHIPS quantum to Washington

1,200+
projected Washington jobs (5-yr)

$500K
total Washington quantum funding

The Washington State quantum economy — June 2026

INCUMBENTS

- **Microsoft** Azure Quantum (Redmond)
- **AWS** Amazon Braket (Seattle)
- **IonQ** Bothell mfg (HQ in MD, factory in Bothell)
- **Boeing** networking (Everett, WA)
- **nLight** photonics (Vancouver, WA)

Out-of-state, with a WA presence

- **Google**
- **IBM**
- **Micron**
- **Meta**

STARTUPS

- **SQK** quantum–HPC
- **NLM Photonics** EO materials
- **American Binary** PQC
- **Nion** e-microscopy
- **Hummingbird Sci.** cryo-TEM
- **Eagle Harbor** pulsed power
- **Paradigm Optics** QD fibers
- **Qinsight**, PQC consultancy

INVESTORS

- **Acequia Capital** ~7 deals
- **Madrona** deep tech
- **Breakthrough Energy**
- **Microsoft M12** corporate
- **Boeing HorizonX** corporate
- **Bellingham · E8** angels
- **Angel networks**
- **Barclo × Qubit** studio
- **18West** post-quantum security: evolutionQ,; fibers

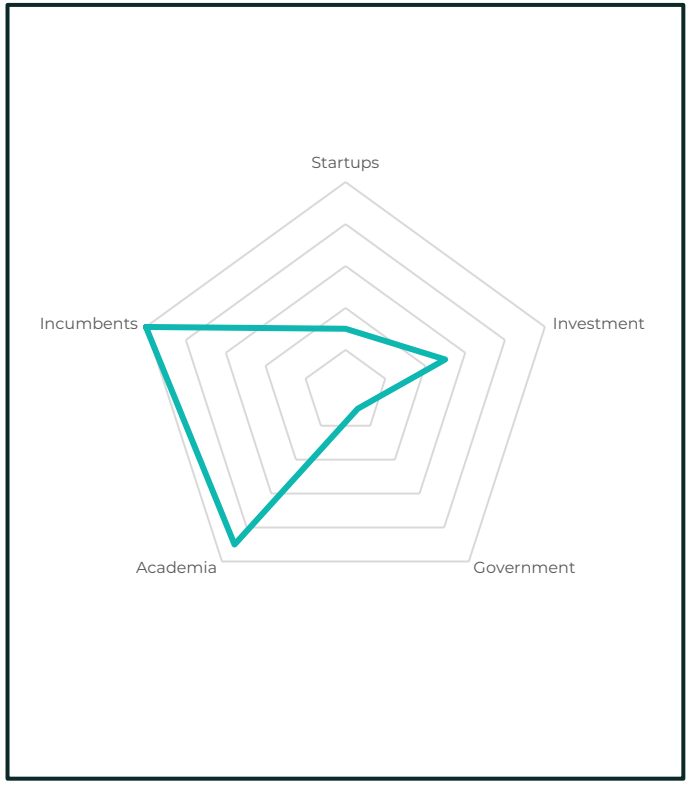
ANCHORS

- **NW Quantum Nexus** est. 2019
- **WTIA**
- **Washington Nanofab** UW
- **PNNL** national lab
- **UW** QuantumX
- **WSU** Quantum Init.

Where Washington stands — a five-dimension baseline

World-class on private and research end, near-empty on the public-funding, slow on the entrepreneurial end — the frame and foundation are strong; its time to build.

Incumbent strength	STRONG	Microsoft, AWS, Boeing + IonQ's Bothell line (quantum manufacturing); top-3 U.S. patents; cross-sector incumbent strength, notably in aerospace, logistics, health, space, and technology
Academic research	STRONG	UW QuantumX, National Science Foundation (NSF) AQET, Dept. of Energy (DOE) IQuS, WSU; NQN hosted at UW — but no flagship federally-funded center.
VC attraction	MODERATE	Largely corporate-R&D-funded, local investors make solution bets, not platform bets. Barclo Venture and 18 West represent emerging local pipeline; IonQ raised ~$3B but is headquartered in Maryland.
Startup activity	WEAK	Thin bench — American Binary (PQC); SQK (quantum medical imaging, IBM Ventures-backed). Early signal: Barclo Venture Studio launched (2024) to build local ventures.
Government funding	WEAK	$0 of $2B CHIPS; leads no DOE/NSF center; ~3% of national SBIR; first state $ = $500K (Apr 2026); HB 2446 unfunded.



Where Washington stands — versus peer states and metros

VS. OTHER STATES

- Leads on incumbents and quantum-computing patents (top-3, via Microsoft & Amazon); significant quantum manufacturing activity.
- Trails every peer on public commitment: Illinois ($500M+ Illinois Quantum and Microelectronics Park [IQMP]), Maryland ($1B initiative), New York ($1.375B CHIPS), Colorado (Tech Hub).
- Captures ~3% of national quantum SBIRs and $0 of CHIPS.

SEATTLE VS. OTHER METROS

- One of few metros strong on both current commercial hiring and committed buildout (IonQ Bothell).
- Edge: a corporate-plus-manufacturing stack and software engineering expertise anchored by Microsoft, AWS, and IonQ.
- Gaps: no large public quantum park (vs Chicago's IQMP), no federal/cleared center (vs DC / N. Virginia), less depth than Boston or the Bay Area.

The mirror image: *Washington has deep corporate intellectual property but thin public scaffolding; Illinois has deep public infrastructure but thin patents — each is strong exactly where the other is weak.*

SWOT — Washington's quantum position

STRENGTHS

- Two hyperscalers, a DOE lab, and an aerospace prime in one region
- Significant quantum manufacturing (IonQ Bothell)
- Top-3 U.S. patents; strong UW/WSU research; NQN host
- Seattle is high on currently open and committed jobs

WEAKNESSES

- No funded cluster org; 2025 strategy vetoed
- $0 of CHIPS; ~3% of SBIR
- Patents one-assignee deep (Microsoft); thin startup/VC layer
- No technician pipeline; ~50% foreign-national students

OPPORTUNITIES

- AI + quantum convergence potential productivity multiplier for existing industries with end users including aerospace, health/biotech, logistics, and energy
- An EDA Tech Hub bid built on the Washington stack
- Cascadia + Mountain West corridor (BC funding, MT testbed, OR fab)
- Surging federal quantum-security / PQC demand

THREATS

- Peer states scaling public investment far faster
- Immigration friction (H-1B $100K, OPT) vs half-foreign pipeline
- IonQ HQ in Maryland — commitment / retention risk
- Stalled NQI reauthorization; federal-funding uncertainty

Recommendations at a glance

01	The State & Governor as catalyst — convene for federal capture, bring in Dept. of Defense (DoD)
02	Build a narrative around winnable lanes
03	Build the workforce across all three tiers — led by developer enablement
04	Position Seattle as the quantum bridge to the Pacific
05	Grow the startup and founder ecosystem

(See full recommendations in section 5)

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This 2026 update was prepared by Moonbeam Exchange for the WTIA and NQN, building on the January 2023 landscape report and incorporating new public-source research and a 2026 interview program.

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- We are grateful to the quantum researchers, founders, and economic-development leaders across Washington who contributed time to the 2026 interview program.

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Ecosystem Mapping

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Who is here now, what changed since 2023, and the regional neighborhood that frames Washington's position.

MOONBEAM WTIA NORTHWEST QUANTUM NEXUS Washington State Department of Commerce

Quantifying & qualifying the quantum economy in Washington

Washington remains the only North American region combining two hyperscalers, a DOE national lab, two research universities, the country's only large-scale quantum manufacturing facility, and a major aerospace prime.

WASHINGTON-BASED PILLARS

Hyperscalers

Microsoft (Azure Quantum, Redmond) · AWS (Amazon Braket, Seattle)

National Lab

Pacific Northwest National Laboratory (Richland + Seattle)

Universities

University of Washington (QuantumX) · Washington State University · some coursework at Western Washington University

Manufacturing

IonQ — first dedicated U.S. quantum mfg. facility (Bothell)

Industry

Aerospace: Boeing — quantum communications & sensing (Q4S mission)
Health: Fred Hutchinson Cancer Center, UW
Energy, Space, Technology

Startups & PQC

American Binary (Kirkland) · SQK · emerging firms

OUT-OF-STATE — WITH A WASHINGTON QUANTUM FOOTPRINT

Google Santa Barbara HQ; quantum research presence in the Seattle/Kirkland hub (control & software, not fabrication).

IBM NQN IBM NQN partner; NY Headquarters; remote Washington hire; providing quantum cloud access to Washington researchers

The delta since January 2023

The dominant theme is consolidation and physical-footprint deepening — not new-company creation. Washington added marquee assets and lost almost nothing.

NET ADDITIONS

- IonQ opens first U.S. quantum manufacturing facility (Bothell)
- NQN relaunched in 2025
- Microsoft Majorana 1 & 2; AWS Amazon Braket integration with IonQ, Rigetti, QuEra
- PNNL Low-Background Cryogenic Facility + NVIDIA partnership
- Boeing Q4S in-space entanglement mission; NQN partner growth
- Barclo Ventures established in Seattle in 2024

EXITS / LOSSES

- QuantyCat — silent pivot out of quantum (only real exit)
- No major Washington quantum company shutdowns identified

Net assessment: *the structural gap relative to peer states is now on the public-investment dimension, not the asset base.*

Highlighting new entrants & milestones

IonQ — Bothell
Feb 2024

First dedicated U.S. quantum-computer manufacturing facility; now 100,000+ sq ft with a second cloud data center.

UW
2023–24

Quantum Technologies Training and Testbed Lab (QT3) and two NSF quantum materials centers at UW; Former Microsoft Station Q Copenhagen director joined and moved on from UW

Microsoft Majorana 1 / 2
2025–26

Topological-qubit chips; Majorana 2 claims 20-second parity lifetime (claims contested).

AWS Amazon Braket
Feb 2025

Quantum compute offered as-a-service on IonQ, Rigetti, and QuEra systems

PNNL LBCF + NVIDIA
2024–26

Underground shielded qubit testbed; hybrid classical-quantum partnership via NVQLink/CUDA-Q.

Boeing Q4S
2024–26

First in-space quantum entanglement-swapping mission, with HRL Laboratories.

Barclo Venture Studio
2024

The PNW's first quantum/deep-tech venture studio, tied to Qubit Ventures — a local quantum startup-formation and VC pipeline.

AWS + QuEra — Libra
Jun 2026

AWS (Seattle-HQ'd) to bring QuEra's Libra — billed as the first fault-tolerant quantum computer (256+ logical qubits) — to Amazon Braket by 2028.

Notable initiatives — Northwest Quantum Nexus

The Northwest Quantum Nexus (NQN) is the region's anchor coalition, now hosted at UW with new leadership and a re-energized convening role.

- Website relaunched (https://nwqn.org/).
- Joseph Williams named interim volunteer executive director, April 2025.
- NW Quantum Day Summit (Seattle, April 2026) — Lt. Gov. Heck, Nvidia's Krysta Svore.
- Partner base expanded: Meta, K&L Gates, Micron, IBM, Seattle University, MonArk/MSU, U. Oregon, Oregon State, UBC, U. Calgary, State of Washington.

PARTNER GROWTH SINCE 2023

20+

institutions now in the NQN coalition across WA, OR, MT, and BC

Notable initiatives — the Cascadia & Mountain West neighborhood

British Columbia

Vancouver
Quantum BC

Anchored by UBC's Stewart Blusson Quantum Matter Institute. Coordinated public funding via Canada's National Quantum Strategy; CA$92M procurement (Xanadu, Photonic, Nord Quantique). Birthplace of D-Wave & 1QBit.

Montana

Bozeman
MPQA · MSU QCORE

Federally funded testbed: $26.7M + $31.5M AFRL. One of few sites worldwide with both superconducting and photonic quantum computers.

Oregon

Portland
Intel Hillsboro

Semiconductor edge: silicon spin qubits on 300mm CMOS lines; Tunnel Falls 12-qubit chip distributed to labs.

Idaho

Boise / Idaho Falls
INL · Boise State · Micron

Materials & enablement: INL's C-QAST actinide quantum center (NQI-aligned); Boise State Quantum DNA group ($1.6M, NIH/NSF/DOE); Micron (Boise HQ) — fab, memory & materials; NQN partner.

Why it matters: *each neighbor has something Washington lacks — public funding (BC), a federally funded testbed (MT), 300mm fab capacity (OR), or quantum-materials depth (ID). A Cascadia + Mountain West corridor is the opportunity.*

Notable initiatives — Washington State action

Proposed	**$100M injection**	Rep. Barnard has floated a $100M state quantum injection — not yet enacted. Also, current State request of $2M/year to UW's Washington Nanofabrication Facility (WNF)
Apr 2026	**First state dollars**	Gov. Ferguson directs $500K from the Strategic Reserve Fund to IonQ (Bothell), matched by $14M+ private investment.
Jan 2026	**HB 2446 advances**	Passed House Tech/Economic Development Committee 12–1; mandates a Commerce-led quantum strategy — but with no appropriation attached.
2025	**Quantum strategy vetoed**	A proposed Dept. of Commerce quantum strategy was vetoed for fiscal reasons.

The April 2026 IonQ grant is the first tangible state quantum investment — a fraction of peer-state commitments.

SECTION 2

Market & Funding Analysis

2

A tipping-point year for the field — and a sharp test of how Washington attracts quantum-related federal funding.

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Overview — a tipping-point year, and Washington's funding paradox

2025 was a step-change for quantum globally. Washington shares fully in the private-sector and research momentum but is largely absent from the place-based and manufacturing funding channels where the largest public dollars now sit.

- Global private investment: $12.6B in 2025 (6.3× over 2024).
- Market value forecast: up to $2.7 trillion by 2035 (McKinsey).
- Federal engine strong but NQI reauthorization stalled.
- Washington paradox: top-tier research & patents, near-zero commercialization capture.

THE PARADOX IN ONE VIEW

Strong

Research funding, patents, corporate R&D

Weak

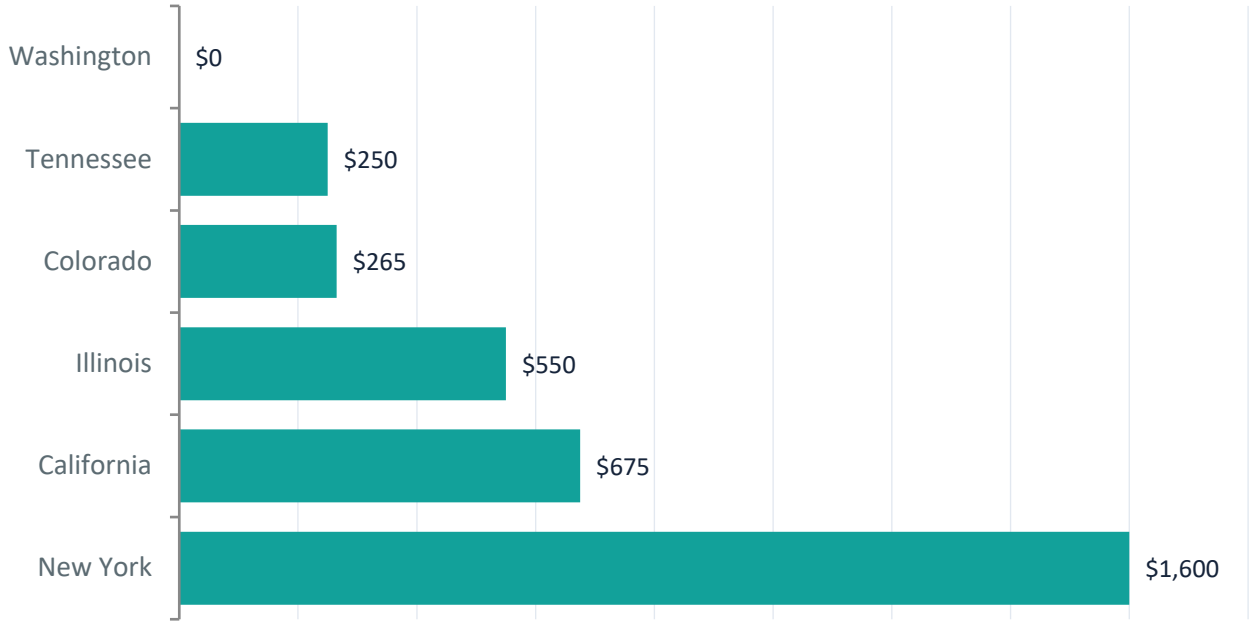
CHIPS incentives, DOE centers, NSF institutes, Tech Hubs

~3%

WA share of national quantum SBIR dollars

Federal funding mapped by state

There is no official 'quantum dollars by state' ledger; this maps four cleanly attributable channels — DOE centers, NSF institutes, CHIPS incentives, and EDA Tech Hubs. Washington appears in none of the large place-based awards.



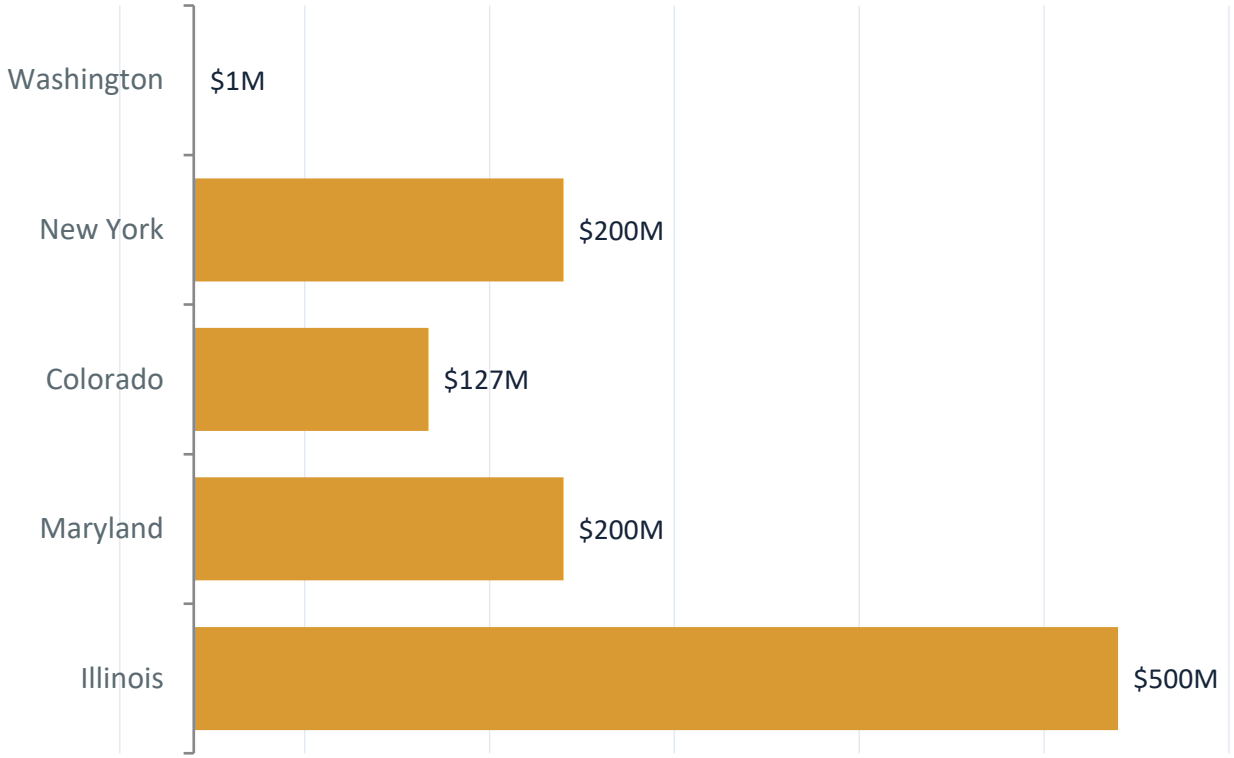
CHIPS quantum incentives — $2.0B (May 2026)

State	Recipients	Amount
New York	IBM + GlobalFoundries	**$1.375B**
California	Rigetti · D-Wave · PsiQuantum · Atom	$400M
Colorado	Infleqtion · Quantinuum	$200M
Washington	— none —	**$0**

By state, CHIPS quantum money concentrates in NY ($1.375B), CA ($400M), and CO ($200M). Awards attributed by company HQ; figures are signed letters of intent.

Source: *DOE Office of Science; NSF; CHIPS Program Office / NIST; EDA Tech Hubs; CSIS (2026). Approximate; place-based awards mapped by company HQ.*

State funding — Washington trails its peers

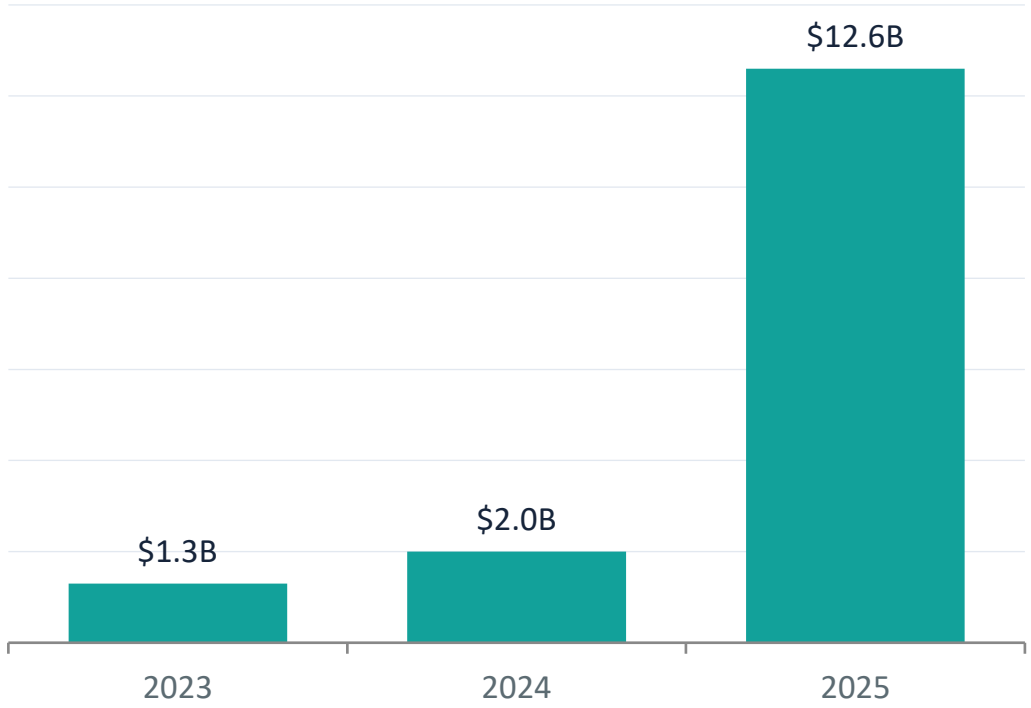


THE CONTRAST

- Illinois: $500M+ for the Illinois Quantum & Microelectronics Park (PsiQuantum anchor; IBM algorithm center).
- Maryland: ~$200M 'Capital of Quantum' initiative.
- Colorado: Elevate Quantum Tech Hub ($127M Phase 2 region).
- Washington: $500K SRF grant to IonQ — the first state quantum dollars; HB 2446 mandates a strategy with no appropriation.

Source: *State of Illinois; Maryland 'Capital of Quantum'; Elevate Quantum (CO); New York State; WA Governor's Office & Legislature (HB 2446, 2026).*

Venture capital — a tipping-point year in 2025



6.3× jump in a single year

Headline rounds & deals, 2024–25

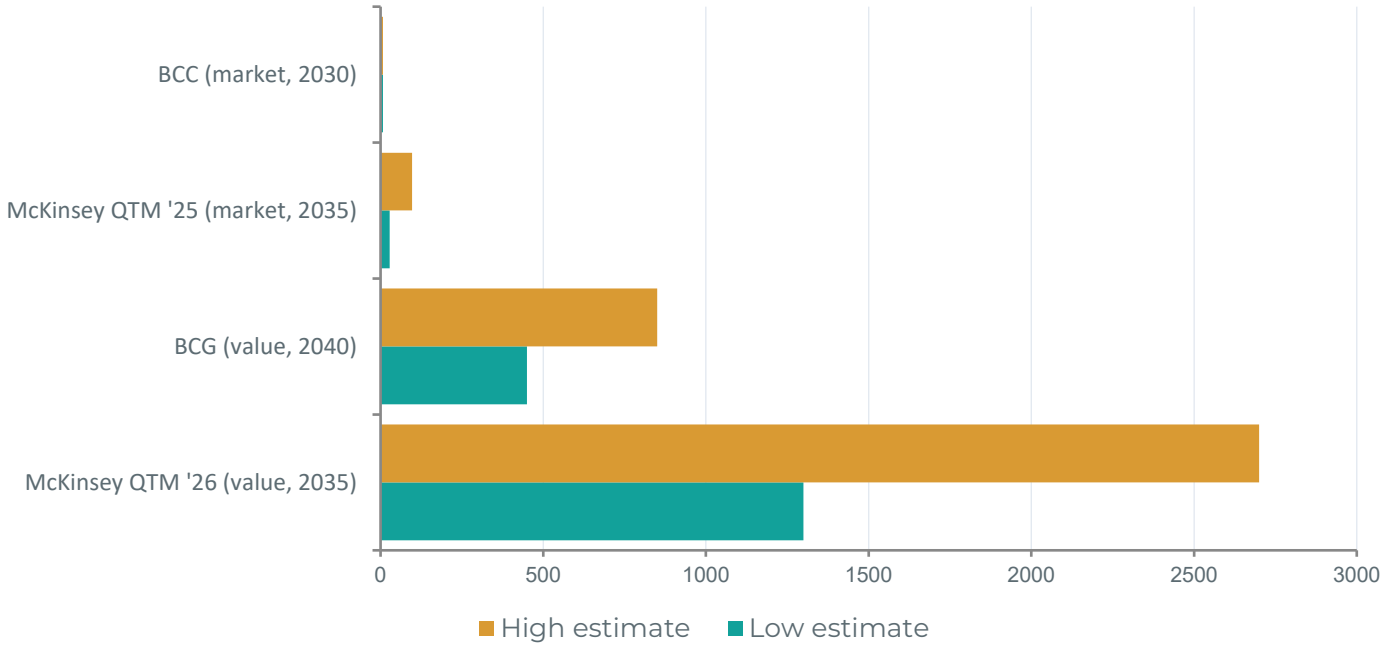
Deal	Detail
PsiQuantum Series E	$1B · $7B post-money
Quantinuum Series B	$600M · $10B pre-money
IonQ → Oxford Ionics	$1.075B — largest sector M&A
IonQ → SkyWater + Federal	$1.8B (Jan 2026)
IonQ equity raised (2025)	~$3B cumulative

~90% of 2025 investment went to quantum computing; 60% concentrated in the top 10 deals.

> ***Washington angle:*** *local quantum is mostly corporate-R&D-funded — but Barclo Venture Studio, partnered with Qubit Ventures, is an emerging homegrown venture-formation pipeline.*

Source: *McKinsey Quantum Technology Monitor 2026; The Quantum Insider; company announcements (PsiQuantum, Quantinuum, IonQ).*

Market sizing — a wider but more credible band



KEY FIGURES

$1.3–2.7T

Quantum-computing economic value by 2035 (McKinsey)

$1B+

Global QC company revenue passed in 2025; ~$4.4B by 2028

Variance reflects definition (economic value vs. provider revenue), so a range is more honest than a point estimate.

Source: *McKinsey Quantum Technology Monitor 2025 & 2026; BCG; BCC Research.*

Other notable activity — SBIR & the commercialization gap

From 2015–2023, U.S. agencies made ~862 quantum SBIR awards totaling ~$400M, with DoD supplying 40%+. Washington captured roughly 3% of that pool — and only one from DoD, the dominant channel.

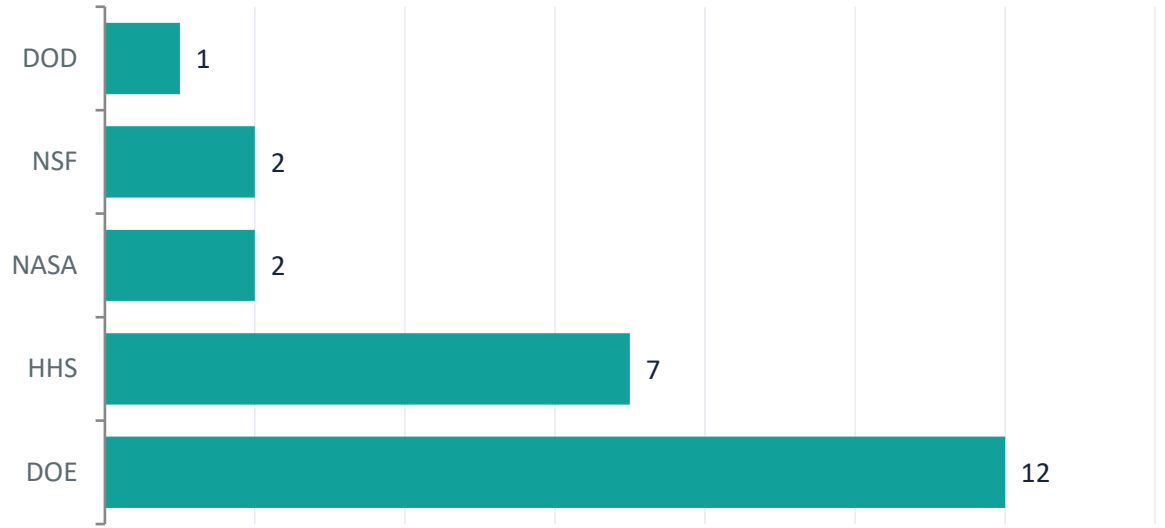
~$12.7M
Washington quantum SBIR, 2015–23 (24 awards, 10 firms)

~3%
Washington share of national quantum SBIR dollars

1
Washington DoD quantum SBIR awards (of 24) — vs DoD = 40% nationally

vs 18
Colorado quantum-SBIR companies (national leader)

Washington award mix by agency (2015–23)



Source: *SBIR.gov award data; CSIS (March 2026); user SBIR export. 2015–23; broad 'quantum' keyword — to be tightened before publication.*

Other notable activity — patent activity by state

Patents are the counterpoint: on every funding channel Washington trails, but on quantum-computing patents it is plausibly top-three nationally — because Microsoft, a top-4 global holder, is headquartered in Redmond.

State	Computing	Comms	Sensing	Anchor assignees
California	●●●	●●	●●	Google, Intel HQ, Rigetti, D-Wave, IBM Silicon Valley Lab
New York	●●●	●	●	IBM (Yorktown) — world's largest QC holder
Washington	●●●	◐	◐	**AWS; Microsoft (Redmond) — top-4 global; UW**
Maryland	●●	●●	●●	IonQ, Northrop Grumman, NIST/JQI, UMD
Illinois	◐	◐	◐	Argonne, Fermilab, UChicago (research-led, not corporate)
Colorado	◐	◐	●●●	NIST Boulder, Quantinuum, Infleqtion, QuSpin

STRONG BUT NARROW

Washington's patent strength is essentially one assignee deep. California and Maryland are diversified; Washington rests on Microsoft and Amazon — powerhouses by concentration, not breadth.

Inferred from assignee geography; no source publishes quantum patents by state. ***Sources: QED-C, QuIC, EPO, Harrity 'Quantum Patent 50'; measured counts via the PatentsView script recommended before publication.*** *Note that patent filings in this report are attributed to the state of the filing company's corporate headquarters, not where the invention was made – e.g. all IonQ patents are attributed to Maryland, and all Microsoft patents are attributed to Washington.*

Other notable activity — technical milestones, 2023–26

June 2023 — **IBM**

2023 — IBM demonstrates quantum utility using the 127-qubit IBM Quantum "Eagle" processor

Aug 2024 — **NIST PQC standards**

FIPS 203/204/205 finalized; HQC added March 2025.

Oct 2023 — **Atom Computing**

Crosses 1,000-qubit threshold (1,180 neutral atoms).

Feb 2025 — **Microsoft Majorana 1**

Topological-qubit chip (claims contested) — WA-connected.

Dec 2024 — **Google Willow**

First error-correction below the surface-code threshold.

Nov 2025 — **Quantinuum Helios**

99.921% two-qubit gate fidelity — highest commercial.

Source: *Company and laboratory announcements and Nature papers (Atom Computing, NIST, Google, Microsoft, AWS, Quantinuum), 2023–2025.*

Sources of quantum funding for Washington companies

Open, On-going, and Historic Opportunities

Washington companies are eligible for every government vehicle below — the gap is capture, not access. Seven channels, current as of June 2026 – however, some channels include historic vehicles that are not currently open (e.g. Washington State ICAP).

SBIR / STTR

Non-dilutive R&D grants for small businesses (NSF·DOE·DoD·NIH)

COMPANY-DIRECT

OTA & evaluation

DARPA QBI — funding plus third-party validation

HARDWARE

Research grants

NSF NQVL/NQNI/X-Labs · DOE Office of Science; Genesis & upcoming Quantum Genesis

PARTNER-LED

Place-based / cluster

EDA Tech Hubs · Build to Scale · NSF Engines

ECOSYSTEM

Washington State

Commerce ICAP · Strategic Reserve Fund

STATE

Challenges / prizes

XPRIZE Quantum Applications · Challenge.gov

PRIZE

Contracts / BAAs

SAM.gov · PNNL CRADAs & partnerships

REVENUE

Note: *deadlines move constantly and the 2025 SBIR lapse reshuffled federal calendars. Confirm each opportunity on its official portal — SBIR.gov · Grants.gov · SAM.gov · WEBS — before acting.*

SBIR / STTR — the non-dilutive workhorse

The SBIR program has been reauthorized through 2031. It offers non-dilutive R&D for small businesses (<500 employees) — the most accessible channel, and the one Washington most underuses (~3% of national quantum SBIR).

NSF SBIR/STTR (26-510 / 26-511) — **Phase I due Jul 27, 2026**

$250M relaunch · quantum is an explicit topic · first-time applicants welcome

DOE SBIR/STTR — **Phase II ~Spring 2026**

Topic-based · mandatory Letter of Intent · highly PNNL-relevant

DOD SBIR/STTR (AFRL · Army · Navy) — **2025.4 + FY26 BAAs**

Largest quantum SBIR channel nationally · dual-use; Washington wins very few

NIH Omnibus — **Jan 5 · Apr 5 · Sep 5**

Quantum sensing & biosensing applications

BEST FIT FOR

Small businesses with a defined R&D project — startups, university spinouts, post-quantum cryptography (PQC) and sensing firms. Phase I ≈ $275K; Phase II ≈ $0.75–1.8M.

NON-DILUTIVE GRANT

Source: *SBIR.gov; NSF 26-510/511; agency portals. Reauthorized Apr 2026 (S.3971). Confirm all deadlines.*

Other-transaction & evaluation programs

Other-Transctional-Authorities (OTA) offersflexible, fast funding routes for quantum hardware builders outside standard Federal Acquisition Regulation (FAR)-based contracts — well-suited to novel approaches.

DARPA QBI — Stage A QBIT — **Abstracts due Jul 31, 2026**

DARPA-PA-26-02-02 · open to new entrants · novel architectures of interest · funding + third-party V&V

DARPA QBI / US2QC — Stages B–C — **Ongoing / invitation**

By advancement · IonQ already in Stage B

DIU · Navy S2MARTS / NSWC Crane — **Rolling (SAM.gov)**

OTA consortia for defense-relevant prototyping

BEST FIT FOR

Quantum hardware companies with a credible path to a utility-scale, fault-tolerant machine — especially distinct or underexplored qubit modalities.

CONTRACT + EVALUATION

Source: *DARPA QBI (darpa.mil; SAM.gov, DARPA-PA-26-02-02). Confirm on SAM.gov.*

Federal research grants & infrastructure

Grants offer larger, longer-horizon awards — mostly university- and lab-led, but NSF explicitly wants industry partners. It is a route for UW, WSU, and PNNL to collaborate with industry.

NSF National Quantum Virtual Lab (NQVL) — Rolling phases

QSTD Design ≤$2M/yr · Implementation ≤$10M/yr · industry partners welcomed

NSF Quantum & Nanotech Infrastructure (NQNI) — 2026 competition

Network of university user facilities (fabrication + characterization)

NSF X-Labs — New (2026)

$1.5B · milestone-driven research orgs · quantum systems & sensing

DOE Office of Science (QIS) — Rolling (Grants.gov)

FOAs · National QIS Research Centers (on a renewal cycle), Quantum Genesis Initiative

BEST FIT FOR

Universities and PNNL teaming with companies; consortia and research-heavy spinouts. Multi-year, larger awards — a teaming play, not a solo one.

RESEARCH GRANT · PARTNER-LED

Source: *NSF (NQVL, NQNI, X-Labs); DOE Office of Science; Grants.gov. Confirm windows.*

Place-based & cluster funding

The biggest ecosystem dollars — but they fund regions and consortia, not single companies, and need a coordinating organization to pursue.

EDA Regional Tech Hubs — New NOFO expected 2026

FY25 round limited to 19 designated hubs — Washington is not among them

EDA Build to Scale (Venture & Capital) — Next NOFO (EDA.gov)

~$50M; up to ~$150M accumulated · funds ecosystem builders

NSF Engines · SBA Regional Innovation Clusters — Periodic

Adjacent place-based / cluster funding

BEST FIT FOR

Regional consortia and cluster organizations — WTIA's Advanced Technology Cluster with universities, labs, and companies — not individual firms.

PLACE-BASED / ECOSYSTEM

Source: *EDA.gov; Grants.gov. FY25 Tech Hubs limited to designated hubs; new NOFO expected 2026.*

Washington State channels

Washington's own channels are thin but historically impactful — and they mostly flow to the cluster organization and to major recruitment, not directly to startups. However, they can help to build a regional brand which turns around to help regional companies

Commerce Innovation Cluster Accelerator (ICAP) — Periodic cohorts (WEBS)
Funds industry-led clusters · $50K–$150K (cohorts ≤$1.5M) · WTIA ATC is an awardee

Strategic Reserve Fund (SRF) — By negotiation
Governor's discretionary tool · source of the $500K IonQ grant

HB 2446 · proposed $100M injection — Pending legislation
Mandates a state quantum strategy (no appropriation yet); $100M floated

SBIR FAST Partnership Program — No active Washington POC
SBA-funded SBIR/STTR proposal-assistance hub; WA's prior life-sciences awardee did not renew.

BEST FIT FOR

The cluster organization (ICAP) and major expansion/recruitment projects (SRF). Direct startup grants are limited — itself a gap to raise with the state.

STATE

Source: *WA Dept. of Commerce; WEBS. Verify R&D B&O tax-credit status separately; pending items not enacted.*

Challenges & prizes

Challenge-based funding are often non-dilutive, equity-free, and high-visibility — best for teams that can demonstrate real-world quantum advantage. However, they are often timing-dependent.

XPRIZE Quantum Applications — Mid-flight (prizes Mar 2027)

$5M · Google Quantum AI + GESDA · algorithms for real-world impact

Challenge.gov — federal prize competitions — Rolling

Agency-run prizes (NIST, DOE, DoD) with periodic quantum topics

Wellcome Leap Q4Bio (health quantum) — Concluded · watch for next round

Now closed; a follow-on is anticipated — fits Washington's life-sciences expertise.

BEST FIT FOR

Algorithm and applications teams — software-first firms and university groups — able to benchmark a quantum advantage on real problems.

PRIZE · EQUITY-FREE

Source: *XPRIZE (xprize.org/competitions/qc-apps); Challenge.gov. XPRIZE not currently open to new entries. Wellcome Leap Q4Bio (wellcomeleap.org/q4bio)*

Direct contracts & BAAs

Direct federal procurement turns R&D into revenue. The Washington-specific route is partnering with PNNL to access DOE dollars and facilities in-state.

SAM.gov — agency BAAs — Rolling (SAM.gov)

AFRL · Army Research Office · ONR · DARPA broad agency announcements

PNNL CRADAs & partnerships — By agreement

Cooperative R&D with a DOE national lab in-state · facilities access

AFRL / ARO programs — Program-specific

e.g., funding behind regional testbeds; Qubits-for-Computing Foundry

BEST FIT FOR

Companies with a defense or agency customer, dual-use technology, or a path to partner with PNNL. Revenue plus non-dilutive support.

CONTRACT · REVENUE

Source: *SAM.gov; PNNL partnerships. Confirm active solicitations on SAM.gov.*

Which companies fit which vehicle

Match the company to the channel. Nearly every Washington quantum company should be running an SBIR/STTR cycle now; the rest depends on what they build.

Company archetype	Best-fit vehicles	Funding character
Early-stage startup / spinout	NSF & DOE SBIR/STTR · ICAP-linked cluster support	**Non-dilutive grant**
Quantum hardware / modality builder	DARPA QBI (OTA) · DOD SBIR · SAM.gov contracts	**Contract + grant**
Software / algorithms / applications	NSF SBIR · XPRIZE · PNNL CRADA	**Grant + prize**
PQC / quantum-security firm	DOD SBIR · federal contracts (SAM.gov) · NIST / NSA	**Contract + grant**
University spinout / research-heavy	NSF NQVL · DOE Office of Science · SBIR Phase I	**Research grant**
Cluster / ecosystem org (WTIA, NQN)	EDA Tech Hubs · Build to Scale · ICAP · NSF Engines	**Place-based**
Manufacturing / scale-up	Strategic Reserve Fund · Tech Hubs · DOD contracts	**State + place-based**

Cross-cutting: *every Washington State quantum startup should have an active SBIR/STTR pipeline; hardware builders should add DARPA QBI; and the ecosystem vehicles only get won if someone is funded to pursue them. Washington also lacks an active SBIR FAST point of contact (its prior life-sciences awardee did not renew); re-establishing a multi-sector one before the ~mid-July RFP would directly lift SBIR capture.*

SECTION 3

Workforce Assessment

3

A real but tightening market — and a structural Washington advantage that erodes without a state plan.

MOONBEAM WTIA NORTHWEST QUANTUM NEXUS Washington State Department of Commerce

Overview — the market is real, but tighter than the headlines

- ~16,500 pure-play quantum professionals globally (+14% YoY); 8,000+ open postings.
- Roughly one qualified candidate per three open quantum roles.
- Projected 250,000 new quantum-sector jobs by 2030; 840,000 by 2035.
- Washington produces more quantum talent than local industry absorbs — the 2023 'export' dynamic persists.

GLOBAL TALENT SNAPSHOT

16,500

pure-play quantum professionals worldwide

1 : 3

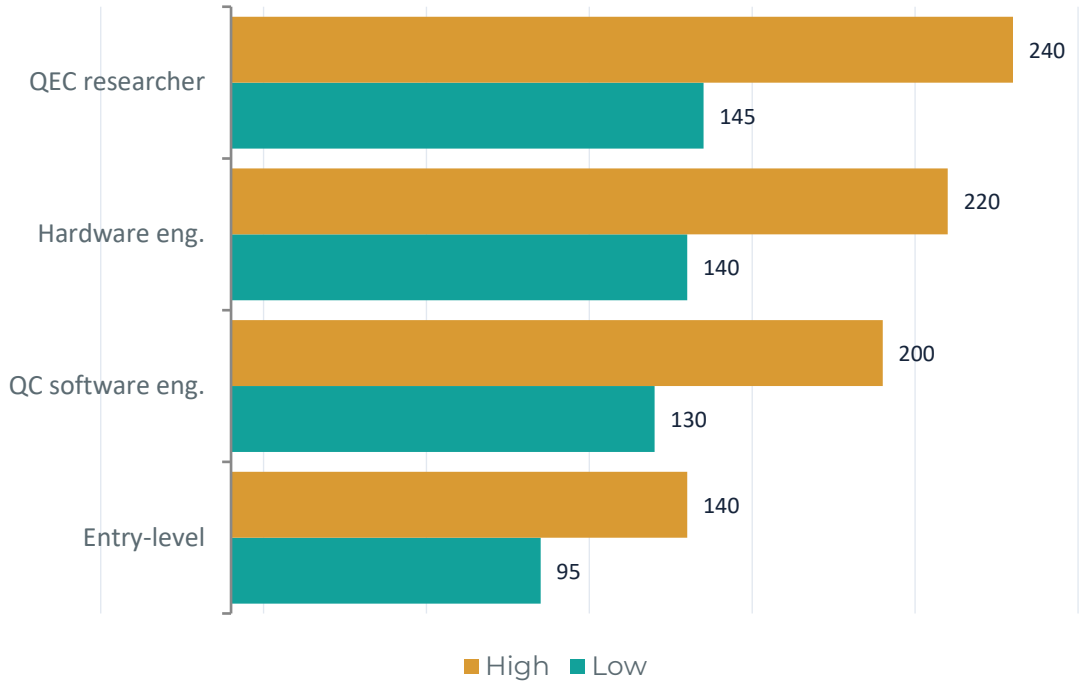
qualified candidates per open role

Source: *McKinsey Quantum Technology Monitor 2026; QED-C; The Quantum Insider.*

Jobs analysis — hiring, salaries & the IonQ effect

- Washington quantum hiring is steady; IonQ Bothell is now the largest single net contributor.
- Microsoft's 2025 layoffs (2,300+ Washington jobs) appear to have spared Microsoft Quantum.
- AWS also had apparent effect on quantum team during 2025 layoffs.
- IonQ, Quantinuum, PsiQuantum all in net-hiring postures.
- IonQ Bothell: ~100 roles at $177K average, scaling toward 1,200–2,000 over five years.

Salary ranges by role, 2025–26 ($K)



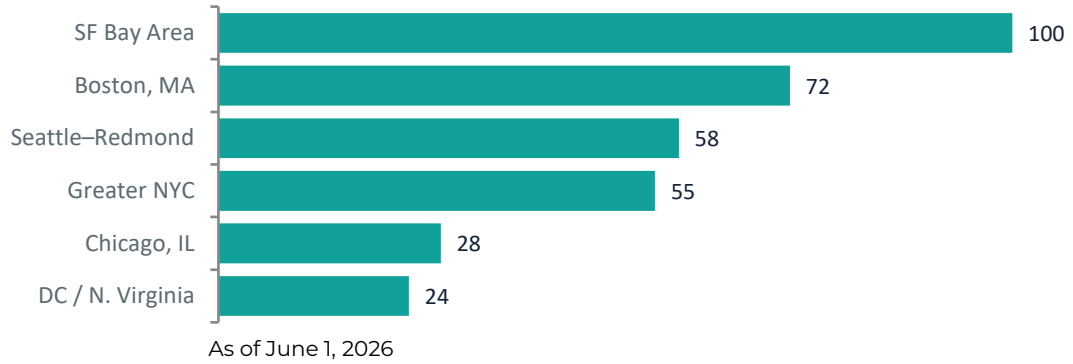
Source: *QED-C and industry compensation surveys & job postings, 2025–26; IonQ public disclosures (Bothell).*

Two lenses on quantum job demand

A current-postings snapshot understates committed buildout and federal/cleared demand — read both lenses together.

LENS 1 · OPEN COMMERCIAL POSTINGS

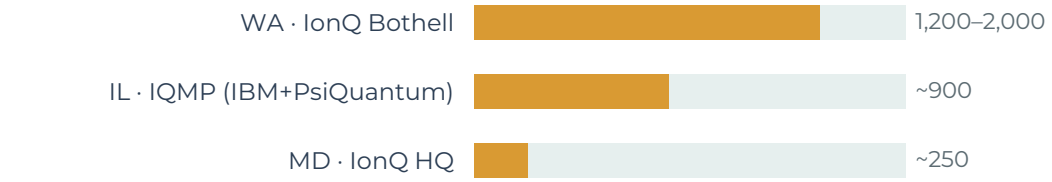
board snapshot · indexed to leader = 100



LENS 2 · COMMITTED BUILDOUT + FEDERAL DEMAND

sourced figures, not indexed

Announced multi-year hiring commitments (jobs, ~5 yrs)



Federal / cleared demand, open now

~824 cleared 'quantum' roles (Indeed) — DC / N. Virginia heavy

~221 open post-quantum cryptography roles (multi-sector)

Hub	Open commercial	Committed buildout (5-yr)	Federal / cleared
SF Bay Area, CA	High	Medium	Low
Seattle–Redmond, WA	High	High · IonQ 1,200–2,000	Low
Chicago, IL	Low	High · IQMP ~900	Medium
DC / N. Virginia	Low	Medium	High · ~824 / 221 PQC
Maryland · College Park	Low–Med	High · IonQ +250	High

Open postings: commercial boards (relative). Committed: IQMP (IBM+PsiQuantum), IonQ (Bothell & College Park), Gov. Pritzker & Gov. Moore. Federal: Indeed 'quantum clearance' (~824), Quantum Jobs List PQC (~221). Lens 2 mixes 5-yr commitments with current openings — read as direction and magnitude, not one ranking.

University pipeline — strong at the top, missing at the technician level

- UW QuantumX expanded sharply: a Graduate Certificate in QISE (launched Fall 2023, 50+ alumni).
- Charles Marcus recruitment + 2022–24 cluster hires across Physics, ECE, MSE, Allen CSE. (Note: Marcus recently announced that he would be moving on from UW)
- UW hosts the NSF AQET traineeship and the DOE InQubator for Quantum Simulation (IQuS).
- iQ@WSU: distinct cold-atom & quantum-sensing strength (Forbes, Engels, Guan, Kuzyk, Mei, Saam, Sekhar, Tomsovic).

NOTE: The Chicago Quantum Exchange (CQE) built a database of more than 5,000 job postings supplied by Quantum Economic Development Consortium (QED-C), managed by SRI International and the Quantum Computing Report. They found that more than half of all quantum technology jobs do not require a graduate degree. The analysis covered more than 5,000 roles from 2021–2023; among 2022 and 2023 ads about 31% requested a PhD and roughly 14% a master's.

THE GAP: TECHNICIANS

Washington has no community-college quantum technician program comparable to Colorado's bootcamps or Illinois's Quantum Quickstart.

~2/3

of industry quantum jobs require a bachelor's degree or less demonstrating demand for BS, Associates, and certificate programs in state.

Source: *UW QuantumX; WSU Quantum Initiative; QED-C workforce data; Colorado & Illinois program comparisons;* a Chicago Quantum Exchange analysis of QED-C job-postings data..

Migration — talent retention meets immigration friction

The 2023 finding that ~50% of QIS students are foreign nationals needing visa sponsorship has become more consequential under 2025–26 federal immigration and export-control policy.

- Proclamation 10973 (Sep 2025): $100,000 H-1B fee for new out-of-country petitions.
- DHS rule (Oct 2025) ended the 540-day automatic EAD extension; STEM OPT preserved.
- Expanded social-media vetting for H-1B/H-4; China-specific student-visa actions.
- Export controls: quantum designated foundational tech; BIS disclosure rules; entity-list additions.

50%

of Washington QIS students are foreign nationals needing visa sponsorship

For a pipeline that is half foreign-national, the cumulative effect is a meaningful narrowing of the path from UW/WSU into local quantum employers.

Source: *White House Proclamation 10973 (Sep 2025); DHS rule (Oct 2025); BIS export-control rules; 2023 WTIA baseline.*

Future needs — skills gaps & demand

Demand forecasts and recurring skills gaps across QED-C, McKinsey, Riverlane, and WEF reports point to clear priorities for any Washington workforce strategy.

1. **Quantum software**
   Qiskit, Cirq, Q# development
2. **Error correction**
   Decoders, codes, fault-tolerance
3. **Control electronics**
   Cryogenic, RF, FPGA/ASIC
4. **Materials & nanofab**
   Device fabrication
5. **Hybrid integration**
   Quantum–classical workflows
6. **PQC & translators**
   Post-quantum crypto; use-case mapping
7. **Quantum domain applications**
   Quantum chemistry and materials discovery, nuclear physics & fundamental quantum research, biotechnology

Demand outlook: 250,000 new quantum jobs by 2030, rising toward 840,000 by 2035 (The Quantum Insider; consistent with WEF / Elevate Quantum).

SECTION 4

AI / Quantum Convergence

4

Where artificial intelligence and quantum computing meet — and Washington's play.

MOONBEAM WTIA NORTHWEST QUANTUM NEXUS Washington State Department of Commerce

Overview — five dimensions of convergence

The convergence of AI and quantum computing now runs along five dimensions. Washington sits at the front of this story through Microsoft's Azure Quantum and PNNL's research.

1

AI designs qubits

Machine learning for device design & calibration

2

AI decodes errors

Neural-network quantum error-correction decoders

3

AI orchestrates

Agentic AI managing quantum workloads & R&D

4

Quantum speeds AI

Quantum algorithms accelerating machine learning

5

Hybrid discovery

AI + quantum simulation for materials & chemistry

6 **Quantum domain applications**

Quantum chemistry and materials discovery
Quantum nuclear physics
Quantum biotechnology

Notable areas where AI and quantum technologies converge

Approach (in plain terms)	Potential use-cases	Maturity	Washington angle	Key sources
Quantum neural networks — small quantum circuits that learn from examples, run alongside a regular computer	Image and pattern recognition; classifying medical, financial, or sensor data; fraud detection	**Near term**, today's leading approach for early quantum machines; not yet shown to beat strong classical AI on real data	Usable now by any Washington developer via Amazon Braket and Microsoft Azure — fits the developer-enablement push	Cerezo et al., Nature Reviews Physics (2021); Biamonte et al., Nature (2017)
Quantum-enhanced classification (quantum kernels) — a quantum computer judges how similar data points are	Sorting complex data: flagging fraud; classifying cells, tissues, or materials	**Near term**, run on IBM hardware in 2019; a 2021 result proved a speed-up on a specially built problem; everyday-data benefit unproven	Health/life-sciences and finance classification; runs on the hyperscalers' cloud machines in WA's backyard	Havlíček et al., Nature (2019); Liu, Arunachalam & Temme, Nature Physics (2021)
Quantum generative models — quantum cousins of the generative AI that invents images, molecules, or data	Designing new drug molecules and materials; synthetic training data; financial scenario modeling	**Near term (emerging)**, small proof-of-concept demos; watched because quantum machines make patterns hard to copy classically	Ties to life sciences (Fred Hutch) and materials / clean-energy design — existing state priorities	Lloyd & Weedbrook, Phys. Rev. Lett. (2018); Benedetti et al., npj Quantum Information (2019)
Quantum optimization (QAOA and annealing) — hunts for the best answer among astronomically many options	The optimization step inside AI training; logistics and supply-chain routing; scheduling; portfolio selection	**Near term**, hardware available today; whether it beats the best classical solvers is an open, actively debated question	Maps to aerospace / logistics and supply-chain optimization — a Washington vertical — and to finance	Farhi, Goldstone & Gutmann (2014); Quantum Algorithm Zoo
Quantum data-crunching for big-data AI (quantum linear algebra) — a faster way to do ML's heavy math	Large-scale regression and recommendation; analyzing massive datasets	**Long term**, needs large error-corrected machines and fast quantum memory that don't yet exist; classical methods have matched early versions	A future fit for the hyperscalers' cloud-and-big-data strength — not a near-term play	Harrow, Hassidim & Lloyd, Phys. Rev. Lett. (2009); Tang, Phys. Rev. Lett. (2021)
Teaching AI from quantum sensors and experiments — feeding AI data from quantum devices, not business data	Analyzing quantum-sensor signals; materials characterization; navigation and detection; discovery	**Near term**, a 2022 Science study showed a rigorous, robust advantage for learning from quantum-generated data	Strongest Washington fit — leverages Washington / WSU quantum-sensing depth (the sensing lane in Direction 2)	Huang et al., Science (2022)

Approaches grouped by maturity; notes that across the field, no quantum approach has yet beaten the best classical AI on real-world data

Case study 1 — Google DeepMind AlphaQubit

NATIONAL REFERENCE

A recurrent-transformer neural network that decodes the surface code — the canonical published example of AI applied to quantum error correction (Nature, Nov 2024).

6%
fewer logical errors than the best tensor-network decoder

30%
fewer errors than correlated matching

49 → 241
qubits validated (experiment → simulation)

What it is: AlphaQubit reads the error 'syndrome' from Google's Sycamore processor and predicts logical errors more accurately than prior decoders, validated on distance-3 (17-qubit) and distance-5 (49-qubit) hardware, with simulations to 241 qubits.

Washington thread: AlphaQubit is a Google DeepMind (London) + Google Quantum AI (Santa Barbara) result — but Google keeps a quantum research presence in the Seattle/Kirkland hub, giving this national story a thin local tie.

Case study 1 — significance & alternatives

NATIONAL REFERENCE

SIGNIFICANCE

- This is a canonical published reference for AI-driven quantum error correction — a report omitting it would be dated.
- Shows machine learning directly improving the core bottleneck of fault-tolerant quantum computing.

CAVEAT

- Currently too slow for real-time decoding on fast superconducting hardware; training-cost scaling to millions of qubits is unsolved.
- Washington tie is indirect — via Google's Seattle/Kirkland quantum research hub.

Source: *Google DeepMind / Google Quantum AI, Nature (Nov 20, 2024); Microsoft and PNNL announcements (alternatives).*

Case study 2 — IBM quantum-centric supercomputing

QUANTUM + HPC + AI

Quantum processors, GPUs, CPUs, and AI orchestration working as one machine — "quantum-centric supercomputing" — to run chemistry no single approach can handle alone.

12,635
atoms in a protein–ligand simulation — a quantum-centric record

158,976
Fugaku nodes run in a closed loop with an IBM Heron QPU

3
compute types combined — QPUs, GPUs, and CPUs

What it is: IBM's quantum-centric supercomputing splits a problem across a quantum processor (which samples the hard part) and classical supercomputers (which finish the math), with AI used to compile circuits, mitigate errors, and orchestrate the workflow. In 2025 IBM and RIKEN ran the first closed-loop quantum–HPC workflow at scale on Fugaku using sample-based quantum diagonalization (SQD).

Washington thread: the future IBM describes is heterogeneous — QPUs beside GPUs, CPUs, and AI — exactly the cloud, AI, and HPC muscle already concentrated in Washington's hyperscalers; the chemistry and life-science targets map to the state's life science sector (e.g. Fred Hutch, UW) and to materials and clean energy. Boeing and IBM used this very method on an IBM Heron processor to simulate the photodegradation of aerospace composite materials — quantum applied to a real Boeing problem, in Washington's core aerospace vertical (arXiv 2508.08229).

Case study 2 — significance & Washington angle

- IBM's quantum-centric supercomputing reframes quantum not as a stand-alone computer but as an accelerator inside a larger AI-and-HPC system — the way GPUs joined CPUs. IBM, RIKEN, Cleveland Clinic, and Boeing have used it in chemistry, life sciences, and aerospace materials — domains that map directly to Washington's aerospace, life-science, materials, and clean-energy verticals.
- Shows machine learning directly improving the core bottleneck of fault-tolerant quantum computing.

CAVEAT

These are hybrid, error-mitigated (not error-corrected) results on specific chemistry problems; much of the heavy lifting is still classical, and AI's role is supporting — circuit compilation, error mitigation, and orchestration — rather than the headline. No general-purpose quantum advantage is claimed.

WASHINGTON ANGLE

- Boeing and IBM used this same approach (entanglement forging with sample-based quantum diagonalization on an IBM Heron processor) to simulate the photodegradation of aerospace composite materials (arXiv 2508.08229). Leveraging quantum approaches on a real Boeing materials problem demonstrates the value of a local quantum cluster to advance use cases in incumbent industries.

Source: IBM Quantum / RIKEN, quantum-centric supercomputing (Fugaku closed-loop SQD, Oct 2025); IBM + Cleveland Clinic + RIKEN, 12,635-atom simulation (2026). Boeing R&T + IBM, aerospace composite photodegradation (arXiv 2508.08229).

SECTION 5

Recommendations

5

Priority moves to convert Washington's world-class assets into a resilient, diversified quantum ecosystem.

MOONBEAM WTIA NORTHWEST QUANTUM NEXUS Washington State Department of Commerce

Recommendations at a glance

The near-term lever is convening power, not large new appropriations — and Washington's strong pillars mean it can move for far less than peer states spent.

01	**The State & Governor as catalyst — convene for federal capture, bring in DoD** A standing table that rebuilds federal-funding coordination, closes the VC–government divide, and coordinates with the under-utilized defense presence for innovation.
02	**Build a narrative around — and back — winnable lanes** Specialize in PQC/security, the supply chain, or application verticals; champion and celebrate the sector from the top.
03	**Build the workforce across all three tiers — led by developer enablement** Developer/founder focus with hackathons and an SDK community first; then the missing undergraduate layer and technician pathways.
04	**Position Seattle as the quantum bridge to the Pacific** Position Seattle as the bridge to Asian quantum ecosystems – provide landing pad for Asian companies and coordinate with established ecosystems in Japan, S. Korea, and Taiwan.
05	**Grow the startup and founder ecosystem** A single front door, packaged machine access, and year-round activations to turn ideas into companies that stay.

Recommendation 1 — The State & Governor as catalyst: convene for federal capture, bring in DoD

01

THE PROBLEM

Washington punches below its weight on federal funding and lost its full-time coordination staff in last year's layoffs — while a VC–government divide and an underused defense presence (1 of 57 quantum SBIRs from DoD) compound the gap.

WHAT TO DO

- Convene a standing federal-capture table — universities, PNNL, incumbents, VCs, and Commerce — to pick targets and assemble consortium bids.
- Replace the lost coordination capacity; arm the Governor's office with grants-lost case studies and the convening models peer states use.
- Bring VCs into the government-funding conversation, as California and Maryland do.
- Connect the state's military presence to quantum to win DoD SBIR/STTR, BAAs, and OTAs (PNNL as anchor).
- Re-establish an active, multi-sector SBIR FAST point of contact — Washington's prior (life-sciences-only) awardee lapsed; the next application is due ~mid-July.
- Support state-run schools like UW and WSU to help them attract and retain top talent

TARGET OUTCOME

Top 10

Move Washington into the top tier of states for federal quantum dollars — starting with one joint multi-partner bid.

Recommendation 2 — Build a narrative around, and back, winnable lanes

02

THE PROBLEM

Every successful region specializes; Washington has no defined focus and no coherent story. Gate-based computing is not yet commercial, so anchor on what generates value now — and celebrate assets the state currently leaves unpromoted.

WHAT TO DO

- Commit to one to three feasible lanes: PQC/security, the supply chain and enabling hardware, and — Washington's real edge — use-case exploration across its concentrated life-science, materials, energy, and logistics industries.
- Frame a differentiation story — “a center of excellence for X,” not “quantum for everything.”
- Have state leadership champion the sector and celebrate wins (e.g., AWS–QuEra's Libra by 2028), and show up when companies announce, as Illinois and Maryland do.
- Lead with a distinctive story — the hyperscaler “customer-success” angle: we're where the world learns to use quantum, on our backyard stacks (Amazon Braket, Azure, IonQ).
- Use state and utility procurement (quantum cloud compute, PQC, sensing) to seed early demand.

TARGET OUTCOME

Focus

One to three well-told, winnable lanes the state can recruit, fund, and bid around.

Recommendation 3 — Build the workforce across all three tiers, led by developer enablement

03

THE PROBLEM

The pipeline is gapped at every tier: no technician training, no undergraduate program (about half of UW's PhDs leave), and a frontier-theory bottleneck. Developer enablement is the fastest near-term move and builds the community founders say is missing.

WHAT TO DO

- Launch a recurring developer-enablement push — hackathons, challenges, meetups, an SDK community — with the incumbents (Microsoft, AWS, IBM, IonQ) and NQN.
- Stand up an undergraduate credential (the Colorado School of Mines model) integrated into other technical disciplines. Also develop community-college technician and photonics certificates.
- Build employer-linked apprenticeships and subsidize Nanofab prototyping to retain fab-trained talent.
- Create retention pathways and visa support for foreign-national graduates.
- Build a go-to-market and commercial-translation talent pipeline — people who turn technical breakthroughs into customer value — leveraging Washington's deep enterprise GTM bench from the hyperscalers, which other states often struggle to recruit.

TARGET OUTCOME

3 tiers

Technician, undergraduate, and frontier talent — with developer momentum leading.

Recommendation 4 — Position Seattle as the quantum bridge to the Pacific

04

THE PROBLEM

Seattle's proximity and trade ties to Japan, Korea, and Taiwan are an underused asset. Japan's QSTAR already works with the governors of Illinois and Maryland; the PNW has been represented only by Barclo, and Gov. Ferguson is not yet engaged.

WHAT TO DO

- Identify strategic geographies with which to build partnerships, both globally and regionally with a focus on connections with Oregon, BC, Alberta, Montana, and Idaho
- Formalize a Washington–Japan QSTAR partnership, with the Governor engaging alongside Illinois and Maryland.
- Adopt QSTAR's demand-led methods — vertical use-case design and supply-chain value-chain mapping — for the region.
- Leverage the planned Japan/Korea delegation and JETRO/K-Startup programs to attract startups.
- Make Seattle the landing pad for Asian quantum companies, using the Microsoft and Amazon campuses as venues.

TARGET OUTCOME

1 bridge

A formal Pacific partnership and inbound pipeline no peer state has claimed.

Recommendation 5 — Grow the startup and founder ecosystem

05

THE PROBLEM

Startups are the report's weakest pillar alongside government funding. Promising ideas die before company formation; founders and corporate users have no single front door; and the machine access Washington already has (Braket via WTIA, IonQ, IBM, WSU's IQ) is real but unpromoted.

WHAT TO DO

- Stand up a single point of contact — a quantum 'front door' — for founders and corporates asking 'what can quantum do for me?'.
- Package and promote the machine and test-bed access the state already has — Montana lets startups buy time on a quantum computer; Washington has it but hasn't made it legible.
- Negotiate consortium-scale cloud credits from the hyperscalers for an accelerator, and give advanced builders a home (e.g., the Amazon Skill Center).
- Run year-round activations — hackathons, challenges, meetups tied to hiring employers (e.g. UW dubhacks, SURF Incubator events, or similar based on MIT/NASA models) — not one annual event.
- Create on-ramps for hyperscaler employees and reskilling pathways for laid-off tech workers.

TARGET OUTCOME

1 front door

A single entry point, packaged machine access, and a founder community that turns ideas into companies before they leave the state.

Also on the table

Lead a regional corridor

Convene a Cascadia + Mountain West quantum corridor with BC, Montana, Oregon, and Idaho — combining BC's funding, Montana's testbed, and Oregon/Idaho fab with capacity with Washington's corporate and lab assets – while weighing the supply-chain risk with tightening national sovereignty and dual-use export-control rules pose to cross-border collaboration.

Diversify beyond one anchor

Washington's patent strength is essentially one assignee (Microsoft) deep. Cultivate startups, a second corporate anchor, and university spinouts to reduce concentration risk.

Convert inbound international interest

International players are already looking (e.g., Finland's IQM met with the state). Turn that interest into Washington operations and co-investment.

The roundtable also steered away from two moves: a state-owned quantum computer (access already exists, and the hardware turns over every few months) and a large 'gravity' conference (the near-term gap is community and activations, not a marquee event).

SECTION 6

Appendix

6

Interview notes, glossary, sources, acknowledgements, and authors.

MOONBEAM WTIA NORTHWEST QUANTUM NEXUS Washington State Department of Commerce

Glossary of quantum terms (1 of 3)

Qubit
The basic unit of quantum information; unlike a bit it can exist in a superposition of 0 and 1.

Entanglement
A correlation between qubits such that the state of one cannot be described independently of another.

Decoherence
Loss of quantum information as a system interacts with its environment — the core engineering challenge.

Superposition
A quantum system's ability to be in multiple states at once until measured.

Quantum gate
An operation that manipulates qubit states; the quantum analog of a logic gate.

Fidelity
A measure of how accurately a quantum operation matches the intended result.

Glossary of quantum terms (2 of 3)

Quantum error correction (QEC)
Encoding logical qubits across many physical qubits to detect and correct errors.

Logical vs. physical qubit
A logical qubit is an error-protected unit built from many physical qubits.

Fault tolerance
The ability to compute reliably despite component errors — the threshold for useful machines.

NISQ
Noisy Intermediate-Scale Quantum — today's era of imperfect, mid-sized processors.

Topological qubit
A qubit encoding information in global properties for intrinsic error protection (e.g., Microsoft's approach).

Neutral-atom / trapped-ion
Two leading hardware modalities using atoms or charged ions as qubits.

Glossary of quantum terms (3 of 3)

Quantum sensing
Using quantum effects to measure quantities (time, fields, gravity) with extreme precision.

Post-quantum cryptography (PQC)
Classical cryptography designed to resist attack by future quantum computers (NIST FIPS 203/204/205).

Quantum machine learning
Algorithms combining quantum computing and machine learning.

Quantum communications
Transmitting information using quantum states, including quantum key distribution (QKD).

Quantum advantage
The point at which a quantum computer outperforms the best classical computer on a useful task.

Cryogenics
Ultra-low-temperature systems required to operate many quantum processors.

Selected sources & references (1 of 2)

Baseline report

Moonbeam Exchange & WTIA, "Quantum Information Sciences in Washington State" (Jan 2023); PitchBook company and investor data.

Market & investment

McKinsey Quantum Technology Monitor (2025, 2026); BCG; BCC Research; The Quantum Insider; QED-C.

Federal funding

DOE Office of Science (National QIS Research Centers); NSF (Quantum Leap Challenge Institutes); CHIPS Program Office / NIST; EDA Tech Hubs; CSIS (2026); SBIR.gov.

State funding & policy

State of Illinois, Maryland, Colorado (Elevate Quantum), New York; Washington Legislature (HB 2446); WA Governor's Office (Strategic Reserve Fund grant, Apr 2026).

Selected sources & references (2 of 2)

Patents & IP

QED-C; QuIC; European Patent Office; Harrity "Quantum Patent 50"; USPTO PatentsView (for the proposed measured inventor-location pull).

Companies & milestones

Nature (AlphaQubit, Willow, Majorana 1); Google, Microsoft, AWS, IonQ, Quantinuum, Atom Computing, PsiQuantum announcements; PNNL; PRX Quantum (2024).

Workforce & immigration

QED-C; McKinsey; WEF; Riverlane; UW QuantumX; WSU Quantum Initiative; White House Proclamation 10973 (Sep 2025); DHS (Oct 2025); BIS export rules.

Regional & ecosystem

Quantum BC; PacifiCan / Canada National Quantum Strategy (Budget 2025); MPQA & Montana State University (QCORE/AFRL); Intel Hillsboro; Northwest Quantum Nexus; Google Research (Seattle/Kirkland).

Sources are grouped by report section. Full footnoted citations with URLs and access dates to be finalized before publication.

Interview program — overview

Interviews were conducted through out June 2026 with notable experts from across the Pacific Northwest; notes from these sessions follow.

Experts Consulted:

- Alex Roblowsky, CMO, Northwest Quantum Nexus
- Orlagh Neary, CMO, Photonic Inc.; Founder/CEO, Quantum Links (ex-Microsoft)
- Kai-Mei Fu, University of Washington (Physics / ECE)
- Daniel Pollard, University of Washington (administration)
- Charles Marcus, University of Washington
- Brandon Kim, CEO & Co-founder, SQK
- Beau Perschbacher, Senior Policy Advisor — Economic Development, Office of Gov. Ferguson
- Sierra Clouse, Co-founder, Barclo Venture Studio
- Michael Brett, Lead, Quantum Business Development, AWS
- Michael Forbes, Washington State University
- Sukanta Bose, Washington State University
- Bala Krishnamoorthy, Washington State University
- Jamie Garcia, Dir., Strategic Growth & Partnerships, IBM
- Paul Parazzoli, Strategic Partnerships, IBM
- Jason Yager, Executive Director, Montana Photonics & Quantum Alliance

Interview notes — Northwest Quantum Nexus

Alex Roblowsky, CMO, Northwest Quantum Nexus • **June 2026**
stakeholder input; views are the contributor's own and are not individually attributed in the report body.

WHAT WE HEARD

- Federal quantum dollars increasingly flow through an "X-Lab" model — university-led consortia spun out as separate entities. PNNL can't lead by regulation; universities lack the spin-out muscle.
- Washington hasn't built that entity infrastructure — "a full lap behind" on being positioned to capture federal money, not just on the money itself.
- The Illinois template: the state funded the University of Chicago to build "attract-federal-money infrastructure," which let it lead the consortium — state dollars snowballed into federal dollars.
- Real traction is in manufacturing (IonQ + Boeing), not the software/applications lead expected in 2023.
- VC is structurally mismatched: Seattle makes "solution bets, not platform bets." Current quantum VC is largely PQC and largely out-of-state.
- Talent follows funding — if federal money flows to labs elsewhere, top (often foreign-born) scientists migrate with it.

NQN'S ECONOMIC-DEVELOPMENT LENS

Four pillars — industry (strong), workforce (strong), capital (weak), and government (the critical gap: "the state isn't showing up").

IMPLICATIONS FOR RECOMMENDATIONS

- Fund an entity — NQN or another — to build X-Lab-capable, federal-capture infrastructure. The keystone.
- Frame the ask as leverage, not scale: strong industry + workforce mean WA needs far less than Chicago's $40–100M to start.
- Add a post-quantum-cryptography readiness initiative as an immediate economic-security play.

DEFERRED TO FOLLOW-UPS

- NQN budget-ask amount → confirm; revisit whether BC belongs in the competitive frame.

"Watching it doesn't make it change. You have to participate." — NQN stakeholder interview, June 2026

Interview notes — Quantum Links

Orlagh Neary, Founder/CEO, Quantum Links (ex-Microsoft) • **June 2026**
commercialization & go-to-market lens.

WHAT WE HEARD

- Don't be a general quantum hub — be an applications center of excellence for verticals where Washington owns infrastructure: health (e.g. Fred Hutch), energy, and scientific discovery.
- Commercial reality: quantum sensing and annealing already generate revenue; gate-based computing isn't commercial at scale.
- Peer states specialize by vertical — Maryland/Virginia in government security, New York in finance/PQC, Arizona in semiconductors, Colorado in neutral-atom talent (now drawing Google).
- No federal traffic cop — QED-C is weak and states compete independently, so Washington must self-define its niche.
- Microsoft's near-term quantum value is AI for scientific discovery — drug and materials discovery, e.g., the PNNL battery work.
- PQC demand concentrates in finance and regulated industries, where risk and urgency are highest.

RECOMMENDATIONS & ASKS

- Invest in supply-chain sovereignty and a sub-PhD pipeline — technical-college apprenticeships and bachelor's programs (Colorado School of Mines as the model), not just PhDs.
- Use tax incentives (Ireland-style) and address startup-deterring tax policy.
- Offer co-investment for workforce development; align university specializations with industry need.

FLAGS / FOLLOW-UPS

- Microsoft research materials offered for follow-up.
- Since the interview, Orlagh joined Photonic, Inc. as Chief Marketing Officer

Headline takeaway: specialize — be an applications center of excellence for a vertical, not a hub for everything.

Interview notes — University of Washington

Kai-Mei Fu (Physics / ECE) & Daniel Pollard (administration) · **June 2026**
research & economic-development lens.

WHAT WE HEARD

- UW is “top-tier but not top 10” — and ties the gap to limited state support versus peer institutions.
- Core strengths are materials science and photonics (interconnect and transduction) — a university can't build a 1000-qubit machine, so innovation sits upstream.
- Workforce assets are real: a now self-sustaining NSF certificate (~20 students/yr across 7–8 departments) and 5–6 industry-sponsored capstones per quarter (Microsoft, IonQ, Boeing).
- QT3 is an open-access characterization facility with undergraduate hardware labs and shared 10-mK dilution refrigerators (a $2.5M Cantwell/NIST earmark).
- Graduates mostly leave the state; Microsoft and IonQ are the local exceptions.
- DoD funding is approached “ad hoc” despite DoD being ~40% of national quantum funding.

RECOMMENDATIONS & ASKS

- Remove UW–PNNL collaboration barriers through policy, not money (3.5-hour distance and DOE red tape; contrast MIT–Lincoln Labs and Maryland–NIST).
- Subsidize hardware prototyping at the Washington Nanofabrication Facility — “less expensive, not free” — to retain fab-trained talent.
- Focus on classical supporting hardware and the quantum supply chain, like AI's component suppliers.

FLAGS / FOLLOW-UPS

- Possible Lt. Gov. Heck campus tours of the Nanofab and QT3.

“Definitely top-tier — but not top 10.” — University of Washington interview, June 2026

Interview notes — SQK

Brandon Kim, CEO & Co-founder, SQK (quantum medical imaging) • **June 2026**
founder lens.

WHAT WE HEARD

- Washington has no defined quantum focus — yet every successful region has a clear specialization (Colorado cryogenics, Chicago fab, Tennessee communications, Quebec photonics).
- Weak local hiring signals make talent readiness hard to assess; corporate VC (IBM Ventures) is more active than traditional VC.
- An underused differentiator: Seattle as an Asia–US bridge — Korea (K-Startup), Japan (JETRO), and Taiwan have government money to place startups in the US.
- A hardware-adjacent niche: use Boeing for packaging and integration (not fabrication), partner with Asian fabs, and focus on sensing.
- Data is a magnet: opening UW medical data (à la Stanford's PHI program and Cleveland Clinic) would attract domain startups.
- IBM's sponsorship model is more flexible than IonQ's for ecosystem-building.

RECOMMENDATIONS & ASKS

- Government as orchestrator: a shared-space consortium of 5–10 companies, joint SBIR/STTR bids, and a dedicated Commerce quantum unit.
- Commit for multiple years — Calgary's Quantum City collapsed after a single batch with no follow-up.
- Use the Microsoft and Amazon campuses as convening venues.

FLAGS / FOLLOW-UPS

- SQK confirmed active (QMEDIC imaging, IBM Ventures, U Chicago data) — update the company census.
- UW's public-university status may slow medical-data-access decisions.

Headline takeaway: pick a lane, commit for years, and play the Asia bridge no one else has.

Interview notes — Washington Governor's Office

Beau Perschbacher, Senior Policy Advisor — Economic Development, Office of Gov. Ferguson · **June 2026** ·
the state's decision-maker seat.

WHAT WE HEARD

- Validated: Washington "punches below its weight" on federal funding despite its assets — and since other blue states succeed, it isn't only the federal administration.
- The near-term lever is convening power, not new state money — limited appetite to fund new quantum incentives right now.
- The state lost its full-time federal-funding coordination staff in layoffs; remaining staff are picking up the slack.
- A VC–government divide: Washington VCs avoid or disparage government funding (unlike CA, MD, MA), which suppresses SBIR pursuit.
- An underused military presence: only 1 of 57 quantum SBIRs is from DoD, despite DoD being ~40% of national funding; the tech–defense link is weak versus aerospace–defense.
- Maryland, Massachusetts, and Illinois win by coordinating university, industry, and state; Chicago integrated an end-to-end story from PhD to technician.

RECOMMENDATIONS & ASKS

- Use the Governor's convening power to rebuild federal-capture coordination — a standing table of universities, incumbents, VCs, and Commerce that picks targets and assembles consortium bids.
- Give him the specifics: convening/nonprofit models from MD/MA/IL, case studies of grants Washington lost and why, and peer-comparison metrics for internal advocacy.
- Connect the state's military presence to the tech economy to capture DoD dollars.

FLAGS / FOLLOW-UPS

- Bring in the federal delegation's view (Sen. Cantwell's office) on where Washington falls short.
- International attraction: IQM (Finland) met with the state; a Washington delegation to Japan/Korea is planned this year.

"Federal funding — that's where the real money is." — Washington Governor's Office interview, June 2026

Interview notes — Barclo Venture Studio

Sierra Clouse, Co-founder, Barclo Venture Studio • **June 2026**
venture-builder lens; Japan QSTAR trade mission.

WHAT WE HEARD

- Washington is a good place to build in software, PQC/security, supply-chain enablement, and quantum-AI hybrid — not hardware.
- PQC is the most winnable near-term lane: it sells into existing enterprise security budgets with set standards and clear sales cycles, unlike net-new quantum categories.
- Confirmed “high potential, low activity” (Qubit Ventures): strengths are talent, hyperscaler alignment, supply-chain proximity, and adjacent industries like space tech.
- Confirmed the platform-vs-solution VC gap and the 2023→now strategy-execution gap (the report said software; success came via IonQ hardware).
- Japan's QSTAR runs a demand-led strategy: a 10M-user-by-2030 target, a “user company” model validating business cases against shared national testbeds, and use cases designed by industry vertical.
- QSTAR maps priority investments to existing industrial and trade partners so customers already exist; the PNW holds many components it needs (ports, dilution chillers, connectors).

RECOMMENDATIONS & ASKS

- Specialize in feasible, demand-led lanes: PQC/security, supply-chain enablement, and industrial systems (a 2–5 year horizon for Cascadia).
- Adopt QSTAR's methods — vertical use-case design and supply-chain mapping — and join the partnership (Illinois and Maryland governors already work with QSTAR).
- Treat startups as catalysts (customers, integrators, providers) and invest demand-led, against known regional gaps.

FLAGS / FOLLOW-UPS

- Governor Ferguson is not yet engaged with QSTAR (unlike Illinois and Maryland).
- Sierra to share QSTAR decks and supply-chain mappings for citation; a Commerce event with a Japanese partner is planned for September.
- Open question: should incumbents (Microsoft, Amazon) or startups fill the SDK/framework gap?

“Don't speculate when you have specifications.” — Barclo Venture Studio interview, June 2026

Interview notes — Amazon Web Services (AWS)

Michael Brett, Lead, Quantum Business Development, AWS • **June 2026**
hyperscaler & go-to-market lens.

WHAT WE HEARD

- AWS does four things in quantum: the Braket cloud service, its own hardware R&D, professional services, and security (PQC, communications, networking).
- Hardware R&D is at Caltech (Pasadena); the security/PQC group and much of the Braket team are in Seattle — but AWS's presence isn't locality-dependent ("no reason it couldn't be somewhere else").
- Washington is late, and AWS struggles to engage 50+ competing state initiatives — so the state must differentiate or risk diluted participation.
- Application-level work is Washington's unlock — Boeing, pharma, biotech — "the way New York is quantum finance."
- A storytelling/celebration gap: Illinois and Colorado have governors out front (Pritzker); Washington doesn't visibly celebrate its own assets.
- Workforce: a low barrier to entry, but frontier algorithm work is a math/theory bottleneck ("tens of people worldwide") — complementing, not replacing, technician and undergraduate needs.

RECOMMENDATIONS & ASKS

- Pursue federal funding in the next rounds (the Illinois/Colorado model) — that's where AWS engages.
- Adopt a UK-style industry-engagement model to pull banks, manufacturers, and aerospace into application-level research; position around a vertical.
- Align the state's semiconductor strategy with quantum; keep investing in STEM, which cascades to quantum.

FLAGS / FOLLOW-UPS

- Milestone (June 15, 2026): AWS + QuEra to deliver the first fault-tolerant quantum computer to the cloud by 2028 — a Seattle-HQ'd win to celebrate (verify press details).
- AWS treats quantum sensing as a customer/partner space (and possible future buyer for robots/satellites), not a direct effort.
- PNNL is "super important" for defense research and DOE funding; AWS answered a recent DOE quantum-workloads RFI.

"Seattle-headquartered, you're the leader in quantum — we should celebrate that." — AWS interview, June 2026

Interview notes — Washington State University

Michael Forbes, Sukanta Bose & Bala Krishnamoorthy — IQ at WSU • June 2026
the second academic anchor; sensing-led.

WHAT WE HEARD

- WSU's institute (IQ at WSU) is deliberately quantum-adjacent — sensing, cold/Rydberg atoms, nonlinear optics, cryo-electronics — not quantum computing.
- It adds a real sensing pillar: Engels/Mei cold-atom sensing, Bose's LIGO sensors, Som's spin-resonance imaging (Northrop Grumman), and Bala's PQC.
- WSU's strongest differentiator may be Mark Cusick's nonlinear optics / optical interconnects — overlapping UW's Kai-Mei Fu, and an NSF X-Labs photonics topic.
- WSU may be a smoother PNNL conduit (joint appointments, Tri-Cities proximity) — but PNNL can't lead (bound to its DOE mission, consumed by the 'Genesis' AI mandate).
- A quantum certificate (undergraduate + graduate) launches labs Spring 2026 / certificate Fall 2027, co-taught with U Idaho — partly closing the undergrad gap.
- Honest read: quantum computing is at the 'vacuum-tube' stage — a co-processor in a classical-quantum hybrid; PQC is the only capability industry actively requests.

RECOMMENDATIONS & ASKS

- Broker the UW-WSU optical-interconnects / photonics niche and target NSF X-Labs.
- Two new state levers: researcher stability (bridge) funding when federal grants lapse, and a coordinated cluster-hire fund across UW and WSU.
- Stand up a low-cost statewide student-industry matchmaking platform; define the state's strategic advantage first (the Montana model) before a funding ask.

FLAGS / FOLLOW-UPS

- Forbes holds an affiliate UW appointment and is bridging the two universities (a collaborate-not-compete directive).
- Mengyu Liu (WSU Tri-Cities) has interfaced with NQN; Jonathan Mayo is the PNNL liaison.

A sensing-and-adjacent second anchor — define the state's advantage first, then ask for the money. — WSU interview, June 2026

Interview notes — IBM

Jamie Garcia (Dir., Strategic Growth & Partnerships) & Paul Parazzoli (Strategic Partnerships) · June 2026
ecosystem & federal-partnership lens.

WHAT WE HEARD

- IBM has no Washington manufacturing or office — it engages via universities, national labs, industry, remote staff, and its investment in SQK.
- A successful ecosystem needs every ingredient together (universities, startups, industry users, students) with a clear, complementary — not competitive — vision; regional framing helps.
- The differentiating move: engage industry end-users from the start (not universities first) to prove demand and build lobbying voice — letting Washington leap ahead of earlier states.
- Most quantum jobs won't be in manufacturing — they'll be industry roles (e.g., finance) using quantum as a skill; the startup gap is on applications/software, not hardware.
- Market-ready now: PQC and quantum sensing; leading verticals are finance (HSBC) and healthcare/life sciences (Cleveland Clinic's ~13,000-atom simulation).
- An on-premise quantum system 'nucleates' ecosystems (Japan, RPI, Illinois, Basque, Cleveland Clinic); quantum is always integrated with AI + HPC.

RECOMMENDATIONS & ASKS

- Lead with industry demand; build the user base through developer enablement — IBM offers free curated content, engineers, and its 341-member Quantum Network.
- Specialize in healthcare / life sciences (Fred Hutch) and the enterprise founder community; treat PQC and sensing as the market-ready lanes.
- Consider an on-premise quantum system as a nucleator; build on Boeing (an early IBM partner) and UW's Martin Savage (high-energy physics).

FLAGS / FOLLOW-UPS

- IBM cited fault tolerance by 2028 and a $1B quantum foundry in New York State (verify 2028 vs. IBM's public 2029 'Starling' roadmap).
- Jamie Garcia offered written follow-up Q&A; relationship open for partnership development.

Headline takeaway: build the user base — lead with industry demand and lower the barrier for non-physicists to use quantum. — IBM interview, June 2026

Interview notes — Montana Photonics & Quantum Alliance

Jason Yager, Executive Director, Montana Photonics & Quantum Alliance • **July 2026**
regional model & the photonics–quantum lane

WHAT WE HEARD

- Define-your-advantage-first is the core lesson: a decade ago Montana asked "who are we, how are we different?" and answered on photonics — creating continuity across government, industry, and academia, and a clear lane.
- That lane won the Headwaters Tech Hub and lets Montana align with other ecosystems rather than duplicate them; the region is now a self-identified global photonics leader, with quantum the natural next step.
- Scale grew fast: MSU nears ~$130M in AFRL quantum funding; an AFRL-backed testbed runs two machines — the first US ORCA G1 (photonic) and a superconducting Rigetti, the ORCA tied to an HPC.
- A $48M Tech Hub (integrated photonics) brought MPQA ~$15M directly, funding >$10M in semiconductor wafer-test capacity and onshoring Dutch partner PHIX.
- Pivot to private capital — federal money is "transformative, not foundational": a family office now runs a quantum-platform fund from MPQA's building.

RECOMMENDATIONS & ASKS

- For Washington: define what makes WA unique, own it, then align regionally — don't reinvent what others built; do something new and connect the regions.
- Build a "technical, not political" forum so regions stop duplicating — Williams recruited Yager to NQN for this; WA's cryogenics/cold-optics (WSU) is a real complementary strength.
- Federal money now favors industry/commercialization (NSF X-Labs ~$1.5B excludes academia, consortia, and labs); Montana pairs political alignment with private capital.

FLAGS / FOLLOW-UPS

- He offered a written quote — worth taking up.

The clearest outside validation of Recommendation 2: Montana won by defining its lane first — and wants technical regional alignment with Washington, not duplication.

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