Analyst Day 2023

September 19, 2023
Cautionary Notes

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," "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, better error correction and sustained growth in system usage; the potential benefits of our partnership with Quantum Basel 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; 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. These and other risks identified under the header "Risk Factors" in our Annual Report on Form 10-K for the year ended December 31, 2022, and our Quarterly Reports on Form 10-Q for the quarters ended March 31, 2023, and June 30, 2023, each filed with the Securities and Exchange Commission, or SEC, as well as other information we file with the SEC could cause our results to differ from those stated or implied by our forward-looking statements. You are encouraged to read our filings with the SEC, available at www.sec.gov, for a discussion of these and other risks and uncertainties. You should not place undue reliance upon forward-looking statements. Except as required by law, we undertake no obligation to update or revise any forward-looking statement as a result of new information, future events or otherwise.
## Analyst Day 2023 Overview

### Agenda

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<th>Presenter</th>
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<td>01 The Quantum Horizon</td>
<td>Peter Chapman, President &amp; CEO</td>
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<td>9:45AM</td>
<td>02 Quantum Advantage: #AQ64</td>
<td>Dean Kassmann, VP Engineering</td>
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<td>Pat Tang, VP Research &amp; Development</td>
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<td>10:45AM</td>
<td>03 Lab Tour (on-site only)</td>
<td>Chris Monroe, Co-Founder &amp; Chief Scientist</td>
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<td>11:45AM</td>
<td>04 How Quantum Applications Work</td>
<td>Jungsang Kim, Co-Founder &amp; CTO</td>
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<td>12:30PM</td>
<td>05 Product &amp; Go-To-Market</td>
<td>Ariel Braunstein, SVP Product</td>
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<td>Rima Alameddine, CRO</td>
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<td>Margaret Arakawa, CMO</td>
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<td>1:30PM</td>
<td>06 Scaling Deployment</td>
<td>Dave Mehuys, VP Production Engineering</td>
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<td>2:00PM</td>
<td>07 Financials</td>
<td>Thomas Kramer, CFO</td>
</tr>
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<td></td>
<td></td>
<td>Jordan Shapiro, VP FP&amp;A &amp; Head of IR</td>
</tr>
<tr>
<td>2:30PM</td>
<td>08 University of Maryland QLab Ribbon</td>
<td>Various</td>
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<td></td>
<td>Cutting Ceremony (on-site only)</td>
<td></td>
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</tbody>
</table>
The Quantum Horizon
The Next Technological Revolution is Quantum

IonQ is positioned to be the first mover in the quantum revolution, ushering in the next great age of productivity.
Defining Quantum Success
01 The Quantum Horizon

Our Goal: Putting the world’s most powerful computers in the hands of customers to solve their most complex business problems.
Consistently Ahead of Schedule on Technology Roadmap

IonQ was 7 months early to delivering Forte #AQ29

Note: Prepared on the basis of certain technical, market, competitive and other assumptions to be subsequently described in further detail, and which may not be satisfied. As a result, these projections are subject to a high degree of uncertainty and may not be achieved within the time-frames described or at all.

Note: Market inflection points are estimated based on alignment of IonQ technical roadmap with publicly documented quantum research problems in each market.

1. Algorithmic qubit number defined as the effective number of qubits for typical algorithms, limited by the 2Q fidelity
2. Employs 16 error-correction encoding
3. Employs 32.1 error-correction encoding

© 2023 IonQ
01 The Quantum Horizon

#AQ64 Represents a ~$34,000,000,000x$ Increase in Compute Power Over #AQ29

Size of Algorithmic Qubits

Size of Computational Space

#AQ5

Tip of a marker
~10 mm²

#AQ29

Basketball court
~500 million mm²

#AQ64

United States
~10 quintillion mm²

#AQ64 is 100,000 times larger than the limit of a classical supercomputer simulation
How IonQ Pulled Ahead of The Pack
IonQ Chose a Mature Technology From The Start

Individual atomic ion qubits in an ion trap are superior to competing qubit platforms, and allowed IonQ to move farther, faster than the competition

- Identical and naturally quantum
- Designed to be perfectly isolated from environmental influences
- Capable of running at room temperature
- Reconfigurable and highly-connected
- Unparalleled inherent performance
- Longest qubit lifetime
Connectivity and Fidelity Matter Far More Than Physical Qubit Count

IonQ Forte (29 #AQ)
- All-to-all connectivity
- Two qubit gates

Superconducting Competitors
- Nearest-neighbor connectivity
- Multiple swap gates required
Trapped Ions Could Allow IonQ to Reach the Enterprise Era Without Error Correction

**Expected Phases of Quantum Computing Maturity**

**Boston Consulting Group Analysis**

**Phase I**
- Estimated Impact (Operating Income): $2-5 Billion
- Technical Barrier To Entry: Error Reduction

**Phase II**
- Estimated Impact (Operating Income): $25-50 Billion
- Technical Barrier To Entry: Error Correction

**Phase III**
- Estimated Impact (Operating Income): $450-850 Billion
- Technical Barrier To Entry: Modular Architecture

New Developments: For IonQ, Phase II may **not** require error correction and may be reached with error mitigation.
IonQ to Deliver Enterprise-Grade Quantum

Estimated Competitive Landscape

**Phase I:**
Proof-of-Concept
Design Phase
Lab Experiments

**Phase II:**
Enterprise-Grade Era
Design Phase
Production Ready

**Phase III:**
Broad Adoption
Design Phase
Mature Systems

Quantum Pure-Plays
Tech Giants
Blue-Chip Tech Company
Led by Distinguished Industry Veterans Today

Peter Chapman
President & Chief Executive Officer
amazon

Rima Alameddine
Chief Revenue Officer
NVIDIA, Cisco, Sun Microsystems

Tom Jones
Chief People Officer
Blue Origin, Microsoft, Honeywell

Jungsang Kim
Co-Founder & Chief Technology Officer
Duke, Bell Laboratories

Thomas Kramer
Chief Financial Officer
Oracle

Chris Monroe
Co-Founder & Chief Scientist
University of Maryland, NIST

Margaret Arakawa
Chief Marketing Officer
Microsoft, fastly

Ariel Braunstein
SVP, Product
Google, Cisco

Dean Kassmann
VP, Engineering
Blue Origin, Amazon

David Mehuys
VP, Production Engineering
PsiQuantum, Infinera

Jordan Shapiro
VP, FP&A | Head of IR, CorpDev
NEA, Samsung

Pat Tang
VP, Research & Development
Amazon, Apple

Kurt Kennett
VP, Software
Microsoft, Nintendo

Matt Keesan
VP, Quantum Platform

Masako Yamada
Director, Applications Development
GE Research
Launching Our Systems on the Cloud Early Forced IonQ to Build a Commercial Platform
First Mover Advantage Caused Industry Leaders to Notice and Choose IonQ

Bookings by Year

- **2021**: $16.7M
- **2022**: $24.5M
- **2023E**: $52.5M

1. Represents the midpoint of FY2023 guidance
01 The Quantum Horizon

Capitalized to Build a Quantum Powerhouse

Half a Billion in Cash\(^1\)

**Investing in R&D**
Maintain market leading technology

**Hiring Top Quantum Talent**
Best-in-class scientists

**Achieving Manufacturing Scale**
Scaling production to win the quantum market

\(^1\text{Cash, cash equivalents and investments were }$509.2\text{ millions as of June 30, 2023}\)
IonQ is the first known company to open a dedicated quantum computing manufacturing facility in the U.S.
Expanding Geographies to Service Growing Global Quantum Interest

Toronto, Canada
Acquired the operating assets of Entangled Networks in Jan 2023

College Park, MD, USA
Headquarters since 2015

Seattle, WA, USA
On schedule to open in Q4 2023

Basel, Switzerland
Quantum data center through partnership with QuantumBasel in Jul 2023

Munich, Germany
Entity created in 2022

Haifa, Israel
Entity created in 2022

Facilities
Commercial presence
Lifecycle of Quantum Hardware Products

1. Research & Development
   Lab experiment iterations creating proof-of-concept designs

2. First Customer Contact
   Working on uptime and calibration of repeatable results

3. Manufacturing at Scale
   Building powerful computers at scale to reduce operating costs of quantum

4. Ongoing Support
   24/7 hardware and software support for customers
IonQ is Leading Quantum Exploration

While most quantum competitors are iterating on PoCs, IonQ is leading the pack in application and hardware development.
IonQ Will Benefit From First Movers Advantage

90% of the value created by the top 10% companies

Timeline:
- Today
- 2026
- 2030
- 2040

Quantum Computing:
- Early Adopters 10%
- Early Majority 40%
- Late Majority 40%
- Laggards 10%

Source: BCG, Building toward quantum advantage today, December 2022
The Time to Build an Enduring Company Together is Now
Questions?

Peter Chapman
President & CEO
Quantum Advantage: #AQ64

Dean Kassmann
VP Engineering

Pat Tang
VP Research & Development
#AQ Explained

Physical qubit count is not representative of actual system performance

#AQ is defined as *useable qubits* in a quantum computer

Defining #AQ based on QED-C benchmarking

**Optimization**
- Problems involving complex routing, sequencing and more
  - Amplitude Estimation
  - Monte Carlo Simulation

**Quantum Simulation**
- Understand the nature of the very small
  - Hamiltonian
  - Variational Quantum Eigensolver

**Quantum Machine Learning**
- Problems involving complex routing, sequencing and more
  - Quantum Fourier Transform
  - Phase Estimation

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Note: Graph is illustrative and not representative of actual results

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The #AQ Increase in Computation Power

The computational states available within the quantum computer double for each additional #AQ the system achieves.

- **#AQ1**: Width of a Paper Clip, 2 Possible Encoded States
- **#AQ10**: Height of a Giraffe, 1024 Possible Encoded States
- **#AQ23**: Width of the English Channel, 8 Million Possible Encoded States
- **#AQ30**: Width of the United States, 1 Billion Possible Encoded States
- **#AQ36**: Distance to the Moon, 69 Billion Possible Encoded States
- **#AQ51**: Width of the Solar System, 2 Quadrillion Possible Encoded States
Consistently Ahead of Schedule on Technology Roadmap

IonQ was 7 months early to delivering Forte #AQ29

Note: Prepared on the basis of certain technical, market, competitive and other assumptions to be subsequently described in further detail, and which may not be satisfied. As a result, these projections are subject to a high degree of uncertainty and may not be achieved within the time-frames described or at all.

Note: Market inflection points are estimated based on alignment of IonQ technical roadmap with publicly documented quantum research problems in each market.

1. Algorithmic qubit number defined as the effective number of qubits for typical algorithms, limited by the IQ fidelity
2. Employees 16.1 error-correction encoding
3. Employees 32.1 error-correction encoding

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Technological Path to Achieving #AQ64 by 2025

Today
#AQ29
Accomplishments:
- Acousto-optical deflectors (AODs)
- Introduced Error Mitigation
- High Performance Control Electronics
- Compiler Development

2025
#AQ64
Advancements:
- Barium Ion Advantage
- Advancing Error Mitigation
- Reconfigurable Multi-Core Quantum Architecture
- Multilayer Glass Trap Technology
- Full-Stack Software & OS
- Sympathetic Cooling
- Multi Zone / CW Raman laser systems
- Optimizing Compiler Technology

Beyond
#AQ64+
Opportunities:
- Advancing Laser Systems
- Error Correction & Gate Speed
- Photonic Interconnects
- Integrated Photonics
- Compact Vacuum
Enabling #AQ64: Barium Development

Advantages of Barium:

- Higher fundamental gate fidelities (~99.98%) for superior overall performance
- Visible spectrum lasers allowing for increased gate speeds, higher levels of integration, and better stability
- Lower state preparation / measurement (SPAM) errors
Enabling #AQ64: Error Mitigation

Error Mitigation Considerations

- IonQ’s current bottleneck, 2-qubit gate errors, are mostly systematic and coherent.
- Actively working toward new error mitigation techniques to enable #AQ64.
- IonQ is currently boosting output without requiring error correction.

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1. Estimate based on IonQ technical roadmap and experimental results recently published by IonQ founder Chris Monroe, advisor Ken Brown and collaborators.
2. 1000:1 based on overhead for surface codes on a 2-D lattice. 1,000,000:1 based on linear connectivity systems.
Enabling #AQ64: Reconfigurable Multi-Core

Advantages of Reconfigurable Multi-Core

- **More ions** on a singular chip
- Allows ions to communicate without interconnects
- **Increase scale** without decreasing fidelity
Enabling #AQ64: Trap Technology

Multilayer Glass Trap (MGT)

- More robust manufacturing for higher yields
- Increased quantum zones for multi-core
- Path to scaling to hundreds or more ions
Enabling #AQ64: Superior Full-Stack Software & OS

IonQ deploys a full-stack software and operating system to enable quantum computing applications.

- Apps
- Tools
  - API/SDK
  - Intermediate Representation
  - Compiler
- Quantum OS
- Real-time Quantum Control
- Hardware

Note: Real-time control runs on embedded SoC, while quantum OS runs on commodity hardware.
IonQ R&D is Working To Enable #AQ64+

Today

#AQ29

Accomplishments:
• Acousto-optical deflectors (AODs)
• Introduced Error Mitigation
• High Performance Control Electronics
• Compiler Development

2025

#AQ64

Advancements:
• Barium Ion Advantage
• Advancing Error Mitigation
• Reconfigurable Multi-Core Quantum Architecture
• Multilayer Glass Trap Technology
• Full-Stack Software & OS
• Sympathetic Cooling
• Multi Zone / CW Raman laser systems
• Optimizing Compiler Technology

Beyond

#AQ64+

Opportunities:
• Advancing Laser Systems
• Error Correction & Gate Speed
• Photonic Interconnects
• Integrated Photonics
• Compact Vacuum
Beyond #AQ64: Advancing Laser Systems

Quantum Qubit accesses greater computational states than Classical Bits

Quantum computing states lie on a sphere of possibilities

Virtual State

Excited state in Ion

Ground state
Beyond #AQ64: Advancing Laser Systems

Improving laser system technology leads to higher gate fidelity

Today
Frequency Comb Laser

Future
Pure 2-Tone Laser

$f_{PR} = 100$ GHz

Intensity
Frequency

10GHz

Intensity
Frequency
Beyond #AQ64: Photonic Interconnects

IonQ expects to be able to scale Quantum Computing Power exponentially through Photonic Interconnects of multiple QPU systems.
Beyond #AQ64: Compact Vacuum

Reducing the vacuum chamber size to be smaller than a deck of cards to meet future system form factors
Questions?

Dean Kassmann
VP Engineering

Pat Tang
VP Research & Development
Lab Tour (on-site only)

Livestream attendees should wait for our next streamed session at 11:45AM ET

Chris Monroe
Co-Founder & Chief Scientist
How Quantum Applications Work

Jungsang Kim
Co-Founder & CTO
04 How Quantum Applications Work

Quantum Applications

Developing Enterprise-Grade Quantum Applications

**Cargo Loading Optimization**
Solving complex loading problems to reduce costs

**Molecular Modeling Simulations**
Simulating chemistry interactions for drug discovery

**Quantum ML for Image Recognition**
Reading street signs to enable self-driving

IonQ and its partners lead in Quantum Application development to capture the $450-850B\textsuperscript{1} in explosive business value creation at quantum maturity

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\textsuperscript{1} BCG, Building toward quantum advantage today, December 2022
Cargo Loading Optimization with AIRBUS
04 How Quantum Applications Work

Airbus Cargo Loading Optimization

Complex Loading Considerations:
- Multiple plane types within operating fleet
- Load balancing requirements
- Complex bin and package arrangements
Cargo Loading Optimization

**Task:** Develop a proof-of-concept quantum approach for cargo loading problems for airplanes; Potential business impact of lowering operating costs, fewer fuel emissions and increasing loading predictability

**Constraints:**

- Total mass can’t exceed maximum loading of aircraft
- Center of gravity must be bounded between limits (balancing the load)
- Shear limits of aircraft must be respected (structural strength)
- A package must be assigned to a single bin (type 1 and type 2) or to 2 consecutive bins (type 3)
- Total volume of packages assigned to a bin can’t exceed the volume of the bin
Cargo Loading Optimization

Every incremental package added, creates a more exponentially complicated solution.
Cargo Loading Optimization

Demonstration of first variational quantum optimizer for a 28-qubit problem on IonQ Forte

IonQ Forte found the optimal solution for loading 7 packages in 4 bins\(^1\)

Potential Benefits of Loading Optimization at Scale:

- Increased Operational Efficiency
- Fuel Cost Savings
- Labor Savings

\(^1\) Not all packages are always chosen as optimization is constrained by weight limitations.
Molecular Modeling Simulations with Oak Ridge National Laboratory
Molecular Modeling Simulations

Simulations of more complex molecules require an exponential amount of classical computing power.

Water (H₂O)

Methyl Fluoride (CH₃F)

Benzene (C₆H₆)

Caffeine (C₈H₁₀N₄O₂)

Impossible to simulate classically.

Graph:
- **Y-axis**: Computational Power Required
- **X-axis**: Number of Orbitals
Molecular Modeling Simulations

IonQ Quantum Chemistry Simulations to Date

Most complex quantum chemistry simulation on a real Quantum Computing hardware

1. Based on publicly available research as of August 2023
Molecular Modeling Simulations

At a certain problem size quantum will take significantly less time to reach a solution.

Note: The y-axis in this chart is displayed on a logarithmic scale.
Quantum Machine Learning for Image Recognition with HYUNDAI
Quantum Machine Learning for Image Recognition

IonQ Quantum Computers are working to reliably distinguish real-world images like road signs for machine learning.

German Road Sign Dataset: 43 classes

Source: https://benchmark.ini.rub.de/german_object_dataset.html#Citation
Quantum Machine Learning and Image Recognition
Questions?

Jungsang Kim
Co-Founder & CTO
Product & Go-To-Market

Ariel Braunstein
SVP Product

Rima Alameddine
CRO

Margaret Arakawa
CMO
IonQ Has a History of Building a Platform for Enterprise Use

- **2019**: Runs First System Benchmarks
- **2020**: Introduces #AQ Benchmarks
- **2021**: Establishes Quantum Data Center
- **2022**: Open Sources #AQ Benchmarks
- **2023**: Available on Azure Quantum, Amazon Braket, Google Cloud, Compatible with All Major SDKs
IonQ's Products and Services

**Algorithms and Applications**
Access to state-of-the-art quantum-based solutions on best-in-class quantum systems

**Consulting Services**
Custom solutions for addressing customer needs and enabling customer success

**Platform**
Access to IonQ latest quantum technology and experience regardless of system or access model

<table>
<thead>
<tr>
<th>Shared Access (Cloud)</th>
<th>Dedicated Access (Cloud or On-prem)</th>
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<tbody>
<tr>
<td>The most flexible and reliable method for accessing IonQ quantum technology</td>
<td>The most productive method for securing access to a specific IonQ quantum system</td>
</tr>
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</table>

**Systems**
Generations of trapped ion quantum computers delivering cutting-edge performance

- Harmony
- Aria
- Forte

(New Systems to come)
## IonQ Generational Systems

<table>
<thead>
<tr>
<th></th>
<th>Harmony</th>
<th>Aria</th>
<th>Forte</th>
<th>TBA (Expected)</th>
<th>TBA (Expected)</th>
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<tbody>
<tr>
<td>Commercial Availability</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>System Sales</td>
<td>–</td>
<td>–</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td><strong>Performance</strong></td>
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<tr>
<td>Algorithmic Qubits (#AQ)</td>
<td>#AQ 9</td>
<td>#AQ 25</td>
<td>#AQ 29</td>
<td>#AQ 35</td>
<td>#AQ 64</td>
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<tr>
<td>Physical Qubits</td>
<td>11</td>
<td>25¹</td>
<td>32</td>
<td>TBA</td>
<td>TBA</td>
</tr>
</tbody>
</table>

1. System is capable of up to 2 qubits
## Shared vs. Dedicated Access

Selecting the right solution for each customer

<table>
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<th><strong>Shared Access</strong></th>
<th><strong>Common Benefits</strong></th>
<th><strong>Dedicated Access</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Access to IonQ’s latest technology and systems</td>
<td>✓ SDK compatibility</td>
<td>✓ Uninterrupted access</td>
</tr>
<tr>
<td>✓ Flexible and efficient budget usage</td>
<td>✓ Compilation and optimization toolchain</td>
<td>✓ On-prem or hosted at IonQ’s data center</td>
</tr>
<tr>
<td>✓ Variable usage</td>
<td>✓ Error mitigation solutions</td>
<td>✓ Local data storage (compliance: GDPR, etc.)</td>
</tr>
<tr>
<td>✓ No extra costs (installation &amp; maintenance)</td>
<td>✓ Quantum API</td>
<td></td>
</tr>
</tbody>
</table>
Distributed Cloud Deployments for Multi-Region Data Sovereignty

Quantum Platform

Quantum Platform (USA)
- Dedicated Access (USA)
  - Customer A
  - System

Quantum Platform (Region X)
- Shared Access (International/Multi-Region)
  - IonQ-Hosted Quantum Systems
  - Systems
- Shared Access (X Only)
  - IonQ-Hosted System(s)
  - System
- Dedicated Access (X)
  - Customer B
  - System
- Dedicated Access (Local Only)
  - Customer C
  - System
Production Ready Quantum Platform

High AQ and innovative algorithms are key for delivering applications and creating commercial value.

Enterprise-Grade Solution

- Production-grade: reliable, flexible, secure
- Integrates seamlessly with customer’s production stack
- Rapid customer development and deployment
Go-to-Market
05 Product & Go-To-Market

Expected Quantum Market Potential

Generate End-User Revenue Growth
$1.8T to $3.5T by maturity

1 BCG, Quantum Computing is Becoming Business Ready, May 2023

Note: Inflection points estimated based on alignment of IonQ technical roadmap with publicly documented quantum research problems in each market. Market sizes not to scale.
Now is the Time to Commit to Enterprise-Grade Quantum Development

Source: BCG, Building toward quantum advantage today, December 2022
Leading Application Development to Capitalize on the Explosive Value Creation Opportunity

<table>
<thead>
<tr>
<th>Machine Learning</th>
<th>Optimization</th>
<th>Simulation</th>
<th>Cryptography</th>
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<tr>
<td>$0-10B</td>
<td></td>
<td>Aerospace: CFD $10-20B</td>
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<tr>
<td>$20-30B</td>
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<td>Energy: Solar Conversion $10-30B</td>
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<td>$50-100B</td>
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<td>Aerospace: Route Optimization $20-50B</td>
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</table>

Machine learning applications to impact most, if not all, industries

Source: BCG, Building toward quantum advantage today, December 2022
Early Adopters Projected to Capture 90% of Incremental Value

Source: BCG, Building toward quantum advantage today, December 2022
Market Strategies

1. Quantum Economy
2. Commercial Value Creation
3. Government Enablement
4. Partnership Growth
Market Strategies: Quantum Economy

Customers are investing in the Quantum Economy today to be leaders in the Quantum Revolution tomorrow.
Market Strategies: Quantum Economy

IonQ is excited to welcome the University of Maryland for the official opening of QLab
Market Strategies: Quantum Economy

Partnering with IonQ for two generations of future #AQ35 & #AQ64 systems

- Investment in multiple generations of IonQ’s system roadmap
- Collaboration on quantum application development
- Serving industry, governments, and research
- Supports data sovereignty requirements
Damir Bogdan
CEO, QuantumBasel
Market Strategies: Commercial Value Creation

Building the next generation of industry leaders at the forefront of the quantum horizon
Market Strategies: Commercial Value Creation

Enabling portfolio analysts to more accurately model outliers

Target Distribution

Classical Computer
Generative Adversarial Network

IonQ Quantum Computer
Generative Adversarial Network

IonQ Quantum Computer
Circuit Born Machine

Outliers resulting from notable events

MSFT vs AAPL

20,000 iterations

1,000 iterations

26 iterations
Market Strategies: Government Enablement

Support Core Government Missions

- Collaborate on Quantum Innovation
- Develop Quantum Algorithms
- Supercharge the Quantum Workforce
Market Strategies: Government Enablement

IonQ has partnered with the Air Force Research Laboratory (AFRL) to advance national security
Market Strategies: Scale Through Partnerships

IonQ is the Only Quantum Hardware Available on All Major Clouds

Partnering with leading consulting, software, OEM and integrator companies

[Logos of Azure Quantum, Amazon Braket, Microsoft, Accenture, IBM, BearingPoint, and Lockheed Martin]
The Next Era of Quantum Computing is Here
Questions?

Ariel Braunstein
SVP Product

Rima Alameddine
CRO

Margaret Arakawa
CMO
Scaling Production & Deployment

Dave Mehuys
VP Production Engineering
Confidence in Manufacturing at Scale to Meet Customer Demand with Leading Product

Every IonQ system generation improves with:

- **Higher Performance**
  - Improving #AQ and fidelity

- **Improved Assembly & Test Processes**
  - Deployable for both Shared and Dedicated Access

- **Faster Production and Deployment Cycles**
  - Shorter, predictable lead times
IonQ to Open the First Known Dedicated Quantum Computing Manufacturing Facility in the U.S.
06 Scaling Production & Deployment

Seattle Manufacturing Hub & Data Center

65,000 Sq. Ft.

Q4 2023 Set to Start Manufacturing
Basel Innovation Hub & Data Center

12,000 Sq. Ft.

2024 Planned Occupancy
Global Data Center Footprint in Seattle, DC, and Basel by mid-2024

College Park, MD, USA
Headquarters since 2015

Seattle, WA, USA
On schedule to open in Q4 2023

Basel, Switzerland
Quantum data center through partnership with QuantumBasel in Jul 2023
Engineering and Product Plans Support Manufacturing Investment

- **Rack-Mount Form Factor**
  Ready to plan, build, and ship

- **Modular Design**
  Ready to manufacture and spare

- **Deployable & Serviceable**
  Remote monitoring, improved up-time

**Working to produce systems at scale to equip quantum data centers**
Building the Right Production Foundation

**Governance**
- Quality Management System
- Lean Manufacturing
- Planning and Operations Management Tools
- ESG: Sustainability

**Facility**
- Flexible and Scalable
- ISO 7 Manufacturing Environment
- Critical Infrastructure Redundancy
- Global Data Center Redundancy

**Supply Chain**
- Strategic Partnerships
- TQRDC governance: Flexible and Scalable
- Efficient Inventory Management
- Spares
Questions?

Dave Mehuys
VP Production Engineering
07

Financials

Thomas Kramer
CFO

Jordan Shapiro
VP FP&A, Head of IR
IonQ Revenue Drivers

Application Co-Development
Formation of long-term partnerships with select industry-leading companies to co-develop end-to-end quantum solutions.

Preferred Compute Agreements
Providing customers direct access to IonQ’s cutting-edge quantum systems, as well as technical support to pursue solution development.

Partner Cloud Access
Partnerships with Amazon Bracket, Azure Quantum, Google Cloud, and other cloud providers designed to make quantum hardware available to a broader community of quantum programmers.

Dedicated Hardware
Manufacturing and sales of complete systems for dedicated use by a single customer.
Diverse Profiles of System Hardware Customers

Customer Profiles

- Government
- Commercial
- Academic

System Hardware Options

Production Systems
Standard systems from IonQ’s manufacturing queue

Specialized Systems
Modified systems for special purposes, including networking
07 Financials

Revenue Recognition

IonQ deals vary in size, length, and complexity requiring different revenue recognition methodologies for different deals.

Access Agreements
Fixed amount recognized on monthly basis

Service Period-Based
Recognition over delivery period

Usage-Based
Function of user activity

Percentage Completion
Recognized based on proportion of work completed

Upon Delivery (Future)
Potential model for hardware sales at scale
07 Financials

Gross Margin

Gross margin is still in flux but provides preliminary indications for long-term economics.

Gross Margin Considerations

- Different revenue streams result in different costs of revenue
- Reserves the ability to trade gross margin for market penetration
- Gross margin stability will come with industry maturity

1. YTD as of June 30, 2023.
Note: Gross profit and gross margin excludes depreciation and amortization, and is a non-GAAP measure.
Source: IonQ public filings
07 Financials

Inventory
With manufacturing scaling, IonQ’s finance, operations, and technical teams are collaborating to drive responsible inventory growth

Inventory Principles

- Risk mitigation for long-lead items
- Support for serviceability and uptime of production systems
- Agile budgeting to meet rising demand for system sales and access
07 Financials

Capitalized To Execute
$509M in Cash

Fueling Research & Development
Maintain market leading technology

Hiring Top Quantum Talent
Best-in-class scientists

Achieving Manufacturing Scale
Scaling production to win the quantum market

Investing in Opportunistic M&A
Flexibility to acquire strategically

1. Cash, cash equivalents and investments were $509.2 millions as of June 30, 2023
2. YTD as of June 30, 2023
Source: IonQ public filings

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Publicly-Traded Warrants

Warrant liabilities are inversely correlated to share price and, at times of high volatility, can impact net profit or loss; Adj. EBITDA\(^1\) is an alternative metric that IonQ tracks for operating performance.

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1. Adj. EBITDA definition and reconciliation of net loss to Adj. EBITDA available in the 8-K EX-99.1 filed August 10, 2023. Source: IonQ public filings
## Summary Financial Data

<table>
<thead>
<tr>
<th>$M</th>
<th>2021</th>
<th>2022</th>
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<td>Bookings</td>
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<tr>
<td>Revenue</td>
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<td>11.1</td>
<td>9.8</td>
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<tr>
<td>(-) Cost of Revenue¹</td>
<td>1.0</td>
<td>2.9</td>
<td>2.9</td>
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<tr>
<td><strong>Gross Profit</strong></td>
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<td>6.9</td>
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<tr>
<td><strong>Gross Margin %</strong></td>
<td>50.5%</td>
<td>73.6%</td>
<td>70.0%</td>
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<tr>
<td>R&amp;D</td>
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<td>Sales &amp; Marketing</td>
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<td>6.2</td>
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<tr>
<td><strong>General &amp; Administrative</strong></td>
<td>13.7</td>
<td>36.0</td>
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<td>D&amp;A</td>
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<td>5.6</td>
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<tr>
<td>(-) Operating Expenses</td>
<td>(39.8)</td>
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<tr>
<td><strong>Adj. EBITDA²</strong></td>
<td>(36.2)</td>
<td>(80.1)</td>
<td>(57.0)</td>
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<tr>
<td>Non-operating result³</td>
<td>(67.5)</td>
<td>37.2</td>
<td>(10.0)</td>
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<tr>
<td>Net loss</td>
<td>(106.2)</td>
<td>(48.5)</td>
<td>(71.1)</td>
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</tbody>
</table>

1. Excluding depreciation & amortization
2. Reconciliation of net loss to Adj. EBITDA available in the 8-K EX-99.1 filed August 10, 2023; excludes stock-based compensation
3. Includes change in fair value of warrant liabilities, interest income, and other income (expense)

Source: IonQ public filings
IonQ is Positioned For Success
Questions?

Thomas Kramer
CFO

Jordan Shapiro
VP FP&A, Head of IR
Analyst Day 2023
Thank you.