



Quantum is Now

# Building a Large Global Quantum Business

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September 11, 2024 at 9:00 am ET



**Peter Chapman**  
President & CEO



**Dean Kassmann**  
SVP, Engineering & Technology



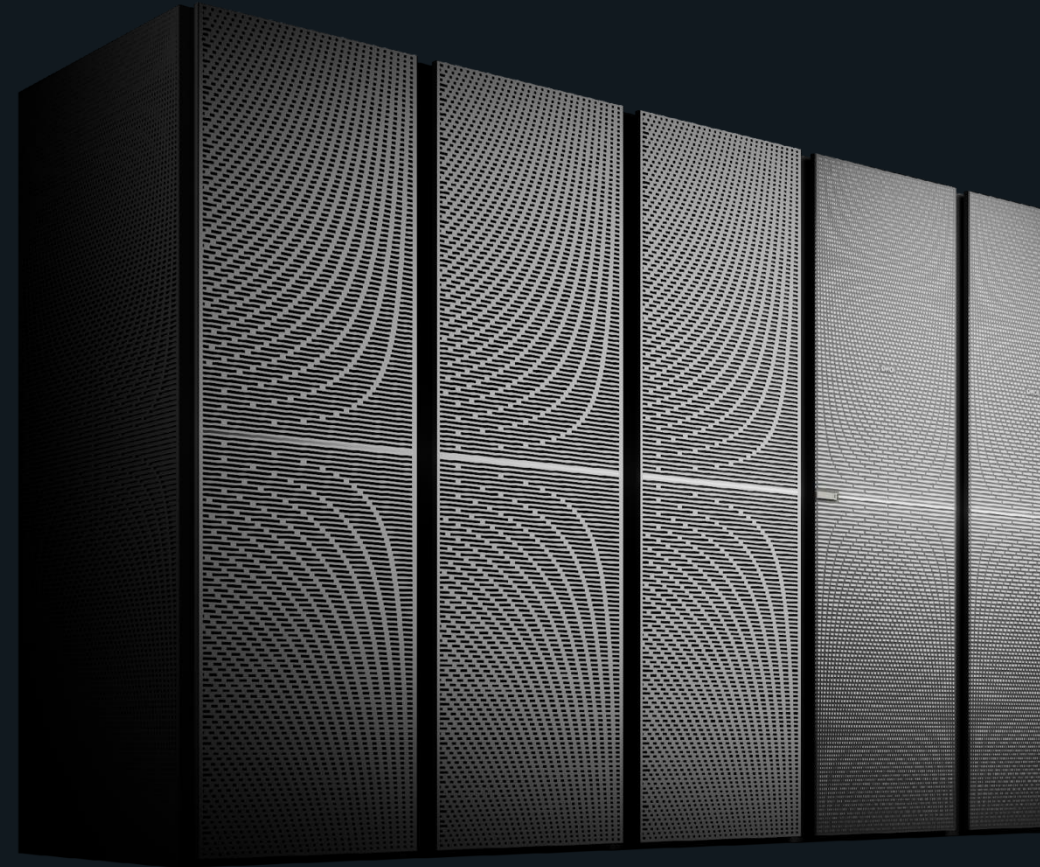
# Forward Looking Statements

This presentation contains statements that constitute forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995 and other securities laws.

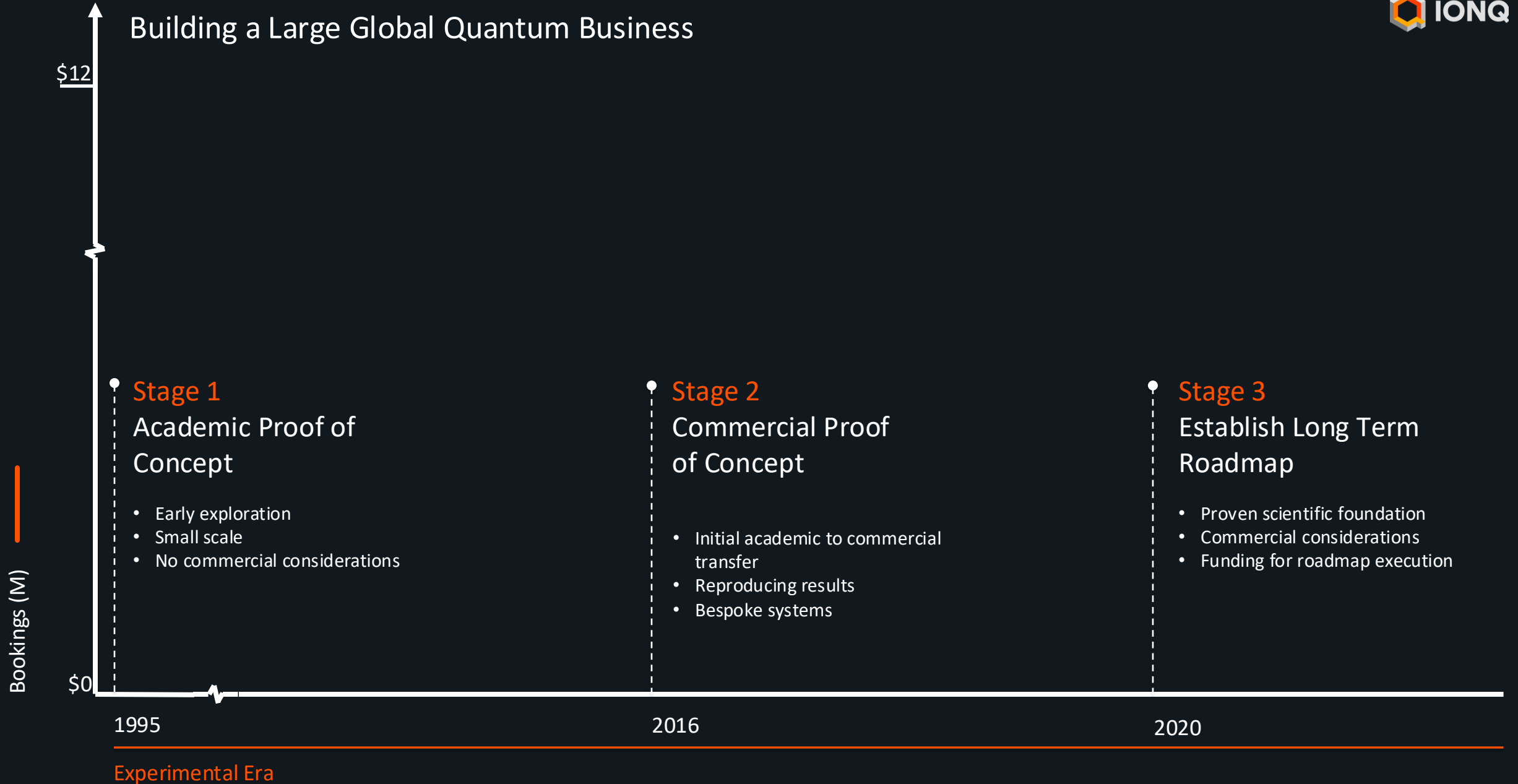
Whenever we use words such as "believe," "expect," "enable," "anticipate," "intend," "plan," "estimate," "can," "will," "may," "has the potential to" and negatives and derivatives of these or similar expressions, we are making forward-looking statements. Forward-looking statements in this presentation relate to various aspects of our business, including statements about IonQ, Inc. ("IonQ," "our" or "we") and our technology roadmap; our anticipated timing and ability to achieve higher algorithmic qubits, faster gates speed, higher fidelity, better error correction and sustained growth in system usage; the potential benefits of our partnerships with Quantum Basel, AFRL, Amazon Braket and other partners and customers; the sufficiency of our cash reserves; the growth, retention and capabilities of our team; the scale and projected growth of quantum computing's total addressable market; the possible applications of quantum computing; the commercial value for our system and for potential applications; the advantages of IonQ's architecture in higher performance, scalability and attainment of commercial value; IonQ's ability to achieve higher performance and scalability; the advantages of IonQ's approach to manufacturing and deployment of our systems; and the timing and value impact of maturity growth in quantum computing. These

forward-looking statements are based upon our present intent, beliefs or expectations, but forward-looking statements are not guaranteed or may not occur. Forward-looking statements involve known risks, uncertainties and other factors, some of which are beyond our control. Many of these factors could cause actual future events to differ materially from the forward-looking statements in this presentation, including but not limited to: market adoption of quantum computing solutions and our products, services and solutions; our ability to protect our intellectual property; changes in the competitive industries in which we operate; changes in laws and regulations affecting our business; our ability to implement our business plans, forecasts and other expectations, and identify and realize additional partnerships and opportunities; and the risk of downturns in the market and the technology industry.

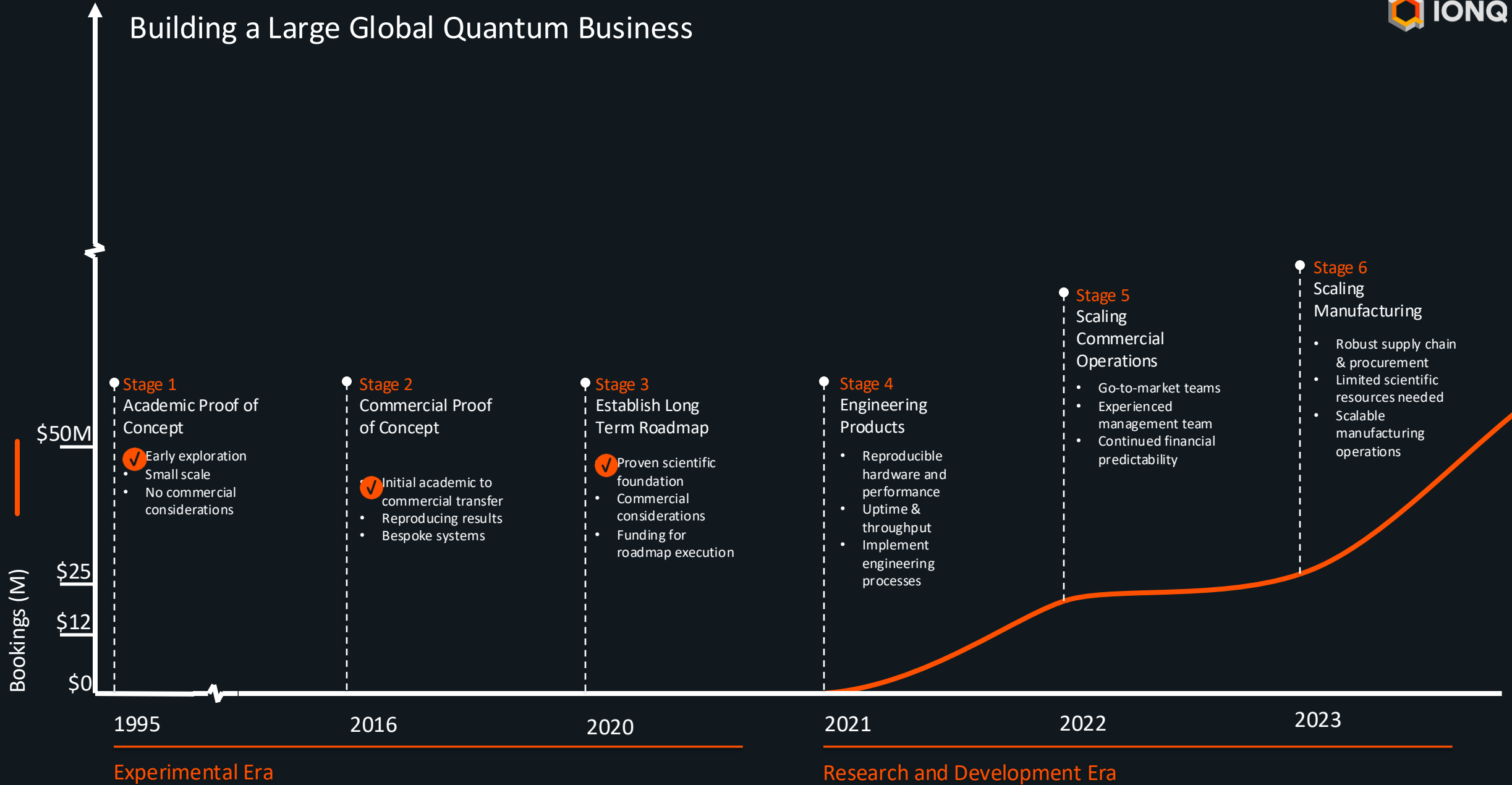
# Performance and Scale Meet Enterprise Grade



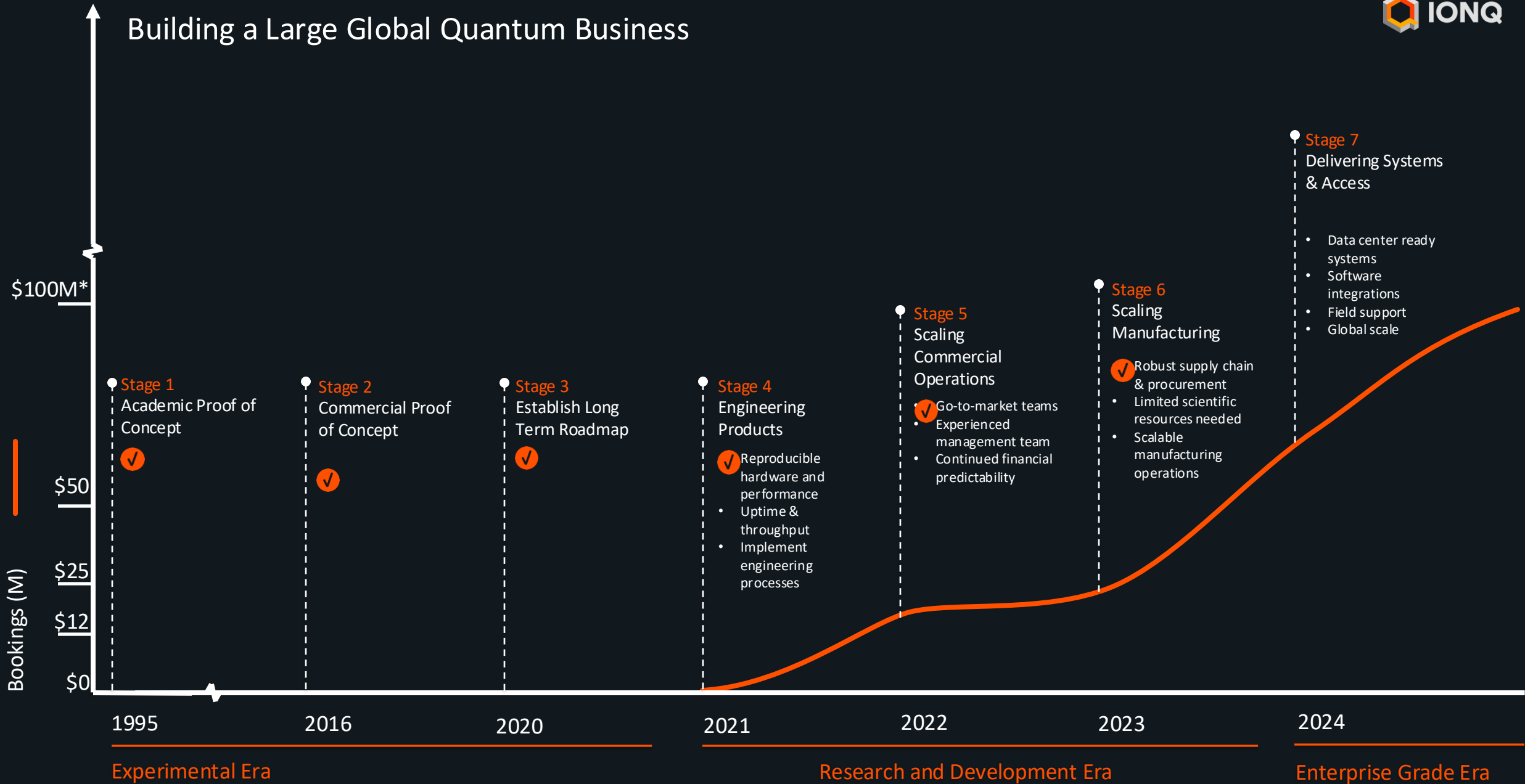
# Building a Large Global Quantum Business



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\*IonQ is reiterating its confidence in meeting or exceeding its bookings guidance of \$75-95 million for the year.

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IonQ and the University of Maryland Sign \$9M Partnership To Drive Quantum Innovation

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Delivering state-of-the-art quantum computing access & programs

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Driving economic development while attracting top talent to the region through the National Quantum Laboratory (QLab)



# University of Maryland

01

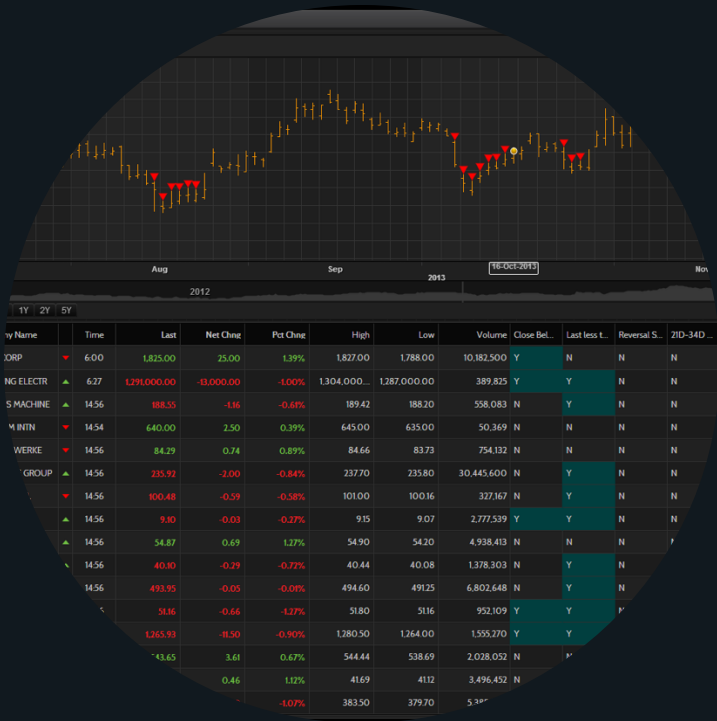


## Hyundai

Battery chemistry and self driving image detection  
quantum application development



02



## GE Research

Portfolio optimization and correlation analysis  
quantum application development

03



## Navy Research Lab

Corrosion modeling and prevention quantum application development

04



## Airbus

Cargo loading optimization  
quantum application development

05



## Applied Research Lab for Intelligence and Security (ARLIS)

Developing Blind Quantum Computing and Networking

06



## Amazon Braket

Reservation access and application support for IonQ Forte and on demand access for IonQ Aria through 2025

AFRL Partnership

# First IonQ Quantum Computer in New York

A pioneering trapped ion system, developed by IonQ, has been delivered to the Air Force Research Lab in Rome, NY

First ion chain was trapped in August 2024, marking a critical step on our path to fully commissioning the system which is targeted for the end of September, 2024.



QuantumBasel Partnership

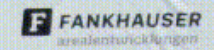
# First IonQ Quantum Computer In Europe

Our flagship system, Forte Enterprise, is in the **final stages of build in Basel, Switzerland**

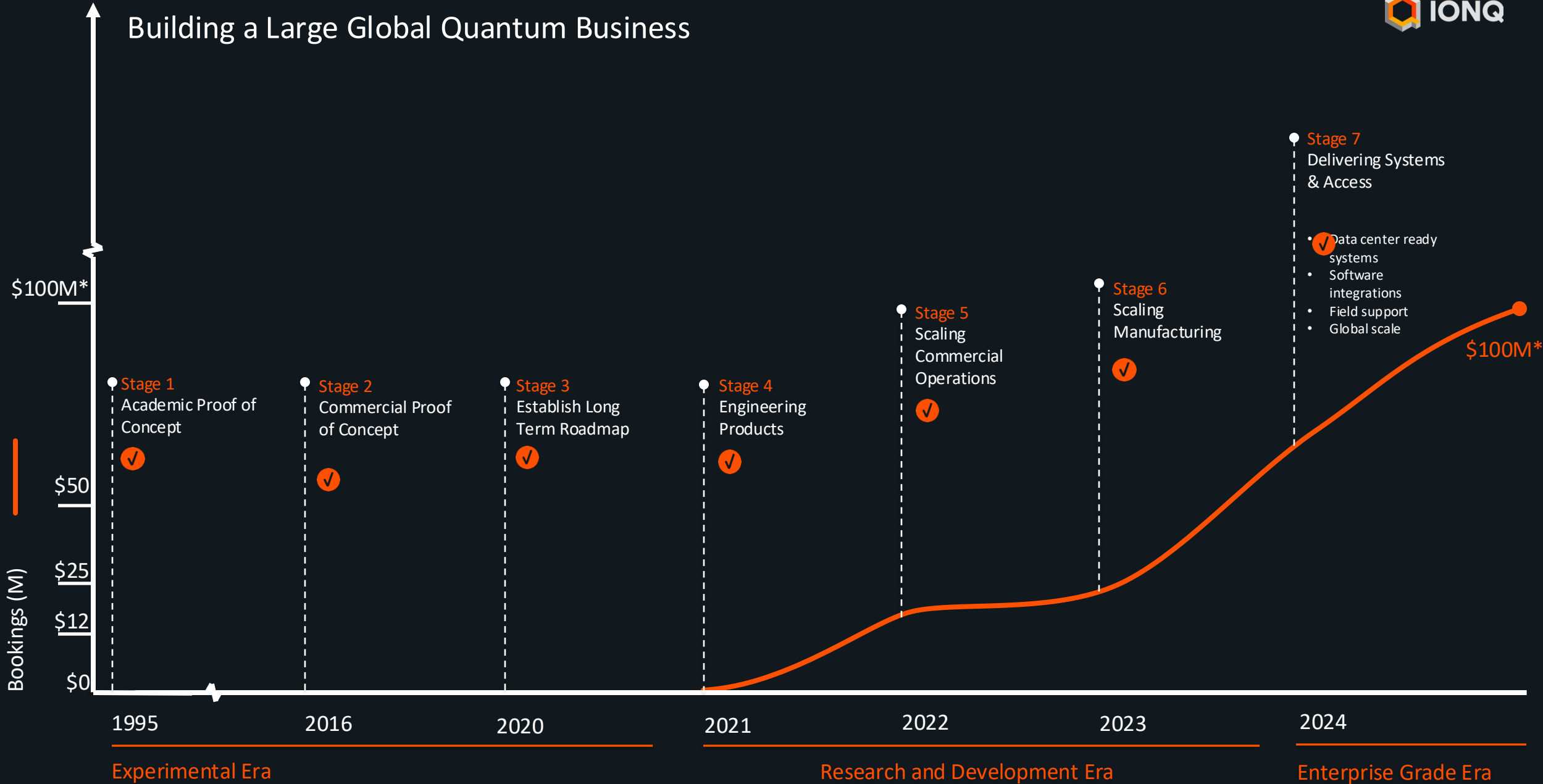
This month the ion trap was delivered to the site for installation in the system

Forte Enterprise will usher in a new stage of quantum computer deployment in EMEA

Welcome to QuantumBasel



# Building a Large Global Quantum Business

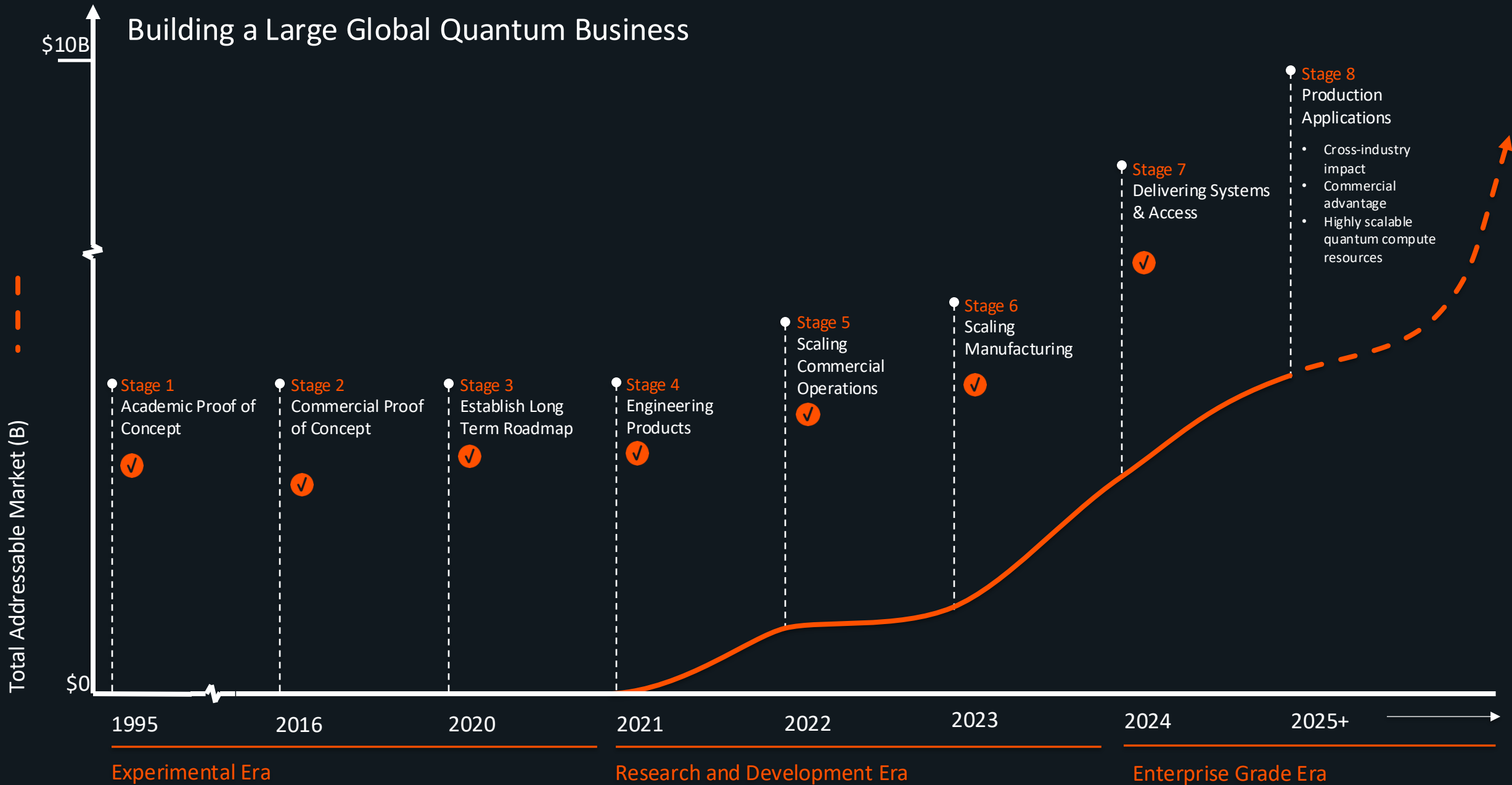



- ✓ Data center ready systems
- Software integrations
- Field support
- Global scale

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# Building a Large Global Quantum Business





Maryland



New York



Seattle



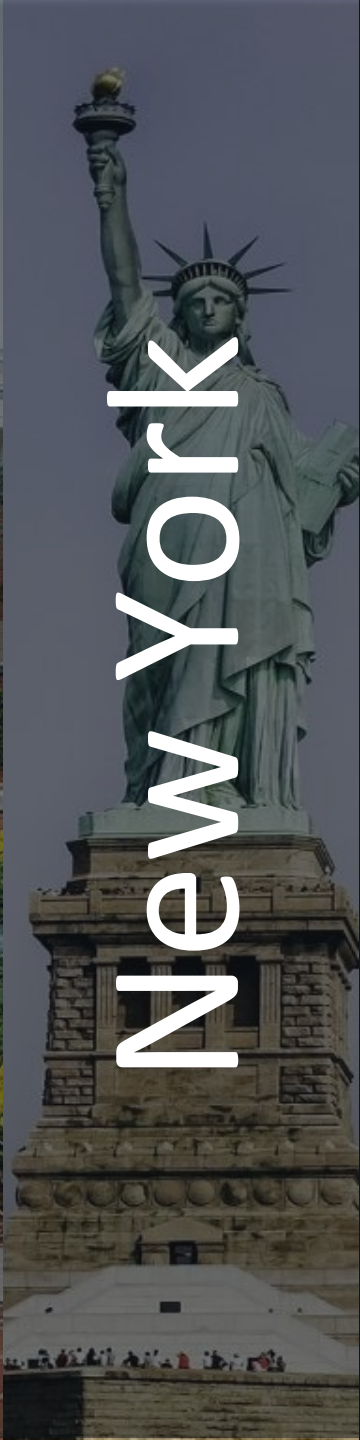
Switzerland



Toronto



Maryland



New York



Seattle



Switzerland



Toronto



Next?



Next?

# Enabling Commercial Advantage Through the Right Choices

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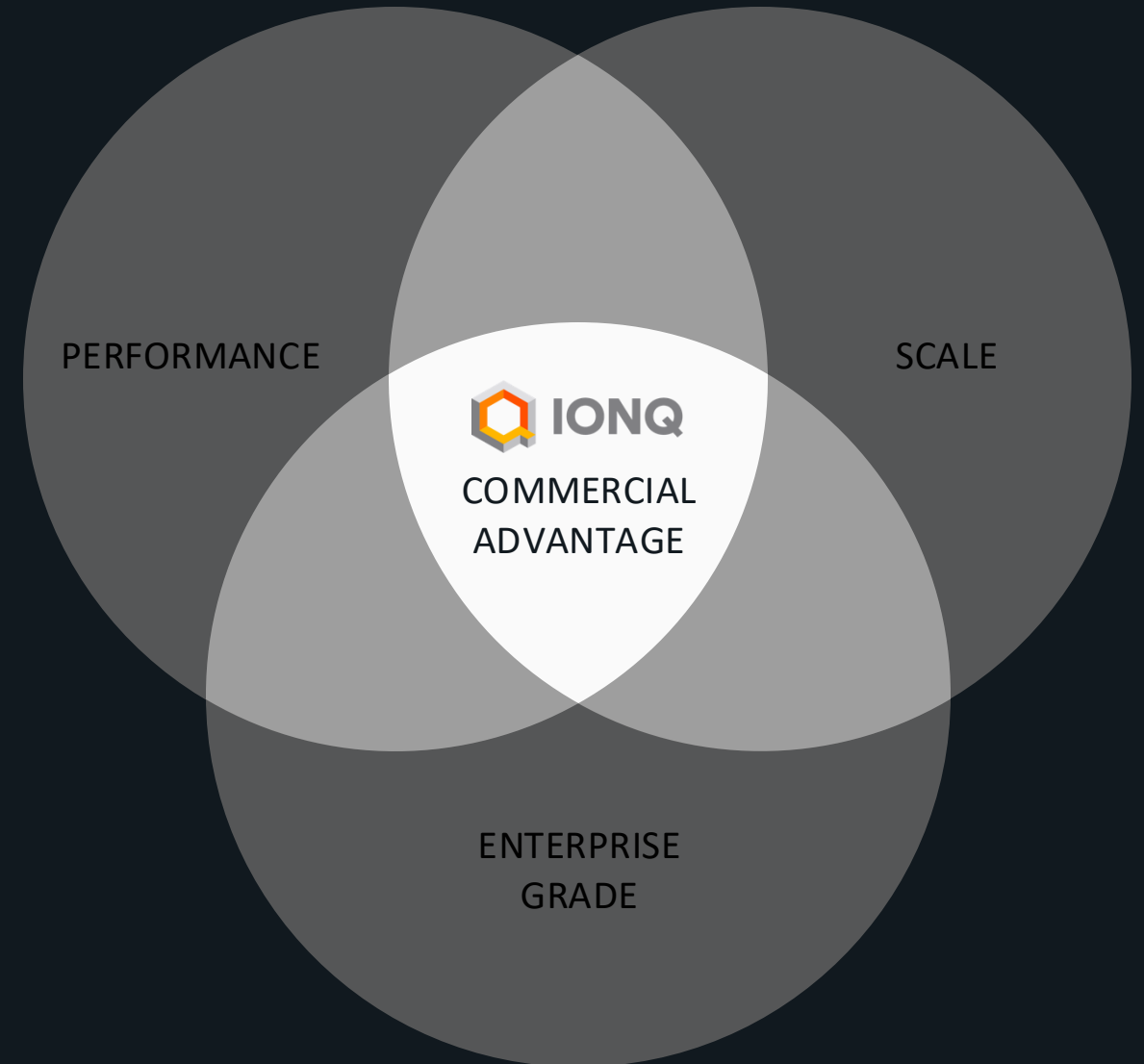
No single dimension tells the whole story

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Over-indexing on just one dimension creates an illusion of success

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A **holistic focus** on all three dimensions is required



# IonQ's Architecture Enables Expansive Growth

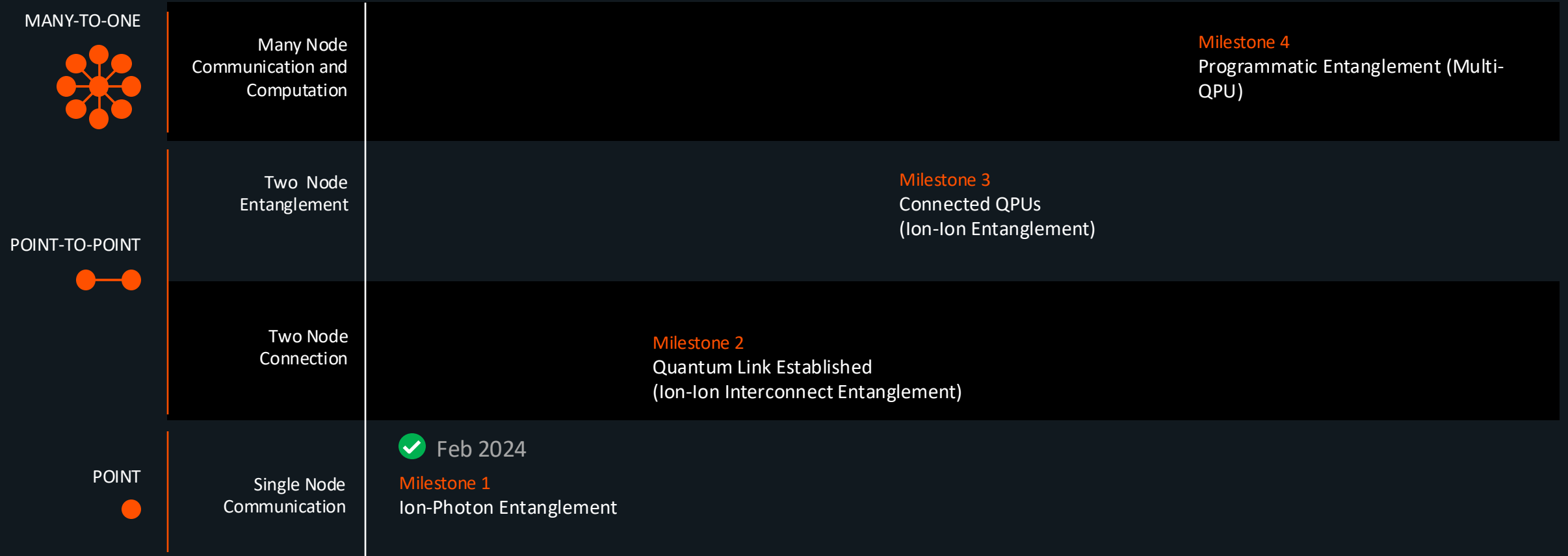
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Scale is our north star – we build for scale

Modularity is a key enabler of our scale, and we have made progress on Photonic Interconnect, Miniaturized Vacuums, and more



# Accelerating Quantum Networking to Enable Increased Scale



# Milestone 2: Ion-Ion Entanglement Achieved

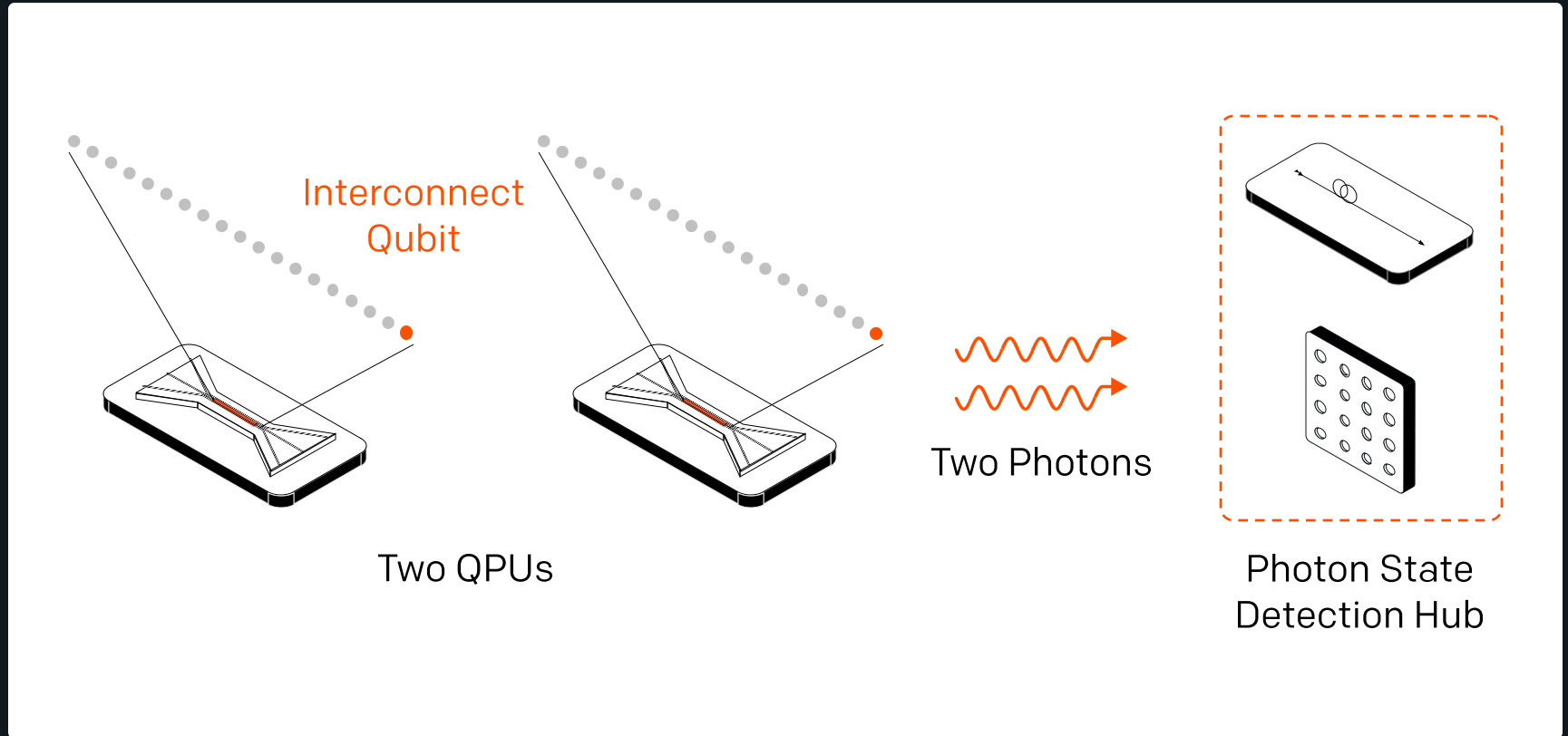


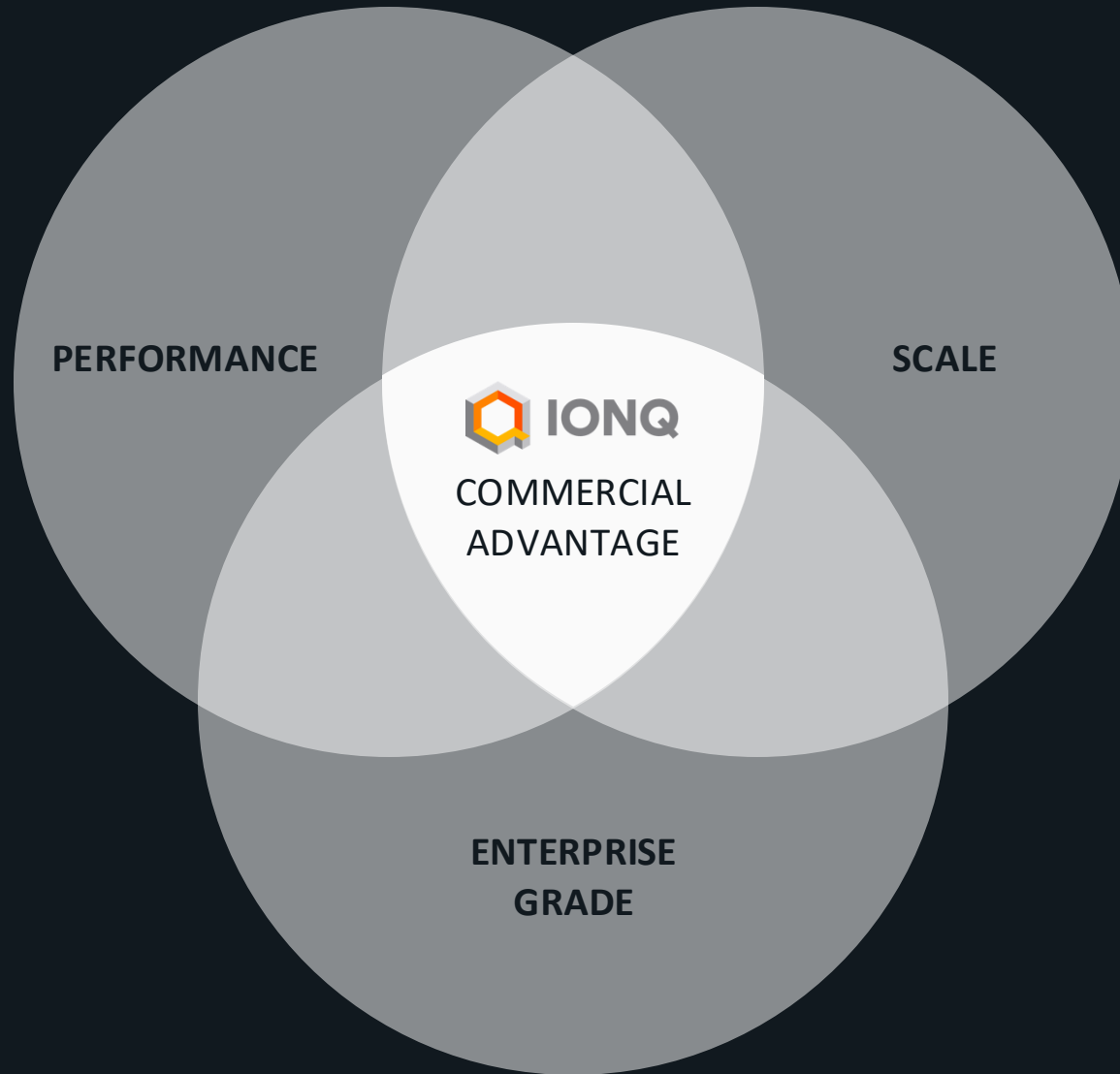
September  
2024

## Milestone 2 Photon-Mediated Ion-Ion Entanglement

Entangling two ion-based communication qubits from separate nodes using entangled photons

Quantum communication link established







# IonQ's Performance Drives Efficiency and Unparalleled Flexibility

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Our Barium bet is paying off, enabling higher fidelity

Inventing novel approaches to error correction today



# Barium High Performance Gates

Leveraged IonQ's long-chain **Barium development platform** with optical system similar to IonQ Forte

**No modification** of hardware to boost fidelity

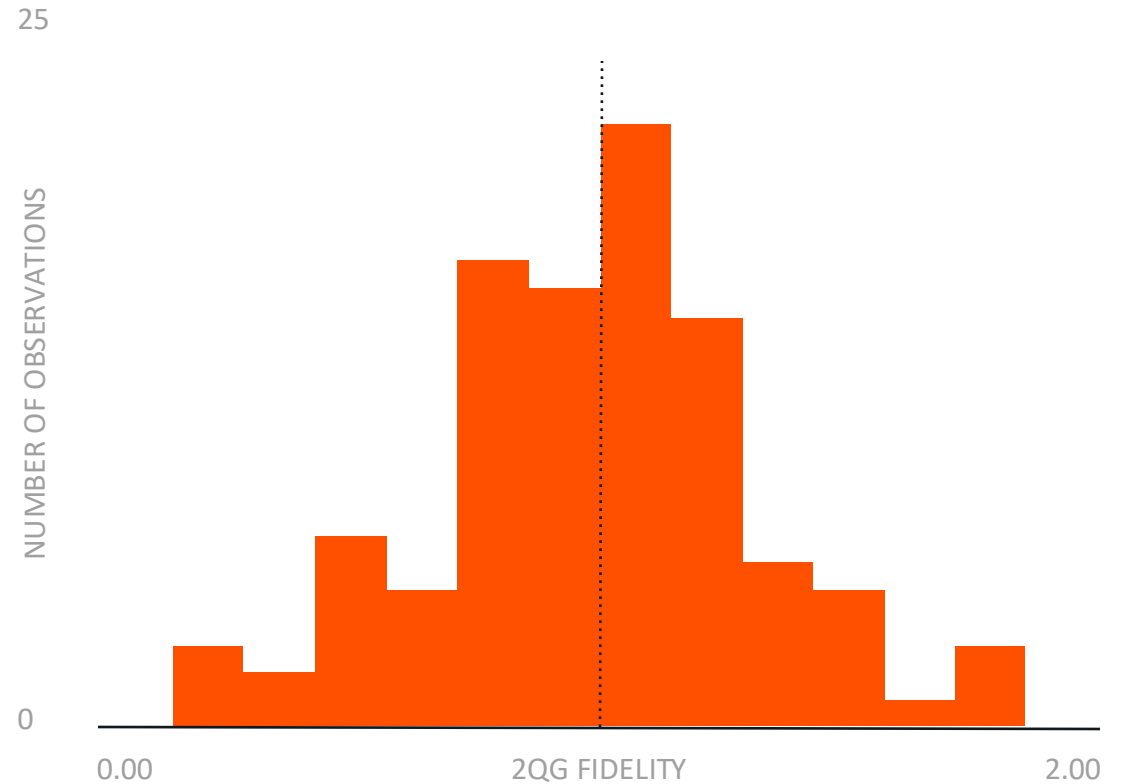
Demonstrates Barium is on track with a **4x improvement** over Forte in 2Q Gate fidelity and a **12x improvement** in gate speed\*

**>99.9%**

2QG Fidelity

**50  $\mu$ s**

Gate Speed



\*results on a Barium development platform configured in 2 qubit context

# An Error Correction Code Breakthrough at IonQ

Partial Quantum Error Correction approach, ~3:1 qubit overhead, 2:1 gate overhead

Fills gap between today's Quantum Error Mitigation and long-term Error Correction providing near term customer value



Paper →



Blog →

# Thank you!

Get Quantum with IonQ today:

[ionq.com/get-started](https://ionq.com/get-started)

Learn about our customers and  
use cases:

[ionq.com/resources](https://ionq.com/resources)