



Investor Day 2026

NEW YORK STOCK EXCHANGE

Sept. 8, 2026



Important Information

FORWARD-LOOKING STATEMENTS AND OTHER INFORMATION

This presentation contains forward-looking statements. All statements other than statements of historical fact are forward-looking statements, including but not limited to statements regarding our guidance for the financial performance of our business and certain of its components, our quantum computing roadmap including expected changes in the cost per qubit, the scaling of our manufacturing and operations including potential acceleration with SkyWater, the timeline to breaking encryption, expectations surrounding the future of the global quantum market, our competitive position, and the applications of our technology. In some cases, you can identify forward-looking statements because they contain certain words such as “anticipate,” “believe,” “close,” “confident,” “continue,” “could,” “estimate,” “expect,” “intend,” “may,” “plan,” “potential,” “predict,” “project,” “should,” “will,” “would” or the negative of these words or other similar terms or expressions. Forward-looking statements are subject to various risks and uncertainties. Accordingly, there are important factors that could cause actual outcomes or results to differ materially from those indicated in these statements. Moreover, new risks and uncertainties emerge from time to time, and it is not possible for us to predict all risks and uncertainties that could have an impact on the forward-looking statements contained in this presentation. The results, events and circumstances reflected in the forward-looking statements made herein may not be achieved or occur, and actual results, events or circumstances could differ materially from those described in the forward-looking statements. Given these risks and uncertainties, you are cautioned not to place undue reliance on any forward-looking statements. For additional information on these and other factors that could cause our actual results to differ materially from those set forth in the forward-looking statements contained in this presentation, please see our Annual Report on Form 10-K for the year ended December 31, 2025 and our Quarterly Report on Form 10-Q for the quarter ended June 30, 2026 filed with the Securities and Exchange Commission. All information contained herein speaks only as of the date of this presentation, except where otherwise stated. Except as required by law, we undertake no duty to update or revise the information contained herein, publicly or otherwise, including any forward-looking statements.

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LEADERSHIP PRESENTATIONS

01 Opening

Niccolo de Masi

02 Quantum Computing

Chris Ballance

03 Introducing SkyWater & Quantum Foundry

Thomas Sonderman

04 Quantum Security & Platform

Jordan Shapiro

05 Financial Model & Outlook

Inder Singh

06 Audience Q&A

REAL-WORLD APPLICATIONS AND CUSTOMER PERSPECTIVES

07 Building with SkyWater Quantum Solutions

Mihir Bhaskar

08 Go-to-Market & Commercial Momentum

Chad Sakac

09 Real-World Quantum Application Narratives

Featuring EPB, MyOme, and ServiceNow

10 Quantum for National Resilience

Undersecretary Alessio Butti

11 Mission Critical Applications at IonQ Federal

Featuring General Jay Raymond, Robert Cardillo, and Rick Muller

12 NYSE Closing Bell Ceremony



Niccolo de Masi

CHAIRMAN & CEO



1995 - 2018

QUANTUM PIONEER

First quantum
logic gate

~\$1M

2019 - 2024

COMMERCIALIZATION

First on all three
major clouds

~\$10M

2025

PLATFORM EXPANSION

First quantum
platform company

~\$100M

2026

VERTICAL INTEGRATION

First vertically integrated
quantum platform

NEARING
\$300M

IONQ OUR FULL STACK QUANTUM PLATFORM

 **IONQ**
QUANTUM
PRODUCTS & SERVICES



QUANTUM
COMPUTING



QUANTUM
NETWORKING



QUANTUM
SENSING



QUANTUM
SECURITY



QUANTUM FOUNDRY

QUANTUM ACCELERATED TECHNOLOGY SERVICES

QUANTUM SEMICONDUCTOR
MANUFACTURING

ADVANCED PACKAGING

QUANTUM PHOTONICS

Serving
customer
segments

**FINANCIAL
SERVICES**

**BIO & LIFE
SCIENCES**

**CHEMISTRY &
MATERIALS**

ENERGY

AI / ML

**CLOUD
SERVICE
PROVIDERS**

**LOGISTICS &
RETAIL**

IONQ Q2 2026 REVENUE EXCEEDS THE REST OF THE PURE-PLAY REPORTED INDUSTRY



\$80.1M

Nearly double all other pure-play quantum companies combined



COMPUTE



SENSING



NETWORKING

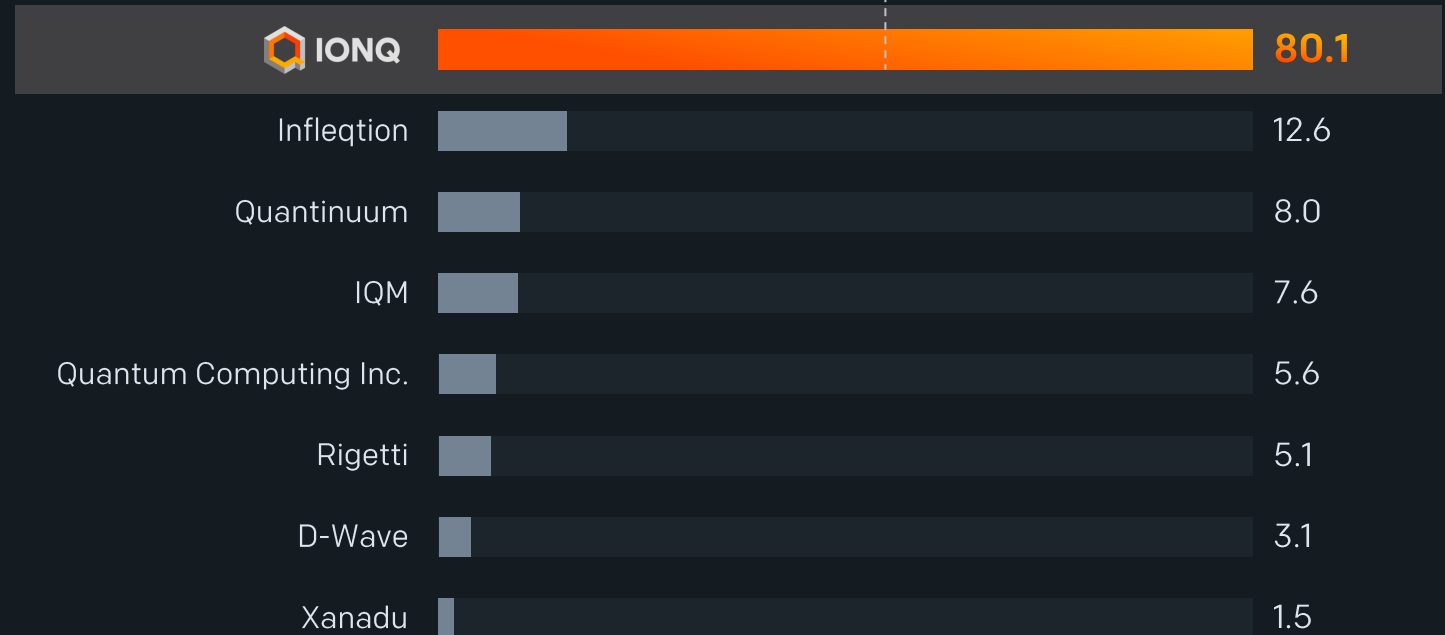


SECURITY

Q2 2026 REPORTED REVENUE · (\$ MILLIONS USD)

\$43.6M

Rest of publicly reported quantum industry combined



Source: available public filings for pure-play quantum computing businesses as of 8/31/2026

Note: IQM €6.7 million converted into USD at 1.15 exchange rate; Horizon Quantum excluded based upon no reported revenue in Q2 2026 period; Pasqal excluded due to no available reported data

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IONQ CONTINUING TO EXECUTE ON OUR MILESTONES

HIGHLIGHTS: SEPTEMBER 2025 → SEPTEMBER 2026

FINANCIAL RESULTS



5x

OUR REVENUE SCALE
H1 2025 TO H1 2026

TECHNICAL LEADERSHIP



1kHz

ENTANGLEMENT RATE,
4X FASTER THAN PREVIOUS
ION-ION RECORD ¹



256 qubit

QPUS FABRICATED AT
SKYWATER

MARKET VALIDATION



3

MAJOR DARPA PROGRAMS
ADVANCING ACROSS OUR
PLATFORM



100%

2026E Y/Y ORGANIC
REVENUE GROWTH ²



9x

BETTER qLDPC ERROR
RATES THAN PRIOR
DEMONSTRATIONS ³



WALKING CAT

COMPLETE ARCHITECTURAL
BLUEPRINT FOR FAULT
TOLERANCE



4

2026 IEEE QUANTUM
WEEK BEST PAPER WINS

1. IonQ findings from a forthcoming study, details of which will be made available upon publication; previous ion-ion record per O'Reilly et al. (2024)
2. Organic revenue is a supplemental measure representing revenue derived from IonQ's quantum computing products, and any acquisitions prior to December 31, 2024
3. Benchmarked on a Tempo engineering system

LATEST ESTIMATES
EXPECT QUANTUM
COMPUTERS TO BREAK
RSA-2048 THIS DECADE

Quantum will
break traditional
encryption

Sensitive data of
every enterprise
and government

Classical AI
is weakening
modern PQC
algorithms

AI HAS FOUND
PREVIOUSLY UNKNOWN
FLAWS IN LEADING NIST
PQC CANDIDATES

Quantum-safe defense in depth

Protection at multiple layers, plus exposure monitoring and remediation.



Posture Management

See your exposure in real time



PQC

Modern algorithms everywhere



QKD

Keys secured by physics

IONQ GLOBAL COMPUTE FOOTPRINT



-  Announced on-prem deployments
-  Select cloud customer locations



1,800+

Cloud users worldwide¹

33,000+

Hours of cloud uptime

6

Continents

100%

FY26E Y/Y Organic Growth²

1. Unique users of IonQ Cloud; does not include AWS, Google or Azure

2. Organic revenue is a supplemental measure representing revenue derived from IonQ's quantum computing products, and any acquisitions prior to December 31, 2024

The full-stack compute platform

Every layer engineered for the others, from application to atom.



01 APPLICATIONS

Real applications, in production today.

02 SOFTWARE & ERROR CORRECTION

A complete, published path to fault tolerance.

03 QPU & MANUFACTURING

Nature's perfect qubits, controlled by silicon.

The full-stack compute platform

Every layer engineered for the
others, from application to atom.



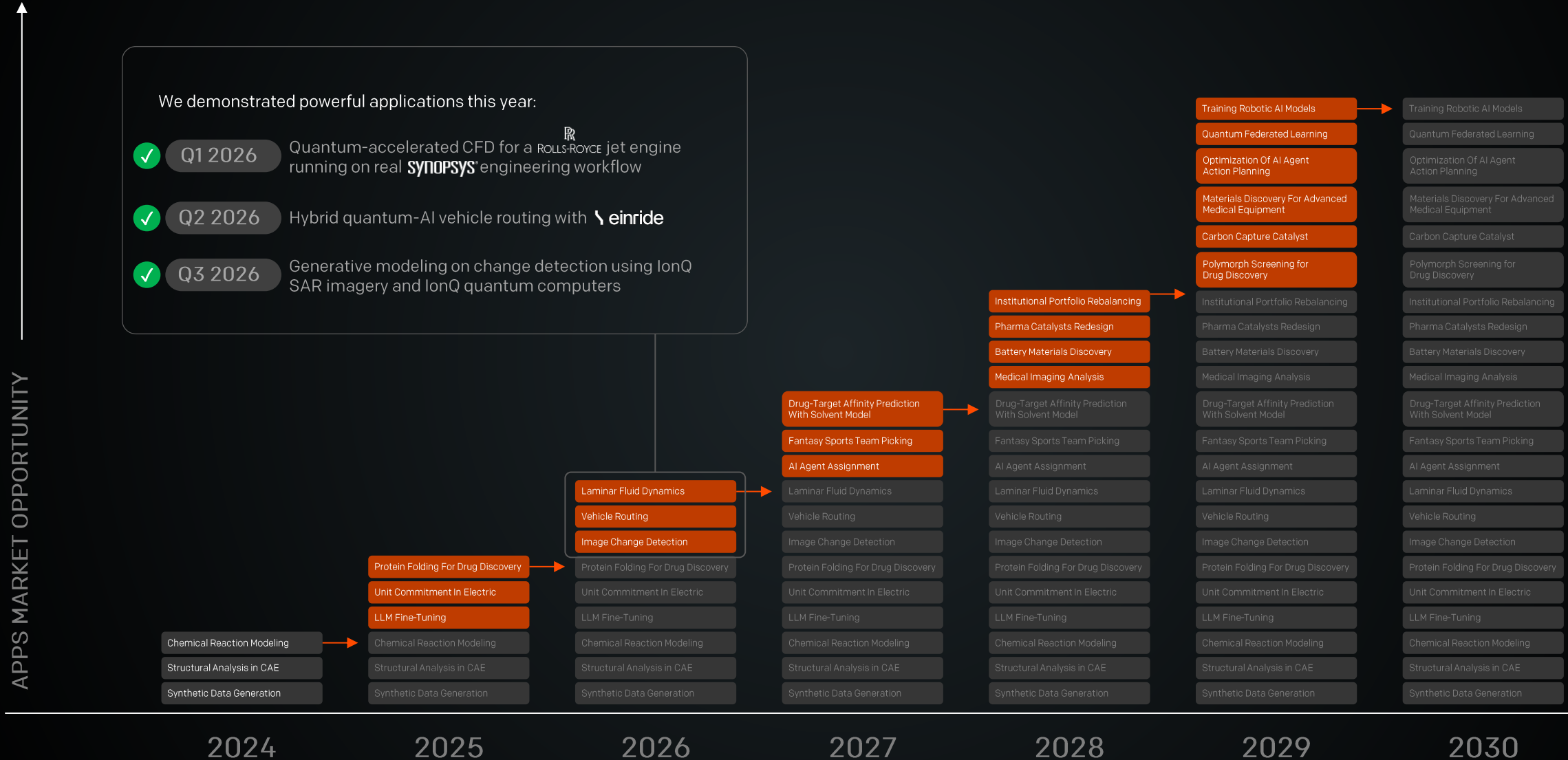
Supported by the
world's fastest
quantum interconnect¹

For data center-scale distributed
architectures



IONQ

OUR FULL STACK APPROACH UNLOCKS VAST APPLICATION SPACE



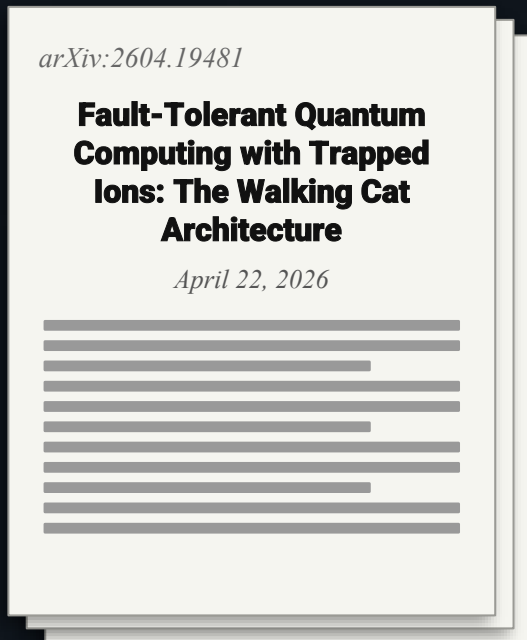
The hardest problems in medicine are computational.

- Design a cancer drug before it exists
- Read a genome with nothing missing
- Fit a treatment to one person's biology
- Detect diseases before symptoms emerge
- Simulate molecular behavior



April 2026

The Walking Cat blueprint



September 2026

Full-stack resource estimate, accounting for every instruction

An IonQ system can recover a 256-bit elliptic-curve key:

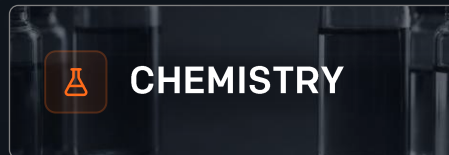
~26 days

TO RECOVER

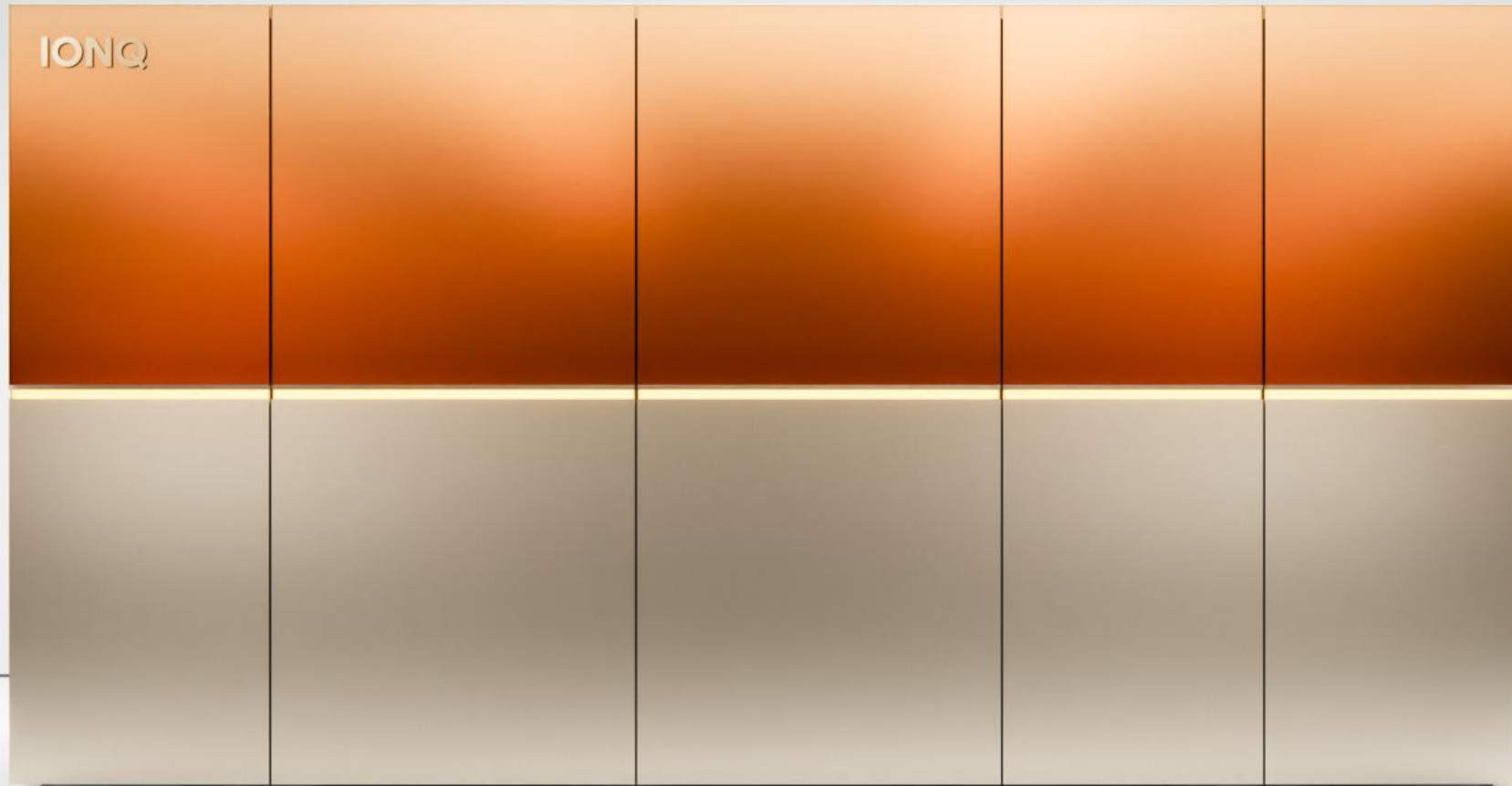
~20,000

PHYSICAL QUBITS

Broad commercial impact across industries:



IONQ SUPERION





Chris Ballance

PRESIDENT, QUANTUM COMPUTING



1st

Generation

HARMONY
2019



2nd

Generation

ARIA
2021



3rd

Generation

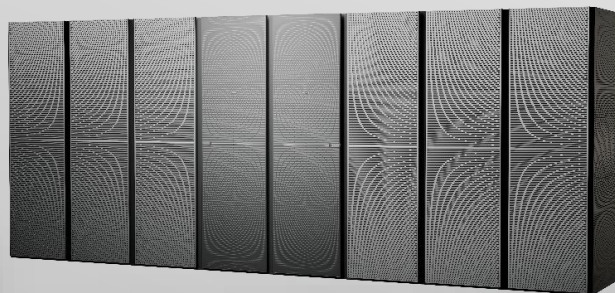
FORTE
2023



4th

Generation

FORTE ENTERPRISE
2024



5th

Generation

TEMPO
2025



25

COUNTRIES WITH
CUSTOMERS WHO HAVE
RUN WORKLOADS

33,000+

LIFETIME HOURS OF CLOUD UPTIME

1,200+

PATENTS GRANTED AND
PENDING WORLDWIDE

FULL STACK
QUANTUM PLATFORM



COMPUTE



SENSING



NETWORKING



SECURITY

100%

2026E Y/Y ORGANIC REVENUE GROWTH¹

1. Organic revenue is a supplemental measure representing revenue derived from IonQ's quantum computing products, and any acquisitions prior to December 31, 2024



ALL 3

MAJOR PUBLIC CLOUD DEPLOYMENTS

99.999%

2 QUBIT GATE FIDELITY²

2. Technical paper released October 2025; <https://arxiv.org/abs/2510.17286>

\$350m+

LIFETIME REVENUE

5

GENERATIONS OF COMMERCIAL SYSTEMS



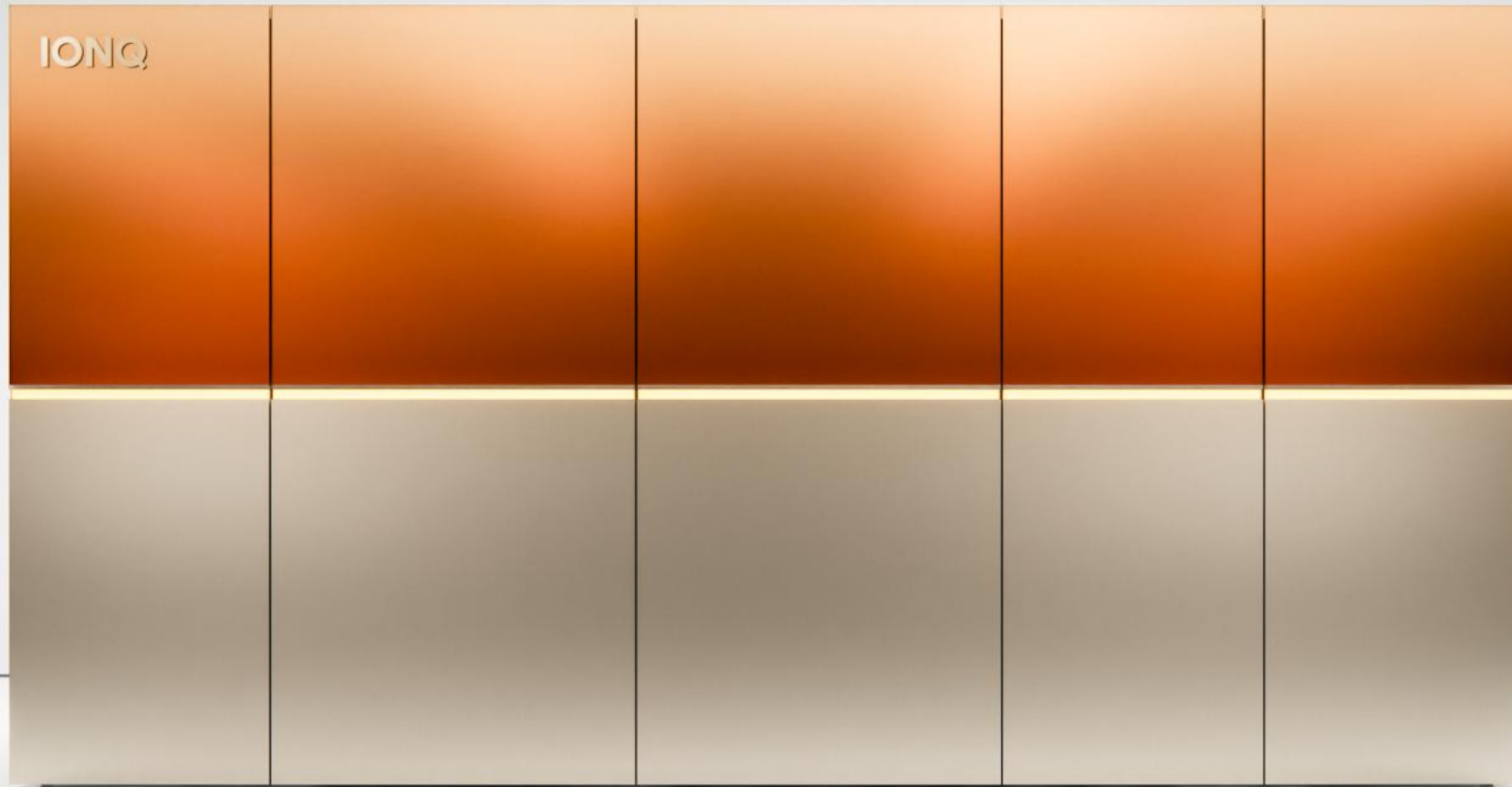
IONQ SCALING THE SUMMIT TO FAULT TOLERANCE

3 DEMONSTRATE SCALE
with the core platform,
across multiple generations,
to enable applications that
couldn't exist before

2 VERTICALLY INTEGRATE
to accelerate innovation
cycles and enable
manufacturability

1 RADICALLY SIMPLIFY
the platform enabling
new levels of scale and
repeatability

IONQ SUPERION





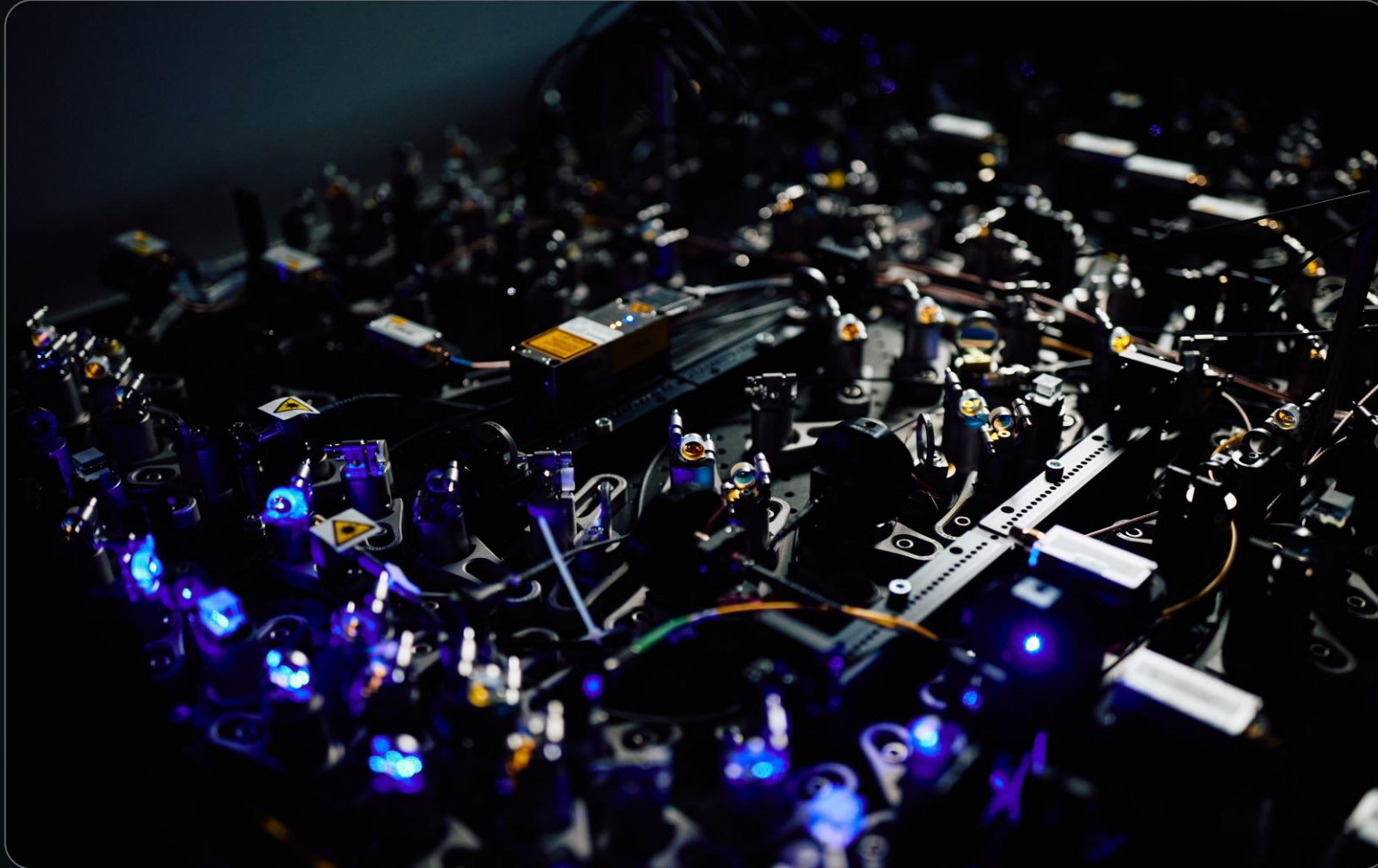
IONQ SCALING THE SUMMIT TO FAULT TOLERANCE

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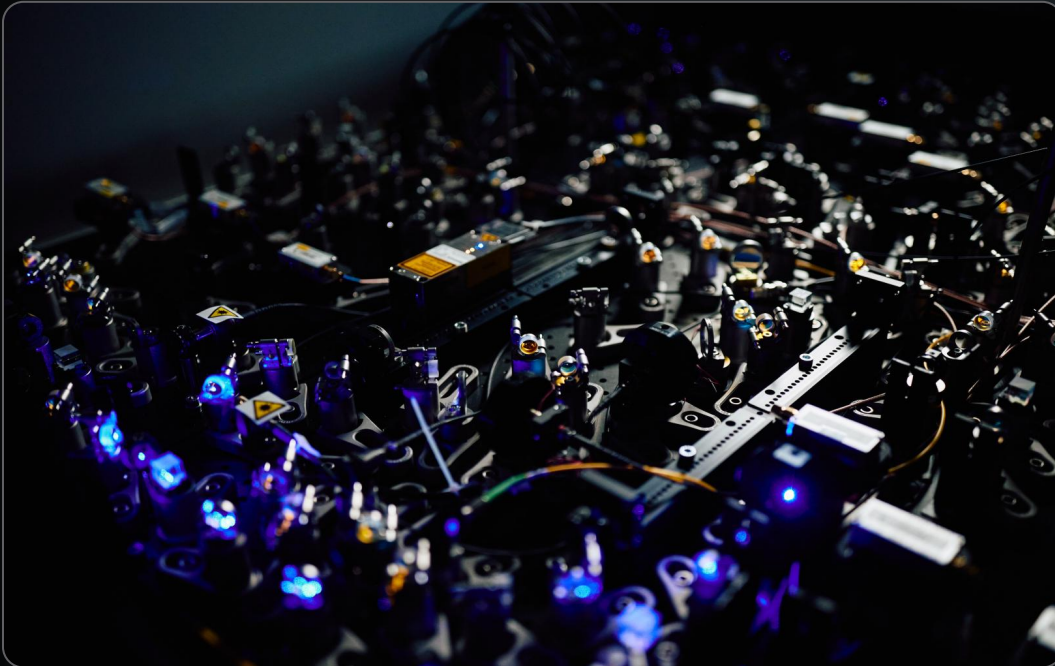
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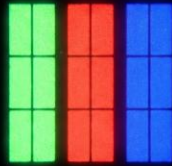
IONQ RADICAL SIMPLIFICATION: ELECTRONIC QUBIT CONTROL (EQC)



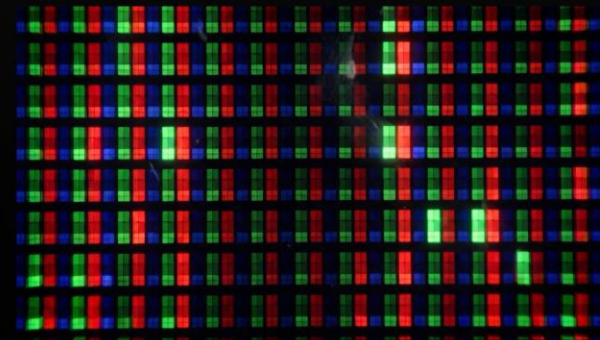
IONQ RADICAL SIMPLIFICATION: ELECTRONIC QUBIT CONTROL (EQC)



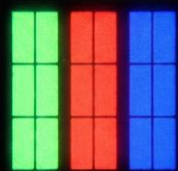
SINGLE LED PIXEL



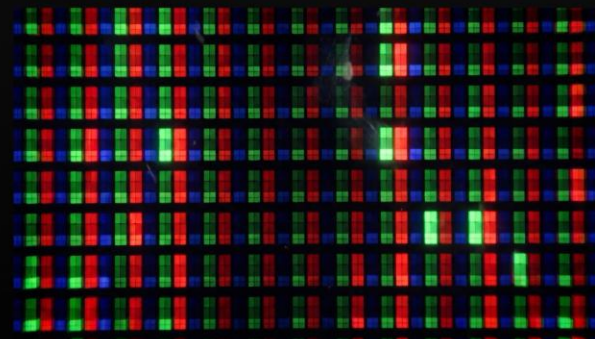
LED PIXEL ARRAY



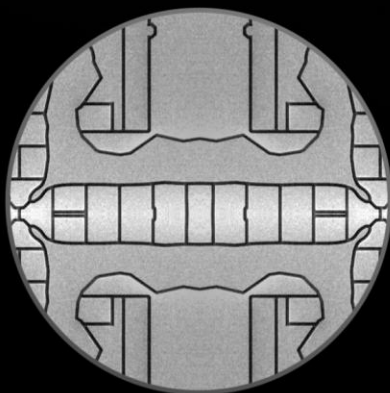
SINGLE LED PIXEL



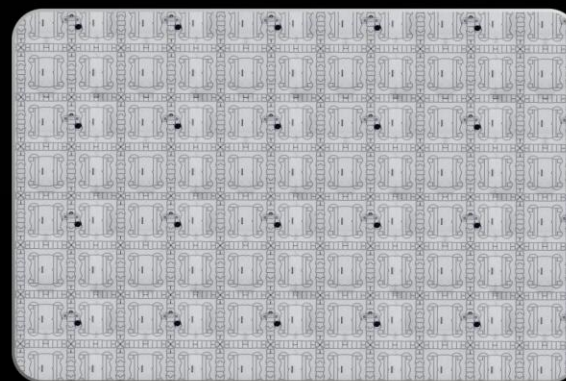
LED PIXEL ARRAY

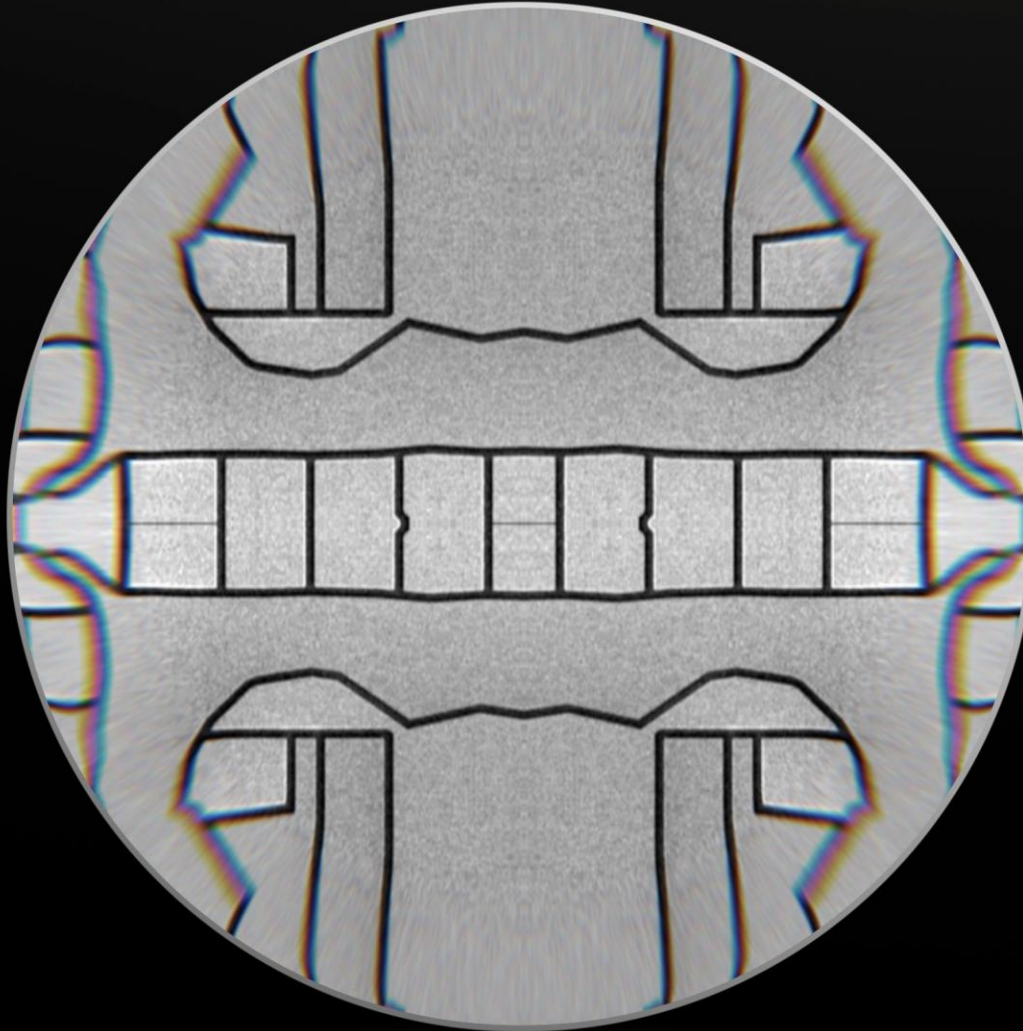


UNIT CELL

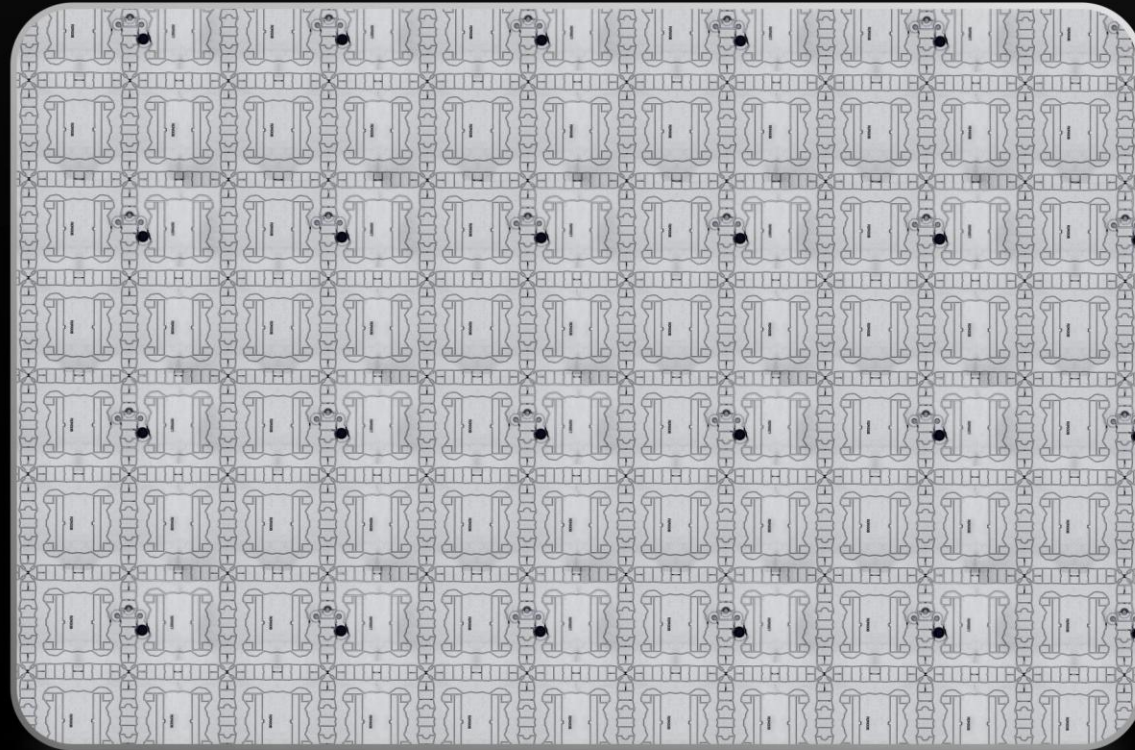


UNIT CELL ARRAY

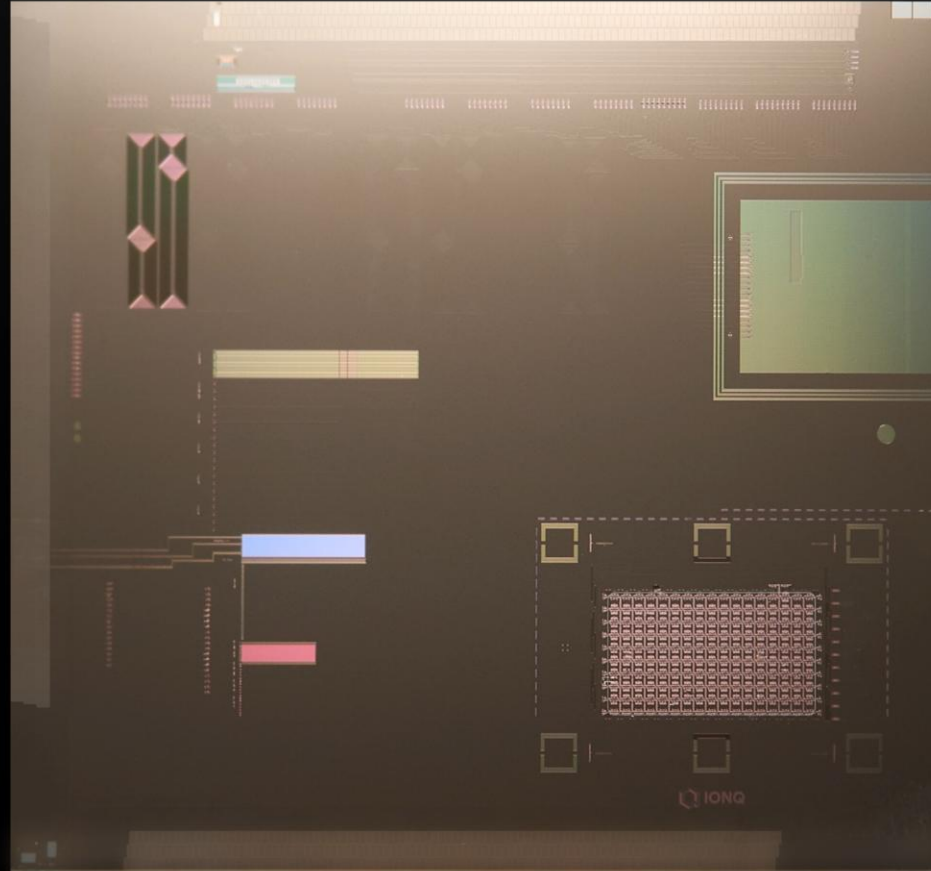




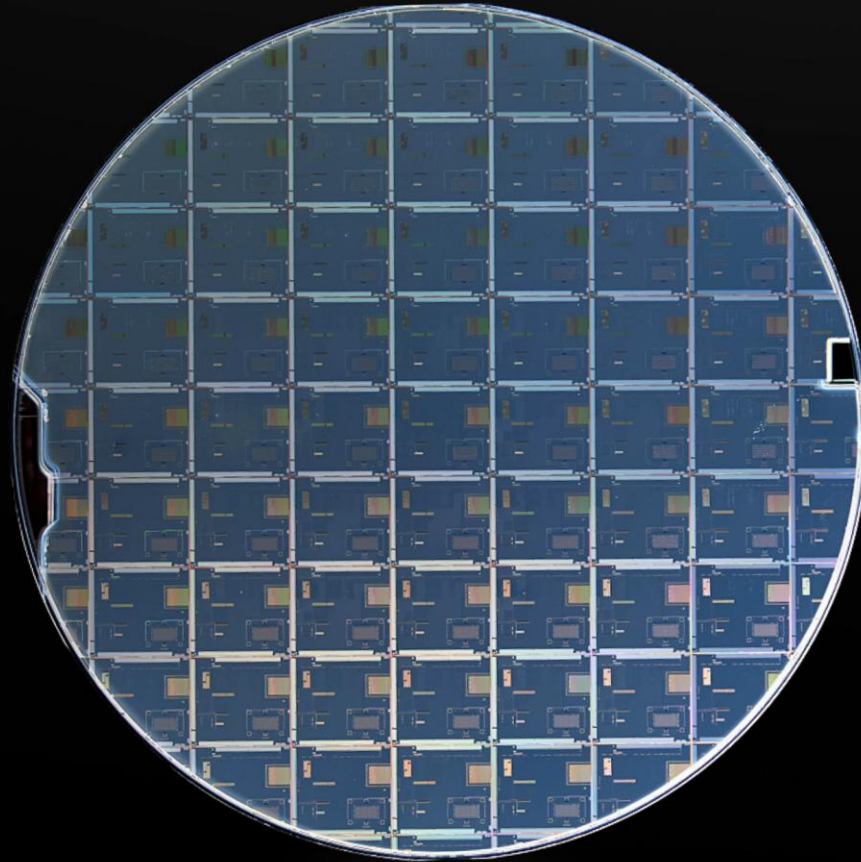
Unit Cell
99.99%
2 qubit gate fidelity



Unit Cell Array

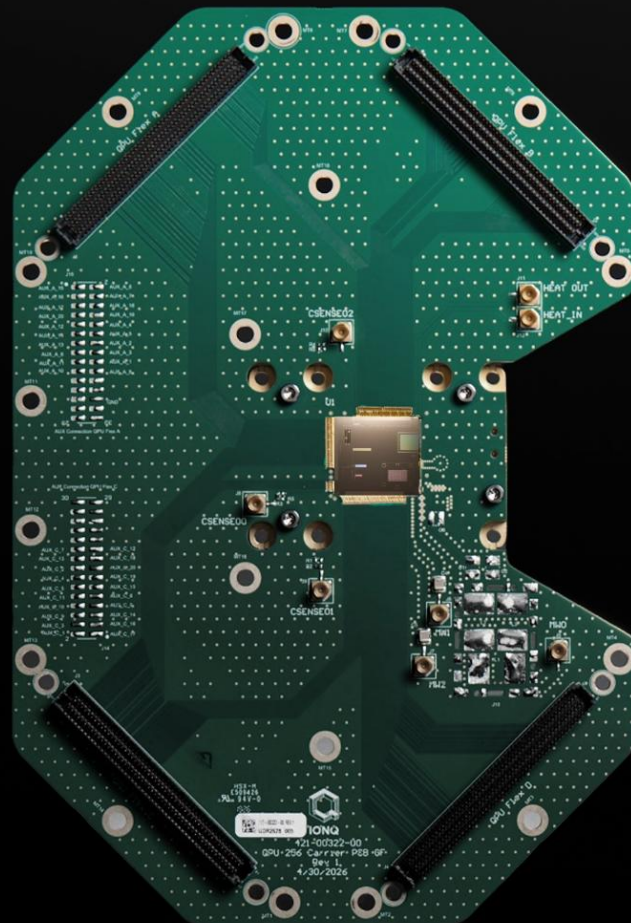


256Q Chip



256Q Wafer



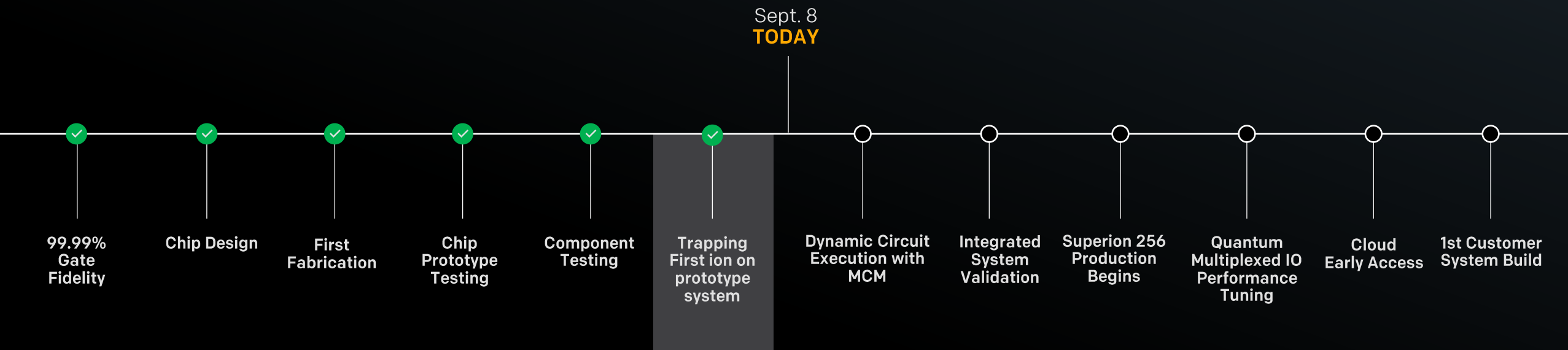


256 QPU

IONQ SUPERION 256 PROTOTYPE SYSTEM



IONQ THE PATH TO DEPLOYING IONQ SUPERION 256





IONQ SCALING THE SUMMIT TO FAULT TOLERANCE

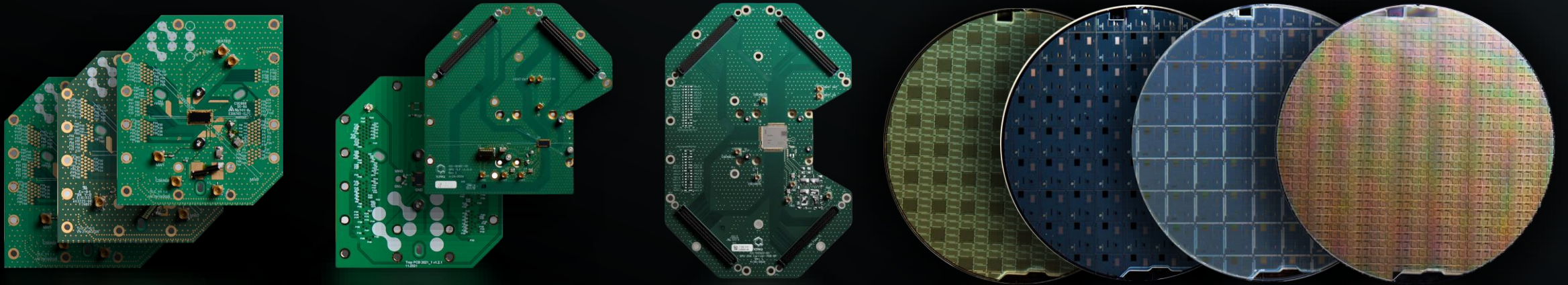
3 DEMONSTRATE SCALE
with the core platform,
across multiple generations,
to enable applications that
couldn't exist before

2 VERTICALLY INTEGRATE
to accelerate innovation
cycles and enable
manufacturability

1 RADICALLY SIMPLIFY
the platform enabling
new levels of scale and
repeatability



IONQ VERTICAL INTEGRATION = RAPID ITERATION



IONQ VERTICAL INTEGRATION = RAPID ITERATION



100+

LEARNING CYCLES PER
YEAR EXPECTED

12x

MORE WAFER LOTS
DELIVERED¹

330x

REDUCTION IN
COST-PER-QUBIT²

9 → 2

MONTHS MONTHS
256Q CHIP CYCLE TIMES

1. Figure based on a per six-month period with SkyWater, as compared to lots delivered in our previous ion-trap fabs

2. Between second generation (Aria) and forthcoming seventh generation Superior 10K



IONQ SCALING THE SUMMIT TO FAULT TOLERANCE

3 DEMONSTRATE SCALE
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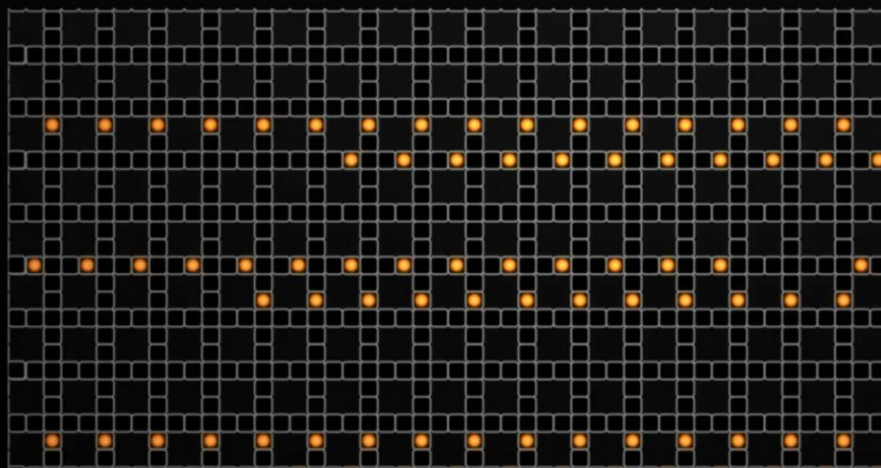
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256 qubits



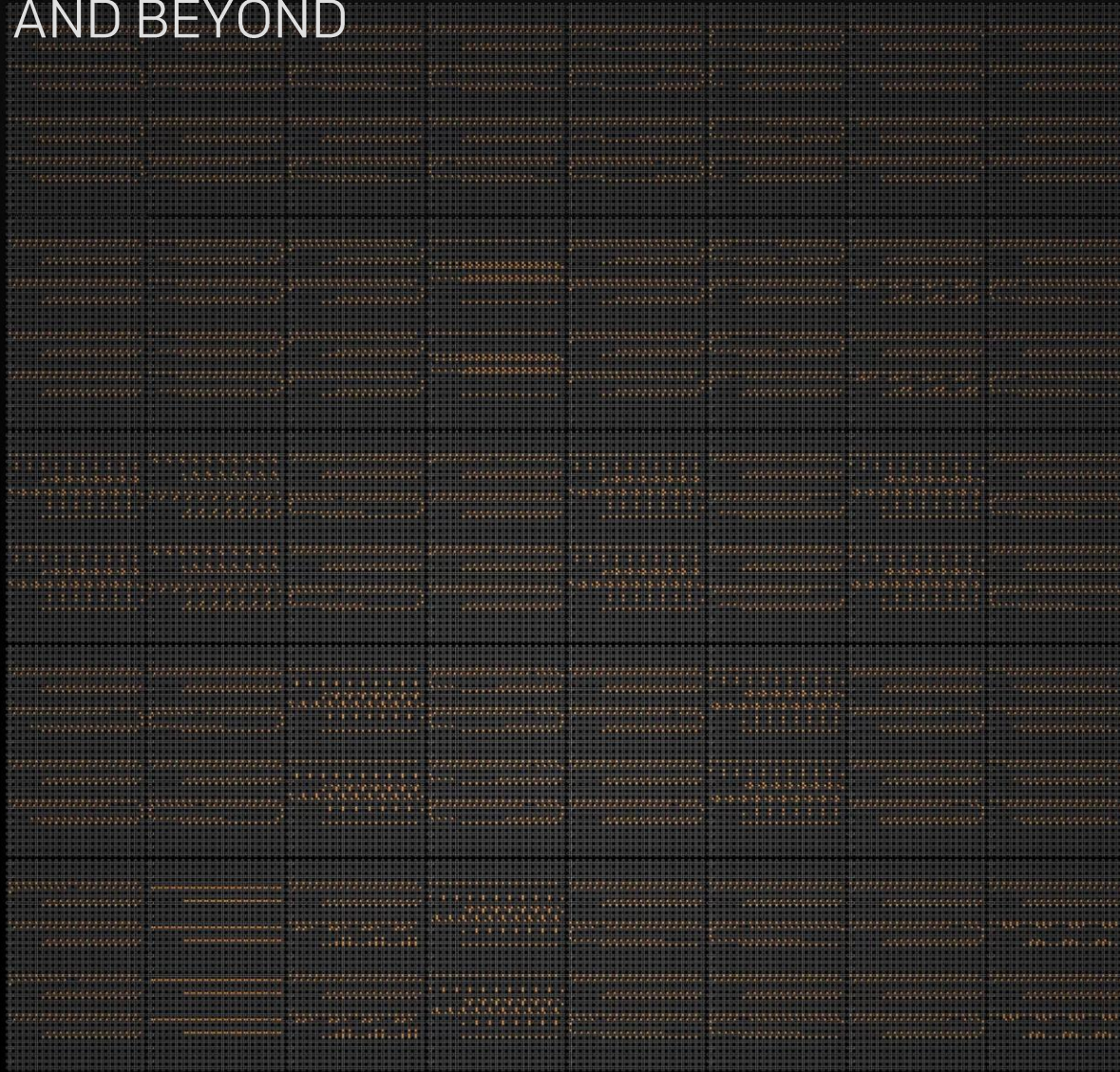
OUR BLUEPRINT FOR SCALE:
WALKING CAT

The most detailed full-
stack quantum
computing architecture



10,000 qubits

SCALING TECHNIQUE: CMOS

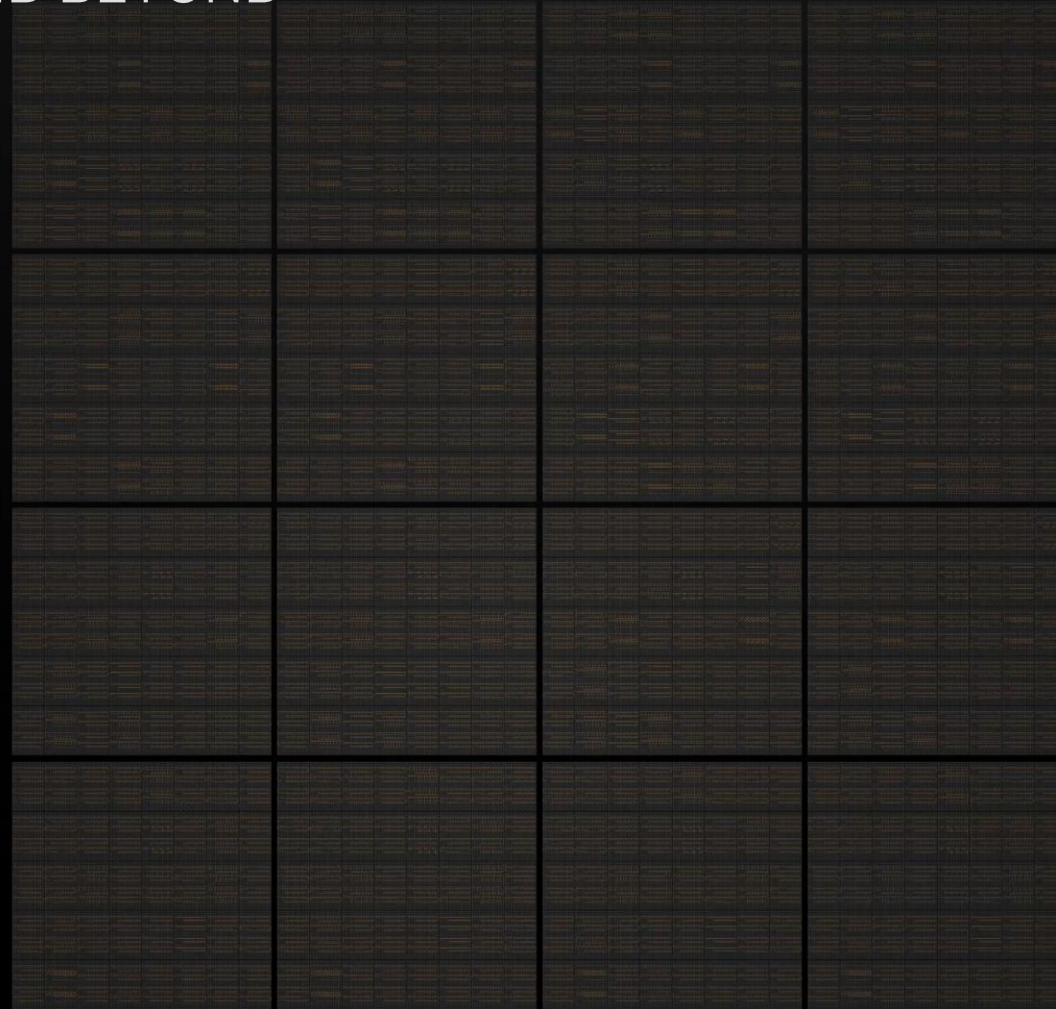


20,000 qubits
SCALING TECHNIQUE: TILING

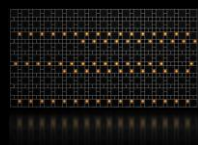


200,000 qubits

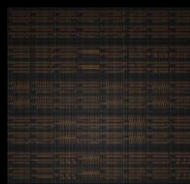
SCALING TECHNIQUE:
DIE SHRINK



IONQ SIMPLE, SCALABLE, AND MASS MANUFACTURABLE

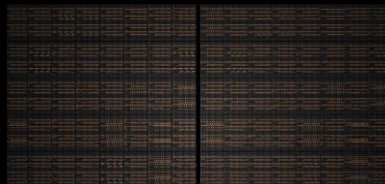


256 qubits



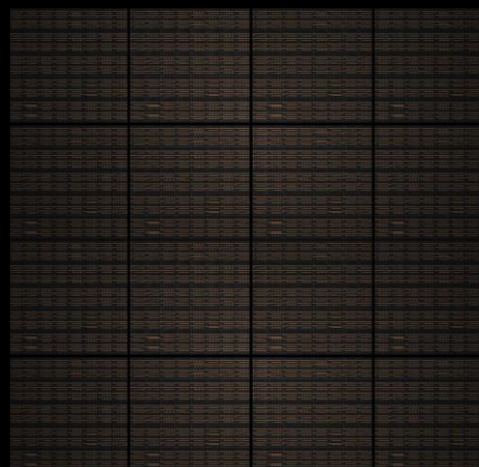
10K qubits

SCALING TECHNIQUE
CMOS



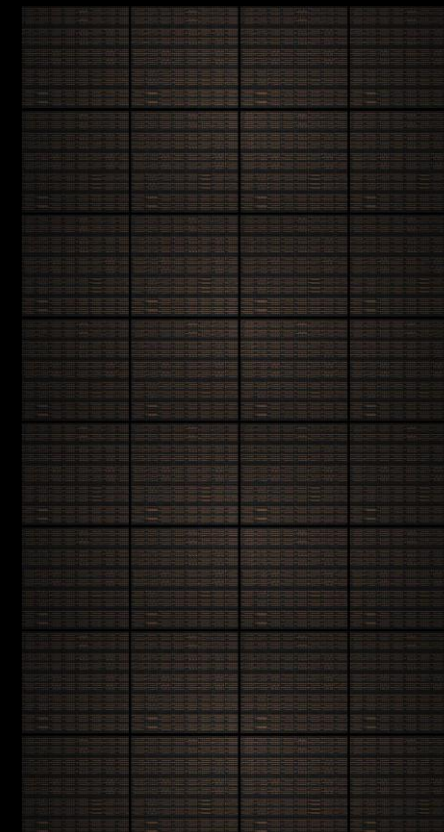
20K qubits

SCALING TECHNIQUE
TILING



200K qubits

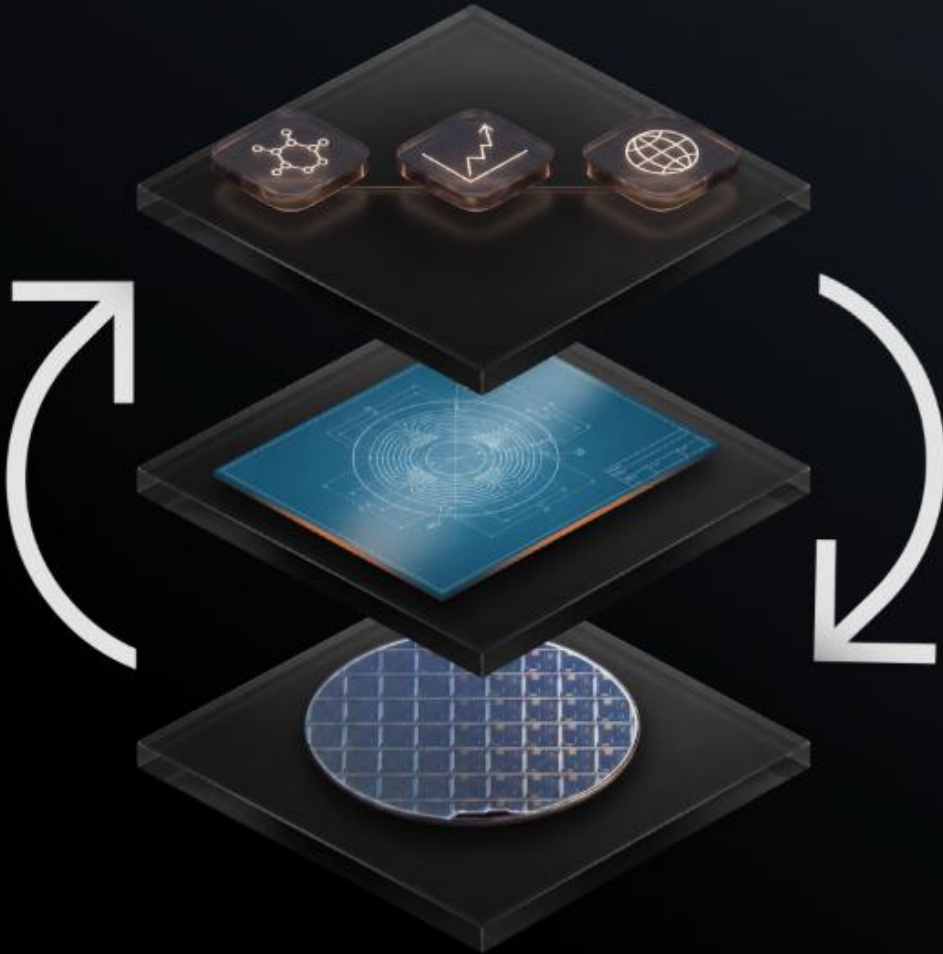
SCALING TECHNIQUE
DIE SHRINK



1M+ qubits and beyond

SCALING TECHNIQUE
2.5D IC PACKAGING

IONQ FULL-STACK COMPUTE PLATFORM



QUANTUM SOLUTIONS

- 100x faster time to solution of MaxCut optimization versus other quantum modalities
- 10,000x improvement in time to solution for signal deconvolution problem
- 20x speedup of hybrid GPU/QPU computational chemistry workflow

SOFTWARE, ARCHITECTURE & ERROR CORRECTION

- Blueprint for an FTQC architecture, designed with realistic engineering constraints in mind
- Customized qLDPC codes running on real hardware
- MegaQuOp realtime decoding stack demonstrated end-to-end on one CPU

QPU & MANUFACTURING

Nature's perfect qubits, controlled by silicon, manufactured into chips at SkyWater

Shor's Algorithm on
256-bit elliptic curve

25.7 days

TO RECOVER, USING

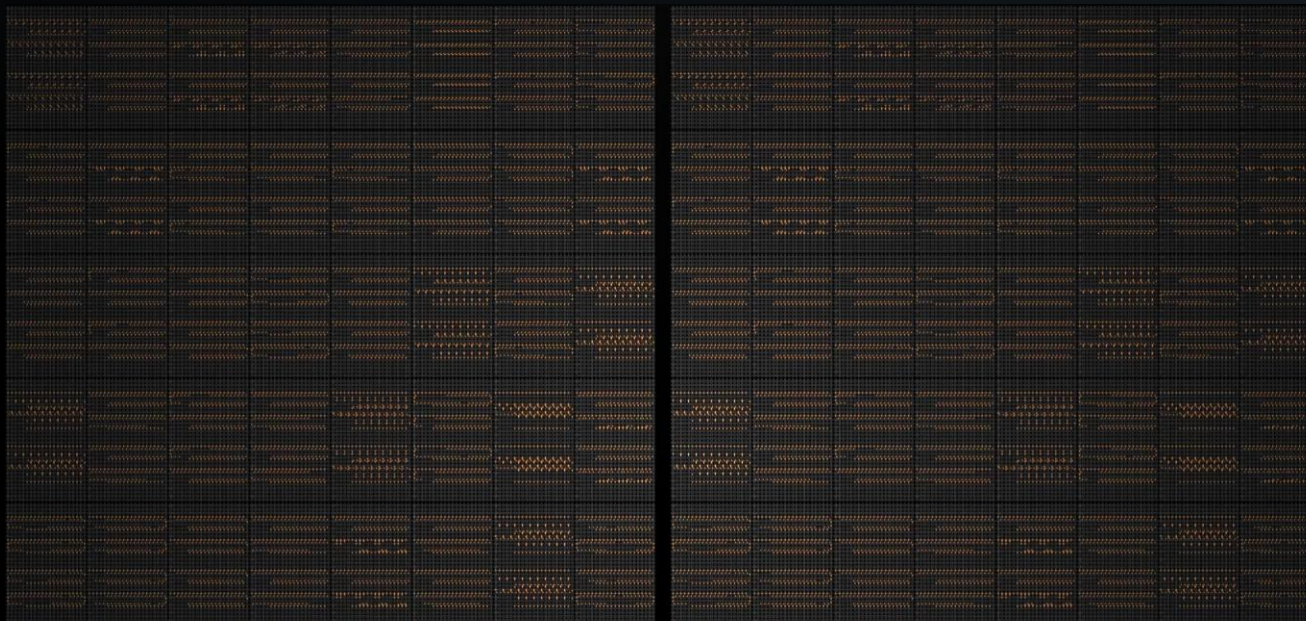
19,397

PHYSICAL QUBITS, WHICH IS

31x

IMPROVEMENT OF ERROR-
CORRECTION MODULES

20,000 physical qubits



FULL-STACK RESOURCE BLUEPRINT

Our implementation model fully accounts for every instruction that needs to run on the computer including:

All necessary error correction | All cooling | All ion loss events | All syndrome extraction cycles



Thomas Sonderman

CEO, SKYWATER



IONQ AT SKYWATER, WE MANUFACTURE BY THE LOT

Semiconductor manufacturing has underpinned other compute revolutions. Quantum is now in that phase.

PHYSICS PROBLEMS

FROM LAB

Units of Production: one trap, one system

ENGINEERING PROBLEMS



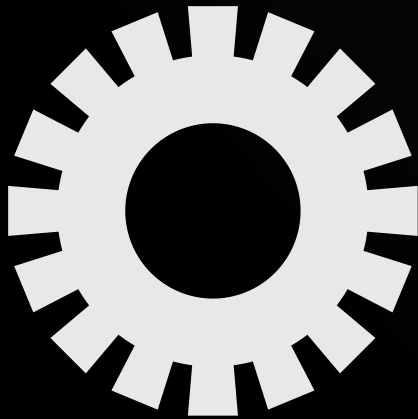
TO FAB

Units of Production: dies per wafer, lots per month



IONQ

QUANTUM INNOVATION REQUIRES SPECIALIZED TECHNOLOGY AS A SERVICE



Quantum
Specialized Design
and R&D



TaaS
Development
in Foundry



Volume
Manufacturing



IONQ

SKYWATER PROVIDES THE UNIQUE CAPABILITIES NEEDED TO SCALE QUANTUM

Conventional Foundry

- Minimal customization
- High-volume

Specialty Foundry

- Moderate customization
- Medium-volume
- Good fit, if they already have what you need



skywater

- Covers entire lab-to-fab spectrum
- High tolerance for customization and complexity
- Rapid prototyping
- Priority hot-lots possible even at low volume
- Advanced packaging in-house (200 & 300 mm)
- Ability to transition seamlessly to volume with domestic fab



IONQ SECURE, DOMESTIC MANUFACTURING IS CRITICAL FOR QUANTUM TECHNOLOGY

**Together, The World's
Only Trusted, U.S.-Based
Quantum Foundry**



Minnesota

**advanced TaaS manufacturing
and CMOS integration**

*91,000 sq. ft. cleanroom
DMEA Category 1A Trusted Supplier*



Texas

high-volume 200mm foundry

*114,000 sq. ft. cleanroom
30,000 sq. ft. probe & test space*



Florida

advanced packaging

*36,000 sq. ft. cleanroom
DMEA Category 1A Trusted Supplier*



Together, IonQ and SkyWater have already delivered:

SPEED

>3x

acceleration in the 256-qubit fab out cycle times

INNOVATION

12x

more wafer lots delivered per 6-month period with SkyWater¹

BREADTH

5

quantum devices being prototyped in parallel²

SCALE

100+

Learning cycles per year expected

These foundational investments accelerate the entire quantum industry

1. As compared to lots delivered in our previous trap fabs

2. Including two quantum computer generations (256-qubit and 10K), quantum networking devices, and low-SWaP optical control technology



IONQ QUANTUM FOUNDRY: DIFFERENTIATED OFFERING READY FOR MARKET NOW



SPEED

Ready for Quantum now

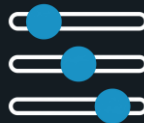
Capacity for quantum wafer services available today

Faster learning cycles

Rapid prototyping and wafer velocity accelerate design, test, and iteration – even at low volumes

Proven operating model

TaaS model for driving process innovation



FLEXIBILITY

Configurable platforms

Process modules and packaging can be tailored within realistic constraints

Customer-controlled IP

Simple and clear IP model to protect customers' freedom-to-operate and competitive differentiation

Development engagements

Customized engagements before committing to development in volume environment



QUANTUM EXPERTISE

Know-your-customer

Decades of quantum semiconductor expertise across superconducting, trapped ion, photonics, advanced packaging, and heterogeneous integration

Experienced team

Dedicated quantum-focused fabrication engineers on every engagement

PHOTO 2

All quantum solutions run through SkyWater



Together, IonQ and SkyWater are building the infrastructure that makes the quantum economy possible

Jordan Shapiro

PRESIDENT, QUANTUM PLATFORM





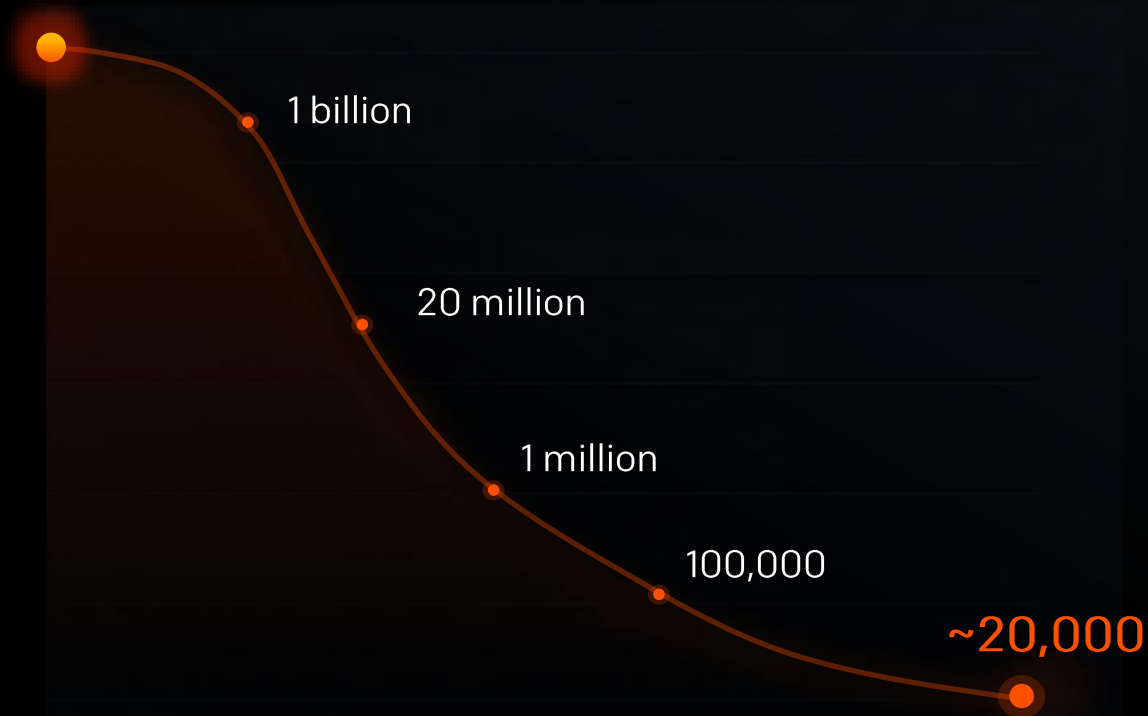
IONQ

CONVERGING FACTORS DRIVING POST-QUANTUM MIGRATION READINESS

First Fully Compiled, End-to-End Blueprint for Breaking 256-Bit Elliptic-Curve Signatures

19,397

trapped-ion physical qubits

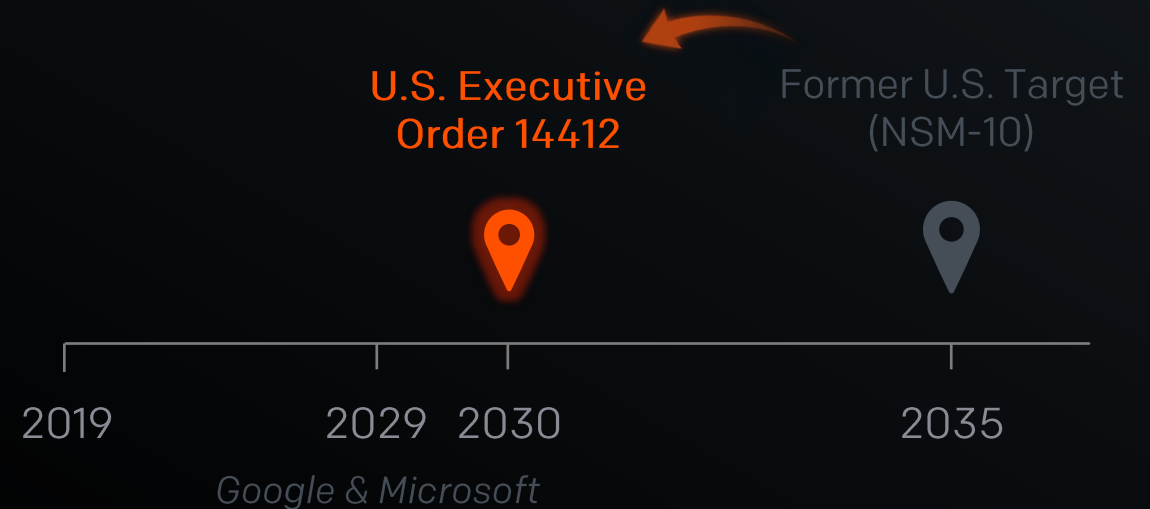


June 2026: Executive orders to prepare for Q-Day

EXECUTIVE ORDER 14412 | JUNE 22, 2026



Securing the Nation Against Advanced Cryptographic Attacks



QUANTUM SECURITY POSTURE MANAGEMENT

**CNSA 2.0 AND NIST-ALIGNED
LIFECYCLE MANAGEMENT**



**MANAGE AND ORCHESTRATE
QUANTUM-SAFE KEYS**



**PHYSICS-BASED QUANTUM KEY
DISTRIBUTION PROTECTION**



IonQ brings these layers together and is continuing to expand the capabilities required for a complete quantum-safe architecture.



IONQ

OUR QUANTUM SECURITY PLATFORM IS IMPACTING THE MARKET TODAY



CONGRUITY | 360



QKD and PQC protect one of the largest commercial quantum security agreements announced in the U.S. to date

Singtel



end-to-end nationwide quantum-safe network supporting financial services and other critical industries

SK broadband



Over 800-km secured by 27 QKD links, 127 secured connections, and infrastructure designed for commercial extension

CONTINUED MARKET VALIDATION

STANDARDS & EVALUATION



NIST

INFRASTRUCTURE & ENTERPRISE



colt



World's largest financial institution

GOVERNMENT & DEFENSE





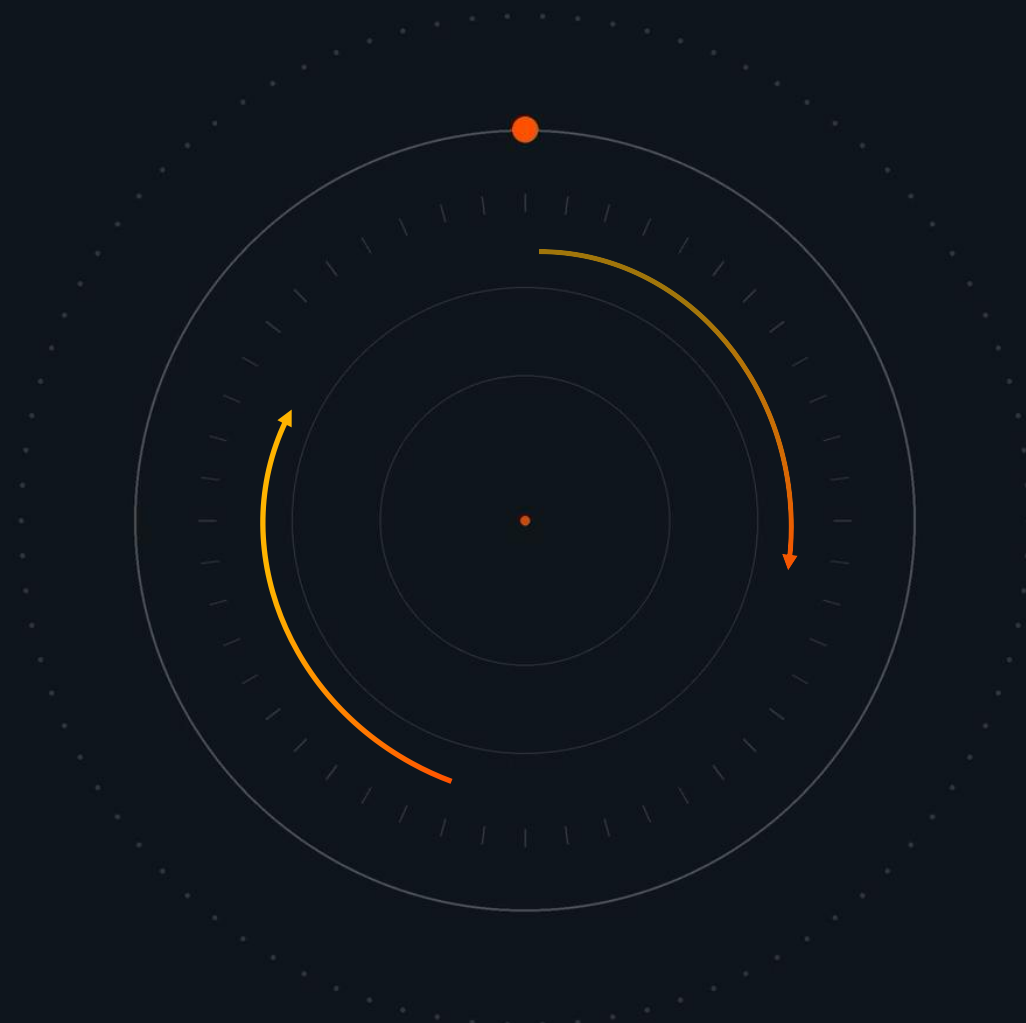
IONQ

IONQ QUANTUM SECURITY SOLUTIONS MADE STRONGER BY CUTTING EDGE ADVANCEMENTS IN QUANTUM COMPUTING

Quantum security



Most companies approach this from one side of the problem. We have both: **understand risks as they emerge and test product effectiveness**



Quantum computing

Only quantum computing company with quantum security to **remediate vulnerabilities**





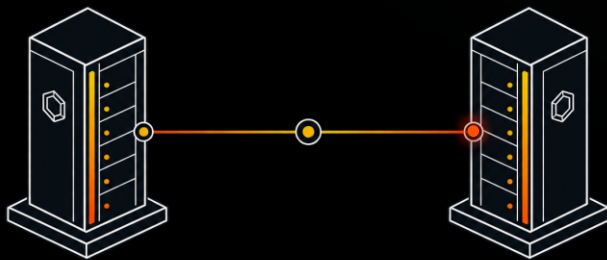
IONQ INTEGRATED SOLUTIONS: DISTRIBUTED QUANTUM COMPUTING

Connect the processors. **Build** the network. **Extend** beyond fiber.

INTERCONNECT

Two independent commercial trapped-ion systems connected

PROVEN TODAY



EXTEND

Free-space optical links extend quantum connectivity across ground, air, sea, and space.

A FUTURE BEYOND FIBER

BUILDING WHATS NEXT

NETWORK

Interoperable network layer for distributed quantum systems



Quantum Radar Image Change Detection

MARINE CORPS AIR STATION MIRAMAR, SAN DIEGO, CA

Before SAR image



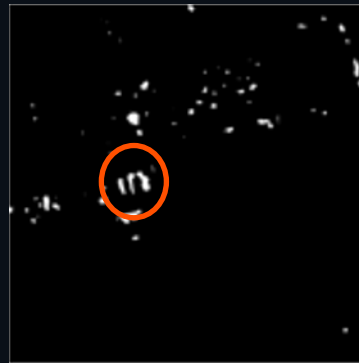
After SAR image



Ground truth change



Quantum, on QPU | 0.41



Classical, NLCD | 0.16



Classical, Copula | 0.24



Increase in false
change detection

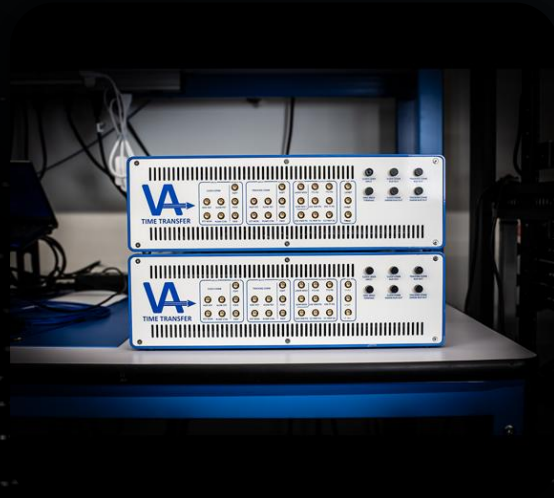
The number above is the filtered F1 score. It combines missed changes and false detections into a score between 0 (missed changes and false detections) and 1 (no missed changes or false detections).

On this complex dataset, quantum processing reduced false detections to isolate meaningful change



IONQ INTEGRATED SOLUTIONS: TIMING, THE FOUNDATION OF EVERYTHING

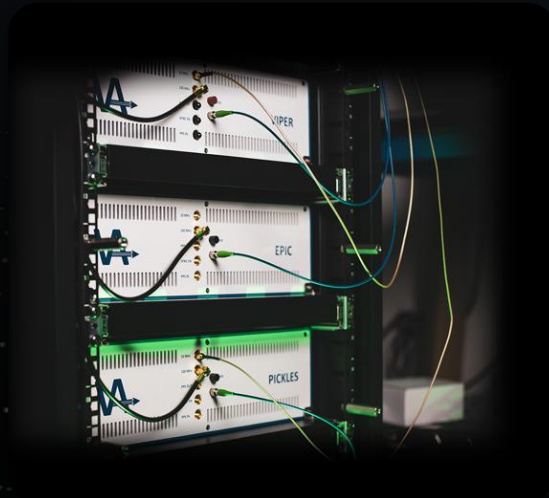
Time transfer modules



FIRST
OPTICAL ATOMIC CLOCK

Operated at sea

Three optical clocks



1000x
BETTER TIMING

vs. microwave clocks

Atomic gravimeter



NIST
VALIDATED

Highest performing clock
in the NIST ensemble

Atomic gyroscope



FIRST
STRATEGIC-GRADE
QUANTUM INERTIAL SENSOR

Flown in space



The U.S. Government is supporting and deploying the building blocks of the future platform



COMPUTE

DARPA QBI:
Phase B



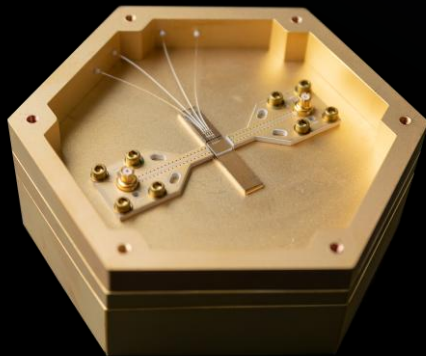
SENSING

DARPA It's About Time:
125 quantum clocks

DARPA GRAVMAP

DIU CRUISE

DIU QuIX



NETWORKING

DARPA HARQ:
*High-speed multi-modality
quantum interconnects*

AFRL:
*scalable/deployable
quantum networking*

*free-space networking /
UAS work*



SPACE

SDA HALO:
*Tactical satellite
communications
demonstration*

84 OCTs on orbit,
supporting SDA Tranche 1

NRO RCA



Inder Singh

CFO & COO





IONQ HAS EXPANDED INTO MULTIPLE HIGH-GROWTH TAMs

Moving from one product to many products

Majority of other quantum companies are here



**QUANTUM
COMPUTING**

\$148B



**QUANTUM
NETWORKING**



**QUANTUM
CYBERSECURITY**



**QUANTUM
SENSING**

\$36B

"Quantum Communications" combined

\$31B



**SKYWATER
QUANTUM AND CMOS SEMICONDUCTOR FOUNDRY**

THIRD
PARTY
TAM¹
2040E

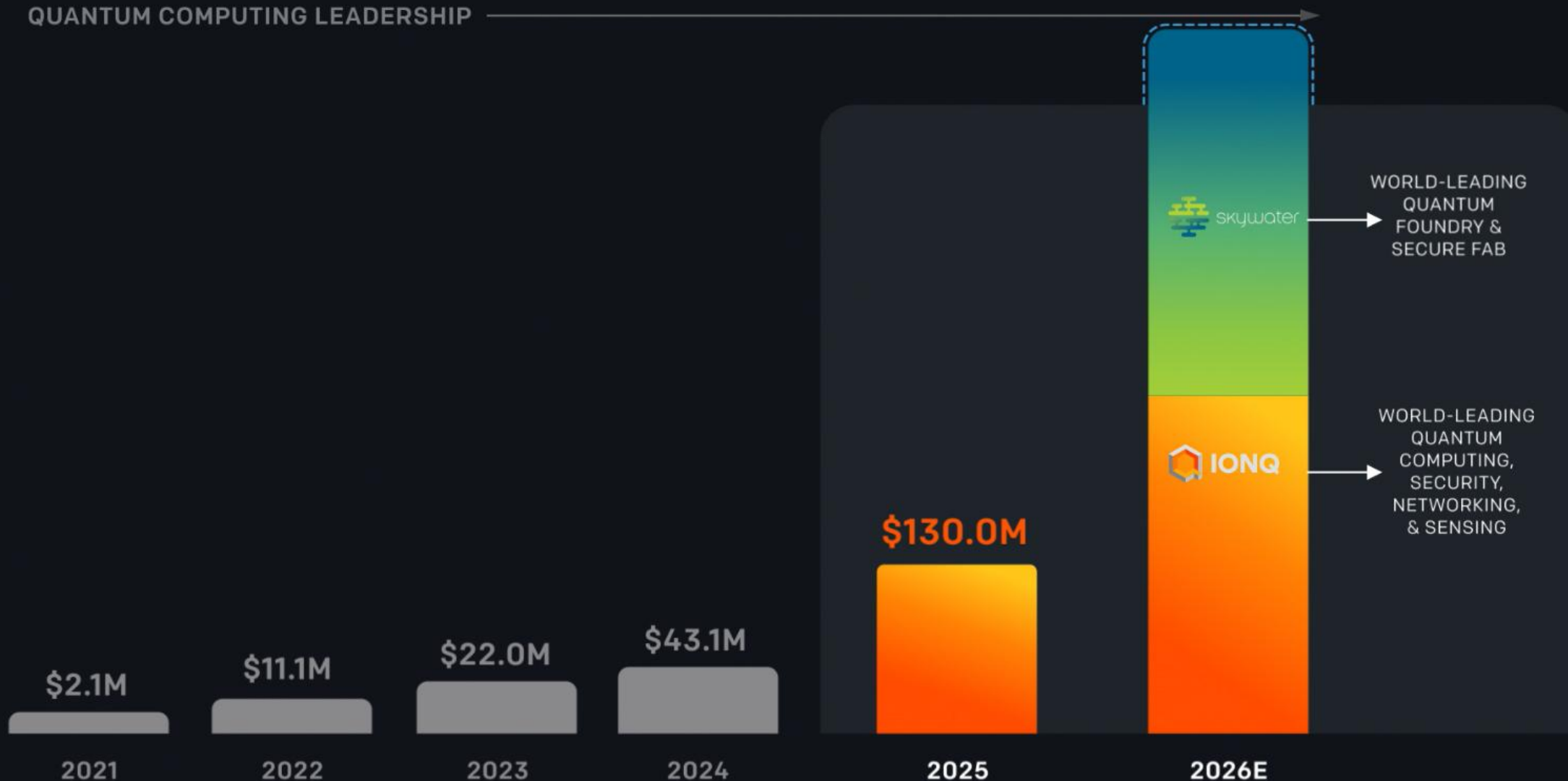
1. Source: McKinsey & Company, *Quantum Technology Monitor 2026: A Commercial Tipping Point* (April 2026). Market-size figures represent McKinsey's estimate of the "internal quantum market" (hardware, software, and services), calculated as the sum of investments, estimated vendor revenue, and estimated internal funding from large technology companies; figures are not vendor revenue alone. Ranges reflect optimistic growth scenarios by 2040.



IONQ

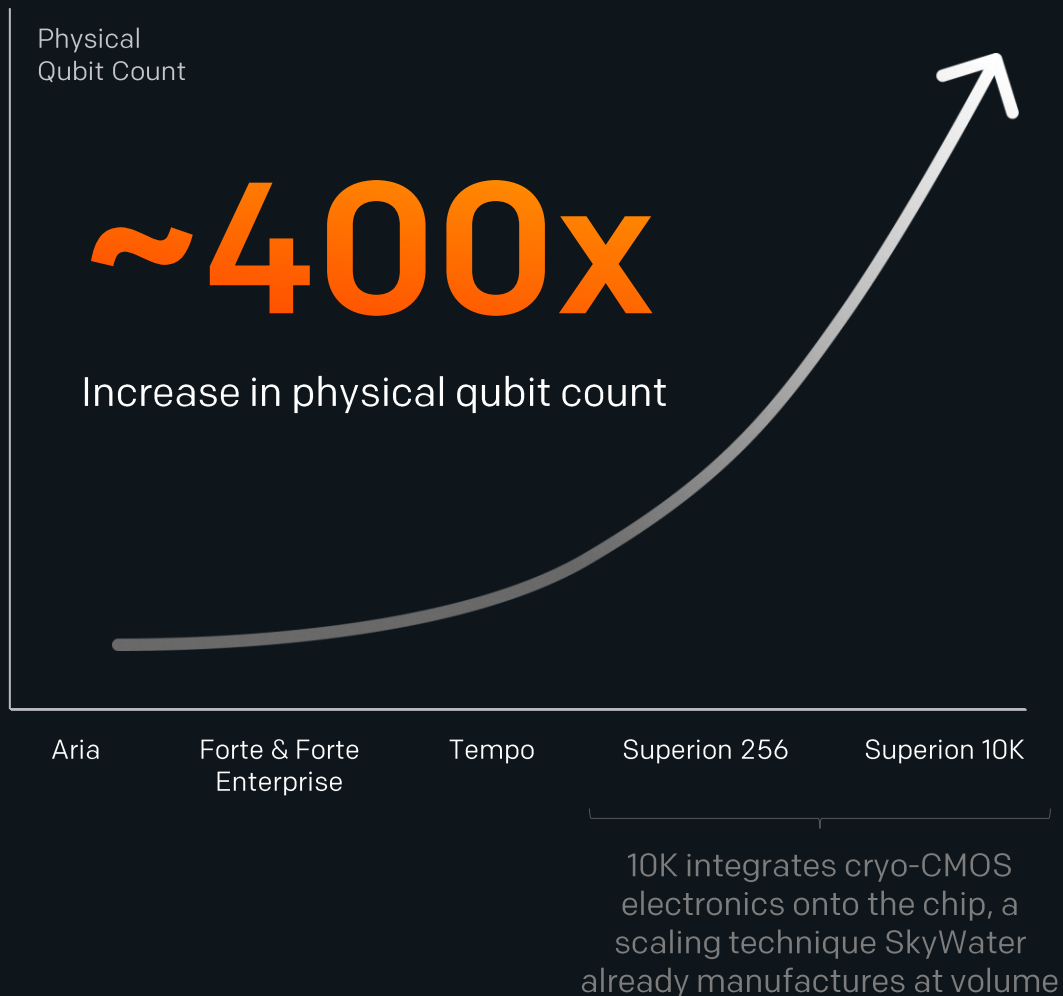
TRACK RECORD OF MULTIPLE GENERATIONS OF QUANTUM COMPUTERS DRIVING OUR REVENUE GROWTH

QUANTUM COMPUTING LEADERSHIP



----- Guidance to be disclosed later in the presentation

Most powerful qubit systems....



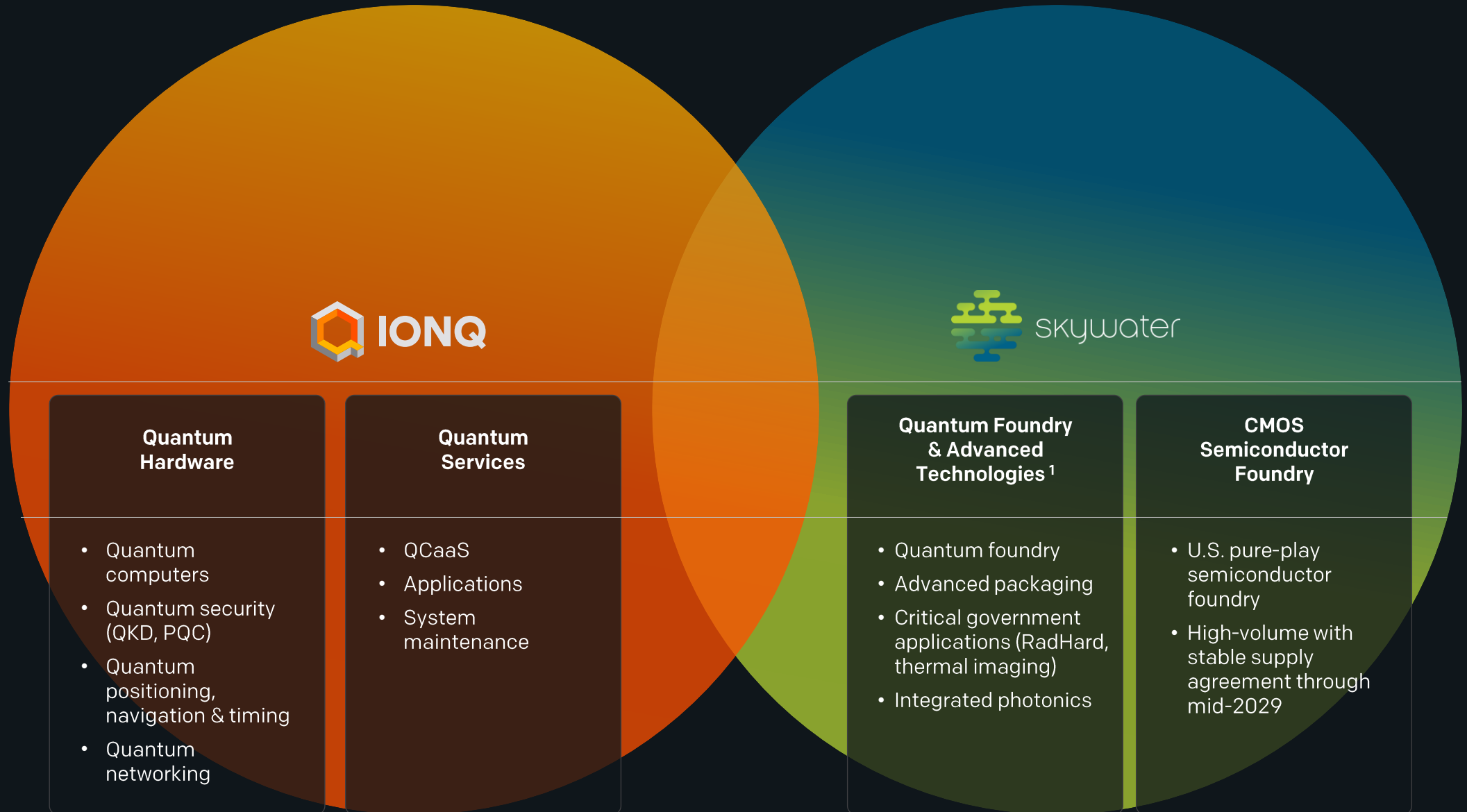
...and the lowest cost-per-qubit





IONQ

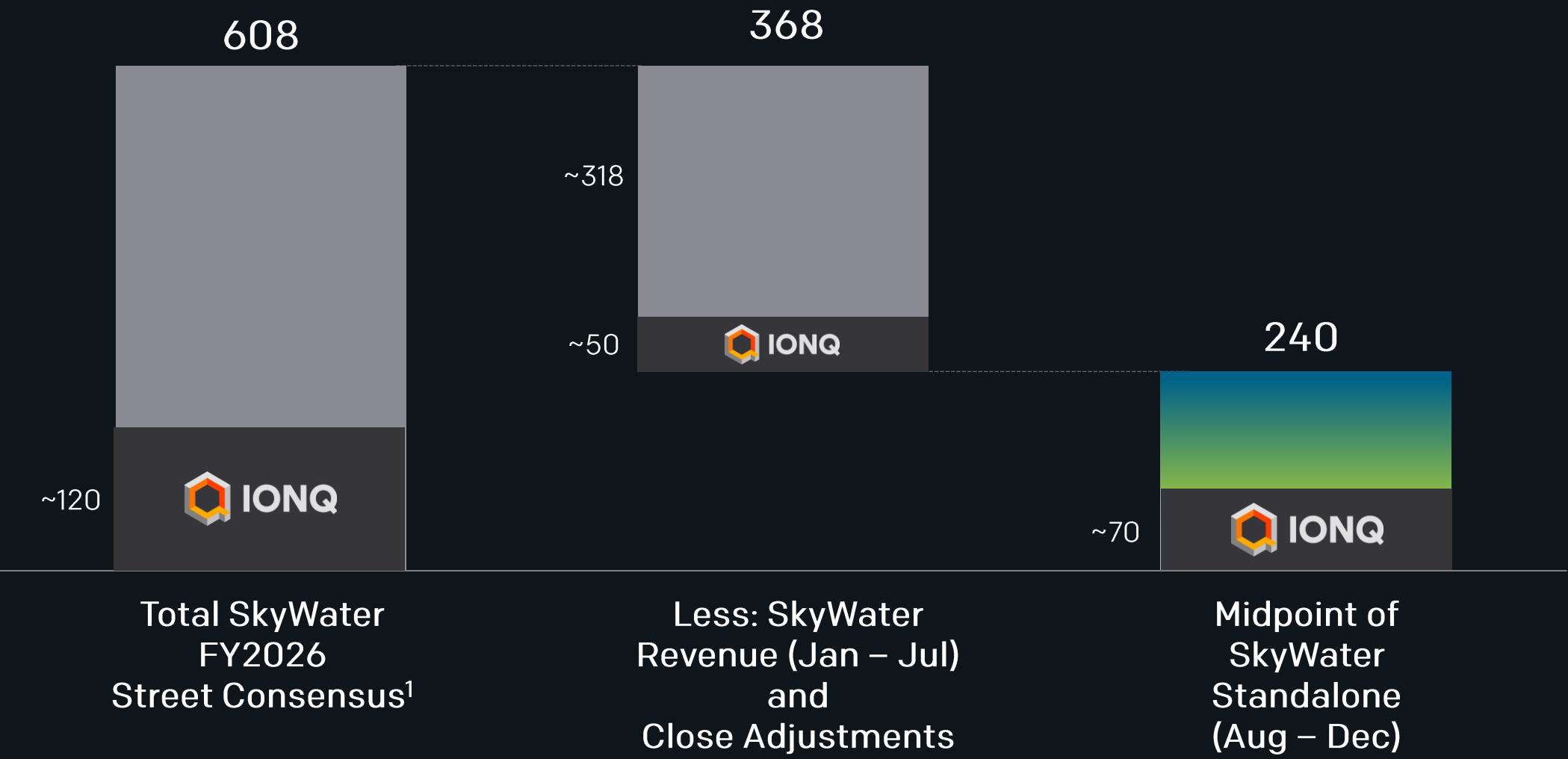
THE MOST POWERFUL COMBINATION... IONQ + SKYWATER



1. Represents SkyWater's historical ATS Development



SKYWATER FY2026 BASELINE REVENUE PROFILE – REPRESENTATIVE PRO FORMA REVENUE CONTRIBUTION TO IONQ



1. FY2026 Street Consensus as published through Capital IQ as of 7/30/26

Preliminary and Unaudited



FY2026 REVENUE: IONQ (FULL YEAR) GUIDANCE

\$280 - \$290 million

as of 2Q 2026 earnings, 8/5/2026, re-affirmed 9/8/2026



SKYWATER PARTIAL YEAR FY2026 REVENUE (AUG-DEC 2026)

\$240 million



ELIMINATION OF ESTIMATED IONQ INTERCOMPANY REVENUE TO SKYWATER (AUG-DEC 2026)

(\$70) million

FY2026 REVENUE: COMBINED COMPANY

\$450 - \$460 million



IONQ

WE ARE VERY BULLISH ON THE FUTURE OF IONQ AND OUR OPPORTUNITY

Pace setter for the entire quantum computing industry over 5 years;
fastest growth, most amount of revenue

Now addressing multiple high-growth quantum TAMs – over \$200B

Current quantum products carry attractive margins for us today, with opportunity to scale and improve these further e.g. computing, QCaaS

Now also delivering **entire quantum solutions** to national security customers – another opportunity to expand margins in the future

Quantum industry's strongest balance sheet

World's only Trusted, at-scale, quantum foundry with SkyWater

Audience Q&A



NICCOLO DE MASI
CHAIRMAN & CEO



CHRIS BALLANCE
PRESIDENT,
QUANTUM COMPUTING



THOMAS SONDERMAN
CEO, SKYWATER



JORDAN SHAPIRO
PRESIDENT,
QUANTUM PLATFORM



INDER SINGH
CFO & COO

Mihir Bhaskar

SVP & GM, QUANTUM TECHNOLOGIES,
SKYWATER





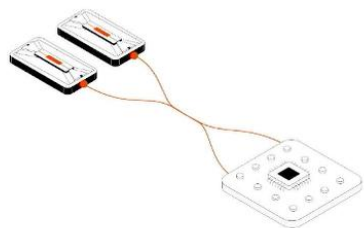
September 2025

"Quantum memories enable distributed quantum computing with 50x faster speeds..."

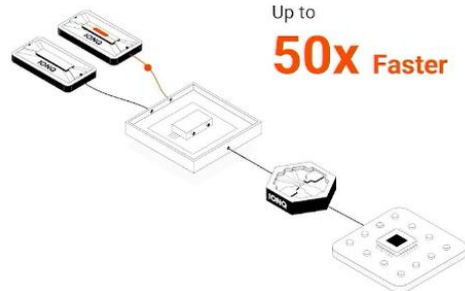
Quantum Memories Increase Interconnect Speed



No Memory



With Memory



Up to
50x Faster

43

IonQ 2025 Analyst Day

Copyright © 2025 IonQ, Inc. All Rights Reserved.



April 2026

"We are working on the first devices sufficient for distributed quantum computing..."



IONQ BUILDING THE BACKBONE OF QUANTUM DATA CENTERS

TRAPPED ION SYSTEM

1 kHz

SiV QUANTUM
INTERCONNECT

Devices operating with record-breaking

1 kHz entanglement rate¹

Fastest published optical entanglement link across ions, atoms, and superconducting platforms

4X

Faster than previous ion-ion record²

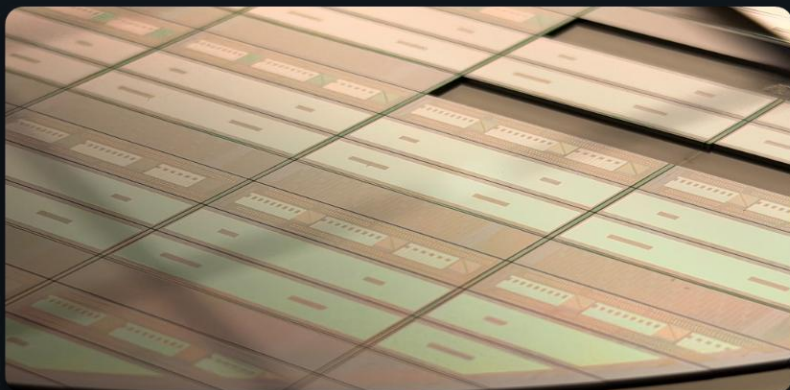
1. IonQ findings from a forthcoming study; details will be made available upon publication
2. O'Reilly et al. (2024)

IONQ SEMICONDUCTOR PLATFORMS DESIGNED TO SCALE ALL QUANTUM MODALITIES

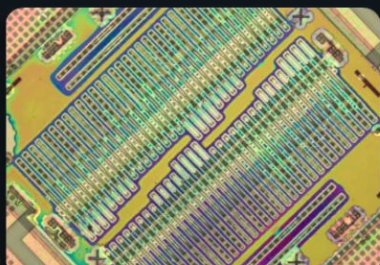
Atoms, ions, photons, superconductors, spins... there are only two ways to scale a quantum system

OPTICS: SP90 PHOTONICS PLATFORM

Supporting on-chip light generation, manipulation, routing, and detection for quantum applications



SP90 silicon nitride wafer with selected dies removed for test

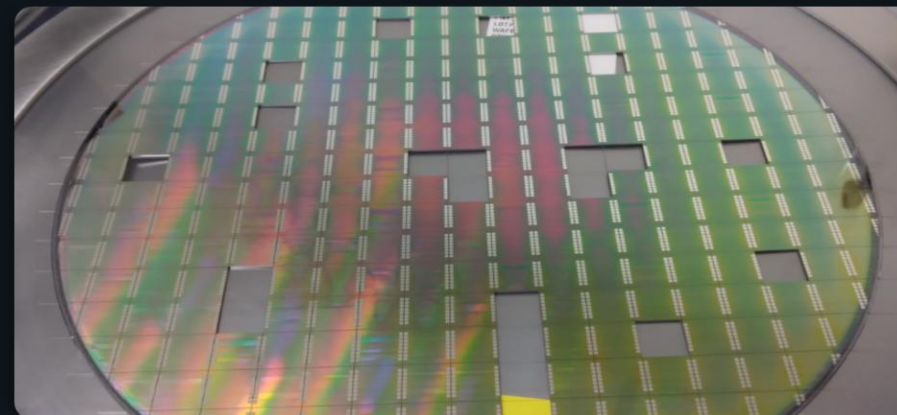


IonQ diamond quantum memory integrated on SkyWater silicon



ELECTRONICS: SC250 SUPERCONDUCTING PLATFORM

High-density, low-loss wiring, interconnect, and control for semi-conductor quantum systems



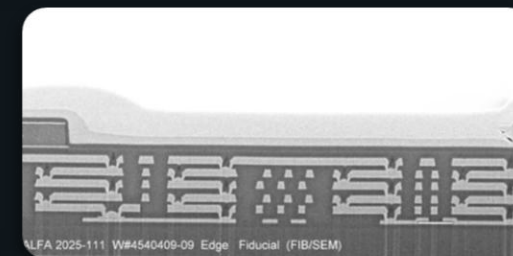
SC250 superconducting wiring wafer with selected dies removed for test

ENABLING TECHNOLOGIES

Advanced Packaging

New Material Integration

Automated Test & Metrology



Microscopic cross-section analysis of SkyWater superconducting device

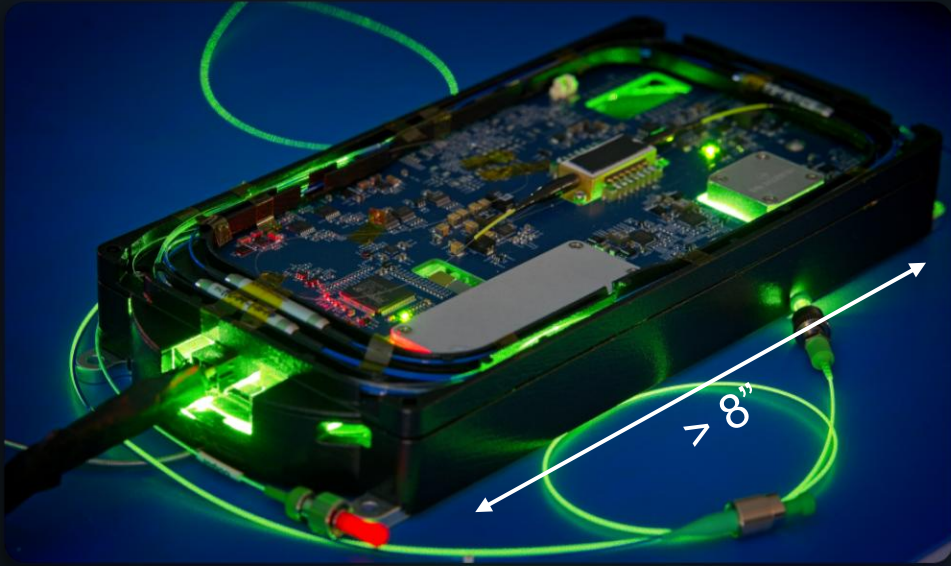


IONQ NEXUS + SKYWATER: MAKING OPTICS SCALABLE FOR QUANTUM

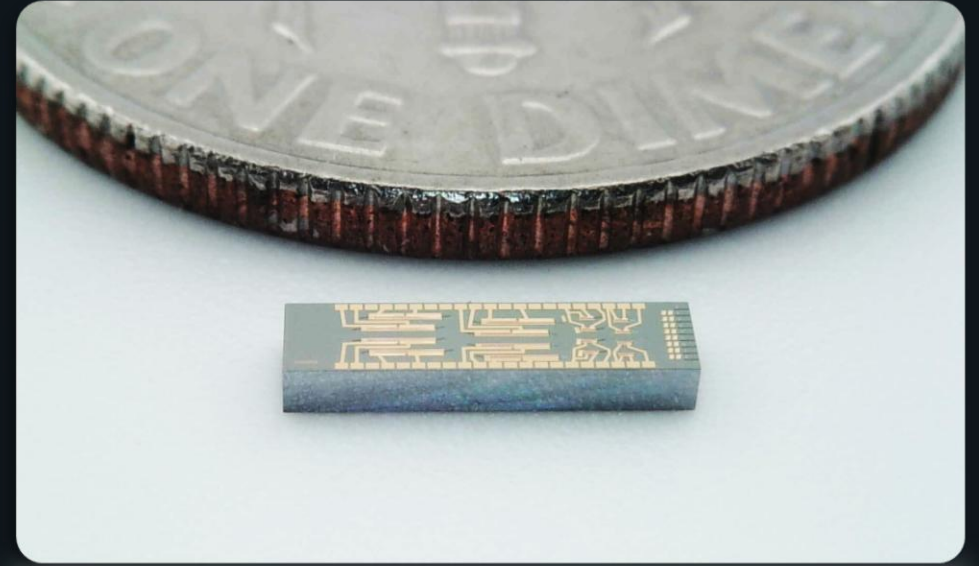


Dr. John Bowers
CO-FOUNDER OF NEXUS PHOTONICS

CURRENT APPROACH TO THE MARKET



SOLUTION ENABLED BY NEXUS



Photonics were critical in enabling transceivers and today's AI / HPC data-center

Nexus enables the **same integration advance for quantum systems**: sensors, networks, and computers



Dr. John Martinis

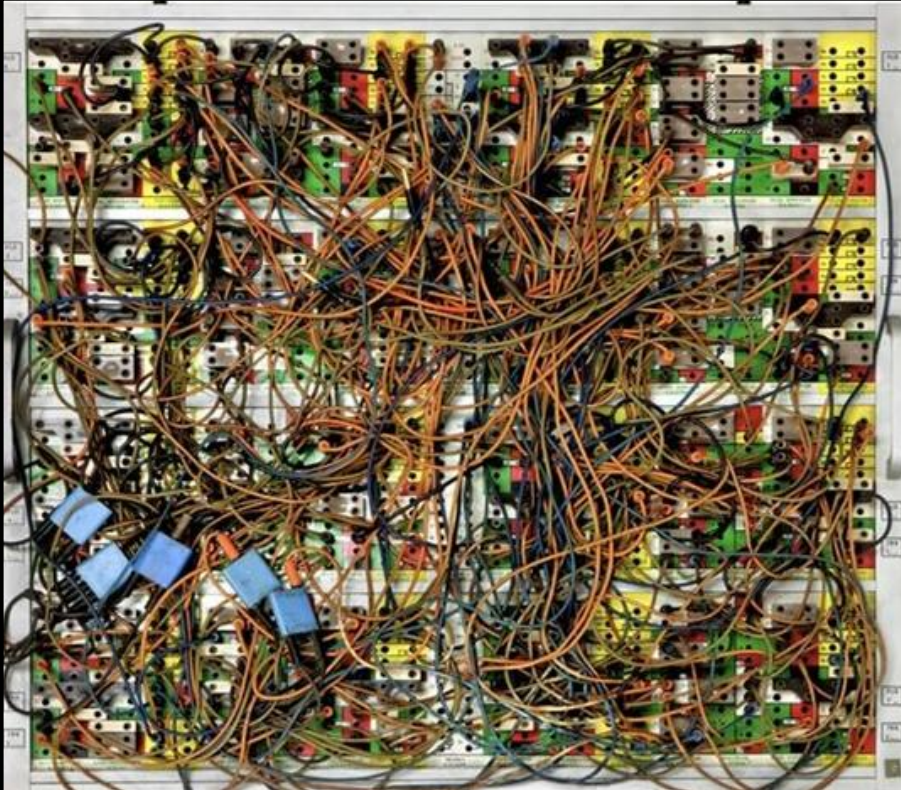
2025 PHYSICS NOBEL LAUREATE / QOLAB CO-FOUNDER & CTO



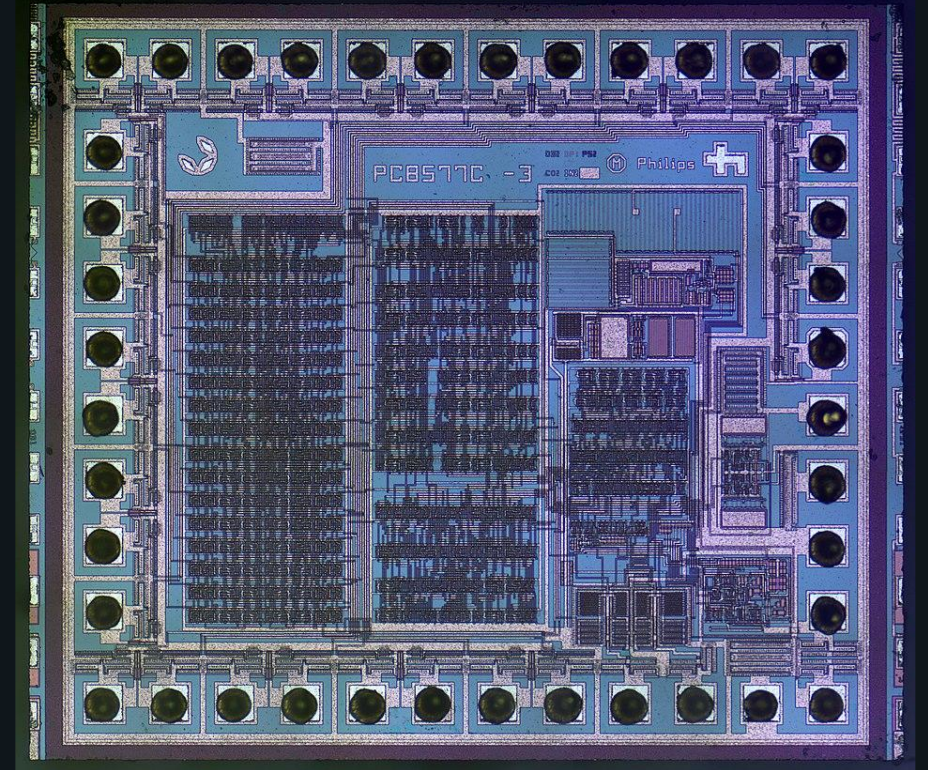
Alan Ho

CO-FOUNDER AND CEO, QOLAB





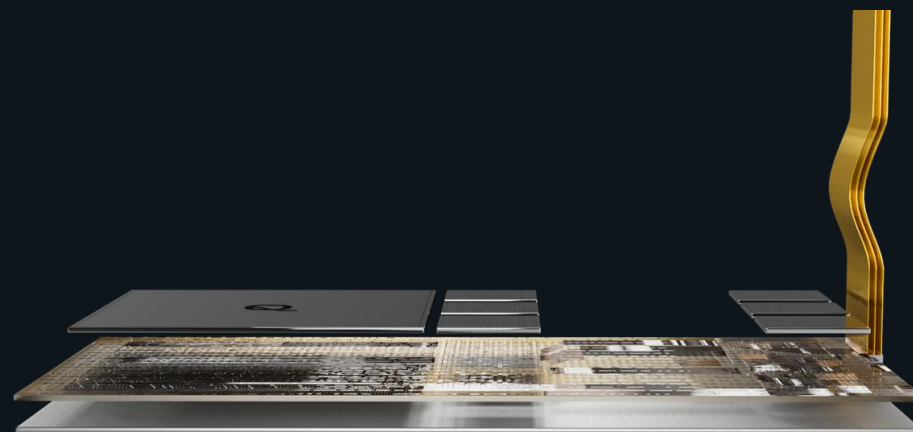
Processor in 1960s



Processor in 1970s



Google 2019

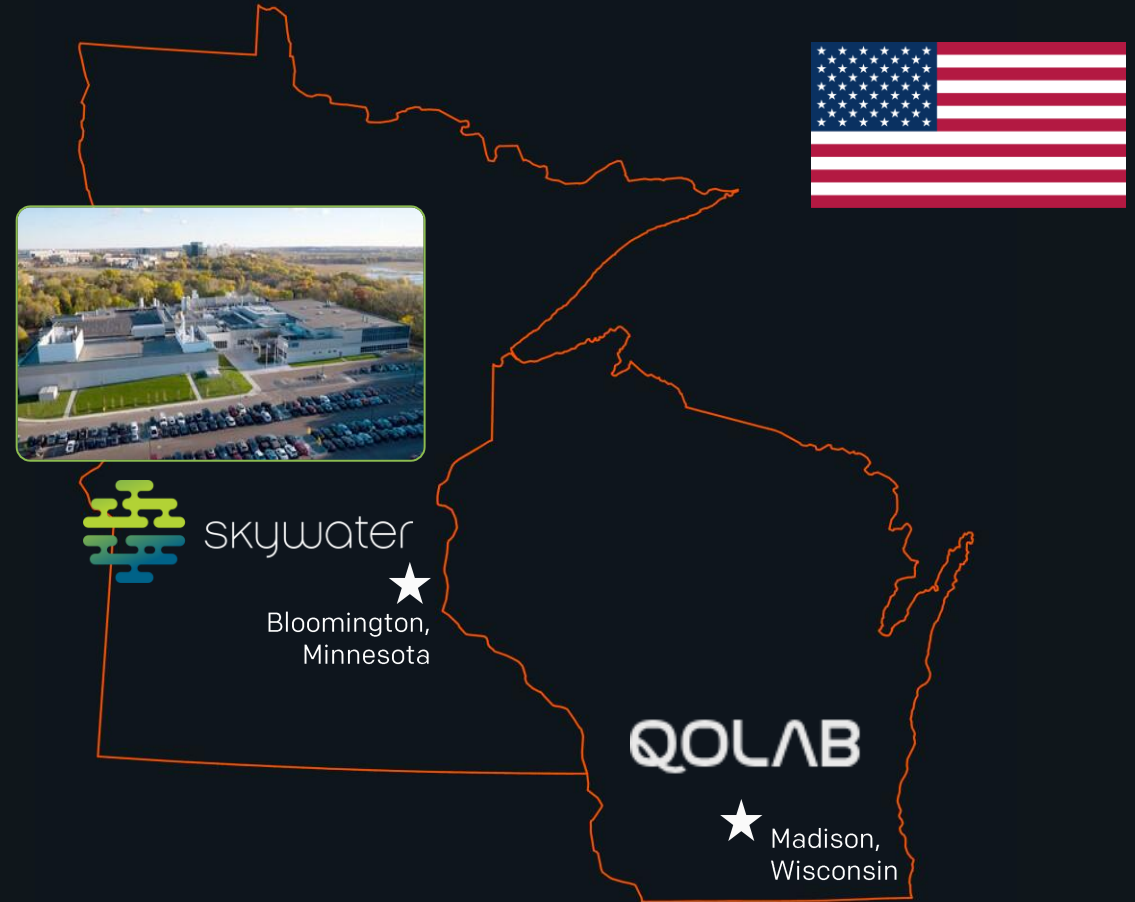


Qolab's Vision

SkyWater's specialized semiconductor fabrication capabilities

Qolab's design, packaging, and cryogenic testing hub

Together, we are establishing a regional quantum manufacturing ecosystem.

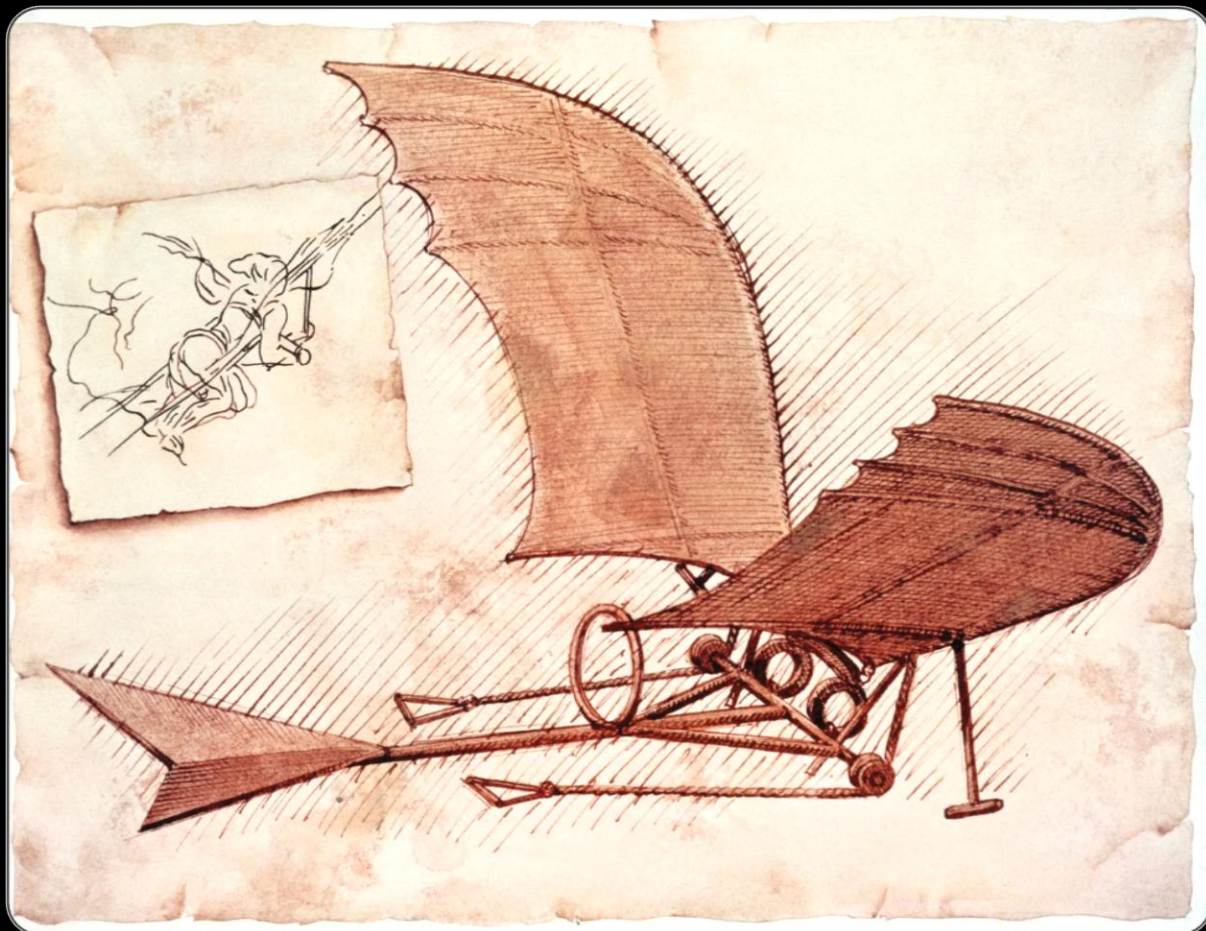




Chad Sakac

SVP, QUANTUM FIELD ENGINEERING













INVENT

APPLY

ITERATE

SCALE

We are building the machine
that builds the machine



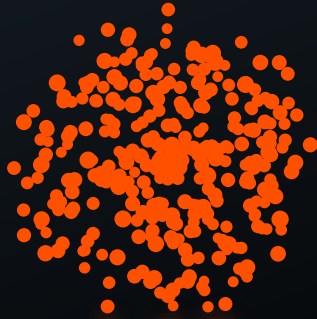
TIME TO SOLUTION: WHAT MATTERS TO CUSTOMERS

World Quantum Day, April 2026



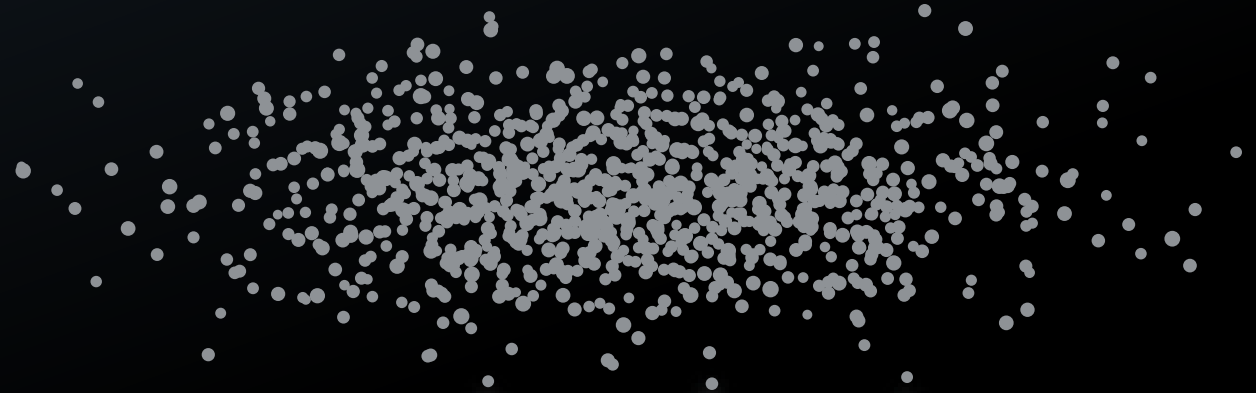
IONQ TRAPPED IONS

IonQ's trapped-ion fidelity cuts through the noise, finding the accurate answer with exponential efficiency.



SUPERCONDUCTING

Superconducting systems require millions of brute-force iterations to overcome inherent noise.





IONQ INDUSTRY LEADERS FOR COMMERCIAL IMPACT & DEPLOYABILITY

Orders-of-magnitude improvements across the metrics that matter based on durable foundations

UP TO
10,000x

Faster time-to-solution demonstrated on **enterprise-relevant workloads** where hardware specifications alone fail to predict commercial value.

Time-to-solution is **the commercial metric**. The clock starts at job submission and stops when a **verified, qualifying answer is returned, or the last shot is completed**. Compilation, quantum execution, error mitigation, and all classical co-processing count toward the total.



Verified by
KEARNEY

99.99%

**HIGH-FIDELITY
2-QUBIT GATE OPERATIONS**

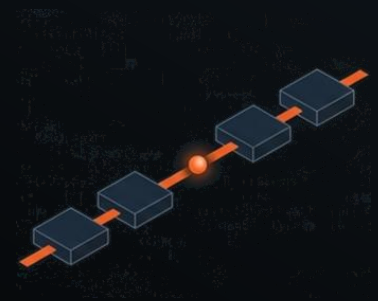
World-leading fidelity at our foundation yields more computational power at scale, due to the polynomial effects of lower error rates

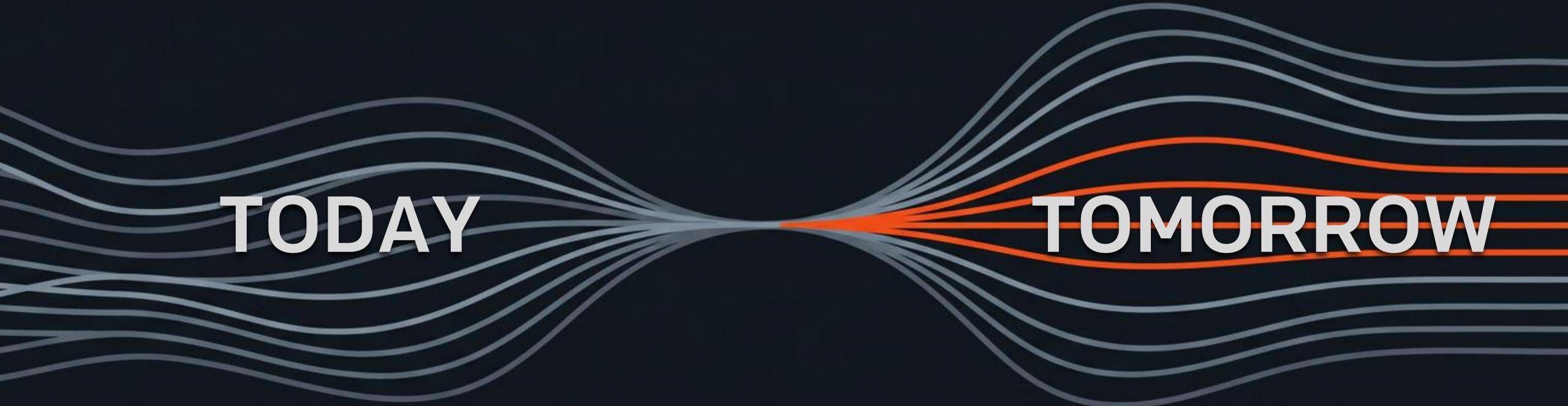


**Parallel-Gate
Architecture**

**WITH PROPRIETARY ELECTRONIC
QUBIT CONTROL**

Bypasses complex lattice structure. Reliable qubit movement establishes long-range connections across the chip instantly





TODAY

TOMORROW



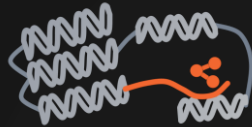
Computational Chemistry

DRUG DISCOVERY & MOLECULAR SIMULATION

Transition-metal catalysis & electron correlation

20x

> FASTER CATALYSIS TTS
THAN PRIOR WORK



Molecular Models & Active Sites

PROTEIN FOLDING, BINDING SITES & REVERSE CODON ENCODING

Counterdiabatic Quantum Optimization

12

AMINO ACIDS, AND AT
BREAKTHROUGH



Manufacturing Optimization Pipeline

SENSITIVE SUPPLY CHAIN LOGISTICS OPTIMIZATION

Constrained combinatorial optimization

EFFICIENCY

HUGE COST IS IN THE SUPPLY CHAIN AND OPTIMIZATION IN
LAB/BIOREACTORS/AUTOMATION



einride



Pattern Detection

fMRI, MEDICAL IMAGING, AEX CHROMATOGRAPHY, CLINICAL DATA

Sparse-data, high-dimensional features, QML, AI + Q

Identify

RARE EVENTS & PATTERNS
60+% of costs are in steps like AEX



IEEE Quantum 2026: 10 accepted papers and 4 best paper wins out of 27. A 3.7σ event



WHAT

AI + Q = better accuracy,
better power efficiency

BEST
PAPER

Quantum
applications track

WITH OUR
PARTNERS &
CUSTOMERS



QuantumBasel



Linear Algebra Hybrid
workflows

Quantum end-to-end
hybrid case studies track

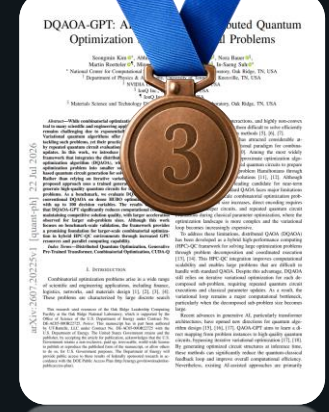


SYNOPSYS®



Next-Gen Protein Folding
on Tempo-generation HW

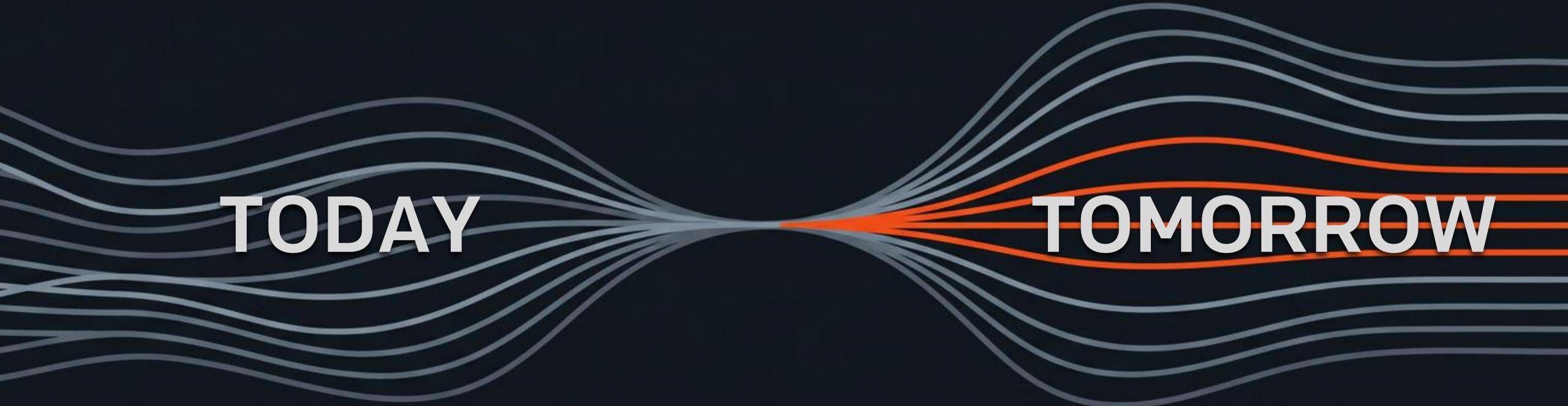
Quantum end-to-end
hybrid case studies track



DQAOA-GPT. AI making
Quantum better

Quantum-GenAI co-design
& co-discovery track



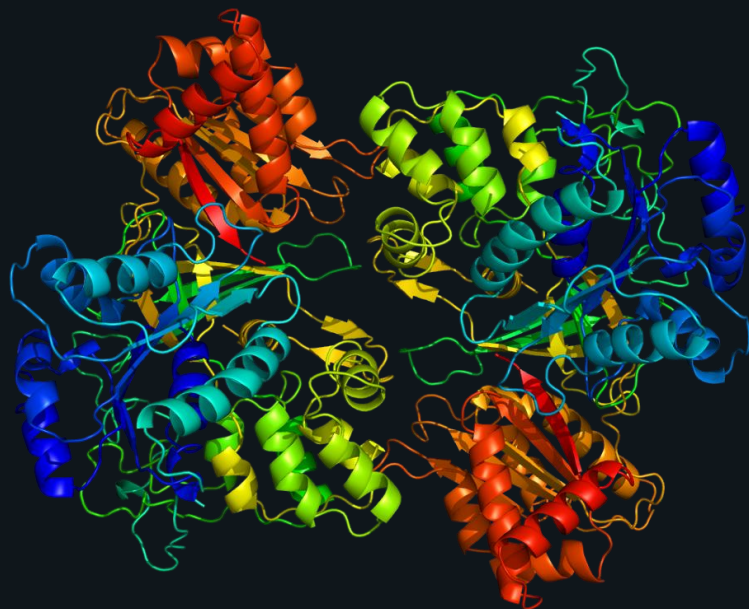


TODAY

TOMORROW

**IONQ**

TIME TO SOLUTIONS -> TIME TO VALUE -> ECONOMICS TO VALUE



arXiv:2502.15882v1 [quant-ph] 21 Feb 2025

Fast quantum simulation of electronic structure by spectrum amplificationGuang Hao Low,^{1,*} Robbie King,^{1,2} Dominic W. Berry,³ Qianli Han,⁴ A. Eugene DePrince III,^{1,5} Alec White,⁶ Ryan Babbush,¹ Rolando D. Somma,⁴ and Nicholas C. Rubin^{1,7}¹Google Quantum AI, Venice, CA 90291, United States²Department of Computing and Mathematical Sciences, Caltech, CA 91125, United States³School of Mathematical and Physical Sciences, Macquarie University, Sydney, NSW 2109, Australia⁴Department of Computer Science, University of Illinois at Urbana-Champaign, Urbana, IL 61801, United States⁵Department of Chemistry and Biochemistry, Florida State University, Tallahassee, FL, United States⁶Quantum Simulation Technologies Inc., Boston, MA, USA

The most advanced techniques using fault-tolerant quantum computers to estimate the ground-state energy of a chemical Hamiltonian involve compression of the Coulomb operator through tensor factorizations, enabling efficient block-encodings of the Hamiltonian. A natural challenge of these methods is the degree to which block-encoding costs can be reduced. We address this challenge through the technique of spectrum amplification, which magnifies the spectrum of the low-energy states of Hamiltonians that can be expressed as sums of squares. Spectrum amplification enables estimating ground-state energies with significantly improved cost scaling in the block encoding normalization factor Λ to just $\sqrt{2\Lambda E_{\text{gap}}}$, where $E_{\text{gap}} \ll \Lambda$ is the lowest energy of the sum-of-squares Hamiltonian. To achieve this, we show that sum-of-squares representations of the electronic structure Hamiltonian are efficiently computable by a family of classical simulation techniques that approximate the ground-state energy from below. In order to further optimize, we also develop a novel factorization that provides a trade-off between the two leading Coulomb integral factorization schemes—namely, double factorization and tensor hypercontraction—that when combined with spectrum amplification yields a factor of 4 to 195 speedup over the state of the art in ground-state energy estimation for models of Iron-Sulfur complexes and a CO₂-fixation catalyst.

I. INTRODUCTION

High-accuracy simulation of the electronic structure of molecules and materials is one of the primary motivations for building a quantum computer. This motivation originates from the difficulty of robustly simulating electrons with classical techniques at low enough cost, to accommodate large systems necessary for quantitative prediction of chemical phenomena such as reaction chemistry, molecular spectra, and ground-state bonding information. The phase estimation algorithm (PEA) [1], implemented on a fault-tolerant quantum computer, provides one such route towards quantitative electronic structure simulation at polynomial cost in the system size [2, 3]. The asymptotic algorithmic advantage of the PEA led to a large body of work examining the constant factors associated with ground-state energy estimation. While initial quantum resource estimates were exceedingly high [4], the focus on optimizing quantum algorithms has resulted in drastic reductions. As a representative example, over the past six years, the quantum resources (gate complexity) required for PEA of the Iron-Molybdenum co-factor FeMoco have steadily improved by factors of 2-4 with each algorithmic innovation [5-9], resulting in a seven orders of magnitude reduction in resources. These reductions enable efficient ground-state energy estimation of classically intractable systems that are predicted to run on future, fault-tolerant quantum computers faster than lower-accuracy classical methods [10, 11]. Computational prediction of chemistry usually requires many calculations and thus even further reductions will be required to enable routine large-scale simulation [12]. Herein, we introduce a new algorithmic strategy and take the first steps towards an optimized implementation, resulting in a substantial reduction over prior art.

At the core of recent algorithmic improvements in second quantized electronic structure simulation is the exploitation of tensor decompositions of the Coulomb operator yielding an efficient linear combination of unitaries (LCU) representation. Using the LCU representation, a unitary (a quantum walk operator) implementing a function of the Hamiltonian can be efficiently constructed and used by the PEA [13-15]. Ultimately, the quantum cost of performing phase estimation on a walk operator constructed using the LCU representation scales linearly in the normalization constant associated with a “block-encoding” of the Hamiltonian [16, 17]. For electronic structure simulation, the normalization constant is intimately related to the degree of compression of the two-electron integral operator when constructing the LCU. The two primary strategies for compressing the large two-electron integrals using tensor factorizations are Double-Factorization (DF) [9] and Tensor-HyperContraction (THC) [7], each providing normalization

* guanghaolow@google.com; Equal contribution

† nickrubin@google.com; Equal contribution

This is a
\$300M / year
compute problem
.. and you need
throughput =
parallelism

<https://arxiv.org/pdf/2502.15882>**~days-weeks**

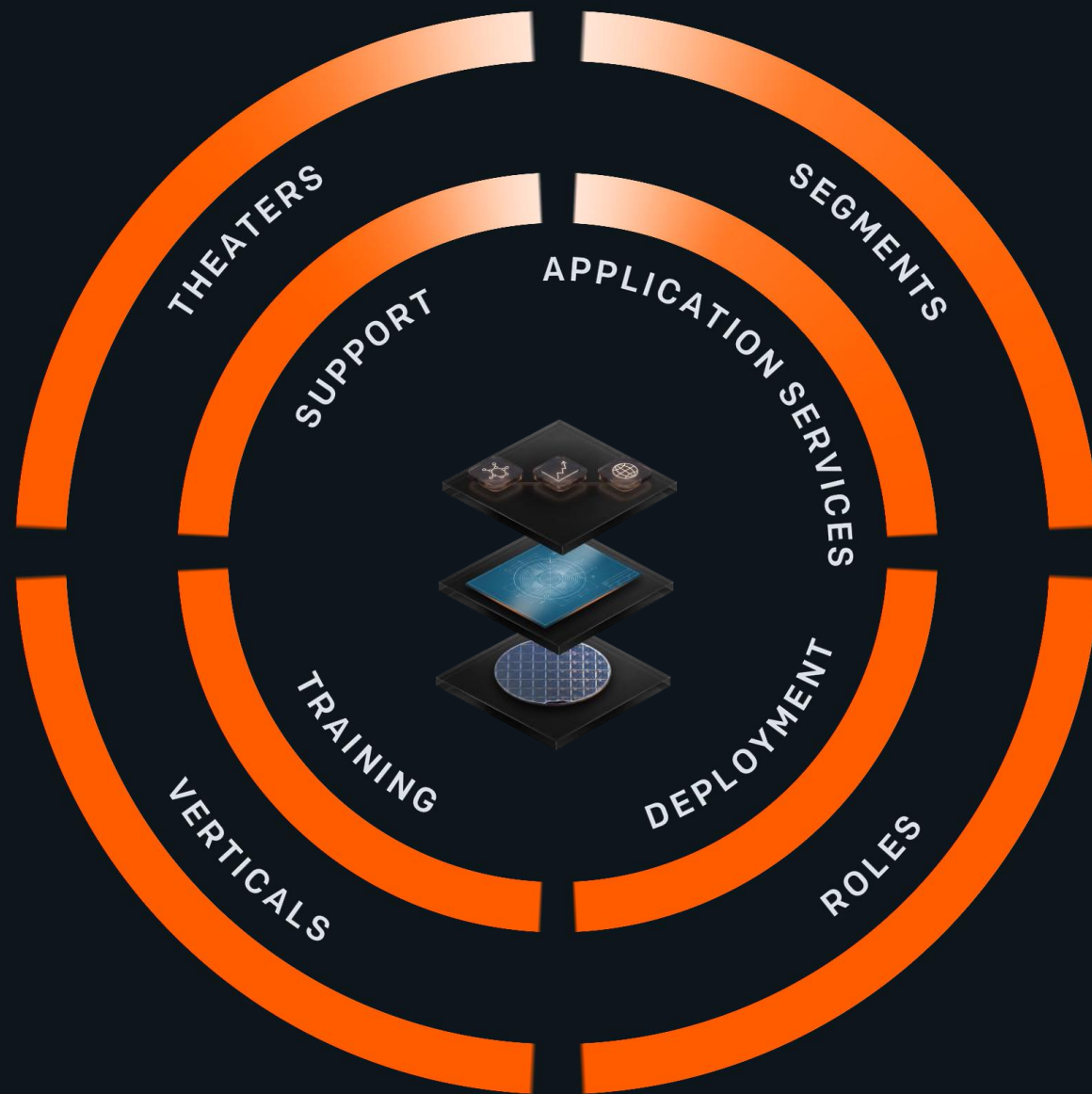
TO RUN

~1300-5000

LOGICAL QUBITS

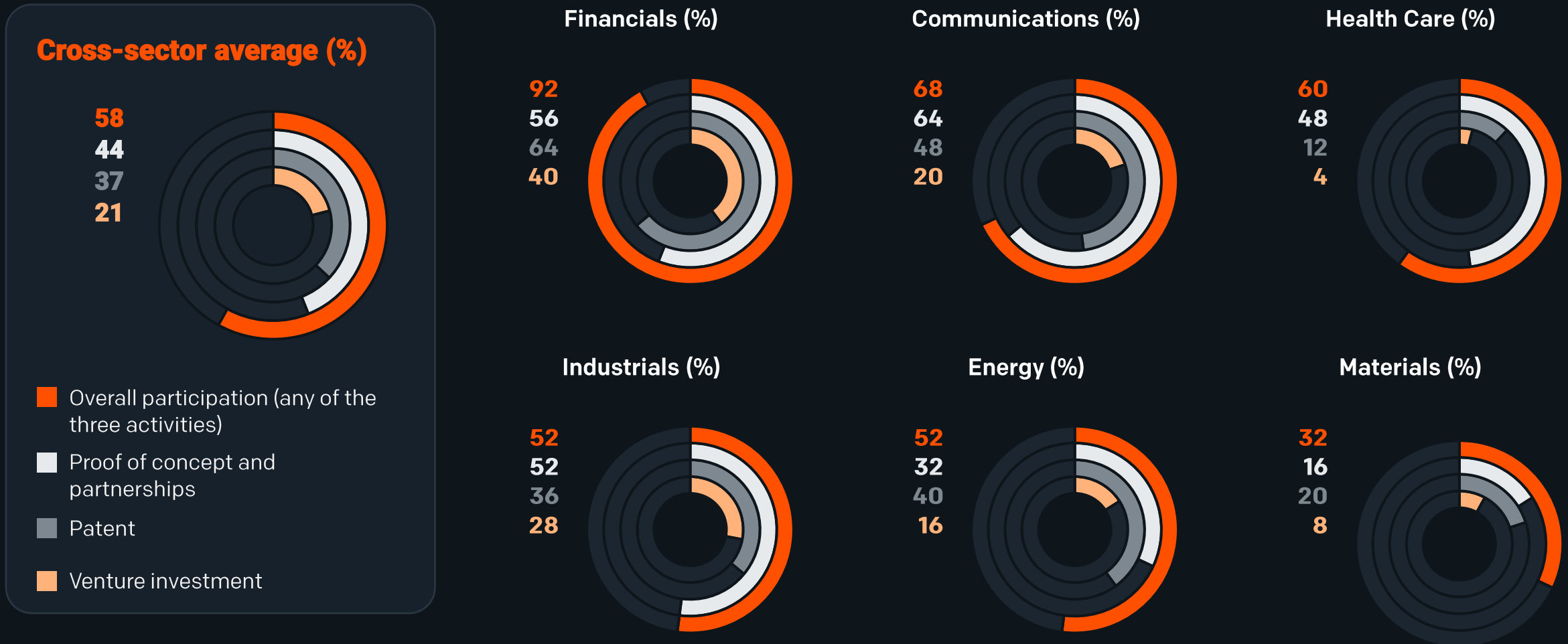
~ 400M – Billion+

TOFFOLI GATES



IONQ COMMERCIAL ADOPTION IS ACCELERATING

Nearly 60% of market leaders are committing capital & securing IP



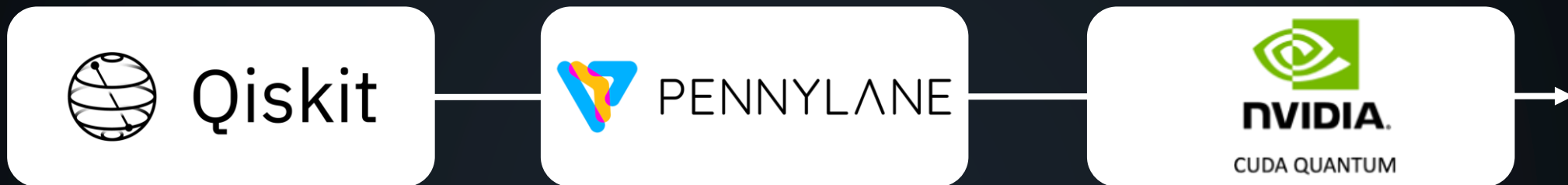
IONQ ITERATE: THE TEAM BEHIND OUR MACHINE

Listening – across verticals and theaters

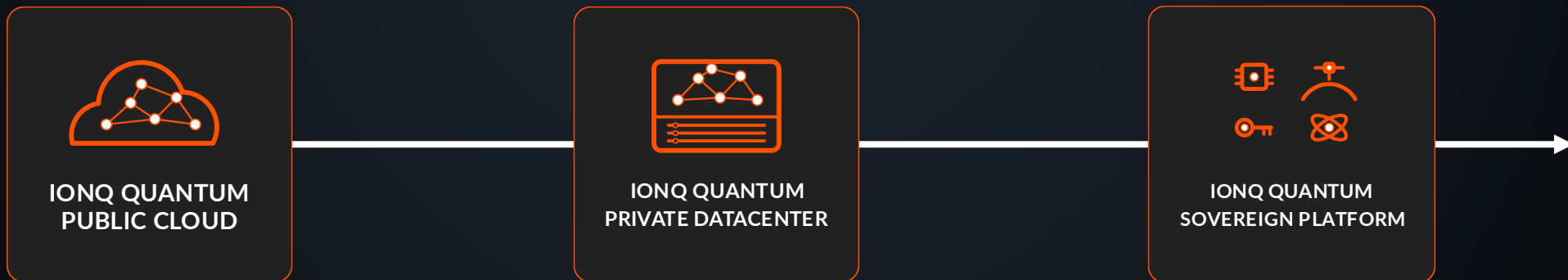




CHOICE OF HOW.



CHOICE OF WHERE.



GROWING WITH US OVER GENERATIONS.



2nd generation **Aria** and
4th generation **Forte Enterprise**
2023



5th generation
Tempo
2025



6th generation
Superion Cloud Access
2025

GROWING WITH US OVER THE PLATFORM.



**QUANTUM
NETWORKING**

2024



**QUANTUM
COMPUTING**

2025



**QUANTUM
MEMORY**

2026

And collaborative application development throughout



INVENT

APPLY

ITERATE

SCALE

We are building the machine
that builds the machine



Research to Reality

A CONVERSATION ON REAL-WORLD ENTERPRISE APPLICATIONS



NICCOLO DE MASI
IONQ CHAIRMAN & CEO



ROBERT LONG
EPB



MATT RABINOWITZ
MEDICI THERAPEUTICS,
MYOME, & NATERA GENETICS



JOHN LICATA
SERVICENOW

Senator Alessio Butti

UNDERSECRETARY OF STATE FOR INNOVATION,
ITALIAN REPUBLIC





Mission Critical Applications for the Federal Sector



NICCOLO DE MASI
CHAIRMAN & CEO



GENERAL JAY RAYMOND
FORMER CHIEF OF SPACE
OPERATIONS FOR THE
U.S. SPACE FORCE



ROBERT CARDILLO
EXECUTIVE CHAIRMAN,
IONQ FEDERAL



RICK MULLER
SVP & CHIEF SCIENTIST,
IONQ FEDERAL



Niccolo de Masi

CHAIRMAN & CEO



