IONQ

Investor Presentation

2021

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This presentation ("Presentation") is for informational purposes only. This Presentation shall not constitute an offer to sell, or the solicitation of an offer to buy, any securities, nor shall there be any sale of securities in any states or jurisdictions in which such offer, solicitation or sale would be unlawful. This Presentation has been prepared to assist interested parties in making their own evaluation with respect to a potential business combination between IonQ, Inc. ("IonQ") and dMY Technology Group, Inc. III ("dMY") and the related transactions (the "Proposed Business Combination") and for no other purpose. These materials are exclusively for the use of the party or the parties to whom they have been provided by representatives of IonQ and dMY. By accepting these materials, the recipient acknowledges and agrees that he, she or it (a) will maintain the information and data contained herein in the strictest of confidence and will not, under any circumstances whatsoever, reproduce these materials, in whole or in part, or disclose any of the contents hereof or the information and data contained herein to any other person without the prior written consent of IonQ or dMY, (b) is not subject to any contractual or other obligation to disclose these materials to any other person or entity, (c) will return these materials, and any other materials that the recipient may have received in the course of considering an investment in dMY and IonQ and (d) will promptly notify IonQ and dMY and their respective representatives of any unauthorized release, disclosure or use of these materials or the information and data contained herein. Furthermore, all or a portion of the information contained in these materials may constitute material non-public information of IonQ, dMY and their affiliates, and other parties that may be referred to in the context of those discussions. By your acceptance of this Presentation, you acknowledge that applicable securities laws restrict a person from purchasing or selling securities of a person with tradeable securities from communicating such information to any other person under circumstances in which it is reasonably foreseeable that such person is likely to purchase or sell such securities.

Certain information included herein describes or assumes the expected terms that will be included in the agreements to be entered into by the parties to the Proposed Business Combination. Such agreements are under negotiation and subject to change. The consummation of the Proposed Business Combination is also subject to other various risks and contingencies, including customary closing conditions. There can be no assurance that the Proposed Business Combination will be consummated with the terms described herein or otherwise. As such, the subject matter of these materials is evolving and us subject to further change by IonQ and dMY in their joint and absolute discretion.

Neither the Securities and Exchange Commission nor any securities commission of any other U.S. or non-U.S. jurisdiction has approved or disapproved of the Proposed Business Combination presented herein, or determined that this Presentation is truthful or complete. No representations or warranties, express or implied, are given in, or in respect of, this Presentation. To the fullest extent permitted by law in no circumstances will dMY, IonQ or any of their respective subsidiaries, stockholders, affiliates, representatives, directors, officers, employees, advisers or agents be responsible or liable for a direct, indirect or consequential loss or loss of profit arising from the use of this Presentation, its contents, its omissions, reliance on the information contained within it, or on opinions communicated in relation thereto or otherwise arising in connection therewith. Industry and market data used in this Presentation have been obtained from third-party industry publications and sources as well as from research reports prepared for other purposes. Neither dMY nor IonQ has independently verified the data obtained from these sources and cannot assure you of the data's accuracy or completeness. This data is subject to change. In addition, this Presentation does not purport to be all-inclusive or to contain all of the information that may be required to make a full analysis of IonQ or the Proposed Business Combination. Viewers of this Presentation should each make their own evaluation of IonQ and of the relevance and adequacy of the information and should make such other investigations as they deem necessary. References in this Presentation to our "partners" or "partnerships" with technology companies, governmental entities, universities or others do not denote that our relationship with any such party is in a legal partnership form, but rather is a generic reference to our contractual relationship with such party.

Forward Looking Statements

Certain statements included in this Presentation that are not historical facts are forward-looking statements for purposes of the safe harbor provisions under the United States Private Securities Litigation Reform Act of 1995. Forward-looking statements generally are accompanied by words such as "believe," "may," "will," "estimate," "continue," "anticipate," "intend," "expect," "should," "would," "plan," "predict," "potential," "seem," "seek," "future," "outlook," and similar expressions that predict or indicate future events or trends or that are not statements of historical matters. These forward-looking statements include, but are not limited to, statements regarding estimates and forecasts of other financial and performance metrics and projections of market opportunity. These statements are based on various assumptions, whether or not identified in this Presentation, and on the current expectations of the respective management of IonQ and dMY and are not predictions of actual performance. These forward-looking statements are provided for illustrative purposes only and are not intended to serve as, and must not be relied on by an investor as, a guarantee, an assurance, a prediction or a definitive statement of fact or probability. Actual events and circumstances are difficult or impossible to predict and will differ from assumptions. Many actual events and circumstances are beyond the control of IonQ and dMY. These forward-looking statements are subject to a number of risks and uncertainties, including changes in domestic and foreign business, market, financial, political, and legal conditions; the inability of the parties to successfully or timely consummate the Proposed Business Combination, including the risk that any regulatory approvals are not obtained, are delayed or are subject to unanticipated conditions that could adversely affect the combined company or the expected benefits of the Proposed Business Combination or that the approval of the stockholders of dMY or IonQ is not obtained; failure to realize the anticipated benefits of the Proposed Business Combination; risks relating to the uncertainty of the projected financial information with respect to IonQ; risks related to the performance of IonQ's business and the timing of expected business or revenue milestones; the effects of competition on IonQ's business; the amount of redemption requests made by dMY's stockholders; the ability of dMY or IonQ to issue equity or equity-linked securities or obtain debt financing in connection with the Proposed Business Combination or in the future; and those factors discussed in dMY's final prospectus that forms a part of dMY's Registration Statement on Form S-1 (Reg. No. 333-249524), filed with the SEC pursuant to Rule 424(b)(4) on November 16, 2020 (the "Prospectus") under the heading "Risk Factors," and other documents dMY has filed, or will file, with the SEC. If any of these risks materialize or our assumptions prove incorrect, actual results could differ materially from the results implied by these forward-looking statements. There may be additional risks that neither dMY nor IonQ presently know, or that dMY nor IonQ currently believe are immaterial, that could also cause actual results to differ from those contained in the forward-looking statements. In addition, forward-looking statements reflect dMY's and IonQ's expectations, plans, or forecasts of future events and views as of the date of this Presentation. dMY and IonQ anticipate that subsequent events and developments will cause dMY's and IonQ's assessments to change. However, while dMY and IonQ may elect to update these forward-looking statements at some point in the future, dMY and IonQ specifically disclaim any obligation to do so. These forward-looking statements should not be relied upon as representing dMY's and IonQ's assessments of any date subsequent to the date of his Presentation. Accordingly, undue reliance should not be placed upon the forward-looking statements.

Cautionary Notes (continued)

Use of Projections

This Presentation contains projected financial information. Such projected financial information constitutes forward-looking information, and is for illustrative purposes only and should not be relied upon as necessarily being indicative of future results. The assumptions and estimates underling such financial forecast information are inherently uncertain and are subject to a wide variety of significant business, economic, competitive, and other risks and uncertainties. See "Forward-Looking Statements" above. Actual results may differ materially from the results contemplated by the financial forecast information contained in this Presentation, and the inclusion of such information in this Presentation should not be regarded as a representation by any person that the results reflected in such forecasts will be achieved.

Use of Data

The data contained herein is derived from various internal and external sources. No representation is made as to the reasonableness of the assumptions made within or the accuracy or completeness of any projections or modeling or any other information contained herein. Any data on past performance or modeling contained herein is not an indication as to future performance. dMY and IonQ assume no obligation to update the information in this presentation.

Use of Non-GAAP Financial Metrics and Other Key Financial Metrics

This presentation includes certain non-GAAP financial measures (including on a forward-looking basis) such as EBITDA and EBITDA Margin. IonQ defines EBITDA as net income (loss), adjusted for for interest expense, depreciation and amortization, stock-based compensation and income taxes. EBITDA Margin is EBITDA divided by total revenue. These non-GAAP measures are an addition, and not a substitute for or superior to measures of financial performance prepared in accordance with GAAP and should not be considered as an alternative to net income, operating income or any other performance measures derived in accordance with GAAP. Reconciliations of non-GAAP measures to their most directly comparable GAAP counterparts are included in the Appendix to this presentation.

IonQ believes that these non-GAAP measures of financial results (including on a forward-looking basis) provide useful supplemental information to investors about IonQ. IonQ's management uses forward looking non-GAAP measures to evaluate IonQ's projected financial and operating performance. However, there are a number of limitations related to the use of these non-GAAP measures and their nearest GAAP equivalents. For example other companies may calculate non-GAAP measures differently, or may use other measures to calculate their financial performance, and therefore IonQ's non-GAAP measures may not be directly comparable to similarly titled measures of other companies.

Certain Risks Related to IonQ, Inc.

All references to the "Company," "IonQ," "we," "us" or "our" in this presentation refer to the business of IonQ, Inc. The risks presented below are certain of the general risks related to the Company's business, industry and ownership structure and are not exhaustive. The list below is qualified in its entirety by disclosures contained in future filings by the Company, or by third parties (including dMY Technology Group, Inc. III.) with respect to the Company, with the United States Securities and Exchange Commission ("SEC"). These risks speak only as of the date of this presentation and we make no commitment to update such disclosure. The risks highlighted in future filings with the SEC may differ significantly from and will be more extensive than those presented below.

- IonQ has a limited operating history, which makes it difficult to forecast our future results of operations.
- IonQ has a history of operating losses and may not achieve or sustain profitability in the future.
- IonQ may not be able to scale its business quickly enough to meet its customers' growing needs, and if it is not able to grow efficiently, its operating results could be harmed.
- The quantum computing industry is competitive on a global scale with many countries aspiring to successfully develop quantum computing. If IonQ is not able to compete successfully, its business, financial results and future prospects will be harmed.
- The quantum computing industry is in its early stages and is volatile, and if it does not develop, if it develops slower than IonQ expects, if it develops in a manner that does not require use of IonQ's quantum computing solutions, if it encounters negative publicity or if IonQ's solution does not drive commercial engagement, the growth of its business will be harmed.
- Even if IonQ is successful in developing quantum computing systems and executing its strategy, competitors in the industry may achieve technological breakthroughs which render IonQ's quantum computing systems obsolete or inferior to other products.
- If IonQ's computers fail to achieve a broad quantum advantage, or it is delayed in doing so, its business, financial condition and future prospects may be harmed.
- IonQ's operating and financial results forecast relies in large part upon assumptions and analyses developed by the company. If these assumptions or analyses prove to be incorrect, IonQ's actual operating results may be materially different from its forecasted results.
- IonQ's estimates of market opportunity and forecasts of market growth may prove to be inaccurate, and even if the market in which it competes achieves the forecasted growth, IonQ's business could fail to grow at similar rates, if at all.
- IonQ may be unable to successfully scale up manufacturing of its products in sufficient quantity and quality, in a timely or cost-effective manner, or at all. Unforeseen issues associated with scaling up and constructing quantum computing technology at commercially viable levels could negatively impact IonQ's business, financial condition and results of operations.
- IonQ could suffer disruptions, outages, defects and other performance and quality problems with its quantum computing systems or with the public cloud and internet infrastructure on which it relies.
- Supply chain issues, including a shortage of adequate component supply or manufacturing capacity, or any political challenges between the United States and countries in which IonQ suppliers are located, including China, could have an adverse impact on its business and operating results.
- If IonQ cannot successfully execute on its strategy, including in response to changing customer needs and new technologies and other market requirements, or achieve its objectives in a timely manner, its business, financial condition and results of operations could be harmed.
- IonQ is highly dependent on its co-founders, who are employed by Duke University, and its ability to attract and retain senior management and other key employees, such as quantum physicists and other key technical employees is critical to its success. If IonQ is unable to retain talented, highly-qualified senior management, engineers and other key employees or attract them when needed, it could negatively impact its business.
- IonQ's failure to effectively develop and expand its sales and marketing capabilities could harm its ability to increase its customer base and achieve broader market acceptance of its quantum computing capabilities.

Cautionary Notes (continued)

- IonQ depends on a particular isotope of an atomic element that provides qubits for its ion trap technology. If IonQ is unable to procure these isotopically enriched atomic samples, or is unable to do so on a timely and cost-effective basis, and in sufficient quantities, IonQ may incur significant costs or delays which could negatively affect its operations and business.
- If IonQ's quantum computing systems are not compatible with some or all industry-standard software and hardware, its business could be harmed.
- System security and data protection breaches, as well as cyber-attacks, could disrupt IonQ's operations, which may damage IonQ's reputation and adversely affect its business.
- State, federal and foreign laws and regulations related to privacy, data use and security could adversely affect IonQ.
- IonQ is subject to U.S. and foreign anti-corruption, anti-bribery and similar laws, and non-compliance with such laws can subject us to criminal or civil liability and harm our business.
- IonQ is subject to governmental export and import controls that could impair its ability to compete in international markets due to licensing requirements and be subject to liability if it is not in compliance with applicable laws.
- Unfavorable conditions in IonQ's industry or the global economy could limit the company's ability to grow its business and negatively affect its results of operations.
- IonQ is subject to requirements relating to environmental and safety regulations and environmental remediation matters which could adversely affect its business, results of operation and reputation.
- IonQ has identified material weaknesses in its internal control over financial reporting. If IonQ is unable to remediate these material weaknesses, or if IonQ identifies additional material weaknesses in the future or otherwise fails to maintain an effective system of internal control over financial reporting, this may result in material misstatements of IonQ's consolidated financial statements or cause IonQ to fail to meet its periodic reporting obligations or cause our access to the capital markets to be impaired.
- IonQ may need additional capital to pursue its business objectives and respond to business opportunities, challenges or unforeseen circumstances, and it cannot be sure that additional financing will be available.
- Acquisitions, divestitures, strategic investments and strategic partnerships could disrupt IonQ's business and harm its financial condition and operating results.
- The COVID-19 pandemic could negatively impact on IonQ's business, results of operations and financial condition.
- IonQ's business is exposed to risks associated with litigation, investigations and regulatory proceedings.
- IonQ's ability to use net operating loss carryforwards and other tax attributes may be limited in connection with the business combination or other ownership changes.
- Licensing of intellectual property is of critical importance to IonQ's business. For example, IonQ licenses patents (some of which are foundational patents) and other intellectual property from the University of Maryland and Duke University on an exclusive basis. If the license agreement with these universities terminates, or if any of the other agreements under which IonQ acquired or licensed, or will acquire or license, material intellectual property rights is terminated, IonQ could lose the ability to develop and operate its business.
- If IonQ is unable to obtain and maintain patent protection for its products and technology, or if the scope of the patent protection obtained is not sufficiently broad or robust, its competitors could develop and commercialize products and technology similar or identical to IonQ's, and its ability to successfully commercialize its product and technology may be adversely affected. Moreover, the secrecy of our trade secrets could be compromised, which could cause us to lose the competitive advantage resulting from these trade secrets.
- IonQ's patent applications may not result in issued patents or its patent rights may be contested, circumvented, invalidated or limited in scope, any of which could have a material adverse effect on IonQ's ability to prevent others from interfering with its commercialization of its products.
- IonQ may face patent infringement and other intellectual property claims that could be costly to defend, result in injunctions and significant damage awards or other costs (including indemnification of third parties or costly licensing arrangements (if licenses are available at all)) and limit our ability to use certain key technologies in the future or require development of non-infringing products, services, or technologies, which could result in a significant expenditure and otherwise harm our business.
- Some of our in-licensed intellectual property, including the intellectual property licensed from the University of Maryland and Duke University, has been conceived or developed through government funded research and thus may be subject to federal regulations providing for certain right for the United States government or imposing certain obligations on IonQ, such as a license to the United States government under such intellectual property, "march-in" rights, certain reporting requirements and a preference for U.S.-based companies, and compliance with such regulations may limit IonQ's exclusive rights and its ability to contract with non-U.S. manufacturers.
- Following the consummation of the business combination, the combined company will incur significant increased expenses and administrative burdens as a public company, which could negatively impact its business, financial condition and results of operations.
- Our success could be impacted by the inability of the parties to successfully or timely consummate the proposed business combination, including the risk that any required regulatory approvals are not obtained, are delayed, or are subject to unanticipated conditions that could adversely affect the combined company or the expected benefits of the proposed business combination or that the approval of the stockholders of dMY is not obtained.
- If the business combination's benefits do not meet the expectations of investors or securities analysts, the market price of dMY's securities or, following the closing, the combined entity's securities, may decline.

dMY Management Team

Harry You, Chairman

Director of Broadcom

Former President, CFO and Co-Founder of GTY (largest tech SPAC at time of IPO)

Former EVP, Office of Chairman of EMC

Former CEO of Bearing Point

Former CFO of Oracle and Accenture

Deep Transactional Experience

- ✓ Closed numerous M&A transactions, debt, equity and IPO issuances during 14 years as an investment banker and subsequently as a corporate officer and director
- ✓ Played a key role in structuring Dell's $67 billion buyout of EMC as EMC's executive vice president
- ✓ Significant shareholder value creation at EMC, Oracle, Accenture, Korn Ferry and Broadcom
- ✓ Completed scores of acquisitions and investments as a Corporate Executive

Niccolo De Masi, Chief Executive Officer

Mobile pioneer – Software & Hardware

Current Chairman of Glu Mobile

Former CEO of Glu Mobile, Monstermob and Hands-On Mobile

Former President of Essential

Former Director of Resideo and Xura

Deep Transactional Experience

- ✓ Extensive transaction experience through dozens of M&A and strategic equity raises in support of companies that he led
- ✓ Completed three turnarounds and successfully navigated three platform transitions
- ✓ Disciplined buyer
- ✓ Cross-border, public-public and public-privates
- ✓ B2B, B2B2C and B2C experience
- ✓ C-Suite or Board of five mobile companies

Transaction Overview

($ in millions, except per share data)

Sources

dMY III Shares	$ 1,275
dMY III Cash Held in Trust	300
IonQ Cash[1]	36
PIPE Investment	350
Total Sources	**$ 1,961**

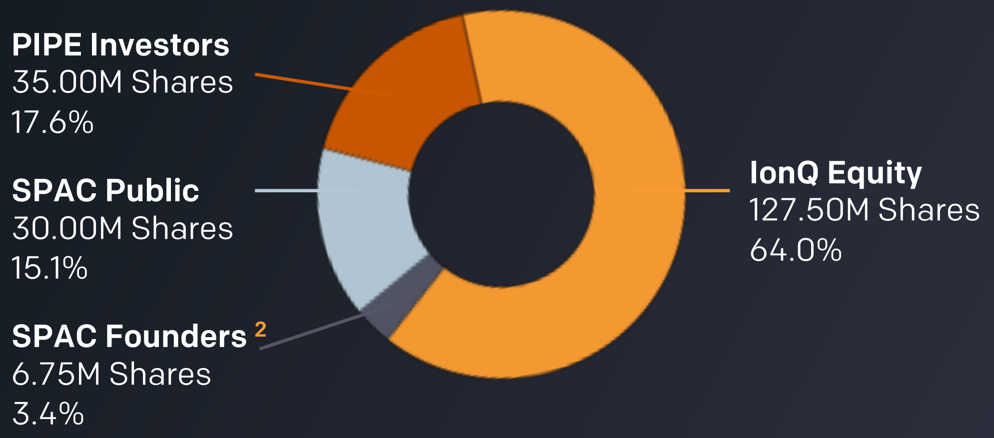
Uses

Pro Forma Cash	$ 616
Equity to IonQ Existing Investors	1,275
Transaction Expenses & Fees	70
Total Uses	**$ 1,961**

Pro Forma Valuation

Share Price	$ 10.00
Pro Forma Shares Outstanding	199
Equity Value	**$ 1,993**
(+) Debt	0
(-) Pro Forma Cash	(616)
Enterprise Value	**$ 1,377**

Illustrative Pro Forma Ownership



1 IonQ cash and cash equivalents reflects cash balance for end of 2020

2 Assumes 6.75M founder shares at $10.00. Excludes 0.25M founder shares subject to earnout based on achievement of $12.50 price per share, 0.25M founder shares subject to earnout based on achievement of $15.00 price per share, and 0.25M founder shares subject to earnout based on achievement of $17.50 price per share any time prior to or as of the 5th anniversary of the closing of the transaction. Excludes 4M founder warrants, which have a strike price of $11.50 per share

Note Assumes no redemptions from dMY's existing public shareholders. Assumes PIPE shares are issued at a price of $10.00. Excludes the impact of dMY's warrants (public or private).

OUR MISSION

To build the world's best quantum computers to solve the world's most complex problems, transforming business, society, and the planet for the better.

The Only Public Pure-Play Quantum Opportunity

Unparalleled Technological Advantage
32,000x more powerful than competing quantum systems

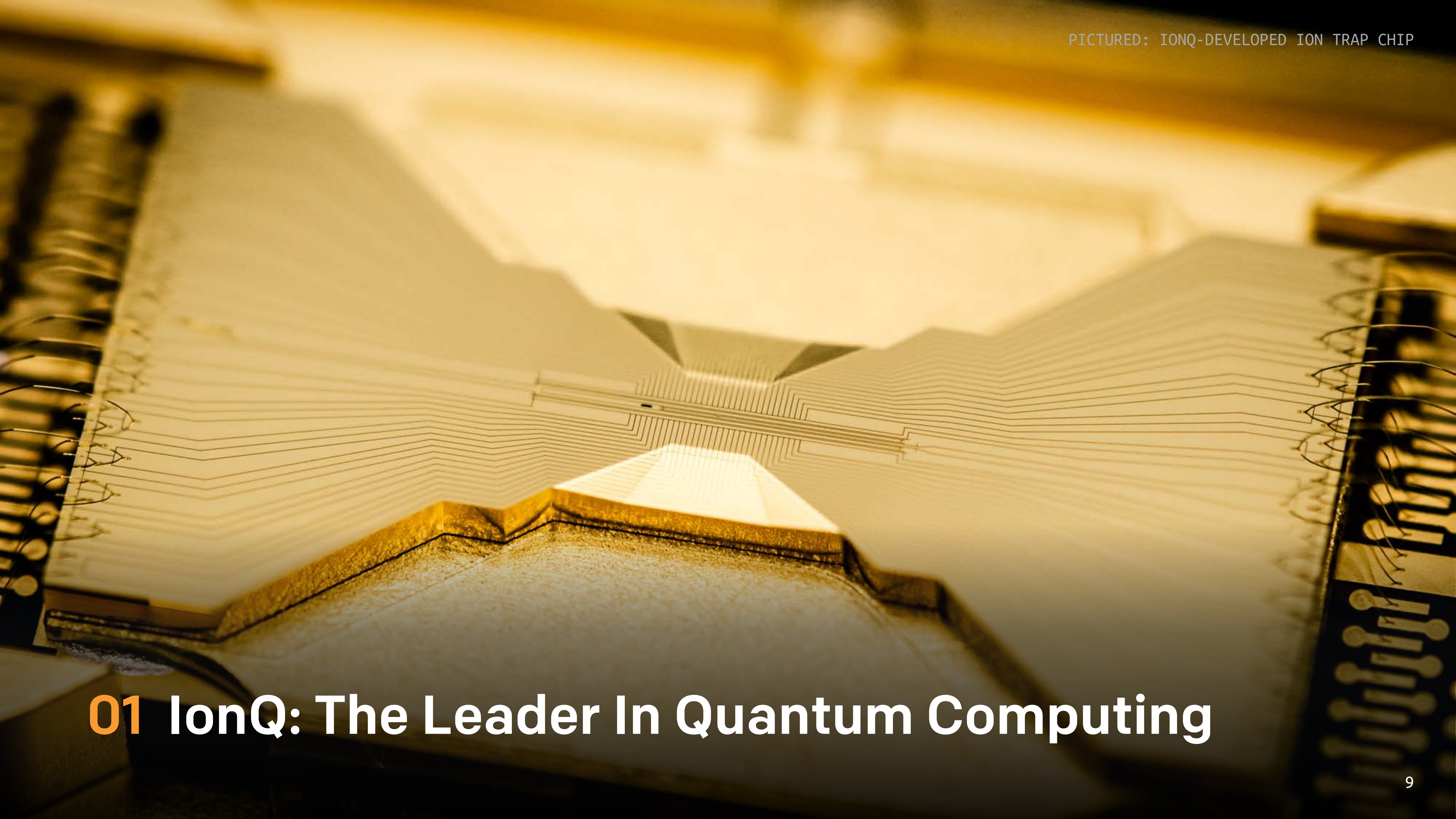
Massive Opportunity
Experts expect a TAM of approximately $65B by 2030 (CAGR of 56.0%)

World-Class Team
Led by the pioneers of quantum computing

Quantum Computation as a Service
AWS, Microsoft Azure, and IonQ Quantum Cloud

World-Class Investor Base
GV, NEA, Mubadala, AWS, Samsung, Airbus, et al.

Significant Barriers To Entry
Complex technology protected by extensive patent portfolio



PICTURED: IONQ-DEVELOPED ION TRAP CHIP

01 IonQ: The Leader In Quantum Computing

Led by Industry Pioneers

Peter Chapman
President & CEO

Career began at 16 in MIT AI Lab under Marvin Minsky

Led technology for Amazon's Prime division, 2014–2019

Innovator in financial, aviation, e-reader technology with several successful exits (Data Acquisition Systems, New Media Graphics, Boston Compliance Systems)

amazon

Jungsang Kim
Co-founder & CTO

In 2001, led a Bell Labs team to break the world record for what is still the world's largest optical switch

Over 20 years in quantum computing and related tech. Duke lab leads the world in miniaturization of quantum systems

Citations: 7136 **h-index**: 38[1]

Duke University   Bell Laboratories

Christopher Monroe
Co-founder & Chief Scientist

Demonstrated first ever quantum logic gate with Nobel laureate David Wineland at NIST in 1995

Over 25 years in quantum computing. Developed many of the fundamental techniques for trapped-ion QC

Citations: 44774 **h-index**: 83[1]

University of Maryland   NIST

David Bacon
VP, Software

Built and led the quantum software team at Google that first demonstrated quantum supremacy in 2019

Over 20 years in quantum computing, including invention of the Bacon-Shor class of error correction codes

Citations: 7601 **h-index**: 29[1]

Google

Salle Yoo
Chief Legal Officer & Corporate Secretary

Chief Legal Officer & Corporate Secretary at Uber, 2012–2017

Investor, board member and advisor to early stage companies and LP in a number of venture funds (Construct Capital, Operator Collective, and January Ventures)

Uber

Thomas Kramer
Chief Financial Officer

CFO at Opower, 2011–2016, taking company through IPO in 2014 and acquisition by Oracle in 2016

CFO and Co-Founder at Cvent, 2000–2011, taking company from zero revenue to 800 employees and market dominance

OPOWER   cvent

1 Citations and h-indices as of 20 December 2020

A 25-Year History of Innovation and Leadership

Our co-founders' academic labs have been at the forefront of quantum computing for decades

Publications
200+

Government Grants To Date[1]
$165M

Licensed Patents[1]
19

Academic Labs

UNIVERSITY OF MARYLAND

Duke UNIVERSITY

1995
Monroe and Wineland demonstrate first known quantum gate (NIST)

2000
Monroe and Wineland develop modern native ion trap gate (NIST)

2004
Kim proposes chip-based ion trap QC architecture (Bell Labs)

2005
Monroe traps ions on a monolithic chip (Michigan)

2007
Monroe demonstrates first known quantum network (UMD)

2011
Kim and Monroe invent photonically-networked modular quantum computer (Duke/UMD)

2012
Kim integrates optics with ion qubits on chip (Duke)

2013
Kim realizes >99.9% fidelity operations on stable qubits (Duke)

2016
Monroe QC bests IBM on all algorithms (UMD)

1 As of 20 December 2020; all grants and patents awarded to University of Maryland and/or Duke. Patents exclusively licensed to IonQ.

IonQ: Leading the Quantum Computing Revolution

IonQ has brought the world's best hardware to the commercial market with extreme capital efficiency

Founded
2015

Total VC Investment[1]
$84M

Patents & Applications[1]
61

Employees[1]
63

Spent To Date[1]
$49M

Hardware Generations[1,2]
6

Investors

G/ amazon NEA SAMSUNG
MUBADALA LOCKHEED MARTIN
BOSCH Hewlett Packard Enterprise AIRBUS
Cambium Capital ACME tao OSAGE UNIVERSITY PARTNERS

2015
Harry Weller (NEA) approaches Monroe & Kim; IonQ is born with $2M seed

2016
Monroe and Kim's labs at UMD and Duke surpass $100M in combined total grants to date

2017
IonQ raises $20M in Series A

2018
IonQ Systems 1 and 2 execute first algorithms: BV-10 and H_2O simulation

2019
IonQ raises ~$62M in Series B

IonQ announces partnership with Amazon and Microsoft to bring hardware to their cloud services

Microsoft amazon

2020
Monroe and team announce logical qubit with only 13 physical qubits (UMD)

IonQ announces 32 qubit quantum computer with an expected quantum volume of 4,194,304, smashing record for most powerful quantum computer

1 As of 20 December 2020
2 Five production generations and one in-development generation

World-Class Board

Peter Chapman
President & CEO, IonQ

40-year innovator with multiple fundamental technologies and successful exits to his credit

Jungsang Kim
Co-founder & CTO, IonQ

Pioneer in photonics, optics, and quantum engineering credited with a variety of novel inventions in the space

Blake Byers
General Partner, GV

Investor in emerging technology and life sciences, including 23andMe, Denali Therapeutics, and others

Ron Bernal
Venture Partner, NEA

Career technologist, early-stage investor and board member for a wide portfolio of high-technology firms

Harry You
Chairman, dMY

Experienced public company officer and board member, including Accenture, Oracle, EMC Corporation, and others

Niccolo De Masi
CEO, dMY

Seasoned public company CEO and board member, with deep expertise in transformative technologies

Craig Barratt
Independent Board Member

Career innovator; director and executive for a variety of high-impact hardware businesses

World-Class Advisors

David Wineland
University of Oregon

Physicist and Nobel laureate, pioneered many fundamental techniques used in trapped-ion quantum computing

Margaret (Peg) Williams
Former SVP R&D, Cray

Career leader in high-performance computing at IBM, Cray, and Maui High Performance Computing Center

Kenneth Brown
Duke University

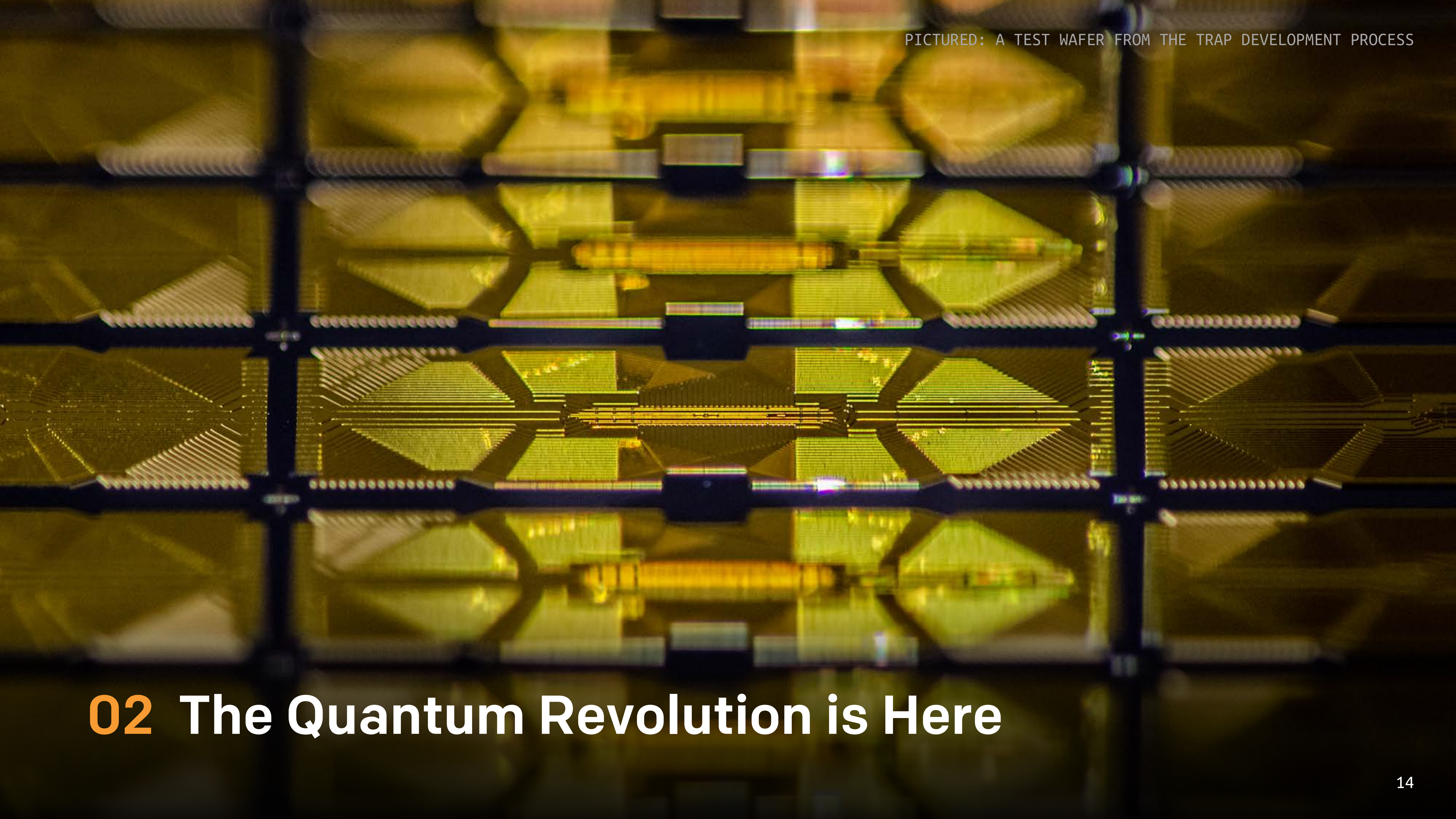
Leading quantum information theorist, first to demonstrate Bacon-Shor on trapped ion quantum hardware

Jagdeep Singh
CEO, QuantumScape

Career leader in photonics and optical networking for telecom and other applications

Umesh Vazirani
University of California, Berkeley

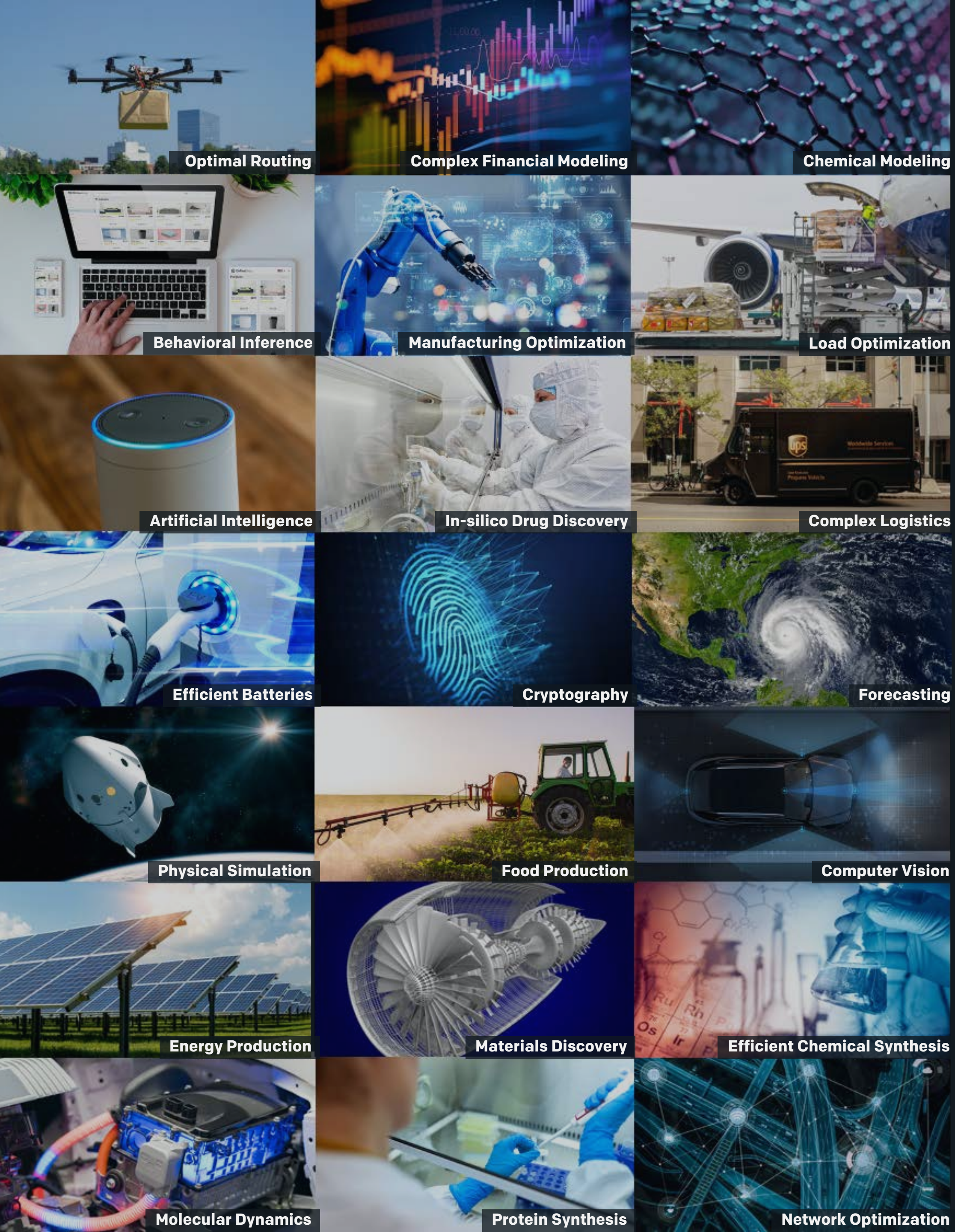
Quantum information science pioneer, inventor of several fundamental quantum algorithms


PICTURED: A TEST WAFER FROM THE TRAP DEVELOPMENT PROCESS

02 The Quantum Revolution is Here

There are important problems that classical computers may never be able to solve

Addressing many of the world's greatest problems and opportunities would require the construction of classical computers larger than the universe itself.

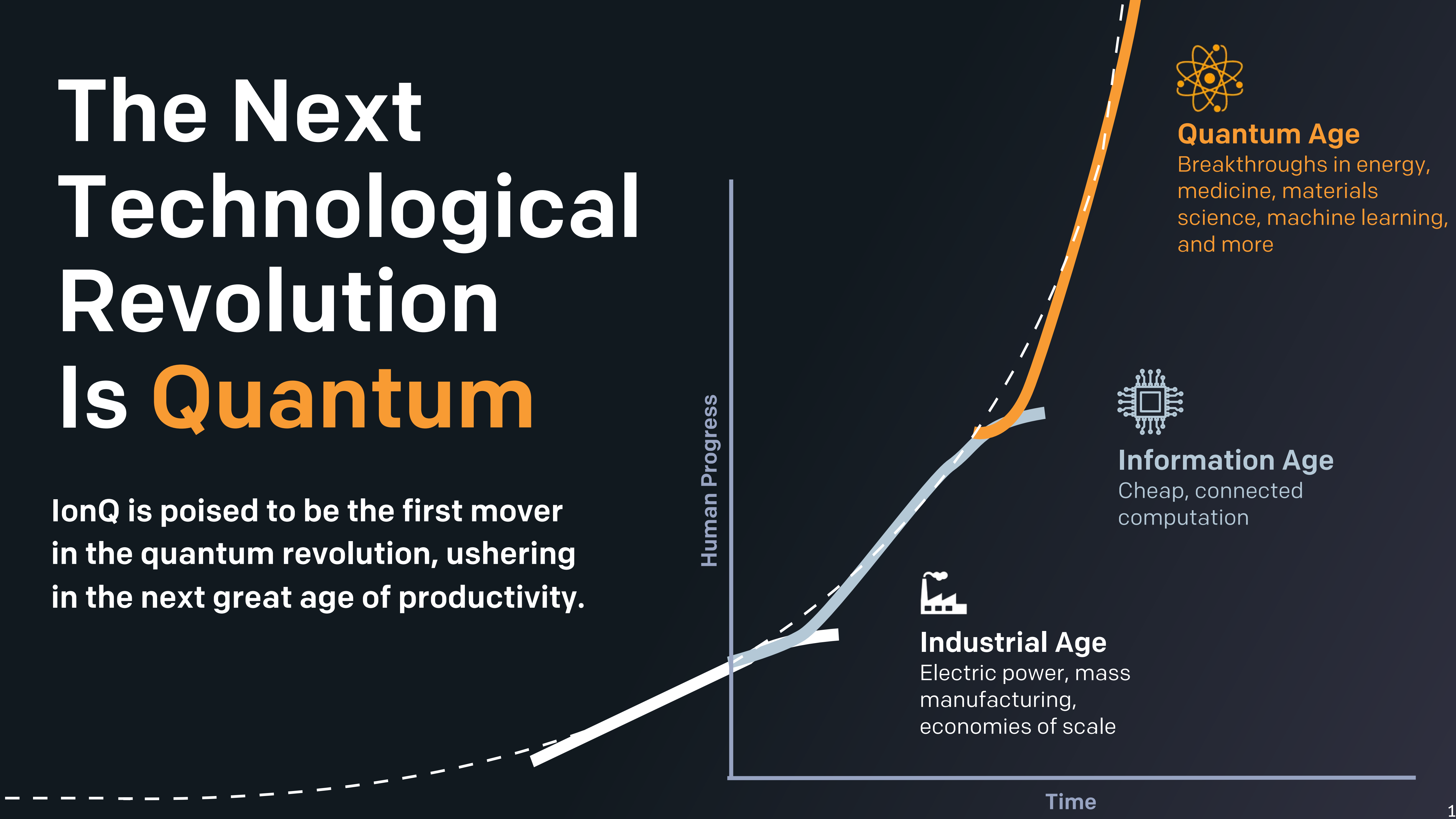


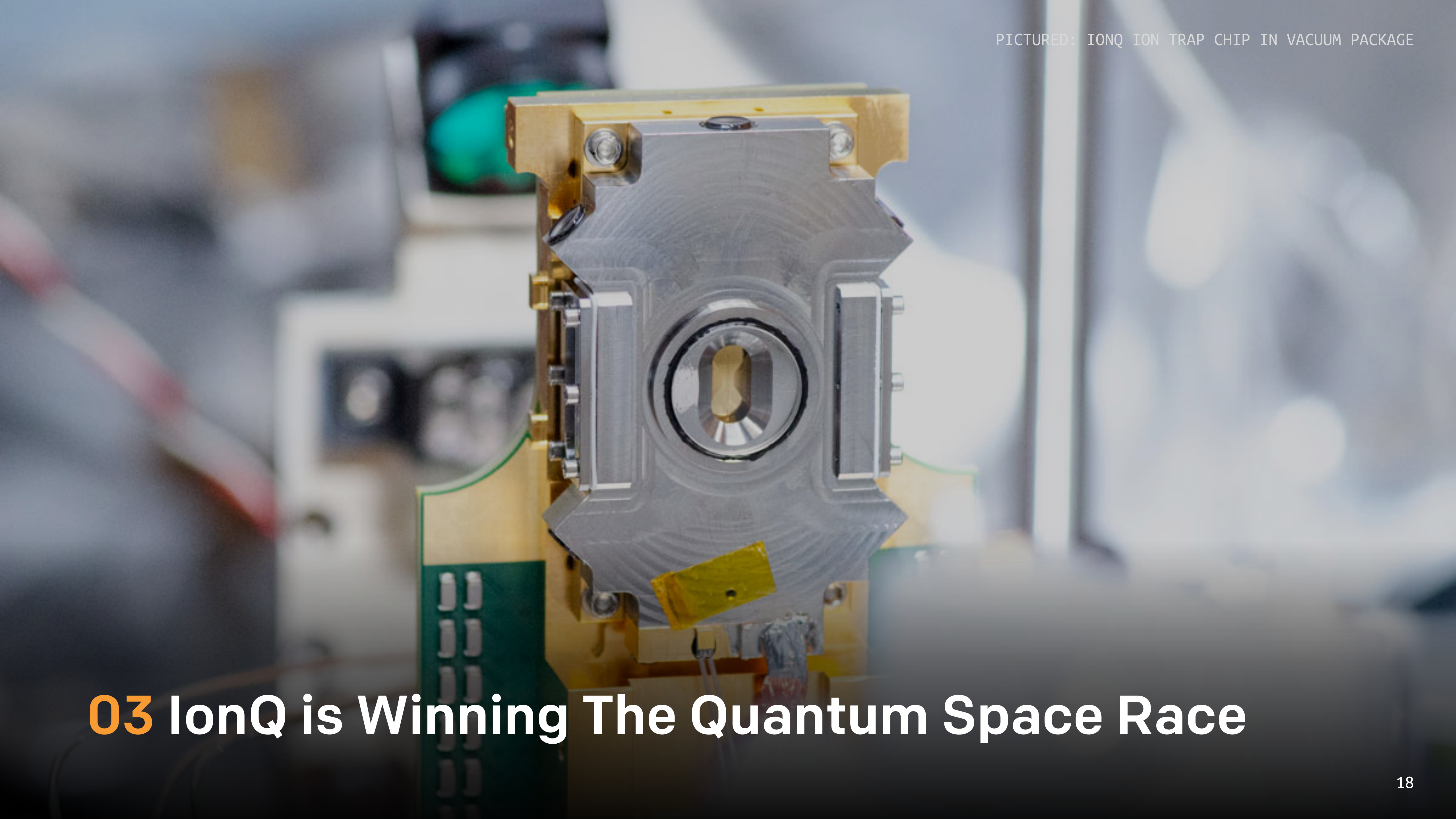
By providing solutions to these challenges, quantum computing has the potential to change the world

Computers that utilize the power of quantum mechanics could provide revolutionary breakthroughs in human health and longevity, climate change and energy production, artificial intelligence, and more.

The Next Technological Revolution Is Quantum

IonQ is poised to be the first mover in the quantum revolution, ushering in the next great age of productivity.





PICTURED: IONQ ION TRAP CHIP IN VACUUM PACKAGE

03 IonQ is Winning The Quantum Space Race

Focus on the Results, Not the Hype

Most usable qubits

Highest quantum volume by many orders of magnitude

Best error correction overhead

Systems **getting smaller** each generation

Only commercial system running at room temperature

aws Microsoft Azure

Only systems available on both AWS *and* Azure

Qiskit Cirq

Q# QDK OpenQASM

Support for **most major** quantum SDKs, and plans for more

First known simulation of water to approach chemical accuracy

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

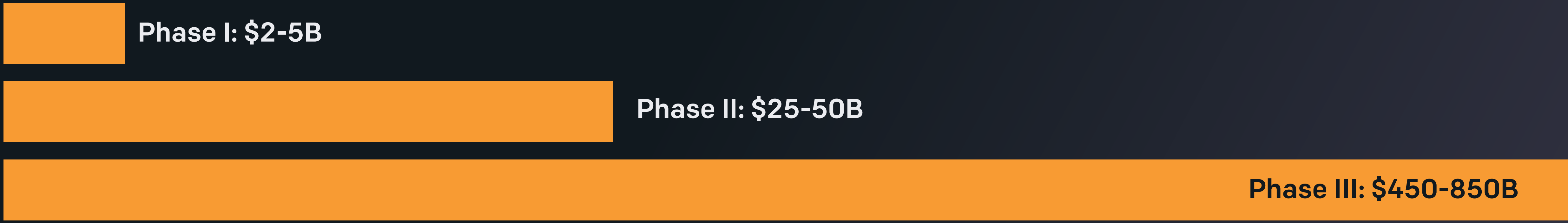
Phase III

Estimated Impact (Operating Income):

$450-850 Billion

Technical Barrier To Entry

Modular Architecture

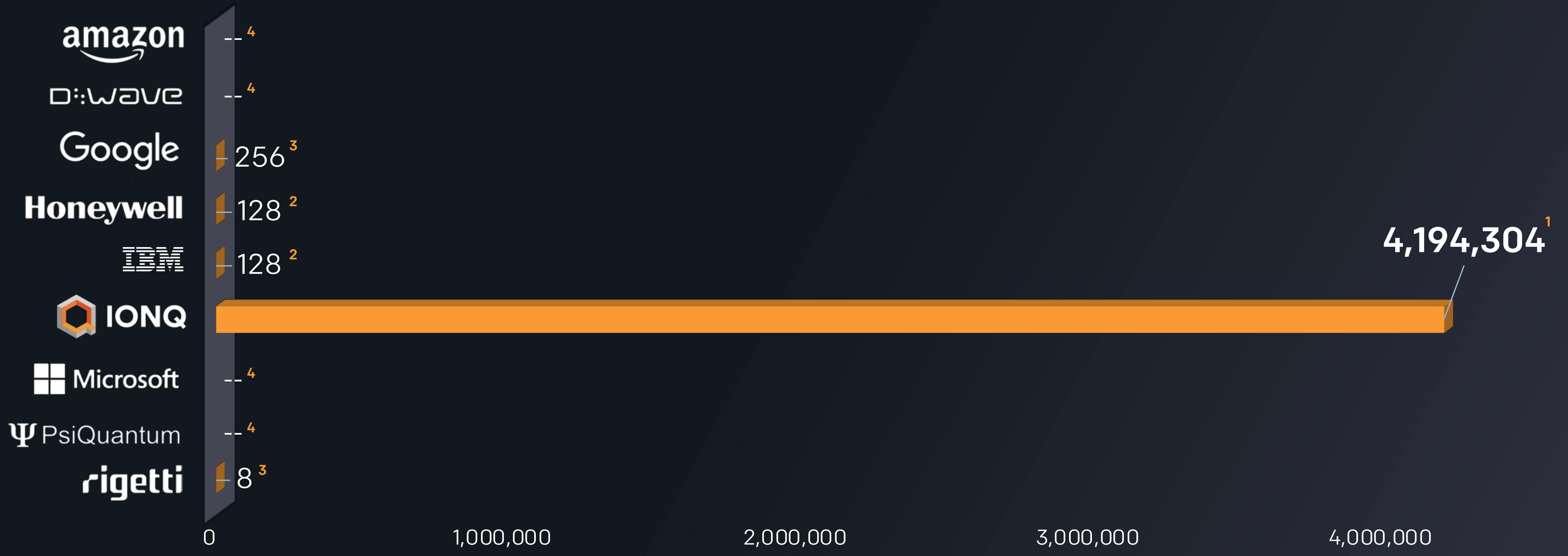


Source Where Will Quantum Computers Create Value—and When? *Boston Consulting Group* (2019)

IonQ Leads The Pack

Phase I

Potential Quantum Volume by Vendor, Q2B December 2020



1 Estimated quantum volume of IonQ's 5th generation system — assumes 32 qubits with 99.9% fidelity two-qubit gates based on internal preliminary results

2 Publicly announced quantum volume based on experimental results: Honeywell announcement, IBM announcement

3 Estimation based on published qubit counts and fidelity

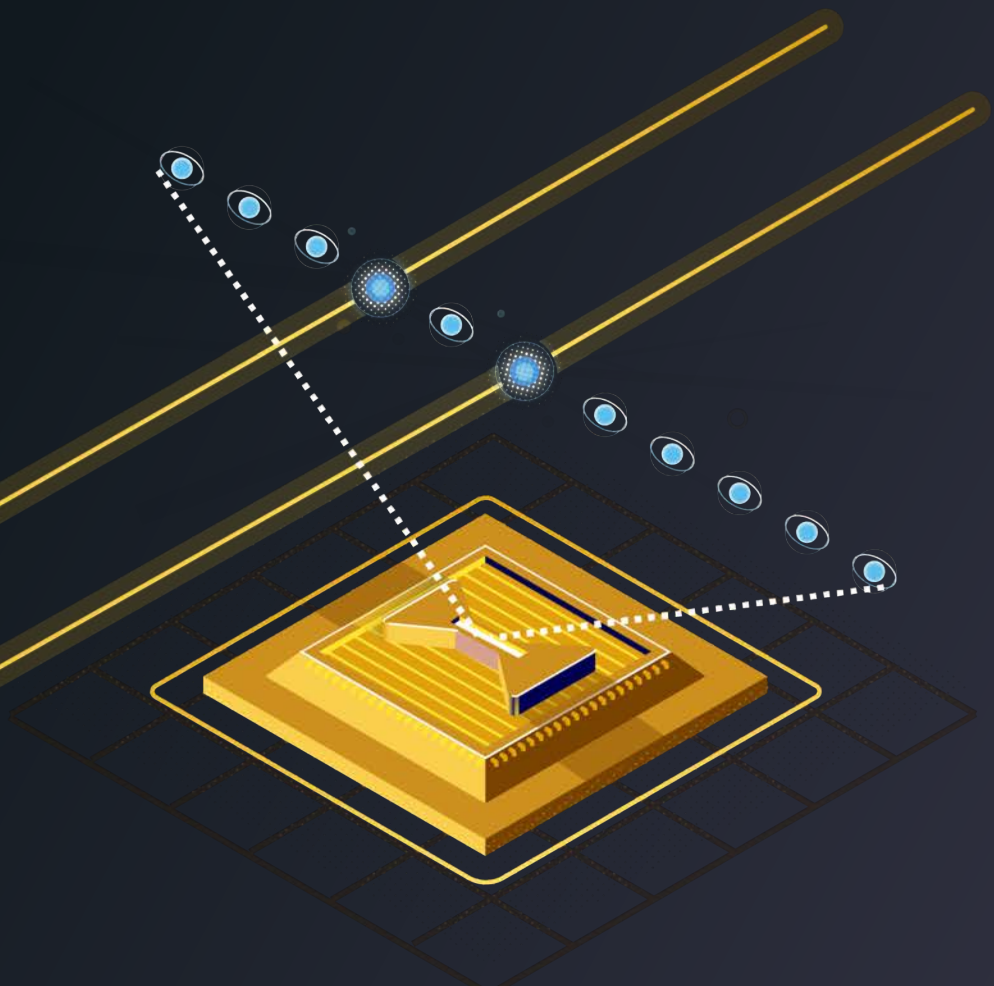
4 Not possible to calculate — either not a universal gate set quantum computer (D-Wave), years from first working prototype, or unproven hardware approach

Note Table reflects different inputs and sources and thus company data is not comparable with other vendors

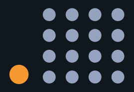
Empowered by Unique Technological Advantages

Individual **atomic ion qubits** in an ion trap are superior to competing qubit platforms, **creating the ability for IonQ to move farther, faster than the competition**.

- **Identical** and **naturally quantum**
- **Perfectly isolated** from environmental influences
- Capable of running at **room temperature**
- **Reconfigurable** and **highly-connected**
- **Unparalleled** inherent performance
- **Longest** qubit lifetime



IonQ Leads in Error Correction Overhead



16:1 [1]

IONQ

1000:1 – 1,000,000:1 [2]

Other Approaches

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.

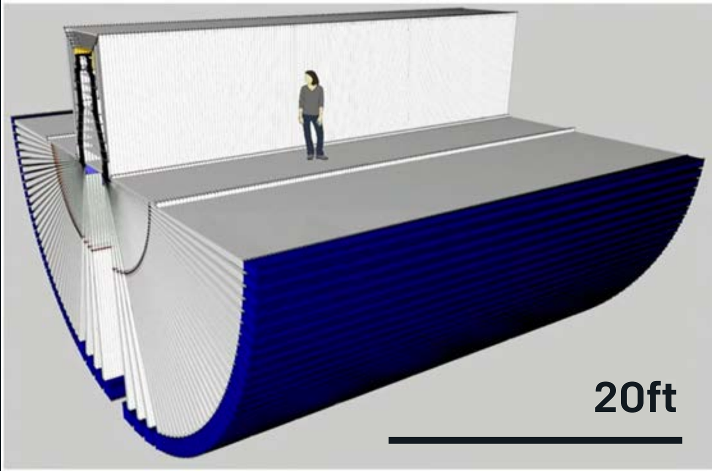
IonQ's Leading Modular Architecture

Each Generation of IonQ Hardware is Getting Smaller & Cheaper to Build

IBM

An IBM engineer working on the custom-built dilution refrigerator casing for a single QPU

Google



Google rendering of a planned million-physical-qubit system

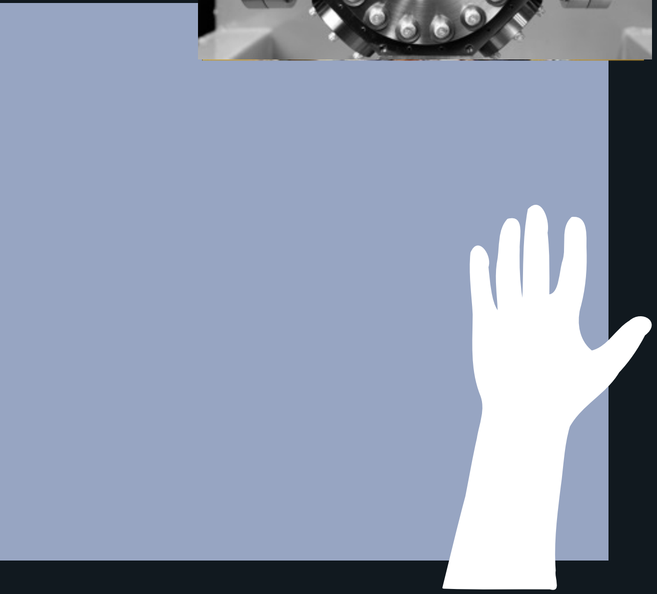
IONQ

IonQ ion trap and vacuum chamber in a single, minuscule package [1]

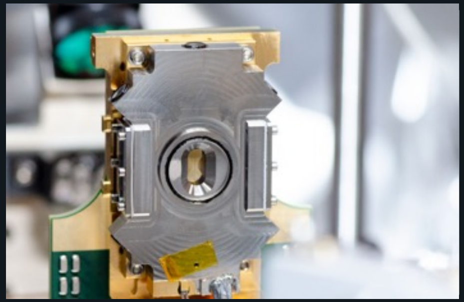
1 The package pictured is a prototype developed at IonQ founder Jungsang Kim's Duke University lab.

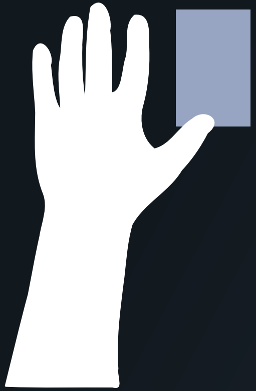
Smaller Every Generation: Quantum Core

2016
Chamber



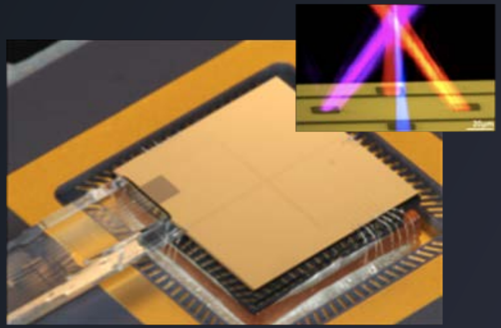
2020
Package





2021
Mini Package [1]

2023
Chip [2]

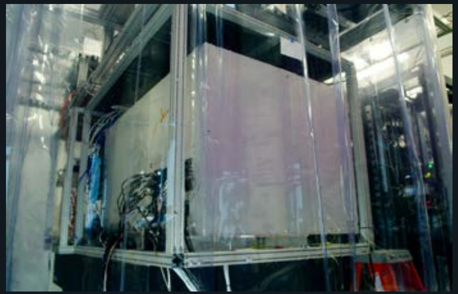


1 The package pictured is a prototype developed at IonQ founder Jungsang Kim's Duke University lab.
2 This chip and image is a project of MIT Lincoln Labs, not IonQ. Used for illustrative purposes only.

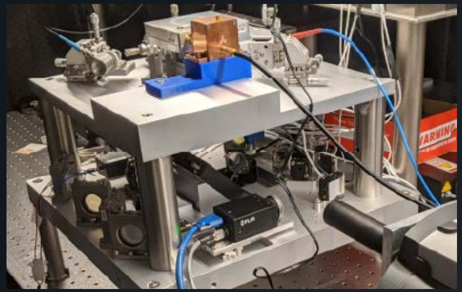
Smaller Every Generation: Complete System

2016
Lab Scale [1]

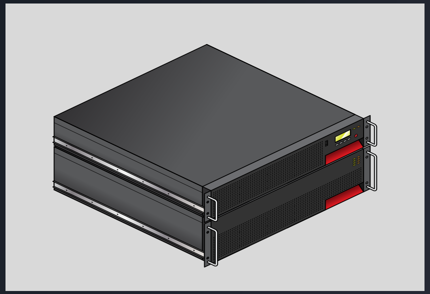
2020
Tabletop



2021
Benchtop [2]

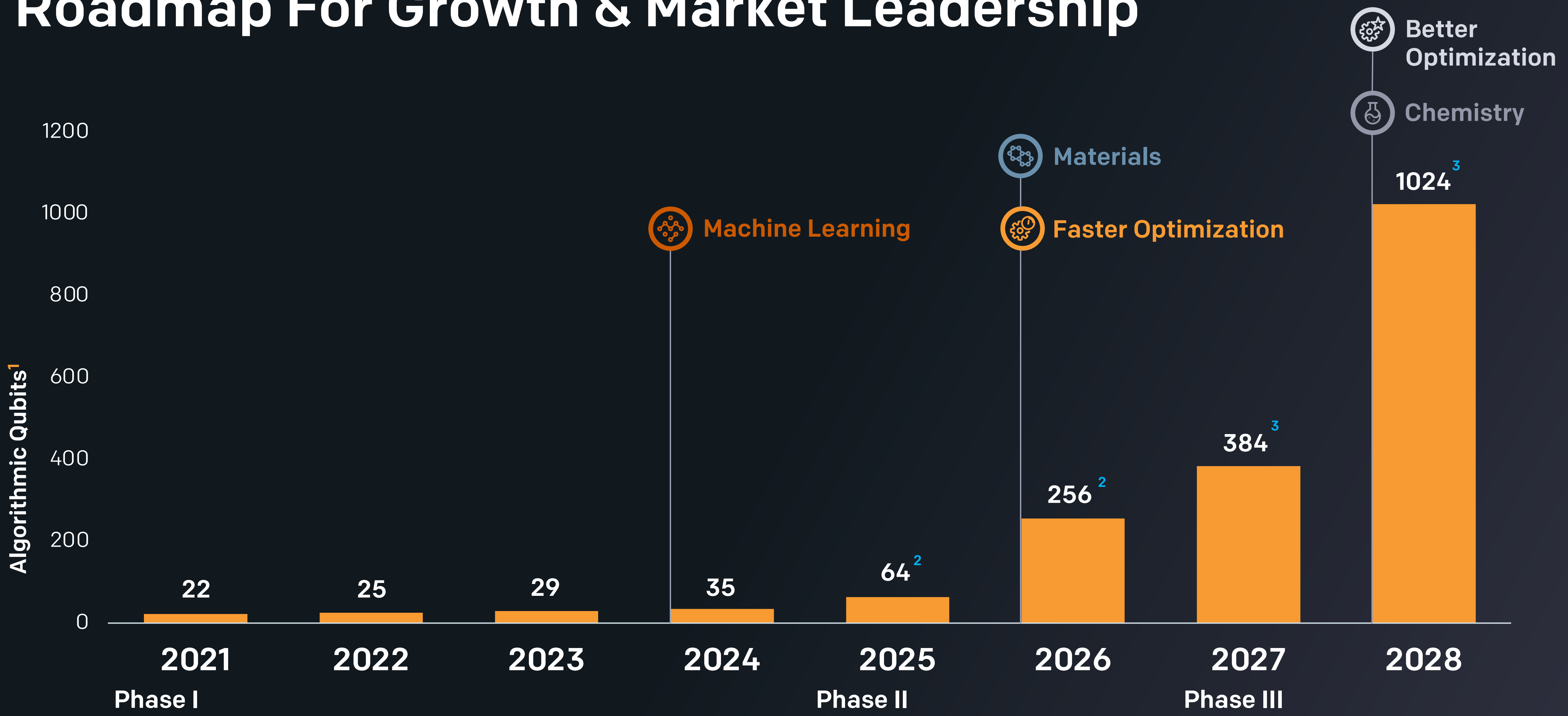


2023
Rackmount [3]



1 The system pictured is an early trapped ion system from IonQ founder Chris Monroe's UMD lab.
2 The system pictured is a prototype developed at IonQ founder Jungsang Kim's Duke University lab.
3 Illustrative rendering of a potential form-factor for rackmount QPU. Not a designed system.

Roadmap For Growth & Market Leadership



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

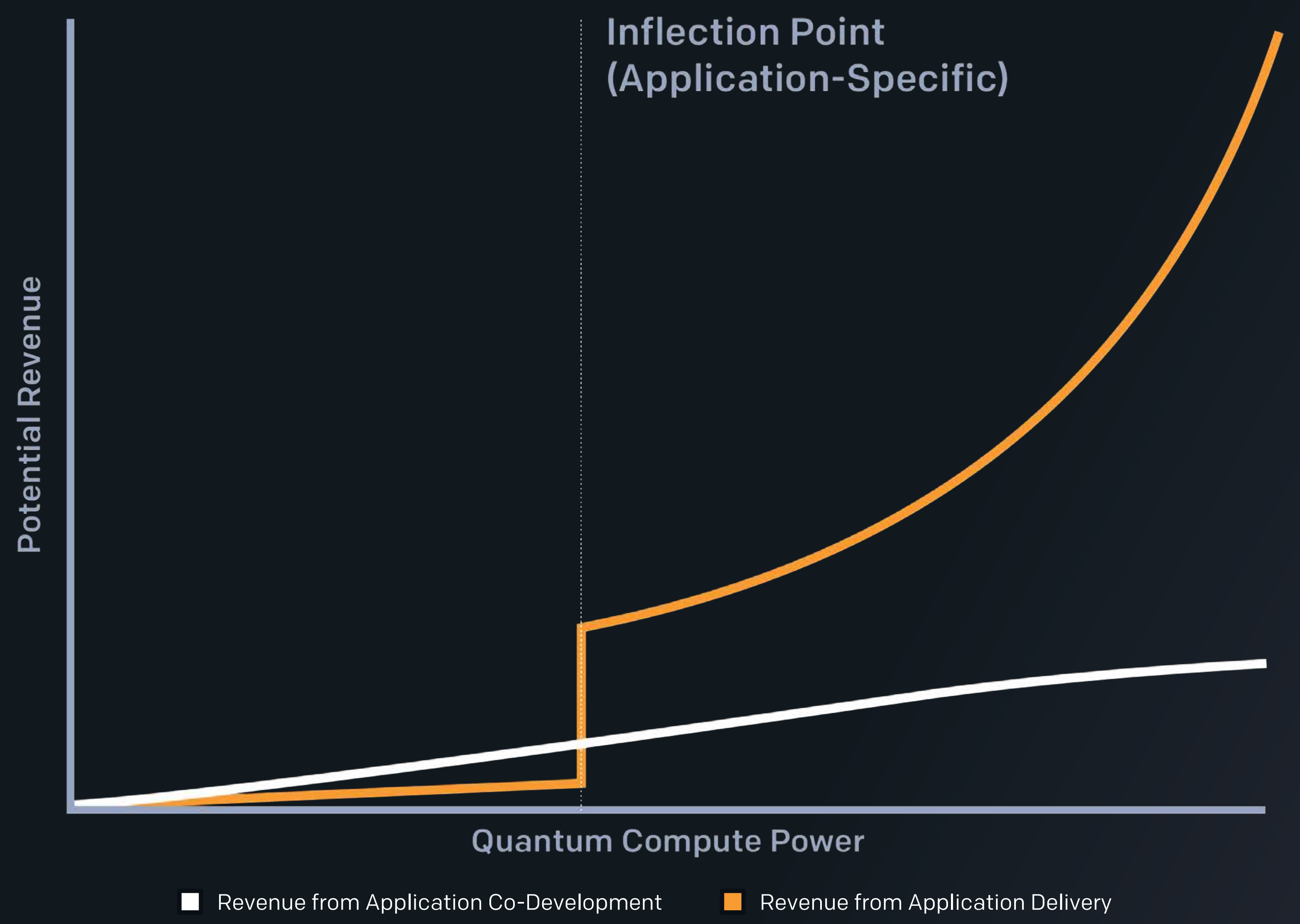
2 Employs 16:1 error-correction encoding

3 Employs 32:1 error-correction encoding

PICTURED: IONQ ION TRAP CHIP MOUNTED IN SUPPORT HARDWARE

04 IonQ Is Poised To Win The Quantum Market

Business Model Aligned to Rapid Quantum Market Growth



Application
Full-scale quantum solutions based on the latest IonQ hardware, accelerating customers into the Quantum Age. Delivered via direct partnerships, value-add resellers, and the world's largest cloud providers.

Microsoft amazon

Development
Side-by-side development of quantum solutions alongside customers, preparing them to succeed as compute capacity scales.

Quantum Machine Learning

Problem

Machine learning powers much of modern technology, but further improvement requires prohibitively expensive classical computation. As an example, Google and DeepMind have used ML techniques to achieve a 40% reduction in energy used for cooling Google's datacenters.[1]

Solution

A quantum computer can map classical data onto complex quantum states, revealing otherwise-hidden correlations in the data, and adding new quantum-trained models to the existing portfolio could improve overall predictive performance. Even when ML-optimized, Google's datacenters consume $500 million per year in energy, giving even modest increases in efficiency the potential for large impact.

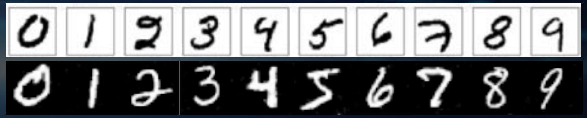
Physical Qubits
40

Year Enabled
2023

IonQ Projects

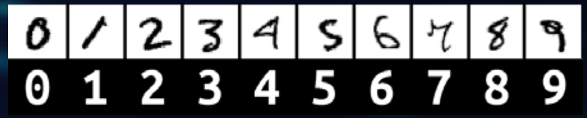
ZAPATA

Generative learning on handwritten digits outperforms comparable classical models[2]



QCWARE

Classification on handwritten digits matches comparable classical models [3]



1 DeepMind AI Reduces Google Data Centre Cooling Bill by 40%, DeepMind Blog (2016)
2 Generation of High-Resolution Handwritten Digits with an Ion-Trap Quantum Computer, arXiv:2012.03924 (2020)
3 Nearest Centroid Classification on a Trapped Ion Quantum Computer, arXiv:2012.04145 (2020)

Finance: Faster Optimal Arbitrage

Problem

Markets are never perfectly efficient, giving arbitrageurs a wealth of opportunities to capitalize on pricing discrepancies if they can identify them before the competition. Improving speed to solution has a direct impact on profit.

Solution

Quantitative hedge funds alone represent a $1 trillion+ industry;[1] even modest speed advantages will let customers win more in the market and may even expose additional currently-unexploitable arbitrage opportunities. The quantum approximate optimization algorithm (QAOA) can provide a wall clock speed advantage over the best classical algorithm for the same problems.

Algorithmic Qubits

256

Year Enabled

2026

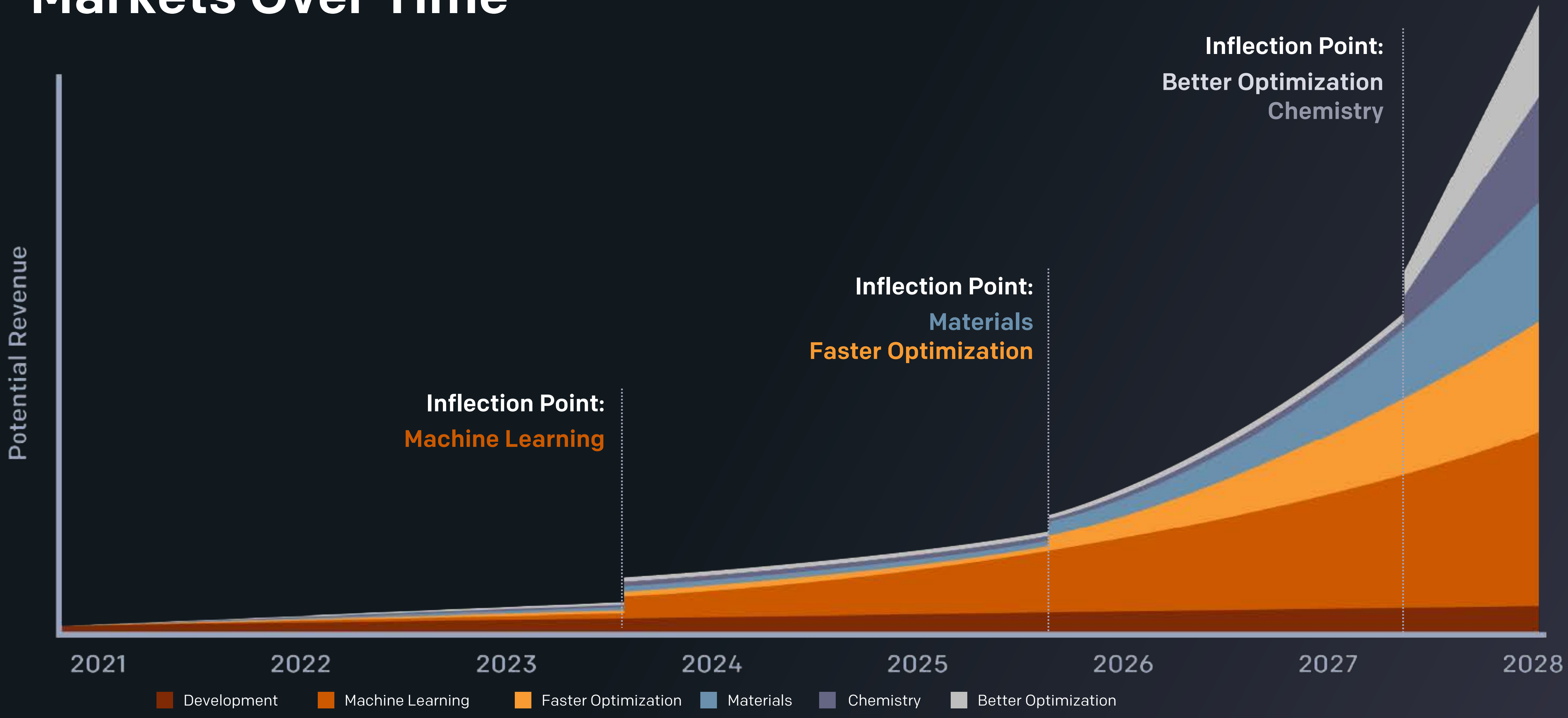
IonQ Projects

Leading Global Bank

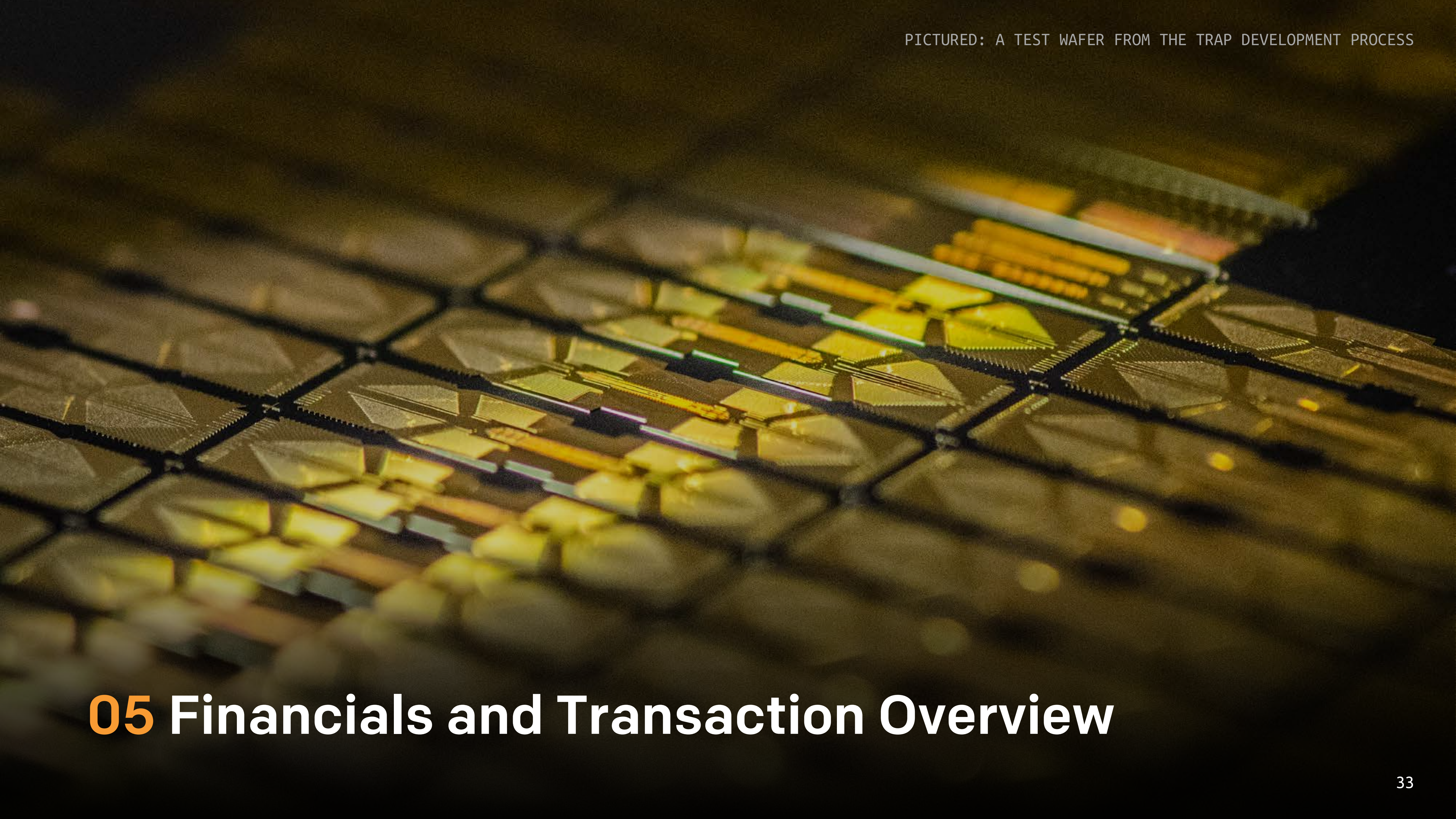
Multiple initiatives related to fraud detection, portfolio optimization for capital requirement and risk mitigation

1 Quant hedge funds set to surpass $1tn management mark, Financial Times (2018)

Technical Progress Unlocks Quantum Commercial Markets Over Time



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.

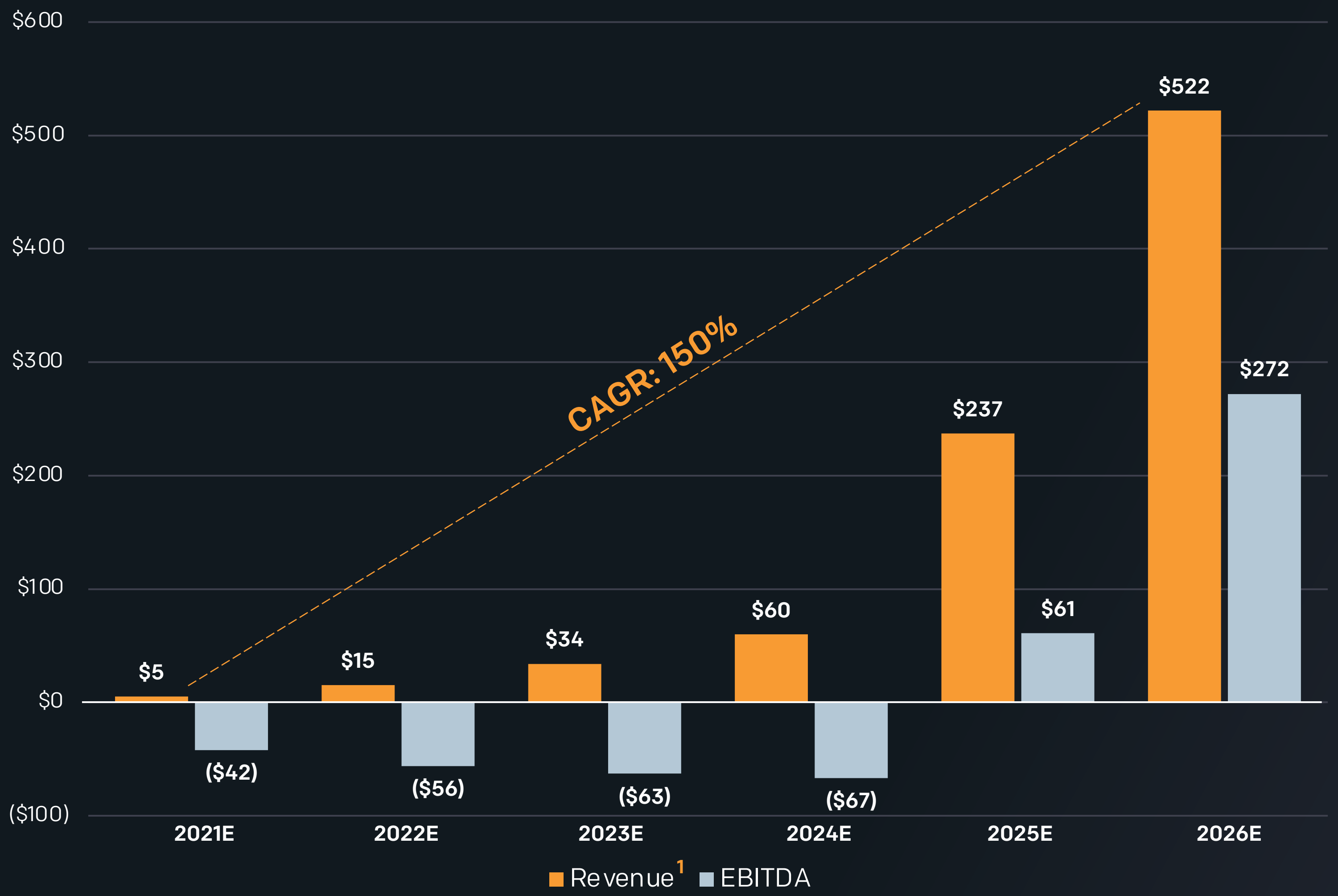


PICTURED: A TEST WAFER FROM THE TRAP DEVELOPMENT PROCESS

05 Financials and Transaction Overview

Poised For Rapid Growth Over The Next Decade

Summary Forecasted Financial Data ($M)



1 Revenue channels still being defined; exact nature and accounting recognition of IonQ revenue to be determined. Revenue may include prepayments, bookings, and recognized contracts.

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.

Key Growth Drivers & Commentary

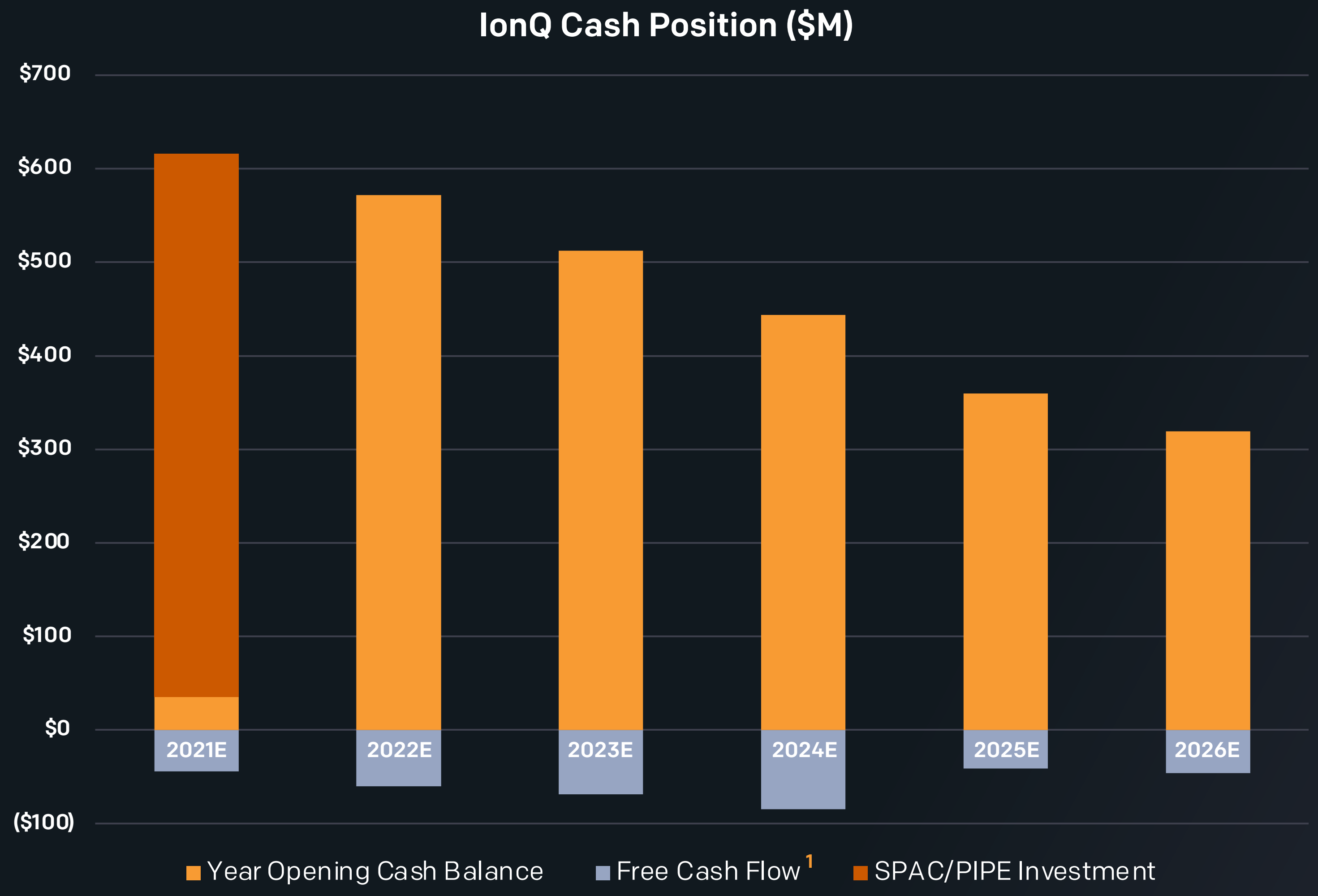
Revenue projection includes algorithm co-development (professional services, compute) and full-scale applications.

Once sufficient computational power is reached for each market, IonQ unlocks substantial application potential, increasing potential demand.

Expenses—consisting mainly of system builds, R&D projects, and headcount—are offset by compounding revenue potential.

As the market leader with the world's best quantum computers, IonQ expects to rapidly grow top-line, even while offering customers exponentially cheaper compute pricing.

IonQ Can Scale Quantum Compute With Controlled CapEx



Cash Balance

SPAC and PIPE are expected to fund IonQ to cashflow breakeven in 2027. IonQ may opportunistically consider debt facilities to fund additional system builds if market demand outpaces expectations.

Free Cash Flow

Operating Cash Flow scales as IonQ fulfills market demand with increasingly powerful quantum systems. IonQ expects to grow system count while maintaining a steady cash balance by exploiting manufacturing economies of scale.

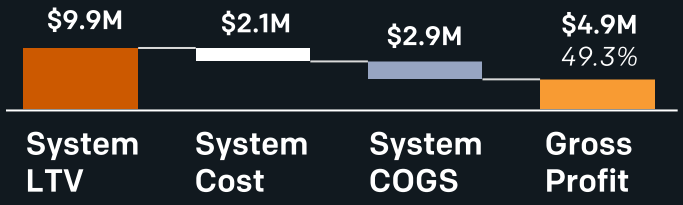
1 Free Cash Flow is defined as the sum of net operating income and capital expenditures related to system builds.

Note $36M approximate existing cash balance as of 1/1/2021, with an additional $580M invested ($300M from SPAC, $350M from PIPE, net $70M expected transaction fees) in 2021

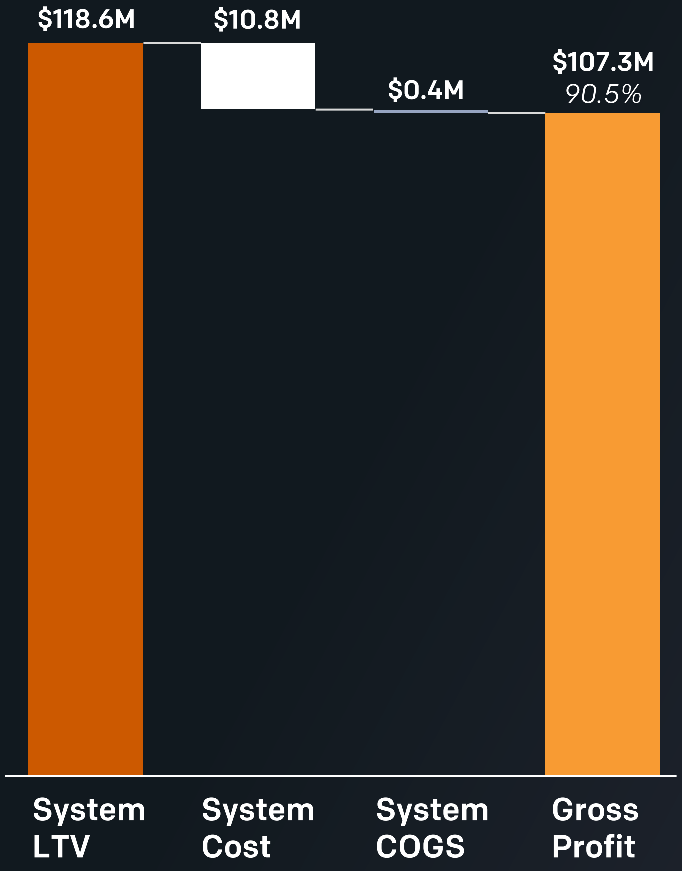
Note Prepared on the basis of certain technical, market, competitive and other assumptions to be subsequently described in further detail, and which may not be satisfied. As a result, these projections are subject to a high degree of uncertainty and may not be achieved within the time-frames described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

Attractive and Increasing System Unit Economics

System Lifetime Value 2021



System Lifetime Value 2026



Additional Commentary

Exponential increases in algorithmic qubit count drive system lifetime value, all while offering lower computer prices.

Utilization and uptime are also expected to improve as technology matures.

Overall, IonQ's cost per system increases over time, but cost-per-qubit and system COGS drop with economies of scale.

Note **System Lifetime Value** is defined as the system's algorithmic qubit count multiplied by expected per-algorithmic-qubit-hour pricing during system prime usage years. **System Cost** includes capitalized labor and materials for building the system. **System COGS** includes operations and maintenance, customer support, professional services, and other COGS attributable to an individual system.

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.

Upon closing of the transaction, IonQ will trade on the NYSE under the symbol IONQ as the first public pure-play quantum computing hardware and software company.

We believe IonQ could grow at a pace similar to previous foundational computing companies.

Join us in creating the future.

Leading Investors

GV, Amazon, NEA, Samsung, Mubadala, Lockheed Martin, Bosch, Hewlett Packard Enterprise, Airbus, Cambium Capital, ACME, tao, OUP Osage University Partners

Leading Cloud Partners

aws, Microsoft Azure

Fully Capitalized Balance Sheet

SPAC/PIPE will enable IonQ to expand its lead, consolidate the quantum market, and attract top talent as the central company in a growing industry

IONQ

PICTURED: IONQ-DEVELOPED ION TRAP CHIP

Appendix

Summary Forecasted Financial Data

$M	2021E	2022E	2023E	2024E	2025E	2026E
Systems Online (Year End) [1]	**1**	**1**	**2**	**7**	**17**	**33**
Revenue [2]	**5**	**15**	**34**	**60**	**237**	**522**
% Growth		*193%*	*118%*	*78%*	*288%*	*120%*
(-) Costs of Goods Sold [3]	(2)	(5)	(6)	(9)	(27)	(75)
Gross Profit	2	10	27	51	210	447
Gross Margin %	*47%*	*67%*	*80%*	*85%*	*88%*	*85%*
(-) Operating Expenses	(45)	(69)	(94)	(123)	(167)	(234)
Depreciation [3,4]	1	2	2	4	18	60
EBITDA	(42)	(56)	(63)	(67)	61	272
(-) ITDA	(1)	(2)	(2)	(4)	(35)	(128)
Net Income	**(43)**	**(58)**	**(66)**	**(71)**	**26**	**144**
Net Income	(43)	(58)	(66)	(71)	26	144
Depreciation	1	2	2	4	18	60
(-) Capital Expenses	(1)	(3)	(4)	(16)	(85)	(250)
Free Cash Flow	**(43)**	**(59)**	**(68)**	**(84)**	**(40)**	**(45)**

1 Systems online subject to change based on IonQ manufacturing timeframes. Figures shown reflect expected systems online at year end, but are not necessarily representative of total number of systems online during the year.

2 Revenue channels still being defined; exact nature and accounting recognition of IonQ revenue to be determined. Revenue may include prepayments, bookings, and recognized contracts.

3 Costs of Goods Sold includes depreciation for commercial systems. Depreciation is added back in to calculate EBITDA.

4 Depreciation is assumed for commercial systems over their prime usage years. Systems may retain commercial value for IonQ after prime usage years.

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.

Selected Financial Data

$ in thousands, except per share data

Statements of Operations Data

Year Ended December 31,		2020		2019
Revenue	$	-	$	200
Operating costs and expenses [1]	$	15,733	$	9,455
Operating loss	$	(15,733)	$	(9,255)
Net loss	$	(15,424)	$	(8,926)
Weighted average common stock outstanding				
Basic and diluted		5,496		3,984
Net loss per share				
Basic and diluted	$	(2.81)	$	(2.24)

Balance Sheet Data

December 31,		2020		2019
Cash and cash equivalents	$	36,120	$	59,527
Working capital [2]	$	36,698	$	59,608
Property and equipment, net	$	11,988	$	3,011
Total assets	$	60,478	$	65,345
Unearned revenue	$	1,358	$	-
Total liabilities [3]	$	6,775	$	1,359
Convertible redeemable preferred stock and warrants	$	85,469	$	84,903
Total stockholders' deficit	$	(31,766)	$	(20,917)

Note This selected financial data has been prepared by management and is derived from the Company's unaudited financial statements, which have been prepared in accordance with U.S. GAAP. The unaudited data may not reflect all adjustments that may result from an audit performed in accordance with PCAOB standards.

1 Includes stock-based compensation expense of $1.2 million and $0.9 million for the years ended December 31, 2020 and 2019, respectively.

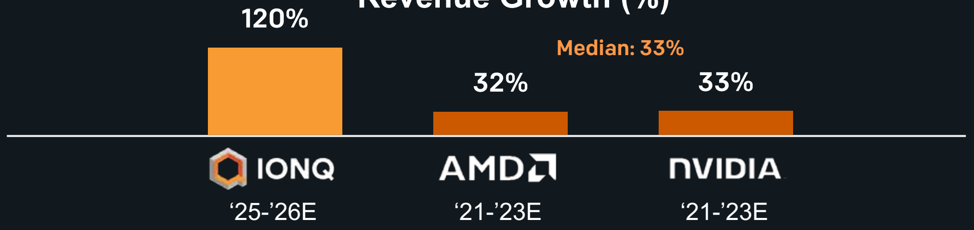
2 Working capital is defined as current assets less current liabilities.

3 The Company has no accruals for loss contingencies pursuant to ASC 450, *Contingencies*.

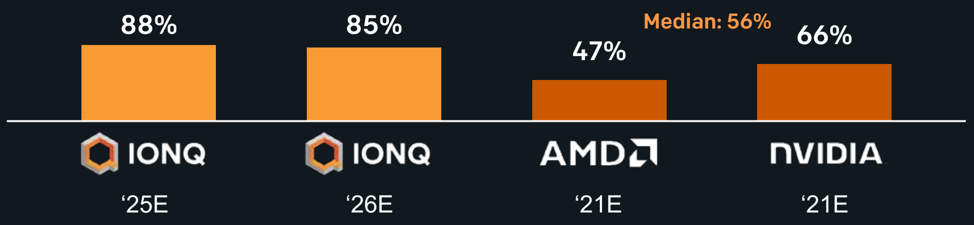
Operational and Valuation Benchmarking

Operational

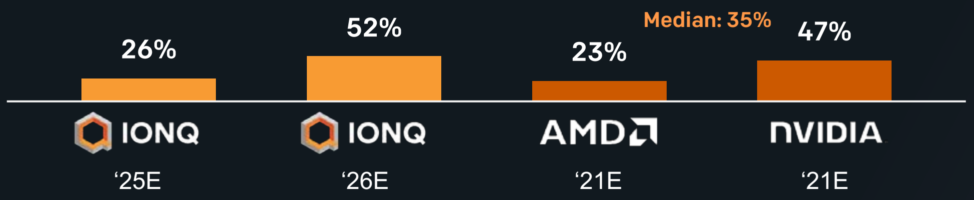
Revenue Growth (%)



Gross Margin (%)



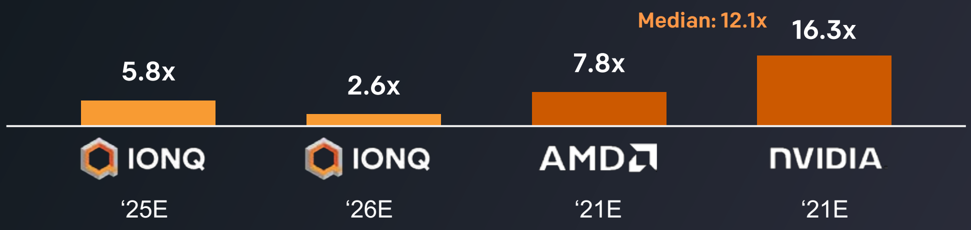
EBITDA Margin (%)



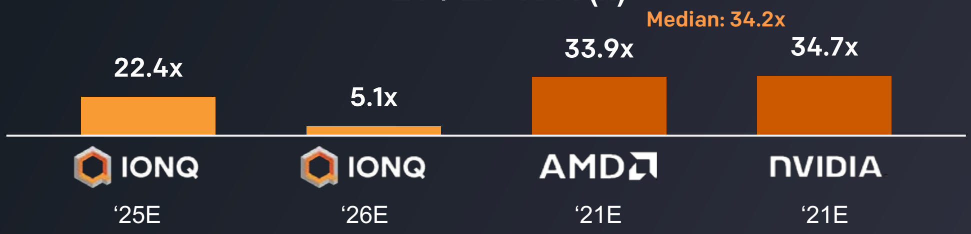
Valuation

Enterprise Value ($billion)

EV / Revenue (x)



EV / EBITDA (x)



Source IonQ Management Projections, IBES, Company Filings, Bloomberg, Thomson Reuters, Market Data as of 03-Mar-2021

Note AMD and NVIDIA not pro-forma for Xilinx and Arm transactions respectively.

IonQ Has Significant Upside Potential

($ in billions)

Summary of Approach

Applies a range of 10.0x – 15.0x EV / Revenue multiple to IonQ's 2026E revenue to arrive at an Implied Future Enterprise Value range.

Future Enterprise Value range is discounted 5 years at a 20% discount rate to arrive at an Implied Discounted Enterprise Value range.

2026E projected financials-based valuation is the appropriate approach given the expected roadmap for revenue growth and inflection point in Quantum Computing maturity.

Note Future enterprise value range is discounted 5 years to 31-Dec-2020.

Key Milestones to Quantum Market Leadership

COMMERCIAL MILESTONES

- Launch Customer, University, Development, and Additional Cloud Partnerships
- >$100M of Revenue
- EBITDA Positive

ILLUSTRATIVE APPLICATIONS MILESTONES [1]

- Handwriting Recognition Matches Classical
- Novel Solutions for Machine Learning, Optimization
- Early Quantum Advantage (ML, Financial Services)
- Broad Quantum Advantage

ALGORITHMIC QUBITS [2]

11 · 22 · 25 · 29 · 35 · 64 [3] · 256 [3]

PATENT APPLICATIONS (CUMULATIVE)

80 · 150 · 250

YEAR (ESTIMATED)

2020 · 2021 · 2022 · 2023 · 2024 · 2025 · 2026

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. Timelines are not indicative of exact beginning and end dates for company milestones.

1 Applications shown are illustrative of potential IonQ projects. Actual application milestones may vary.
2 Algorithmic qubit number defined as the effective number of qubits for typical algorithms, limited by the 2Q fidelity
3 Employs 16:1 error-correction encoding

Materials: Efficient Solar Conversion

Problem

Modern, commercially available solar cells convert sunlight into electricity with about 20% efficiency, with the market valued at $115 billion in 2019.[2] Improving efficiency with existing technology is prohibitively expensive.

Solution

Solar energy production is expected to increase by approximately 35% by 2027, even given 20% efficiency.[2] With approximately 90 algorithmic qubits, IonQ could model the energy transfer process used in photosynthesis, unlocking the opportunity for much more efficient solar cells that approach 100% efficiency. This step-change improvement would have dramatic impact on the market and the planet.

Algorithmic Qubits

90

Year Enabled

2026

IonQ Projects

Dow Chemical

Benchmarking of widely applicable technique for complex molecules (density matrix embedding)

1 Most Efficient Solar Panels 2020, Clean Energy Reviews (2020)

2 Solar PV Panels Market Size, Share & Trends Analysis Report [...] 2020–2027, Grandview Research (2020)

Chemistry: Materials for Better Electric Vehicles

Problem

The electric vehicle market is rapidly emerging, with a large amount of value still left to capture by companies that can effectively innovate in the space. Today, the avenues for innovation—better materials and manufacturing processes, better batteries, etc.—are computationally intensive and/or require costly and slow physical materials synthesis.

Solution

A quantum computer with approximately 256 algorithmic qubits could discover better battery materials faster by performing quantum simulations that are impossible on classical computers, improving range, safety and efficiency without costly synthesis and testing. Several automakers are actively piloting quantum computing to address this problem and more.

Algorithmic Qubits	Year Enabled
256	**2026**

IonQ Projects

Multinational Electronics Conglomerate

Engaged to research and run a variety of materials, electronics, and optimization-focused algorithms

Quantum Solutions Firm

Chemical modeling of simple hydrocarbons relevant to the oil and gas industry

Optimization: Logistics

Problem

As an illustrative example among many parcel services: a UPS driver makes an average of 135 deliveries daily.[1] The number of possible routes they could take is so large, it has 227 digits. It would take a classical computer longer than the age of the universe to calculate the truly optimal route for just one driver. UPS would like to do this for more than 66,000 routes, daily. [1]

Solution

UPS estimates that their current software, which only provides approximately optimal routes, saves the company 100 million miles each year, at a cost savings of approximately $250 million per year. [2] With 1000 algorithmic qubits, a quantum computer could find truly optimal routing, saving additional millions.

Algorithmic Qubits

1000

Year Enabled

2028

IonQ Projects

Volkswagen

Successfully ran a broadly-applicable optimization problem (Binary Paint Shop) on IonQ hardware[3]

International Telecom Firm

Projects focusing on telecommunications network and logistics optimization

1 UPS To Enhance ORION With Continuous Delivery Route Optimization, UPS Pressroom (2020)

2 ORION Backgrounder, UPS Pressroom (2020)

3 Beating classical heuristics for the binary paint shop problem with the quantum approximate optimization algorithm, arXiv:2011.03403 (2020)

Note UPS is used as an illustrative example only. IonQ is not currently engaged with UPS as a customer.

Optimization: Improved Drug Discovery

Problem

The average cost to develop a new pharmaceutical is nearly $2.2 billion. A large portion of this cost is due to the inefficiency of pre-clinical research: it takes 10,000 small molecules initially screened to yield just 10 candidates for clinical trials, and fewer than 10% of clinical trial candidates result in a new drug.[1]

Solution

Large-scale quantum computers will offer many potential improvements to this process, including more accurate computational chemistry and effect modeling. Reducing the cost of development by just 10% would translate to a customer benefit of $200 million.

Algorithmic Qubits
1000 [2]

Year Enabled
2028

1 Intelligent drug discovery, Deloitte Insights (2019)
2 Qubit requirements are compound-dependent

Quantum Computing at The Edge

Problem

As quantum computing applications mature, dedicated, on-site systems will become increasingly attractive to certain customers, including financial firms looking to minimize over-the-wire time, compute-centric businesses with high throughput needs, and increasingly-advanced defense platforms that could benefit from onboard quantum compute capability.

Solution

IonQ's increasingly miniaturized and stable quantum computers are uniquely positioned to capture this market, whether on wall street, in a datacenter, or onboard the next generation of US military assets.

IonQ expects to deliver its first edge-deployed quantum computer within the next 18 months.

Estimated Need (in units)

5,000–25,000

IonQ Projects

Aerospace & Defense Firm

Agreement to put a future-generation system in an aircraft