IONQ

Annual Report 2024

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K

(Mark One)

☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended December 31, 2024

OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934 FOR THE TRANSITION PERIOD FROM TO**

Commission File Number 001-39694

IONQ, INC.

(Exact name of Registrant as specified in its charter)

Delaware	**85-2992192**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**
4505 Campus Drive College Park, MD	**20740**
(Address of principal executive offices)	**(Zip Code)**

Registrant's telephone number, including area code: (301) 298-7997

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, $0.0001 par value per share	**IONQ**	**New York Stock Exchange**
Warrants, each exercisable for one share of common stock for $11.50 per share	**IONQ WS**	**New York Stock Exchange**

Securities registered pursuant to Section 12(g) of the Act: None

Indicate by check mark if the Registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☒ No ☐

Indicate by check mark if the Registrant is not required to file reports pursuant to Section 13 or 15(d) of the Act. Yes ☐ No ☒

Indicate by check mark whether the Registrant: (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the Registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark whether the Registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T(§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the Registrant was required to submit such files). Yes ☒ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	☒	Accelerated filer	☐
Non-accelerated filer	☐	Smaller reporting company	☐
Emerging growth company	☐		

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☒

If securities are registered pursuant to Section 12(b) of the Act, indicate by check mark whether the financial statements of the registrant included in the filing reflect the correction of an error to previously issued financial statements. ☐

Indicate by check mark whether any of those error corrections are restatements that required a recovery analysis of incentive-based compensation received by any of the registrant's executive officers during the relevant recovery period pursuant to § 240.10D-1(b). ☐

Indicate by check mark whether the Registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No ☒

The aggregate market value of the voting and non-voting common equity held by non-affiliates of the Registrant, based on the closing price of $7.03, per share of the Registrant's common stock on the New York Stock Exchange on June 30, 2024, was $1.2 billion. This calculation excludes shares of the registrant's common stock held by current executive officers, directors and stockholders that the registrant has concluded are affiliates of the registrant. This determination of affiliate status is not a determination for other purposes.

The number of shares of registrant's common stock outstanding as of February 19, 2025 was 222,842,179.

DOCUMENTS INCORPORATED BY REFERENCE

Certain information required in Item 10 through Item 14 of Part III of this Annual Report on Form 10-K is incorporated herein by reference to the Registrant's definitive proxy statement for its 2025 Annual Meeting of Stockholders, which shall be filed with the Securities and Exchange Commission pursuant to Regulation 14A of the Securities Act of 1934, as amended.

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CERTAIN TERMS USED IN THIS REPORT

In this report, unless otherwise stated or the context otherwise indicates, the terms "IonQ, Inc.," "the Company," "we," "us," "our" and similar references refer to "IonQ" and our other registered and common law trade names, trademarks and service marks are property of IonQ, Inc. All other trademarks, trade names and service marks appearing in this annual report are the property of their respective owners. Solely for convenience, the trademarks and trade names in this report may be referred to without the ® and ™ symbols, but such references should not be construed as any indicator that their respective owners will not assert their rights thereto.

WHERE YOU CAN FIND MORE INFORMATION

Investors and others should note that we announce material financial information to our investors using our investor relations website at investors.ionq.com, press releases, filings with the U.S. Securities and Exchange Commission ("SEC") and public conference calls and webcasts. We also use IonQ's blog and the following social media channels as a means of disclosing information about the Company, our products and services, our planned financials and other announcements and attendance at upcoming investor and industry conferences, and other matters. This is in compliance with our disclosure obligations under Regulation FD:

- IonQ Company Blog (https://ionq.com/blog)
- IonQ LinkedIn Page (https://www.linkedin.com/company/ionq.co)
- IonQ X (Twitter) Account (https://x.com/ionq_inc)
- IonQ YouTube Account (https://www.youtube.com/@ionq_inc)

Information posted through these social media channels may be deemed material. Accordingly, in addition to reviewing our press releases, SEC filings, public conference calls and webcasts, investors should monitor IonQ's blog and our other social media channels. The information we post through these channels is not part of this Annual Report on Form 10-K. The channel list on how to connect with us may be updated from time to time and is available on our investor relations website.

GLOSSARY OF SELECTED TERMINOLOGY

As used in this Annual Report on Form 10-K, unless the context otherwise requires, references to the following terms have the respective meanings as defined below:

Algorithmic Qubit: A metric describing the number of "useful" qubits in a system, considering noise, connectivity limitations, and other sources of error.

Barium: A silvery rare-earth metal, atomic number 56, that can be used as a qubit for quantum computing. IonQ is exploring barium as an alternative qubit species because its slightly more complex structure offers higher fundamental gate and readout fidelities when controlled correctly, and because it primarily interacts with light in the visible spectrum, allowing additional opportunities for standard fiber optic technologies in parts of the system.

Classical Computer: A computer that stores and calculates information using classical mechanics: information is stored as a 0 or a 1, in a transistor.

Coherence Time: A measurement of the "lifetime" of a qubit, coherence time measures how long a qubit can maintain coherent phase, which allows it to successfully retain quantum information and behave in the ways necessary for it to be part of a useful computation.

Entanglement: A property of quantum mechanics where two particles, even when physically separated, behave in ways conditionally dependent on each other.

Error-Corrected Qubit: Groups of physical qubits that are logically combined using techniques called error correction encoding with the goal of having them act together as one much higher-quality qubit for computational purposes.

Fault Tolerance: A system's ability to accommodate errors in its operation without losing the information it is processing and/or storing.

Gate Fidelity/Error Rate: A measure of how much noise (or error) is introduced in each operation during a quantum algorithm.

Ion Trap: An apparatus that holds ions in place, ready for computation, in a trapped-ion quantum computer.

Measurement: The process at the end of a quantum computation where the exponentially large computational space available during computation collapses down to a binary string in order to produce readable results.

Multi-Core QPU: A single quantum processor that has multiple quantum compute zones that can compute in parallel and be entangled via moving and recombining ion chains.

Noise: For quantum computers to compute correctly, they must be isolated from the environment around them. Any interaction with the environment, or imperfection in the control systems that perform gates, introduces noise. As noise accumulates, the overall likelihood that an algorithm will produce a successful answer goes down. With too much noise, a quantum computer is no longer useful at all.

Photonic Interconnect: A connection between two qubits using photons, typically via a fiber optic cable. A photonic interconnect is used to remotely connect two qubits.

Physical Qubit: The hardware implementation of a qubit in a quantum computer.

Quantum Algorithm: A series of quantum logic gates that together solve a specific problem.

Quantum Bit (Qubit): The quantum equivalent of bits in classical computing, able to exist in a superposition of states and be entangled with other qubits.

Quantum Circuit: A collection of quantum logic gates to be run in a specific order on a given set of qubits.

Quantum Logic Gate(s): Gates used to manipulate the state of qubits, including putting them in superposition states and creating entanglement.

Quantum Networking: Interconnecting multiple quantum processing units to enable communication or computation using photonic interconnects or entanglement to facilitate the distribution of information or computation.

Quantum Processing Unit (QPU): A complete system made up of physical qubits and the apparatus for controlling them.

Superconducting Qubit: A qubit implementation that uses specialized silicon-fabricated chips at ultracold temperatures.

Synthetic (Fabricated) Qubit: A qubit that uses an engineered or "manufactured" quantum system, rather than a naturally occurring one. Examples of synthetic (fabricated) qubits include superconducting transmon qubits and semiconductor quantum dot qubits.

Trapped Ion Qubit: A qubit implementation using charged atomic particles (ions) suspended in vacuum and manipulated with lasers.

PART I

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K (this "Annual Report") contains statements that may constitute "forward-looking statements" within the meaning of Section 27A of the Securities Act of 1933, as amended (the "Securities Act") and Section 21E of the Securities Exchange Act of 1934, as amended (the "Exchange Act") that involve substantial risks and uncertainties. All statements contained in this Annual Report other than statements of historical fact, including statements regarding our future results of operations and financial position, our business strategy and plans, and our objectives for future operations, are forward-looking statements. The words "believes," "expects," "intends," "estimates," "projects," "anticipates," "will," "plan," "may," "should," "could," or similar language are intended to identify forward-looking statements. These forward-looking statements include statements concerning the following:

- our financial and business performance, including financial projections and business metrics;
- changes in our strategy, future operations, financial position, estimated revenues and losses, projected costs, prospects and plans;
- the implementation, market acceptance and success of our business model and growth strategy;
- our expectations and forecasts with respect to market opportunity and market growth;
- our ability to sell full quantum computing and networking systems to customers, either over the cloud or for local access;
- the ability of our products and services to meet customers' compliance and regulatory needs;
- our ability to attract and retain qualified employees and management;
- our ability to adapt to changes in customer preferences, perception and spending habits and develop and expand our product offerings and gain market acceptance of our products, including in new geographies;
- our ability to develop and maintain our brand and reputation;
- developments and projections relating to our competitors and industry;
- our expectations regarding our ability to obtain and maintain intellectual property protection and not infringe on the rights of others;
- the impact of global economic and political developments on our business, as well as the value of our common stock and our ability to access capital markets;
- the impact of public health crises, or geopolitical tensions, in and around Ukraine, Israel and other areas of the world, on our business and the actions we may take in response thereto;
- our future capital requirements and sources and uses of cash;
- our ability to obtain funding for our operations and future growth; and
- our business, expansion plans and opportunities.

You should not rely on forward-looking statements as predictions of future events. We have based the forward-looking statements contained in this Annual Report primarily on our current expectations and projections about future events and trends that we believe may affect our business, financial condition and operating results. The outcome of the events described in these forward-looking statements is subject to risks, uncertainties and other factors described in the section titled "Risk Factors" and elsewhere in this Annual Report. A summary of selected risks associated with our business are set forth below. Moreover, we operate in a very competitive and rapidly changing environment. New risks and uncertainties emerge from time to time, and it is not possible for us to predict all risks and uncertainties that could have an impact on the forward-looking statements contained in this Annual Report. The results, events and circumstances reflected in the forward-looking statements may not be achieved or occur, and actual results, events or circumstances could differ materially from those described in the forward-looking statements.

In addition, statements that "we believe" and similar statements reflect our beliefs and opinions on the relevant subject. These statements are based on information available to us as of the date of this Annual Report. While we believe that information provides a reasonable basis for these statements, that information may be limited or incomplete. Our statements should not be read to indicate that we have conducted an exhaustive inquiry into, or review of, all relevant information. These statements are inherently uncertain, and investors are cautioned not to unduly rely on these statements.

The forward-looking statements made in this Annual Report relate only to events as of the date on which the statements are made. We undertake no obligation to update any forward-looking statements made in this Annual Report to reflect events or circumstances after the date of this Annual Report or to reflect new information or the occurrence of unanticipated events, except as required by law. We may not actually achieve the plans, intentions or expectations disclosed in our forward-looking statements, and you should not place undue reliance on our forward-looking statements. Our forward-looking statements do not reflect the potential impact of any future acquisitions, mergers, dispositions, joint ventures or investments.

Item 1. Business.

Overview

We are developing quantum computers and networks designed to solve some of the world's most complex problems, and transform business, society and the planet for the better. We believe that our proprietary technology, our architecture, and the technology exclusively available to us through license agreements will offer us advantages both in terms of research and development, as well as the commercial value of our intended product offerings.

Today, we sell specialized quantum computing and networking hardware together with related maintenance and support. We also sell access to several quantum computers of various qubit capacities and are in the process of researching and developing technologies for quantum computers with increasing computational capabilities. We currently make access to our quantum computers available via three major cloud platforms, Amazon Web Services' ("AWS") Amazon Braket, Microsoft's Azure Quantum and Google's Cloud Marketplace, and also to select customers via our own cloud service. This cloud-based approach enables the broad availability of quantum-computing-as-a-service ("QCaaS").

We supplement our offerings with professional services focused on assisting our customers in applying quantum computing and networking to their businesses. We also expect to sell full quantum computing systems to customers, either over the cloud or for local access. We also offer quantum networking products which offer customers secure communication networks and enable networked quantum computing.

We are still in the early stages of commercial growth. Since our inception, we have incurred significant operating losses. Our ability to generate revenue sufficient to achieve profitability will depend heavily on the successful development and further commercialization of our quantum computing systems. Our net losses were $331.6 million, $157.8 million and $48.5 million, for the years ended December 31, 2024, 2023 and 2022, respectively. As of December 31, 2024, we had an accumulated deficit of $683.7 million. We expect to continue to incur significant losses for the foreseeable future as we prioritize reaching the technical milestones necessary to achieve an increasingly higher number of algorithmic qubits and higher levels of fidelity than presently exists—prerequisites for quantum computing to reach broad quantum advantage.

The Quantum Opportunity

Throughout human history, technological breakthroughs have dramatically transformed society and altered the trajectory of economic productivity. In the 19th century, it was the industrial revolution, powered by the scientific advances that brought us steam-powered machines, electricity, and advanced medicine. These technologies drastically improved human productivity and lengthened life expectancy.

In the 20th century, computing—arguably the greatest of all human inventions—leveraged human intelligence to run complex calculations, paving the way for profound advances in virtually every realm of human experience, including information processing, communication, energy, transportation, biotechnology, pharmaceuticals, agriculture and industry.

Since classical computing emerged in the mid-twentieth century, there has been exponential progress in computer design, with processing power roughly doubling every few years (Moore's law). The true economic and social impact of computing is difficult to measure because it has so thoroughly permeated every aspect of life, altering the trajectory of society.

However, as transformative as computing has been, many classes of problems strain the ability of classical computers, and some will never be solvable with classical computing. In this traditional binary approach to computing, information is stored in bits that are represented logically by either a 0 (off) or a 1 (on). Quantum computing uses information in a fundamentally different way than classical computing. Quantum computers are based on quantum bits (qubits), a fundamental unit that can exist in both states 0 and 1 simultaneously (superposition). As a result, we believe that quantum computers can address a set of problems classical computing may never solve. The types of problems that currently defeat classical computing include: the simulation of quantum systems (e.g., in materials science or pharmaceuticals); number factoring for decryption; and complex optimization problems. Many of these problems are fundamental, involving society's most pressing needs, such as how to live sustainably on our planet, how to cure diseases, and how to efficiently move people and goods. Classical computers cannot solve these problems because the calculations would take far

too long (i.e., millions to trillions of years) or because the problems involve quantum systems that are far too complex to be represented on a classical computer, even if their remarkable pace of development were to continue indefinitely. While these problems are not solvable by today's quantum computers, we believe that a quantum computer currently offers the best possibility for computational power that could be used to solve them.

The future success of quantum computing will be based on the development of a computer with a substantially higher number of qubits than our current computers. We believe that we will find solutions to these challenges and that our proprietary technology and architecture and the technology exclusively available to us through exclusive license agreements will offer advantages both in terms of research and development as well as the ultimate product we wish to offer customers.

There are certainly thousands, if not millions, of important and fundamental unanswered questions about how the universe works and opportunities associated with the answers to those questions. We envision a future powered by quantum computing and believe the 21st century is poised to be the dawn of this era.

Our Strategy

Our mission is to be the leading quantum computing company enabling the new era of quantum computing. We intend to fulfill our mission by:

- ***Leveraging Our Technology***. We believe that our technology offers substantial technological advantages compared to other competing quantum computing and networking systems. We intend to build upon our technological lead by leveraging our world-class team of leaders and engineers who are pioneers in quantum computing and networking, with proven track records in innovation and technical leadership. To date, we have developed and assembled ten generations of quantum computer prototypes and systems, have constructed quantum operating systems and software tools, and have worked with leading cloud vendors, quantum programming languages and quantum software development kits ("SDKs").
- ***Selling Direct Access to Quantum Computers***. We sell specialized quantum computing and networking hardware to select customers, complemented by access to quantum experts and algorithm development capabilities. We sell direct access to the quantum computers we manufacture, with units offered on a whole system or usage basis. We believe that by offering direct access to quantum computing, supplemented by our professional services, we can assist select customers in deepening their application of quantum solutions.
- ***Offering QCaaS***. We provide QCaaS, complemented by access to quantum experts and algorithm development capabilities. We manufacture, own and operate quantum computers. Our quantum computing solution is currently delivered via AWS's Amazon Braket, Microsoft's Azure Quantum and Google's Cloud Marketplace as well as on our own cloud platform. We believe that by offering QCaaS, we can accelerate the adoption of our quantum computing solutions, while efficiently promoting quantum computing across our partner ecosystems.
- ***Continuing to Enhance Our Proprietary Position***. We have exclusively licensed our core technology from the University of Maryland and Duke University (together, the "Universities"), and our complex technology is protected by an extensive patent portfolio. We intend to continue to drive innovation in quantum computing and networking and seek intellectual property protection where appropriate to enhance our proprietary technology position.
- ***Further Developing Our Quantum Computing and Networking Partner Ecosystem***. We believe our relationships with leading technology enterprises, government agencies, and university research institutes will accelerate innovation, distribution and monetization of our quantum capabilities.

Market Opportunity: A Future Driven by Quantum Computing

The potential uses for quantum applications are widespread and address a number of problems that would be impossible to solve using classical computing technology. Below are a few of the use cases in which we believe quantum computers, if they are successfully developed, will become an important tool for businesses to remain competitive in the market over the coming years.

Quantum Simulations in Chemistry

We believe that there are thousands of problems that could benefit from these quantum algorithms across the pharmaceutical, chemical, energy and materials industries. An example of such a simulation problem is modeling the core molecule in the nitrogen fixation process to make fertilizer. Nature is able to fixate nitrogen (i.e., turn atmospheric nitrogen into more useful ammonia) at room temperature. Scientists, however, have only been able to achieve fixation using a resource-intensive, high-temperature, high-pressure process, called the Haber-Bosch process. A cornerstone of the global agriculture industry, the Haber-Bosch process consumes about one percent of the world's energy and produces about one percent of the world's carbon dioxide. Agronomists have attempted to model the core molecule in nature's nitrogen fixation process, but the molecule is too large for today's classical supercomputers to

simulate. Understanding the quantum process used in nature to fixate nitrogen could lead directly to more efficient ways for scientists to do the same.

Quantum chemistry simulation is expected to impact multiple markets and become an essential tool in chemical industries. For example, computer-aided drug discovery in the pharmaceutical industry is limited by the computing time and resources required to simulate a large enough chemical system with sufficient accuracy to be useful. If future generations of more powerful quantum computers are successfully developed, we believe that we could improve the speed and accuracy of virtual high-throughput screening and improve the molecular docking predictions used in structure-based drug discovery, dramatically reducing the development cost of new drugs and reducing the time to market. Similarly, we believe that developing a detailed understanding of chemical reactions critical to various industries, such as catalytic reaction in battery chemistry for electric vehicles, can lead to higher performing solutions with extended energy storage capacity.

Quantum Algorithms for Monte Carlo Simulations

Monte Carlo simulations are probability simulations used to calculate the expected distribution of possible outcomes in hard-to-predict processes involving random variables. Such simulations are used pervasively in finance, banking, logistics, economics, engineering and applied sciences. A key parameter of Monte Carlo simulations is the degree of accuracy desired to attain with the result. To obtain 99.9% accuracy, a classical computer requires around one million simulations. Quantum algorithms, however, can achieve the same accuracy using only one thousand simulations, thereby significantly reducing the time it takes to perform Monte Carlo simulations. This is especially important when running these simulations is expensive.

One application of the quantum Monte Carlo algorithm is to price options for the financial industry. Simple options models are used ubiquitously in finance, the most famous of these being the Black-Scholes model. However, these models fail to capture the complexities of real markets, and financiers use more sophisticated simulations to obtain better model predictions. Currently, many of these models are limited by the number of simulations required to reach the desired accuracy within a fixed time budget. Quantum algorithms for Monte Carlo simulations could give some financial firms a competitive advantage by enabling them to price options more quickly.

Quantum Algorithms for Optimization

Optimization problems have enormous economic significance in many industries, and they often cannot be solved with classical computers due to their daunting complexity. Quantum algorithms are naturally suited for problems in which an exponential number of possibilities must be considered before an optimized output can be identified. It is widely believed that quantum computers will be able to arrive at a better approximate optimization solution than classical computers can, and with reduced computational cost and time. One method of quantum optimization is a hybrid method called the Quantum Approximate Optimization Algorithm, in which layers of quantum computations are executed within circuit parameters optimized using classical high-performance computers. Because optimization issues bedevil so many complicated processes in industries ranging from logistics to pharmaceutical drug design to climate modeling, the application of quantum algorithms to optimization problems could have far-reaching impacts on society.

Quantum Machine Learning

Quantum computers can generate probability distributions that cannot be efficiently simulated on a classical computer. Similarly, there are probability distributions that can only be efficiently distinguished from each other using a quantum computer. In these examples, models utilizing quantum circuits can be used to capture complex internal structures in the data set much more effectively than classical models. In other words, quantum computers can “learn” things that are beyond the capabilities of classical computers. Quantum computing is likely to offer new machine-learning modalities, greatly improving existing classical machine learning when used in tandem with it. Examples of areas where quantum machine learning could have an impact are risk analysis in finance, natural language processing, and classification of multivariate data such as images and chemical structures. Machine learning is used broadly in industry today, and we believe quantum machine learning could have a similarly broad impact.

As with any completely new technology, the use cases imagined by us today are only a subset of the opportunities that will emerge if future generations of more powerful quantum computers are successfully developed, as users understand the power of quantum algorithms.

Remaining Challenges in Quantum Computing Evolution

One can compare any particular quantum algorithm’s performance to the best classical algorithm for the same problem. The point at which a quantum computer is able to perform a particular computation that exceeds its classical counterpart in speed or reduces its cost to solution is known as the point of “quantum advantage.”

Given the substantial research and development required to build a modern quantum computer that is both functional and practical, industry experts describe the remaining challenges in quantum computing to achieve quantum advantage as being solved in three phases. Although none of these challenges have yet been fully solved, we believe that we are well positioned to do so. A 2019 publicly available report by a leading third-party consulting firm describes these phases—and the associated technical barriers—as paraphrased below:

- *Noisy and intermediate-scale quantum (NISQ) computers*: The earliest stage of development will see component demonstrations and intermediate-scale system development with limited commercial application. The main technical barrier involves the mitigation of errors through improved fabrication and engineering of underlying qubit devices and advanced control techniques for the qubits. These devices are used for developing and validating fundamentally new quantum approaches to tackling difficult problems, but are not expected to generate substantial commercial revenues.
- *Broad quantum advantage*: In this stage, quantum computers are expected to provide an advantage over classical computers with a meaningful commercial impact. The main technical barrier is the deployment of quantum error-correcting codes that allow bigger applications to be executed. If this barrier can be overcome, we believe that quantum computing will offer practical solutions to meaningful problems superior to those provided by classical computers.
- *Fault-tolerant quantum computing (FTQC)*: This last stage will see large modular quantum computers with enough power to tackle a wide array of commercial applications relevant to many sectors of the economy. At this stage, classical computers are expected to no longer compete with quantum computers in many fields. The technical barrier will be the adoption of a modular quantum computer architecture that allows the scalable manufacturing of large quantum computer systems.

In a 2024 update of the previously referenced publicly available report, the third-party consulting firm detailed $50 billion in total government and private investment in quantum technology and estimated up to $2 trillion in economic value from quantum computing in the next ten years.

Building a Quantum Computer or a Quantum Network

Requirements for Building Useful Quantum Computers and Networks

Quantum computers and networks are difficult to build and operate because the physical system of qubits must be nearly perfectly isolated from its environment to faithfully store quantum information. Yet the system must also be precisely controlled through the application of quantum gate operations, and it must ultimately be measured with high accuracy. A practical quantum computer or network requires well-isolated, near-perfect qubits that are cheap, replicable and scalable, along with the ability to initialize, control and measure their states. Breakthroughs in physics, engineering, and classical computing were prerequisites for building a quantum computer or network, which is why for many decades the task was beyond the limits of available technology.

To execute computational tasks, a quantum computer must be able to (i) initialize and store quantum information in qubits, (ii) operate quantum gates to modify information stored in qubits and (iii) output measurable results. Each of these steps must be accomplished with sufficiently low error rates to produce reliable results. Moreover, to be practical, a quantum computer or network must be economical in cost and scalable in compute power (i.e., the number of qubits and the number of gate operations) to handle real world problems.

The development of large-scale quantum computing and networking systems is still in early stages, and several potential engineering architectures for how to build a quantum computer or network have emerged. We are developing quantum computers based on individual atoms as the core qubit technology, which we believe has key advantages in scaling. The ability to produce cheap error-corrected qubits at scale in a modular architecture is one of the key differentiators of our approach. We have achieved many engineering firsts in this field and we believe that, with our focus on achieving additional technical milestones over the next few years, we are well positioned to bring quantum computing advantage to the commercial market.

Scientific Approaches to Quantum Computing

There are a variety of different approaches to (or architectures for) building a quantum computer, each of which involves tradeoffs in meeting the three functional and practical requirements outlined above. Roughly, approaches to performing a quantum computation fall into one of three categories: natural quantum bits, solid state or classical computer simulation.

Natural quantum bits: In natural qubit-based quantum computers, a system is built around naturally occurring substrates exhibiting quantum properties.

- *Atoms*: In atomic-based quantum computers, the qubits are represented by internal states of individual atoms trapped and isolated in a vacuum. There are two categories within this approach: the use of ionized (charged) atoms and the use of neutral atoms.
- *Photons*: In this approach, the state of a photon, a particle of light, is used as the qubit. Various aspects of a photon, such as presence/absence, polarization, frequency (color) or its temporal location can be used to represent a qubit.

Solid state: In solid-state-based quantum computers, the qubits are engineered into the system.

- *Spins in semiconductors*: This approach uses the spins of individual electrons or atomic nuclei in a semiconductor matrix. There are two categories within this approach: (1) the use of electrons trapped in quantum dot structures fabricated by lithographic techniques and (2) the use of atomic defects (or dopants) that capture single electrons. The nuclear spin of the dopant atoms, or the nearby atoms to defects, are often used to store qubits.
- *Superconducting circuits*: This approach uses circuits fabricated using superconducting material that features quantum phenomena at cryogenic temperatures. Two states of the circuit, either charge states or states of circulating current, are used as the qubit.

Classical computer simulation: Classical computers in a data center can be used to simulate quantum computers. Although useful for small-scale quantum experiments, quantum simulation on classical computers is still bound by the same limitations of classical computing and would require an impractical number of data centers to tackle meaningful quantum problems.

Our Technology Approach

Our Approach to Quantum Computing: Trapped Ions

We have adopted the atom-based approach described above and use trapped atomic ions as the foundational qubits to construct practical quantum computers. We are pursuing a modular computing architecture to scale our quantum computers, meaning that, if successful, individual quantum processing units will be connected to form increasingly powerful systems. We believe that the ion trap approach offers the following advantages over other approaches:

- *Atomic qubits are nature's qubits*: Using atoms as qubits means that every qubit is exactly identical and perfectly quantum. This is why atomic qubits are used in the atomic clocks that do the precise timekeeping for mankind. Many other quantum systems rely upon fabricated qubits, which bring about imprecisions such that no single qubit is exactly the same as any other qubit in the system. For example, every superconducting qubit comes with a different frequency (or must be tuned to a frequency) due to manufacturing imprecision. Overall, we believe that systems relying upon fabrication of their qubits are more susceptible to error.
- *Trapped ion qubits are well-isolated from environmental influences*: When a quantum system interacts with its environment, the quantum state loses coherence and is no longer useful for computing. For example, in a superconducting qubit, the qubit tends to lose its coherence within approximately 10 to 50 microseconds. Even neutral atoms are perturbed to some extent when they are trapped in space. In contrast, trapped ion qubits are confined via electric fields in an ultra-high vacuum environment, and their internal qubits are hence perfectly isolated. As a result, the coherence of trapped ions can be preserved for about an hour, and may be able to be preserved for longer if isolation technology improves. Longer coherence times mean more computations can be performed before noise overwhelms the quantum calculation and are key to minimizing the overhead of error correction needed for large-scale quantum computers.
- *Lower overhead for quantum error-correction*. Quantum error-correction will likely be necessary to reduce the operational errors in any large-scale quantum computations relevant to commercial problems. Quantum error-correction uses multiple physical qubits to create an error-corrected qubit with lower levels of operational errors. For solid-state architectures, we estimate that it may take at least 1,000 physical qubits to form a single error-corrected qubit, while for near-term applications with ion traps the ratio is closer to 16:1.
- *Trapped ion quantum computers can run at room temperature*: Solid-state qubits currently require temperatures close to absolute zero (i.e., -273.15°C, or -459.67°F) to minimize external interference and noise levels. Maintaining the correct temperature requires the use of large and expensive dilution refrigerators, which can hamper a system's long-term scalability because the cooling space, and hence the system space, is limited. Trapped ion systems, on the other hand, can operate at room temperature. This is because the qubits themselves are not in thermal contact with the environment, as they are electromagnetically confined in free space inside a vacuum chamber. Although modest cryogenics (< 10 degrees above absolute zero) can be used to dramatically improve the vacuum environment, the inherent properties of the qubits

themselves do not degrade at room temperature. The laser-cooling of the qubits themselves is extremely efficient because the atomic ions have very little mass and this requires just a single low-power laser beam (microwatts). This allows us to minimize the system size as technology progresses, while scaling the compute power and simultaneously reducing costs.

- *All-to-all connectivity*: In superconducting and other solid-state architectures, individual qubits are connected via physical wires, hence a particular qubit can only communicate with a further-removed qubit by going through the qubits that lie in-between. In the trapped ion approach, however, qubits are connected by electrostatic repulsion rather than through physical wires. As a result, qubits in our existing systems can directly interact with any other qubit in the system. Our modular architecture benefits from this flexible connectivity, significantly reducing the complexity of implementing a given quantum circuit.
- *Ion traps require no novel manufacturing capabilities*: Ion trap chips consist of electrodes and their electrical connections, which are built using existing technologies. The trap chips themselves are not quantum materials. They simply provide the conditions for the ion qubits to be trapped in space, and in their current state, they can be fabricated with existing conventional and standard silicon or other micro-fabrication technologies. By contrast, solid-state qubits, such as superconducting qubits or solid- state silicon spins, require exotic materials and fabrication processes that demand atomic perfection in the structures of the qubits and their surroundings; fabrication with this level of precision is an unsolved challenge.

Technological Complexity Creates Significant Barriers to Entry

Alongside the benefits of the trapped ion approach, there are several challenges inherent in it that serve as barriers-to-entry, strengthening the advantages of our systems. These key challenges include:

- *Complex laser systems*: One of the challenges of trapped ion quantum computing is the set of lasers required and the degree to which they must be stable to operate the system. Traditionally, these laser systems were assembled on an optical table on a component-by-component basis, which led to serious stability and reliability issues. We believe that we have resolved this issue from an engineering standpoint and that our future roadmap will further improve manufacturability.
- *Ultra-high vacuum (UHV) technology*: The conventional method to achieve UHV conditions for ion trapping experiments involves using vacuum chamber designs with carefully chosen materials, assembly procedures with cumbersome electrical connections, and a conditioning procedure to prepare and bake the chamber at elevated temperatures for extended periods of time. We have developed new approaches, such as environmental conditioning, that we believe will substantially reduce the time and cost to prepare the UHV environment to operate the quantum computer.
- *Executing high fidelity gates with all-to-all connectivity*: While trapped ion qubits feature the highest fidelity entangling gates, it is nevertheless a major technical challenge to design a control scheme that enables all qubits in a system to form gates with each other under full software control. Through innovation in gate-implementation protocols, we believe that we have developed laser delivery and control systems that will allow us to implement fully programmable, fully connected gate schemes in our system.
- *Slow gate speeds*: Compared to their solid-state counterparts, trapped ions are widely believed to have slow gate speeds. While slow gate speeds are the case for many systems in operation today, both theoretical analyses and experimental demonstrations suggest this may not be a fundamental limit of trapped ion qubits (although this has not yet been demonstrated in commercial applications). In fact, high-fidelity gates with speeds comparable to those of solid-state qubits have been realized in several research laboratories. We expect that our future quantum computers based on barium ions will be faster, more powerful, more easily interconnected, and will feature more uptime for customers. Moreover, we believe that as systems with other qubit technologies scale up, their restricted connectivity and high error-correction overhead will significantly slow down their overall computation time, which we believe will make the trapped ion approach more competitive in terms of operational speed.

Our Trapped Ion Implementation

The specific implementation of our trapped ion systems leverages the inherent advantages of the substrate and creates what we believe is a path for building stable, replicable and scalable quantum computers.

Trapped Ion Infrastructure

Our systems are built on individual atomic ions that serve as the computer's qubits. Maintaining identical, replicable, and cost-effective qubits is critical to our potential competitive advantage, and we have developed a process to produce, confine and manipulate atomic ion qubits.

To create trapped atomic ion qubits using our approach, a solid source containing the element of interest is either evaporated or laser-ablated to create a vapor of atoms. Laser light is then used to strip one electron selectively from each of only those atoms of a particular isotope, creating an electrically charged ion. Ions are then confined in a specific configuration of electromagnetic fields created by the trapping structure (*i.e.*, the ion trap), to which their motion is confined due to their charge. The trapping is done in an UHV chamber to keep the ions well-isolated from the environment. Isolating and loading a specific isotope of a specific atomic species ensures each qubit in the system is identical. Two internal electronic states of the atom are selected to serve as the qubit for each ion. The two atomic states have enough frequency separation that the qubit is easy to measure through fluorescence detection when an appropriate laser beam is applied.

To build quantum computers, many atomic ions are held in a single trap, and the repulsion from their charges naturally forces them into a stable linear crystal (or chain) of qubits. The qubits are highly isolated in the UHV chamber, only perturbed by occasional collisions with residual molecules in the chamber, which provides near-perfect quantum memory that lasts much longer than most currently envisioned quantum computing tasks require. The qubits are initialized and measured through a system of external gated laser beams. An additional set of gated laser beams applies a force to selected ions and modulates the electrical repulsion between the ions. This process allows the creation of quantum logic gates between any pair of qubits, regardless of their distance within the crystal, which can be arbitrarily reconfigured in software.

System Modularity and Scalability

Today, all qubits in our systems are stored on a single chip, referred to as a quantum processing unit ("QPU"). QPUs can have several cores, or zones for trapping chains of ions, comparable to multicore central processing unit ("CPU") chips in classical computing. Each core can contain up to about 100 qubits in a linear crystal, and dozens of cores can potentially be co-located in a single QPU. Within a QPU, some qubits can be physically moved between cores to accommodate quantum communication between the cores. This process of moving ions within a QPU is called "shuttling" and is achieved by modifying the electromagnetic fields that form the trap.

In addition to increasing the number of qubits per QPU, we believe we have identified, and we are currently developing, the technology needed to connect qubits between trapped ion QPUs, which may be commercially viable in the future. This technology, known as a photonic interconnect, uses light particles to communicate between qubits while keeping information stored stably on either end of the interconnect. The basic protocol for this photonic interconnect between ion traps in two different vacuum chambers was first realized in 2007. We believe this protocol can be combined with all-optical switching technology to enable multi-QPU quantum computers at large scale. We at IonQ have assembled a team with deep expertise in photonics and are designing Photonic Interconnects that will enable our systems to compute with entangled qubits spanning multiple QPUs. We believe this can open up the possibility of scaling quantum computers indefinitely, similar to how high-performance computers and data centers have been scaled.

Our quantum architecture is modular, meaning that if development of this architecture is successful, the number of qubits in a QPU, or the number of QPUs in a system, could be scaled. Also, by allowing for each qubit in a system to entangle with any other qubit in that system, we believe that a system's number of quantum gates could increase rapidly with each additional qubit added. This all-to-all connectivity is one of the key reasons we believe our systems will be computationally powerful. Notably, our architectural approach to scaling quantum computers across several QPUs has also contributed to IonQ's work in quantum networking.

Gate Configuration

Our qubits are manipulated (for initialization, detection, and forming quantum logic gates) by shining specific laser beams onto the trapped ions. Our systems employ a set of lasers and a sophisticated optical system to deliver beams precisely tailored to achieve this manipulation. The laser beams are tailored by programming radio frequency ("RF") signals using state-of-the-art digital chipsets, which are custom-configured to generate the signals for qubit manipulation. An operating system manages the quantum computer, maintaining the system in operation. It includes software toolsets for converting quantum programs from users into a set of instructions the computer hardware can execute to yield the desired computational results. To support system access from the cloud, we offer cloud management tools and application programming interfaces ("APIs") that permit programming jobs to run remotely.

Our quantum gates are fully programmable in software; there is no "hard-wiring" of qubit connections in the quantum computing hardware. The structure of a quantum circuit or algorithm can therefore be optimized in software, and the appropriate laser beams can then be generated, switched, or modulated to execute any pattern of gate interactions. Our programmable gate configurations make our systems adaptable. Unlike quantum computer systems that are limited to a single class of problems due to their architecture, we believe that any computational problem with arbitrary internal algorithmic structure could be optimized to run on our system, although this has not been demonstrated at scale.

Quantum Error Correction

A key milestone in building larger quantum computers is achieving fault-tolerant quantum error-correction. In quantum error-correction, individual physical qubits prone to errors are combined to form an error-corrected qubit (sometimes referred to as a logical qubit) with a much lower error rate. Determining how many physical qubits are needed to form a more reliable logical qubit (the resource "overhead") depends on both the error rate of the physical qubits and the specific error-correcting codes used. In 2020, a team of researchers at the University of Maryland, including some current IonQ employees, demonstrated the first fault-tolerant error-corrected qubit using 13 trapped ion qubits. In 2024, we announced a partial error correction scheme which proposes a 3:1 qubit overhead to reduce noise and error in certain quantum gates that we believe we may implement in future generations of IonQ quantum computers. With our unique architecture, we believe quantum error-correction can be coded in hardware and software, allowing varying levels and depths of quantum error-correction to be deployed as needed. Because the ion qubits feature very low idle and native error rates and are highly connected, to achieve the first useful quantum applications we expect the error-correction overhead to be significantly lower than other approaches, for which we estimate the overhead to be on the order of at least 1,000:1.

We believe our architectural decisions will make our systems uniquely capable of achieving scale. We have published a roadmap for scaling to larger quantum computing systems, with concrete technological innovations designed to significantly improve the performance of the systems. For example, in 2022, we announced that through our partnership with the U.S. Department of Energy's Pacific Northwest National Laboratory ("PNNL"), we were able to shrink the barium source material down to a microscopic scale. We believe this is significant because it is evidence of our continued progress to reduce the size of core system components, an important step in the creation of quantum computers small enough to be networked together. However, meeting future milestones included in our roadmap is not guaranteed and is dependent on various technological advancements, which could take longer than expected to realize or turn out to be impossible to achieve. We believe that, with engineering advancements and firsts yet to be achieved, our quantum computers will become increasingly compact and transportable, opening up future applications of quantum computing at the edge.

Our Forward-Looking Roadmap

In December 2020, we publicly released a forward-looking technical roadmap for the next eight years. Our technical roadmap was designed to provide transparent guidance to our quantum computer users regarding when we expect certain quantum computing capabilities to become available. As part of this roadmap, we introduced the notion of "algorithmic qubits" as a metric to measure progress, and a detailed description of how to define and measure the number of algorithmic qubits (#AQ) in early 2022. Roughly speaking, #AQ represents the total number of qubits that can be used to perform a quantum computational task that involves an order of ~(#AQ)^2 entangling gate operations in a list of quantum algorithms that reflect representative real-world use cases of a quantum computer. This metric provides a simple and effective measure to estimate the computational power of each generation of quantum computers. At low #AQ, the size of the problem the quantum computer can tackle is limited by the error rate of the entangling gate operations, rather than by the number of physical qubits available in the computer. The aggressive push for improving the power of quantum computers, including the early introduction of quantum error-correction, is intended to significantly compress the time required for reaching the point when we expect quantum computers may become commercially impactful at scale. We believe that many of the technological components needed to accomplish the performance goals of the roadmap, such as high-fidelity gate operations, photonic interconnects and quantum error-correction, have been realized in proof-of-concept demonstrations in trapped ion systems. Given our track record of engineering and technology development, we believe that, over time, we will be able to successfully translate these technology components into products, which may enable successful deployment of our quantum computers and deliver material commercial value to customers.

We are targeting a Modular Architecture, Designed to Scale, resulting in Smaller Systems and Cheaper Compute Power for Each Generation

The scaling of classical computer technology, which unlocked continuously growing markets over many decades, was driven by exponential growth in computational power coupled with exponential reduction in the cost of computational power for each generation (Moore's law). The key economic driver permitting the expansion of digital computer applications to new segments of the market was this very phenomenon of capability doubling in each generation with costs rising only modestly. We believe the scaling of quantum computing may follow a similar trajectory: as the #AQ available in each generation scales, the per-AQ cost is also reduced and enables true scaling of quantum computers. Our systems have benefited from years of architectural focus on scalability that addresses both #AQ and per-AQ cost and, as such, we believe that if we are able to successfully solve remaining scalability challenges, these systems may become increasingly powerful and accessible in tandem.

At the heart of our approach is the modular architecture that may enable such growth. We expect our future systems to be modular networks of many QPUs working together as a large quantum computer, similar to how classical data centers are designed, constructed and operated today. Our engineering effort is focused on reducing the size, weight, cost, and power consumption of the QPUs that will be the center of each generation of the modular quantum computer, while increasing the number of QPUs

manufactured each year. We intend to focus on achieving these engineering efforts over the next several years. If successful, we expect that we may be able to achieve compact, lightweight and reliable quantum computers, which can be deployed at the edge, similarly to how personal computers have enabled new applications for both government and commercial use.

Our Business Model

Quantum Computing and the Compute Access Model

As quantum hardware matures, we expect the quantum computing industry to increasingly focus on practical applications for real-world problems, known as quantum algorithms. Today, we believe that there are a large number of quantum algorithms widely thought to offer advantages over classical algorithms in that each of these algorithms can solve a problem more efficiently, or in a different manner, than a classical algorithm. Our business model is premised on the belief that businesses with access to quantum computers and networks will likely have a competitive advantage in the future.

We provide quantum computing and networking services, complemented by access to quantum experts and algorithm development capabilities, designed to solve some of the most challenging issues facing corporations, governments and other large-scale entities today. We manufacture, own and operate quantum computers and networks, with compute units being offered to potential customers through system hardware sales and on a QCaaS basis and network units being offered through hardware sales. We manufacture specialized quantum computers for specific use cases for customers including government agencies. We also provide quantum networking solutions to augment existing networks with quantum capabilities.

We expect our target markets to experience two stages of quantum algorithm deployment: the development stage and the application stage. We expect our involvement in these two stages, to the extent they will take place, to be as follows:

- During the development stage, our experts will assist customers in developing an algorithm to solve their business challenges. Customers may be expected to pay for quantum compute usage, in addition to an incremental amount for the consulting and development services provided in the creation of algorithms. We may choose to sell this computing time to customers in a variety of ways. In this stage, we expect revenue to be unevenly distributed, with individual customers potentially contributing to peaks in bookings.
- During the application stage, once an algorithm is fully developed for a market, we anticipate that customers would be charged to run the algorithm on our hardware. Given the mission critical nature of the use cases we anticipate quantum computing will attract, we believe a usage-based revenue model will result in a steady stream of revenue while providing the incremental ability to grow with customers as their algorithm complexity and inputs scale.

Our Customer Journey

In each new market that stands to benefit from quantum computing, we intend to guide our customers and partners through two stages: the development phase and the application phase.

Development Phase: This first stage focuses on quantum algorithm development and we expect it to involve deep partnerships between us and our customers to lay the groundwork for applying quantum solutions to the customer's industry. We also anticipate uneven revenue for this period given that the quantum computing market is still nascent. We expect the development phase for each market to be characterized by the following go-to-market channels:

- *Co-development of quantum applications with strategic partners.* We intend to form long-term partnerships with select industry-leading companies (aligned with our technology roadmap) to co-develop end-to-end solutions for the partner and to provide an early-adopter advantage to the partner in their industry. IonQ has announced co-development agreements with Ansys for computer aided design (CAD) and engineering and with the US Defense Advanced Research Projects Agency (DARPA) to help establish the next generation of benchmarking for quantum computers.
- *Preferred compute agreements with clients*. We expect our preferred offerings to give the customer's application engineers direct access to our cutting-edge quantum systems, as well as technical support to pursue their solution development.
- *Dedicated hardware*. We sell certain specialized quantum computing and networking hardware to select customers. We also expect to manufacture and sell complete quantum systems and networks for dedicated use by a single customer, to be hosted on premises by the customer or remotely by us.
- *Cloud access to quantum computing*. Our current and future cloud partnerships with AWS's Amazon Braket, Microsoft's Azure Quantum, Google's Cloud Marketplace and other cloud providers are designed and will continue to be designed to make access to quantum computing hardware available to a broader community of quantum programmers.

Application Phase: This second phase is expected to commence if we are successful in demonstrating the commercial viability of quantum advantage in the industry and can therefore commence with developing commercial applications and applying that advantage broadly throughout the market with new customers.

- *Delivery of a full-scale quantum compute platform*. For customers who have worked alongside us in the development phase to curate deep in-house technical expertise in quantum computing capabilities at the time quantum advantage is achieved for the customer's application, our preferred compute agreements, cloud offerings, and dedicated hardware sales are expected to offer sufficient quantum computational capacity.
- *Packaged solution offerings*. When appropriate, we may develop full-stack quantum solutions that can be provided directly to customers, regardless of their in-house quantum expertise.
- *Accelerated high-impact applications development*. We intend to provide opportunities for accelerated applications development to customers seeking compressed development timelines to solve some of their biggest problems and drive efficiencies.

We expect the technical complexity of the solutions required for quantum algorithms to address how each application area will impact the timing of that market's inflection point and transition from the development phase to the application phase. We expect computational chemistry and optimization to be among the first solutions to transition into broadly available applications. Additional markets taking advantage of quantum material science research and optimization speed-ups may come online next if broad-scale quantum advantage becomes accessible. If our quantum computers achieve full-scale fault tolerance, a diverse array of industries, ranging from quantum machine learning to deeper optimization, may be able to be transitioned to the application phase.

Customers and Prospects

Quantum Computing and Networking Systems and Hardware

We sell certain specialized quantum computing and networking hardware to select customers. We are also engaged with certain prospects who are interested in purchasing partial or entire quantum computing and networking systems, either over the cloud or for local access.

Direct Access Customers

By directly integrating with us, customers can reserve dedicated execution windows, receive concierge-level application development support, gain early access to next-generation hardware, or host their own quantum computer. Such access is currently limited to a select group of end-users.

We expect our standard offerings will include additional bundled value-add services in exchange for an annual commitment, such as reserved system time, consultations with solution scientists, and other application and integration support.

QCaaS

We provide access to our quantum computing solutions via AWS's Amazon Braket, Microsoft's Azure Quantum, and Google's Cloud Marketplace, and sell access directly to select customers via our own cloud service. Making systems available through the cloud in both cases enables wide distribution. Through our cloud service providers, potential customers across the world in industry, academia and government can access our quantum hardware with just a few clicks. These platforms serve an important purpose in the quantum ecosystem, allowing virtually anyone to try our systems without an upfront commitment or needing to integrate with our platform.

Government Agencies

Our customers, potential customers and partners include government agencies such as the United States Air Force Research Lab. Government agencies and large organizations often undertake a significant evaluation process. Our contracts with government agencies are typically structured in phases, with each phase subject to satisfaction of certain conditions.

Commercial Agreements with the University of Maryland

Lease with the University of Maryland

In March 2020, we entered into an amended and restated office lease with UMD for the lease of our corporate headquarters and our research and development and manufacturing facility. This lease expires on November 30, 2030.

Contracts with the University of Maryland

In September 2021, we entered into a contract with UMD to provide certain quantum computing services and facility access, and in July 2022, we entered into a contract with UMD to provide customized quantum computing hardware.

Competition

There are many other approaches to quantum computing that use qubit technology besides the trapped ion approach we are taking. In some cases, conflicting marketing messages from these competitors can lead to confusion among our potential customer base. Large technology companies such as Google and IBM, and startup companies such as Rigetti Computing, are adopting a superconducting circuit technology approach, in which small amounts of electrical current circulate in a loop of superconducting material (usually metal where the electrical resistance vanishes at low temperatures). The directionality of the current flow, in such an example, can represent the two quantum states of a qubit. An advantage of superconducting qubits is that the microfabrication technology developed for silicon devices can be leveraged to make the qubits on a chip; however, a disadvantage of superconducting qubits is that they need to be operated in a cryogenic environment at near absolute-zero temperatures, and it is difficult to scale the cryogenic technology. Compared to the trapped ion approach, the qubits generated via superconducting suffer from short coherence times, high error rates, limited connectivity, and higher estimated error-correction overhead, ranging from 1,000:1 to 100,000:1 to realize the error-corrected qubits from physical qubits.

There are companies pursuing photonic qubits, such as PsiQuantum and Xanadu, among others. PsiQuantum uses photons (i.e., individual particles of light) as qubits, whereas Xanadu uses a combination of photons and a collective state of many photons, known as continuous variable entangled states, as the qubits. Each company's approach leverages silicon photonics technology to fabricate highly integrated on-chip photonic devices to achieve scaling. The advantages to this approach are that photons are cheap to generate, they can remain coherent depending on the property of the photons used as the qubit, and they integrate well with recently-developed silicon photonics technology; however, the disadvantages of photonic qubit approaches include the lack of high-quality storage devices for the qubits (photons move at the speed of light) and weak gate interactions (photons do not interact with one another easily). Both of these problems lead to photon loss during computation. Additionally, this approach requires quantum error correcting protocols with high overhead (10,000:1 or more).

Several other companies use a trapped ion quantum computing approach similar to ours, including Quantinuum Ltd. and Alpine Quantum Technologies GmbH. These companies share the fundamental advantages of the atomic qubit enjoyed by our approach. The differences between our technology and that of these companies lies in our processor architecture, system design and implementation and our strategies to scale. Based on publicly available information, Quantinuum processors operate with the application circuits broken down to two qubits at a time, with a bus width of two, and the ion qubits are shuffled between each gate operation. Our processor core involves a wide-bus architecture, where the interaction among a few dozens of atomic ion qubits can be controlled using programmable laser pulses. This typically allows quantum logic gates between all possible pairs of qubits in the processor core without extraneous operations, which will enable us to operate some quantum gates that are not possible on other quantum architectures. We have also demonstrated the ability to shuttle multiple processor cores on the same chip, increasing the potential qubit capacity of a system. At scale, we believe these architectural features will confer benefits in the speed and efficiency of running algorithms. At a higher level, our scaling architecture will exploit optical interconnects among multiple QPUs in a way that allows full connectivity between any pair of qubits across the entire system. The modular scaling of multiple QPUs with photonic interconnects is unique in our architecture.

Lastly, there are alternative approaches to quantum computing being pursued by other private companies as well as the research departments at major universities or educational institutions. For example, D-Wave computing produces quantum annealers, a separate form of computing technology that hopes to tackle a class of problems with some overlap to those solved by quantum computing. Another example is QuEra, which hopes to use neutral rubidium atom arrays to build quantum computers.

Intellectual Property

We rely on a combination of the intellectual property protections afforded by patent, copyright, trademark and trade secret laws in the United States and other jurisdictions, as well as license agreements and other contractual protections, to establish, maintain and enforce rights in our proprietary technologies. Unpatented research, development, know-how and engineering skills make an important contribution to our business. We pursue patent protection only when it is consistent with our overall strategy for safeguarding intellectual property.

In addition, we seek to protect our intellectual property rights through non-disclosure and invention assignment agreements with our employees and consultants and through non-disclosure agreements with business partners and other third parties. We have accumulated a broad patent portfolio, both owned and exclusively licensed, across a range of technological fronts that relate to our systems and will continue to protect our inventions in the United States and other countries. Our patent portfolio is deepest in the area

of devices, methods and algorithms for controlling and manipulating trapped ions for quantum computing. Our trade secrets primarily cover the design, configuration, operation and testing of our trapped-ion quantum computers.

As of February 1, 2025, we own or license, on an exclusive basis, 132 issued U.S. patents and 204 pending or allowed U.S. patent applications, 140 issued foreign patents and 134 pending or allowed foreign patent applications, 13 registered U.S. trademarks and 11 pending U.S. trademark applications, and 23 registered international trademarks and 2 pending international trademark applications. Our issued patents expire between 2029 and 2043.

Exclusive License Agreement with the University of Maryland and Duke University

In July 2016, we entered into a license agreement with the University of Maryland ("UMD") and Duke University ("Duke"), or the Universities, which was subsequently amended in September 2017, October 2017, October 2018, February 2021, April 2021, September 2021, January 2023, and February 2024 (as amended, the "License Agreement"), under which we obtained a worldwide, royalty-free, sublicensable license under certain patents, know-how and other intellectual property to develop, manufacture and commercialize products for use in certain licensed fields, the scope of which includes the application of the licensed intellectual property in ion trap quantum computing. The License Agreement provides an exclusive license under the Universities' interest in all patents (and non-exclusive for other types of intellectual property), subject to certain governmental rights and retained rights by the Universities and other non-profit institutions to use and practice the licensed patents and technology for internal research and other non-profit purposes. We also entered into an exclusive option agreement ("Option Agreement") with each of the Universities in 2016 whereby we have the right to exclusively license additional intellectual property developed by the Universities by exercising an annual option and issuing a certain number of common shares to each of Duke and UMD.

We are obligated to use commercially reasonable efforts to commercialize the inventions covered by the licensed patent rights and achieve certain milestones, including the hiring of a Chief Executive Officer, obtaining equity financing by specified times and such other milestones that we may specify in a development plan provided by us to the Universities. We have met all existing milestones as provided for in the License Agreement, have not included any additional milestones in any development plan provided to the Universities, and no longer have any obligation to submit any future development plans to the Universities. We are also responsible for the prosecution and maintenance of the licensed patents, at our expense and using commercially reasonable efforts. We have the sole right to enforce the licensed patents, at our expense.

We may terminate the License Agreement at any time for any reason with at least 90 days' written notice to UMD. UMD and Duke may terminate the License Agreement if we enter into an insolvency-related event or in the event of our material breach of the agreement or other specified obligations therein, in each case, that remains uncured for 90 days after the date that it is provided with written notice of such breach by either university.

In consideration for the rights granted to us under the License Agreement, we issued UMD and Duke shares of our common stock.

Option Agreement with Duke University

In July 2016, we entered into an option agreement with Duke, which was subsequently amended in December 2020 and March 2021 (as amended, the "Duke Option Agreement"), under which we obtained the right to add Duke's interests in certain patents or other intellectual property to the License Agreement, including if they were developed by Jungsang Kim, Christopher Monroe, a professor at Duke and our former Chief Scientist, or Kenneth Brown, a professor at Duke, or by individuals under their respective supervision and such patents or intellectual property relates to the field of quantum information processing devices. We have added patents and other intellectual property to the License Agreement through the Duke Option Agreement. Pursuant to the terms of the Duke Option Agreement, we issued Duke shares of common stock, including shares of common stock issued pursuant to the amendment of the Duke Option Agreement. The Duke Option Agreement terminates in July 2026.

Human Capital Management

Our employees are critical to our success. As of December 31, 2024, we had a 407 person-strong team of quantum hardware and software developers, engineers, and general and administrative staff. Approximately 31% of our full-time employees are based in the greater Washington, D.C. metropolitan area and approximately 35% of our full-time employees are based in the greater Seattle, WA metropolitan area. We also engage a small number of consultants and contractors to supplement our permanent workforce. A majority of our employees are engaged in research and development and related functions, and a significant portion of our research and development employees hold advanced engineering and scientific degrees, including many from the world's top universities.

To date, we have not experienced any work stoppages and maintain good working relationships with our employees. None of our employees are subject to a collective bargaining agreement or are represented by a labor union at this time.

Corporate Information

IonQ, formerly known as dMY Technology Group, Inc. III ("dMY") was incorporated in the state of Delaware in September 2020, and formed as a special purpose acquisition company. Our wholly owned subsidiary, IonQ Quantum, Inc. (formerly known as IonQ, Inc., and referred to as "Legacy IonQ" herein), was incorporated in the state of Delaware in September 2015.

On March 7, 2021, Legacy IonQ entered into an Agreement and Plan of Merger (the "Merger Agreement"), with dMY and Ion Trap Acquisition Inc., a direct, wholly owned subsidiary of dMY (the "Merger Sub"). Pursuant to the Merger Agreement, on September 30, 2021, the Merger Sub was merged with and into Legacy IonQ with Legacy IonQ continuing as the surviving corporation following the merger, becoming a wholly owned subsidiary of dMY and the separate corporate existence of the Merger Sub ceased (the "Business Combination"). Commensurate with the closing of the Business Combination, dMY changed its name to IonQ, Inc. and Legacy IonQ changed its name to IonQ Quantum, Inc.

Our principal executive offices are located at 4505 Campus Drive, College Park, MD 20740, and our telephone number is (301) 298-7997. Our corporate website address is *www.ionq.com*. Information contained on or accessible through our website is not a part of this Annual Report, and the inclusion of our website address in this Annual Report is an inactive textual reference only.

Available Information

Our website address is *www.ionq.com*. We make available on our website, free of charge, our Annual Reports, our Quarterly Reports on Form 10-Q and our Current Reports on Form 8-K and any amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act, as soon as reasonably practicable after we electronically file such material with, or furnish it to, the Securities and Exchange Commission (the "SEC"). The SEC maintains a website that contains reports, proxy and information statements and other information regarding our filings at *www.sec.gov*. The information found on our website is not incorporated by reference into this Annual Report or any other report we file with or furnish to the SEC.

Item 1A. Risk Factors.

RISK FACTORS

Investing in our securities involves a high degree of risk. Before you make a decision to buy our securities, in addition to the risks and uncertainties described above under "Cautionary Note Regarding Forward-Looking Statements," you should carefully consider the risks and uncertainties described below together with all of the other information contained in this Annual Report. If any of the events or developments described below were to occur, our business, prospects, operating results and financial condition could suffer materially, the trading price of our common stock could decline, and you could lose all or part of your investment. The risks and uncertainties described below are not the only ones we face. Additional risks and uncertainties not presently known to us or that we currently believe to be immaterial may also adversely affect our business.

Summary Risk Factors

Our business is subject to a number of risks of which you should be aware before making a decision to invest in our securities. These risks include, among others, the following:

- We are an early-stage company and have a limited operating history, which makes it difficult to forecast our future results of operations.
- We have a history of operating losses and expect to incur significant expenses and continuing losses for the near future.
- We may not be able to scale our business quickly enough to meet customer and market demand, which could adversely affect our financial condition and results of operations or cause us to fail to execute on our business strategies.
- We may not manage our growth effectively.
- Our estimates of market opportunity and forecasts of market growth may prove to be inaccurate.
- Our operating and financial results forecast relies in large part upon assumptions and analyses we have developed. If these assumptions or analyses prove to be incorrect, our actual operating results may be materially different from our forecasted results.
- We have not produced a scalable quantum computer and face significant barriers in our attempts to produce quantum computers. If we cannot successfully overcome those barriers, our business will be negatively impacted and could fail.
- We have experienced in the past, and could also suffer future disruptions, outages, defects and other performance and quality problems with our quantum computing systems, our private cloud, or other information systems, our research and development activities, our facilities, our other fixed assets, or with the public cloud, internet, and other infrastructure on which they rely.
- Even if we are successful in developing quantum computing systems and executing our strategy, competitors in the industry may achieve technological breakthroughs that render our quantum computing systems obsolete or inferior to other products.
- We may be negatively impacted by any early obsolescence of our quantum computing technology.
- If our computers fail to achieve a broad quantum advantage, our business, financial condition and future prospects may be harmed.
- The quantum computing and networking industry is competitive on a global scale and we may not be successful in competing in this industry or establishing and maintaining confidence in our long-term business prospects among current and future partners and customers.
- The quantum computing and networking industry is in its early stages and volatile, and if it does not develop, if it develops slower than we expect, if it develops in a manner that does not require use of our quantum computing solutions, if it encounters negative publicity or if our solution does not drive commercial engagement, the growth of our business will be harmed.
- We may not be able to accurately estimate the future supply and demand for our quantum computers, which could result in a variety of inefficiencies in our business and hinder our ability to generate revenue. If we fail to accurately predict our manufacturing requirements, we could incur additional costs or experience delays.
- Our systems depend on the use of a particular isotope of an atomic element that provides qubits for our ion trap technology. If we are unable to procure these isotopically enriched atomic samples, or are unable to do so on a timely and

cost-effective basis, and in sufficient quantities, we may incur significant costs or delays, which could negatively affect our operations and business.

- If we cannot successfully execute on our strategy, including in response to changing customer needs and new technologies and other market requirements, or achieve our objectives in a timely manner, our business, financial condition and results of operations could be harmed.
- Our business depends on our customers' abilities to implement useful quantum algorithms and sufficient quantum resources for their business. If they are unable to do so, including due to their algorithmic challenge or other technical or personnel dilemmas, our growth may be negatively impacted.
- Much of our revenue is concentrated in a few customers, and if we lose any of these customers through contract terminations, acquisitions, or other means, our revenue may decrease substantially.
- Our future growth and success depends in part on our ability to sell effectively to government entities and large enterprises.
- Contracts with domestic and international government and state agencies are subject to a number of challenges and risks.
- If our information technology systems, data, or physical facilities, or those of third parties upon which we rely, are or were compromised, we could experience adverse business consequences resulting from such compromise.
- Because our success depends, in part, on our ability to expand sales internationally, our business will be susceptible to risks associated with international operations.
- Contracts with government entities subject us to risks, including early termination, audits, investigations, sanctions and penalties.
- If we are unable to obtain and maintain patent protection for our products and technology, or if the scope of the patent protection obtained is not sufficiently broad or robust, our competitors could develop and commercialize products and technology similar or identical to ours, and our ability to successfully commercialize our products and technology may be adversely affected. Moreover, our trade secrets could be compromised, which could cause us to lose the competitive advantage resulting from these trade secrets.
- We 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 rights for the U.S. government or imposing certain obligations on us, such as a license to the U.S. government covered by such intellectual property, "march-in" rights, certain reporting requirements and a preference for U.S.-based companies, and compliance with such regulations may limit our exclusive rights and our ability to contract with non-U.S. manufacturers.
- If our operating and financial performance in any given period does not meet the guidance provided to the public or the expectations of investment analysts, the market price of our common stock may decline.
- Our quarterly operating results may fluctuate significantly and could fall below the expectations of securities analysts and investors due to several factors, some of which are beyond our control, resulting in a decline in our stock price.

Risks Related to Our Financial Condition and Status as an Early-Stage Company

We are an early-stage company and have a limited operating history, which makes it difficult to forecast our future results of operations.

As a result of our limited operating history, our ability to accurately forecast our future results of operations is limited and subject to a number of uncertainties, including our ability to plan for and model future growth. Our ability to generate revenues will largely be dependent on our ability to develop and produce quantum computers with increasing numbers of algorithmic qubits and to connect those quantum computers via quantum networks. As a result, our scalable business model has not been formed and it is possible that neither our December 2020 forward-looking technical roadmap nor our latest technical roadmap will be realized as quickly as expected, or even at all. The development of our scalable business model will likely require the incurrence of a substantially higher level of costs than incurred to date, while our revenues will not substantially increase until more powerful,

scalable computers are produced, which requires a number of technological advancements that may not occur on the currently anticipated timetable or at all. As a result, our historical results should not be considered indicative of our future performance. Further, in future periods, our growth could slow or decline for a number of reasons, including but not limited to slowing demand for our service offerings, increased competition, changes to technology, inability to scale up our technology, a decrease in the growth of the overall market, or our failure, for any reason, to continue to take advantage of growth opportunities.

We have also encountered, and will continue to encounter, risks and uncertainties frequently experienced by growing companies in rapidly changing industries. If our assumptions regarding these risks and uncertainties and our future growth are incorrect or change, or if we do not address these risks successfully, our operating and financial results could differ materially from our expectations, and our business could suffer. Our success as a business ultimately relies upon fundamental research and development breakthroughs in the coming years and decade. There is no certainty these research and development milestones will be achieved as quickly as expected, or even at all.

We have a history of operating losses and expect to incur significant expenses and continuing losses for the near future.

We have historically experienced net losses from operations. For the year ended December 31, 2024, we incurred a loss from operations of $232.5 million. As of December 31, 2024, we had an accumulated deficit of $683.7 million. We believe that we will continue to incur losses each year until at least the time we begin significant production and delivery of our quantum computers. Even with significant production, such production may never become profitable.

We expect to continue to incur operating losses for the near future as we, among other things, continue to incur significant expenses in connection with the design, development and construction of our quantum computers, and as we expand our research and development activities, invest in manufacturing capabilities, build up inventories of components for our quantum computers, increase our sales and marketing activities, develop our distribution infrastructure, and increase our general and administrative functions to support our growing operations and costs of being a public company. We may find that these efforts are more expensive than we currently anticipate or that these efforts may not result in revenues, which would further increase our losses. If we are unable to achieve and/or sustain profitability, or if we are unable to achieve the growth that we expect from these investments, it could have a material adverse effect on our business, financial condition or results of operations. Our business model is unproven and may never allow us to cover our costs.

We may not be able to scale our business quickly enough to meet customer and market demand, which could adversely affect our financial condition and results of operations or cause us to fail to execute on our business strategies.

In order to grow our business, we will need to continually evolve and scale our business and operations to meet customer and market demand. Quantum computing technology has never been sold at large-scale commercial levels. Evolving and scaling our business and operations places increased demands on our management as well as our financial and operational resources to:

- effectively manage organizational change;
- design scalable processes;
- accelerate and/or refocus research and development activities;
- expand manufacturing, supply chain and distribution capacity;
- increase sales and marketing efforts;
- broaden customer-support and services capabilities;
- maintain or increase operational efficiencies;
- scale support operations in a cost-effective manner;
- implement appropriate operational and financial systems; and
- maintain effective financial disclosure controls and procedures.

Commercial production of quantum computers or networks may never occur. We have no experience in producing large quantities of our products and are currently constructing advanced generations of our products. As noted above, there are significant technological and logistical challenges associated with developing, producing, marketing, selling and distributing products in the advanced technology industry, including our products, and we may not be able to resolve all of the difficulties that may arise in a timely or cost-effective manner, or at all. We may not be able to cost-effectively manage production at a scale or quality consistent with customer demand in a timely or economical manner.

Our ability to scale is dependent also upon components we must source from the optical, mechanical, electronics and semiconductor industries. Shortages or supply interruptions in any of these components will adversely impact our ability to deliver revenues.

The stability of ion traps may prove poorer than hoped, or more difficult to manufacture. It may also prove more difficult or even impossible to reliably entangle/connect ion traps together. Both of these factors would adversely impact scalability and costs of the ion trap system.

If commercial production of our quantum computers and networks commences, our products may contain defects in design and manufacture that may cause them to not perform as expected or that may require repair, recalls and design changes. Our quantum computers are inherently complex and incorporate technology and components that have not been used for other applications and that may contain defects and errors, particularly when first introduced. We have a limited frame of reference from which to evaluate the long-term performance of our products. There can be no assurance that we will be able to detect and fix any defects in our quantum computers or networks prior to the sale to potential customers. If our products fail to perform as expected, customers may delay deliveries, terminate further orders or initiate product recalls, each of which could adversely affect our sales and brand and could adversely affect our business, prospects and results of operations.

If we cannot evolve and scale our business and operations effectively, we may not be able to execute our business strategies in a cost-effective manner and our business, financial condition and results of operations could be adversely affected.

We may not manage our growth effectively.

If we fail to manage growth effectively, our business, results of operations and financial condition could be harmed. We anticipate that a period of significant expansion will be required to address potential growth. This expansion will place a significant strain on our management, operational and financial resources. Expansion will require significant cash investments and management resources and there is no guarantee that they will generate additional sales of our products or services, or that we will be able to avoid cost overruns or be able to hire additional personnel to support them. In addition, we will also need to ensure our compliance with regulatory requirements in various jurisdictions applicable to the sale, installation and servicing of our products. To manage the growth of our operations and personnel, we must establish appropriate and scalable operational and financial systems, procedures and controls and establish and maintain a qualified finance, administrative and operations staff. We may be unable to acquire the necessary capabilities and personnel required to manage growth or to identify, manage and exploit potential strategic relationships and market opportunities.

Our management has limited experience in operating a public company.

Our executive officers have limited experience in the management of a publicly traded company. Our management team may not successfully or effectively manage reporting obligations under federal securities laws. Their limited experience in dealing with the increasingly complex laws pertaining to public companies could be a significant disadvantage in that it is likely that an increasing amount of their time may be devoted to these activities, which will result in less time being devoted to our management and growth. We have and we may be required to continue to expand our employee base and hire additional employees to support our operations as a public company, which will continue to increase our operating costs in future periods.

Our estimates of market opportunity and forecasts of market growth may prove to be inaccurate.

Market opportunity estimates and growth forecasts, including those we have generated, are subject to significant uncertainty and are based on assumptions and estimates that may not prove to be accurate. The variables that go into the calculation of our market opportunity are subject to change over time, and there is no guarantee that any particular number or percentage of companies covered by our market opportunity estimates will purchase our products at all or generate any particular level of revenue for us. In addition, alternatives to quantum computing may present themselves, which could substantially reduce the market for quantum computing services. Any expansion in our market depends on a number of factors, including the cost, performance, and perceived value associated with quantum computing solutions.

The methodology and assumptions used to estimate market opportunities may differ materially from the methodologies and assumptions previously used to estimate the total addressable market. To estimate the size of our market opportunities and our growth rates, we have relied on market reports by leading research and consulting firms. These estimates of the total addressable market and growth forecasts are subject to significant uncertainty, are based on assumptions and estimates that may not prove to be accurate and are based on data published by third parties that we have not independently verified. Advances in classical computing may prove more robust for longer than currently anticipated. This could adversely affect the timing of any quantum advantage being achieved, if at all.

Even if the market in which we compete achieves the forecasted growth, our business could fail to grow at similar rates, if at all.

Our success will depend upon our ability to expand, scale our operations, and increase our sales capability. Even if the market in which we compete meets the size estimates and growth forecasted, our business could fail to grow at similar rates, if at all.

Our growth is dependent upon our ability to successfully scale up manufacturing of our products in sufficient quantity and quality, in a timely or cost-effective manner. Our growth is also dependent upon our ability to successfully market and sell quantum computing and networking technology. We do not have experience with the mass distribution and sale of quantum computing and networking technology. Our growth and long-term success will depend upon the development of our sales and delivery capabilities.

Unforeseen issues associated with scaling up and constructing quantum computing and networking technology at commercially viable levels, and selling our technology, could negatively impact our business, financial condition and results of operations.

Moreover, because of our unique technology, our customers will require particular support and service functions, some of which are not currently available. If we experience delays in adding such support capacity or servicing our customers efficiently, or experience unforeseen issues with the reliability of our technology, it could overburden our servicing and support capabilities. Similarly, increasing the number of our customers, products or services, for example by entering into government contracts and expanding to new geographies, has required and may continue to require us to rapidly increase the availability of these services. Failure to adequately support and service our customers may inhibit our growth and ability to expand computing targets globally. There can be no assurance that our projections on which such targets are based will prove accurate or that the pace of growth or coverage of our customer infrastructure network will meet customer expectations. Failure to grow at rates similar to that of the quantum computing and networking industry may adversely affect our operating results and ability to effectively compete within the industry.

Our operating and financial results forecast relies in large part upon assumptions and analyses we have developed. If these assumptions or analyses prove to be incorrect, our actual operating results may be materially different from our forecasted results.

Our projected financial and operating information reflect current estimates of future performance, which may never occur. Whether actual operating and financial results and business developments will be consistent with our expectations and assumptions as reflected in our forecasts depends on a number of factors, many of which are outside our control, including, but not limited to:

- success and timing of development activity;
- customer acceptance of our quantum computing and networking systems;
- breakthroughs in classical computing or other computing technologies that could eliminate the advantages of quantum computing and networking systems rendering them less practical to customers;
- competition, including from established and future competitors;
- whether we can obtain sufficient capital to sustain and grow our business;
- our ability to manage our growth;
- our ability to expand our sales into international markets;
- our ability to retain existing key management, integrate recent hires and attract, retain and motivate qualified personnel; and
- the overall strength and stability of domestic and international economies.

Unfavorable changes in any of these or other factors, many of which are beyond our control, could materially and adversely affect our business, financial condition and results of operations.

We may need additional capital to pursue our business objectives and respond to business opportunities, challenges or unforeseen circumstances, and we cannot be sure that additional financing will be available.

Our business and our future plans for expansion are capital-intensive and the specific timing of cash inflows and outflows may fluctuate substantially from period to period. Our operating plan may change because of factors currently unknown, and we may need to seek additional funds sooner than planned, through public or private equity or debt financings or other sources, such as strategic collaborations. Such financings may result in dilution to our stockholders, issuance of securities with priority as to liquidation and dividend and other rights more favorable than common stock, imposition of debt covenants and repayment obligations or other restrictions that may adversely affect our business. In addition, we may seek additional capital due to favorable market conditions or

strategic considerations even if we believe that we have sufficient funds for current or future operating plans. Weakness and volatility in capital markets and the economy, in general or as a result of bank failures or macroeconomic conditions such as high inflation and interest rates, could limit our access to capital markets and increase our costs of borrowing. There can be no assurance that financing will be available to us on favorable terms, or at all. The inability to obtain financing when needed may make it more difficult for us to operate our business or implement our growth plans.

Our ability to use net operating loss carryforwards and other tax attributes may be limited.

We have incurred losses during our history, do not expect to become profitable in the near future and may never achieve profitability. To the extent that we continue to generate losses, unused losses will carry forward to offset future taxable income, if any, until such unused losses expire, if at all. As of December 31, 2024, we had U.S. federal and state net operating loss carryforwards of approximately $224.2 million and $148.1 million, respectively.

Our net operating loss carryforwards and other tax attributes are subject to review and possible adjustment by the Internal Revenue Service, and state tax authorities. Under Sections 382 and 383 of the Internal Revenue Code of 1986, as amended (the "Code"), our U.S. federal net operating loss carryforwards and other tax attributes may become subject to an annual limitation in the event of certain cumulative changes in the ownership of our stock. An "ownership change" pursuant to Section 382 of the Code generally occurs if one or more stockholders or groups of stockholders who own at least 5% of a company's stock increase their ownership by more than 50 percentage points over their lowest ownership percentage within a rolling three-year period. Our ability to utilize our net operating loss carryforwards and other tax attributes to offset future taxable income or tax liabilities may be limited as a result of ownership changes, including changes in connection with our Business Combination with dMY or other transactions. Similar rules may apply under state tax laws. We have not yet determined the amount of the cumulative change in our ownership resulting from our Business Combination with dMY or other transactions, or any resulting limitations on our ability to utilize our net operating loss carryforwards and other tax attributes. If we earn taxable income, such limitations could result in increased future income tax liability and our future cash flows could be adversely affected. We have recorded a full valuation allowance related to our net operating loss carryforwards and other deferred tax assets due to the uncertainty of the ultimate realization of the future benefits of those assets.

Risks Related to Our Business and Industry

We have not produced a scalable quantum computer and face significant barriers in our attempts to produce quantum computers. If we cannot successfully overcome those barriers, our business will be negatively impacted and could fail.

Producing quantum computers is a difficult undertaking. There are significant research, development, and manufacturing challenges that we must overcome to build our quantum computers. We are still in the development stage and face significant challenges in developing quantum computers with sufficient performance and scale to meet the requirements of commercial use-cases and in producing quantum computers in commercial volumes. Some of the development challenges that could prevent the introduction of our quantum computers include, but are not limited to, failure to find scalable ways to flexibly manipulate qubits, failure to increase their number, failure to transition quantum systems to leverage low-cost, commodity optical technology, and failure to realize multicore and multiple QPU quantum computer technology.

Additional development challenges we face include:

- gate fidelity, error correction and miniaturization may not commercialize from the lab and scale as hoped or at all;
- it could prove more challenging and take materially longer than expected to operate gates within a single ion trap with higher throughput while maintaining gate fidelity;
- it could take longer to tune the qubits in a single ion trap, as well as preserve the stability of the qubits within a trap as we seek to optimize the total number of qubits within one trap;
- the gate speed in our technology could prove more difficult to improve than expected;
- the Reconfigurable Multi-Core Quantum Architecture (RMQA) could prove to be more challenging to develop than expected. This would limit our ability to scale ion traps beyond single-core operation;
- the photonic interconnect technology used to connect ion traps could prove more challenging and take longer to perfect than currently expected. This would limit our ability to scale to a sufficiently large number of qubits in a single system or network systems together;
- it could take longer to incorporate modular architectures for additional cross-processor computational strength than currently expected, limiting our ability to realize the benefits of multicore technology; and

- the scaling of fidelity with qubit number could prove poorer than expected, limiting our ability to successfully run larger circuits or achieve commercial advantage.

In addition, we will need to develop the manufacturing process necessary to make these quantum computers in high volume. We have not yet validated a manufacturing process nor acquired the tools, processes, or support functions necessary to produce high volumes of our quantum computers that meet all commercial requirements. If we are not able to overcome these manufacturing hurdles in building our quantum computers, our business is likely to fail.

Even if we complete development and achieve volume production of our quantum computers, if the cost, performance characteristics or other specifications of the quantum computer fall short of our projections, our business, financial condition and results of operations would be adversely affected.

We have experienced in the past, and could also suffer future disruptions, outages, defects and other performance and quality problems with our quantum computing systems, our private cloud, or other information systems, our research and development activities, our facilities, our other fixed assets, or with the public cloud, internet, and other infrastructure on which they rely.

Our business depends on our quantum computing systems to be available. We have experienced, and may in the future further experience, disruptions, outages, defects and other performance and quality problems with our systems. We have also experienced, and may in the future further experience, disruptions, outages, defects and other performance and quality problems with the public cloud, internet, private data center providers, facilities in which we build and deploy our systems and technology, and other infrastructure like utility power, water supply, air conditioning, air compression, and other inputs on which our systems and their supporting services rely. These problems can be caused by a variety of factors, including software or firmware updates, vulnerabilities and defects in proprietary software and open-source software, hardware components, human error or misconduct, capacity constraints, design limitations, denial of service attacks or other security-related incidents, foreign objects or debris, weather, construction, supply chain events, or accidents and other force majeure. We do not have a contractual right with our public cloud providers that compensates us for any losses due to availability interruptions in the public cloud.

Any disruptions, outages, defects and other performance and quality problems with our quantum computing systems or with the public cloud, internet, and other information systems and infrastructure on which they rely, could result in reduced use of our systems, increased expenses, delayed delivery under our contractual commitments, required provision of service credits, and harm to our brand and reputation, any of which could have a material adverse effect on our business, financial condition and results of operations.

Even if we are successful in developing quantum computing systems and executing our strategy, competitors in the industry may achieve technological breakthroughs that render our quantum computing systems obsolete or inferior to other products.

Our continued growth and success depend on our ability to innovate and develop quantum computing and networking technology in a timely manner and effectively market these products. Without timely innovation and development, our quantum computing solutions could be rendered obsolete or less competitive by changing customer preferences or because of the introduction of a competitor's newer technologies. We believe that many competing technologies will require a technological breakthrough in one or more problems related to science, fundamental physics or manufacturing. While it is uncertain whether such technological breakthroughs will occur in the next several years, that does not preclude the possibility that such technological breakthroughs could eventually occur. Any technological breakthroughs that render our technology obsolete or inferior to other products could have a material effect on our business, financial condition or results of operations.

We may be negatively impacted by any early obsolescence of our quantum computing technology.

We depreciate the cost of our quantum computing systems over their expected useful lives. However, product cycles or quantum computing systems may change periodically due to changes in innovation in the industry, and we may decide to update our products or production processes more quickly than expected, resulting in obsolescence of all or part of our quantum computing systems prior to the end of the previously expected useful life. Moreover, we may need to alter the way in which we deliver our products due to changes in engineering and production expertise and efficiency.

If our quantum computing systems are not compatible with some or all industry-standard software and hardware in the future, our business could be harmed.

Programming for quantum computing requires unique tools, software, hardware, and development environments. We have focused our efforts on creating quantum computing hardware, the system control platform for such hardware and a suite of low-level software programs that optimize execution of quantum algorithms on our hardware. Further up the stack, we rely on third parties to create and advance software, standards, specifications, applications, hardware and services that enable these systems to integrate into

various environments and be utilized towards various customer use cases. Full utilization of our quantum computing solutions may depend on these third-party software, standards, specifications, applications, hardware and services, which may not be compatible with our quantum computing solutions and their development, or may not be available to us or our customers on commercially reasonable terms, or at all, which could harm our business.

If our customers are unable to achieve compatibility between other software and hardware and our hardware, it could impact our relationships with such customers or with customers, generally, if the incompatibility is more widespread. In addition, the mere announcement of an incompatibility problem relating to our products with higher level software tools could cause us to suffer reputational harm and/or lead to a loss of customers. Any adverse impacts from the incompatibility of our quantum computing solutions could adversely affect our business, operating results and financial condition.

We may be unable to reduce the cost per qubit sufficiently, which may prevent us from pricing our quantum systems competitively.

Our projections are dependent on the cost per qubit decreasing over the next several years as our quantum computers advance. These cost projections are based on economies of scale due to demand for our computer systems, technological innovation and negotiations with third-party parts suppliers. If these cost savings do not materialize, the cost per qubit may be higher than projected, making our quantum computing solution less competitive than those produced by our competitors, which could have a material adverse effect on our business, financial condition or results of operations.

If our computers fail to achieve a broad quantum advantage, our business, financial condition and future prospects may be harmed.

Quantum advantage refers to the moment when a quantum computer can compute faster than traditional computers, while quantum supremacy is achieved once quantum computers are powerful enough to complete calculations that traditional supercomputers cannot perform at all. Broad quantum advantage is when quantum advantage is seen in many applications and developers prefer quantum computers to a traditional computer. No current quantum computers, including our quantum hardware, have reached a broad quantum advantage, and they may never reach such advantage. Achieving a broad quantum advantage will be critical to the success of any quantum computing company, including us. However, achieving quantum advantage would not necessarily lead to commercial viability of the technology that accomplished such advantage, nor would it mean that such system could outperform classical computers in tasks other than the one used to determine a quantum advantage.

Quantum computing technology, including broad quantum advantage, may take decades to be realized, if ever. If we cannot develop quantum computers that have quantum advantage, customers may not continue to purchase our products and services. If other companies' quantum computers reach a broad quantum advantage prior to the time ours reaches such capabilities, it could lead to a loss of customers. If any of these events occur, it could have a material adverse effect on our business, financial condition or results of operations.

An element of our business is currently dependent upon our relationship with our cloud providers. There are no assurances that we will be able to commercialize quantum computers from our relationships with cloud providers.

We currently offer our QCaaS on public clouds provided by AWS's Amazon Braket, Microsoft's Azure Quantum, and the Google Cloud Marketplace. The companies that own these public clouds have internal quantum computing efforts that are competitive to our technology. There is risk that one or more of these public cloud providers could use their respective control of their public clouds to embed innovations or privileged interoperating capabilities in competing products, bundle competing products, provide us with unfavorable pricing, leverage their public cloud customer relationships to exclude us from opportunities, and treat us and our end users differently with respect to terms and conditions or regulatory requirements than they would treat their similarly situated customers. Further, they have the resources to acquire or partner with existing and emerging providers of competing technology and thereby accelerate adoption of those competing technologies. All of the foregoing could make it difficult or impossible for us to provide products and services that compete favorably with those of the public cloud providers.

Any material change in our contractual and other business relationships with our public cloud providers could result in harm to our brand and reputation and reduced use of our systems, which could have a material adverse effect on our business, financial condition and results of operations.

The quantum computing and networking industry is competitive on a global scale and we may not be successful in competing in this industry or establishing and maintaining confidence in our long-term business prospects among current and future partners and customers.

The markets in which we operate are rapidly evolving and highly competitive. As these markets continue to mature and new technologies and competitors enter such markets, we expect competition to intensify. Our current competitors include (among others):

- large, well-established tech companies that generally compete in all of our markets, including Amazon, Google, IBM, Intel, and Microsoft;
- countries such as China, Russia, Australia, Canada, the United Kingdom, and certain countries in the European Union;
- less-established public and private companies with competing technology, including companies located outside the United States; and
- new or emerging entrants seeking to develop competing technologies.

We compete based on various factors, including technology, price, performance, multi-cloud availability, brand recognition and reputation, customer support and differentiated capabilities, including ease of administration and use, scalability and reliability, data governance and security. Many of our competitors have substantially greater brand recognition, customer relationships, and financial, technical and other resources, including an experienced sales force and sophisticated supply chain management. They may be able to respond more effectively than us to new or changing opportunities, technologies, standards, customer requirements and buying practices or to cross-subsidize their quantum offerings from their other higher margin operations. In addition, many countries are focused on developing quantum solutions either in the private or public sector and may subsidize quantum computers or quantum networks, which may make it difficult for us to compete. Many of these competitors do not face the same challenges we do in growing our business. In addition, other competitors might be able to compete with us by bundling their other products in a way that does not allow us to offer a competitive solution.

Additionally, we must be able to achieve our objectives in a timely manner or quantum computing and networking may lose ground to competitors, including competing technologies. Because there are a large number of market participants, including certain sovereign nations, focused on developing quantum computing and networking technology, we must dedicate significant resources to achieving any technical objectives on the timelines established by our management team. Any failure to achieve objectives in a timely manner could adversely affect our business, operating results and financial condition.

For all of these reasons, competition may negatively impact our ability to maintain and grow consumption of our platform or put downward pressure on our prices and gross margins, any of which could materially harm our reputation, business, results of operations, and financial condition.

The quantum computing and networking industry is in its early stages and volatile, and if it does not develop, if it develops slower than we expect, if it develops in a manner that does not require use of our quantum computing solutions, if it encounters negative publicity or if our solution does not drive commercial engagement, the growth of our business will be harmed.

The nascent market for quantum computers and networks is still rapidly evolving, characterized by rapidly changing technologies, competitive pricing and competitive factors, evolving government regulation and industry standards, and changing customer demands and behaviors. If the market for quantum computers and networks in general does not develop as expected, or develops more slowly than expected, our business, prospects, financial condition and operating results could be harmed.

In addition, our growth and future demand for our products is highly dependent upon the adoption of quantum computers and networks and commercially useful quantum algorithms to run on quantum computers by developers and customers, as well as on our ability to demonstrate the value of quantum computing to our customers. Delays in future generations of our quantum computers or technical failures at other quantum computing and networking companies could limit market acceptance of our solution. Negative publicity concerning our solution or the quantum computing and networking industry as a whole could limit market acceptance of our solution. We believe quantum computing will solve many large-scale problems. However, such problems may never be solvable by quantum computing technology, or may only be solvable by systems that are more technologically mature than we currently expect. If our clients and partners do not perceive the benefits of our solution, or if our solution does not drive customer engagement, then our market may not develop at all, or it may develop slower than we expect. If any of these events occur, it could have a material adverse effect on our business, financial condition or results of operations. If progress towards quantum advantage ever slows relative to expectations, it could adversely impact revenues and customer confidence to continue to pay for testing, access and "quantum readiness." This would adversely affect revenues in the period before quantum advantage.

We have and may continue to face supply chain issues that could delay the introduction of our product and negatively impact our business and operating results.

We are reliant on third-party suppliers, including sole source suppliers, for components necessary to develop and manufacture our quantum computing and networking solutions. As our business grows, we must continue to scale and adapt our supply chain or it could have an adverse impact on our business. Any of the following factors (and others) could have an adverse impact on the availability of these components necessary to our business:

- our inability to enter into agreements with suppliers on commercially reasonable terms, or at all;
- inability of suppliers to mature their operations in line with our growth and to meet our evolving requirements;
- a significant increase in the price of one or more components, including due to industry consolidation occurring within one or more component supplier markets or as a result of decreased production capacity at manufacturers;
- any reductions or interruption in supply, including disruptions on our global supply chain as a result of the global chip shortage, geopolitical tensions in and around Ukraine, Israel and other areas of the world and any indirect effects thereof;
- financial problems of either manufacturers or component suppliers;
- intentional sabotage by a malicious actor or actors;
- significantly increased raw material costs and other expenses associated with our business;
- difficulty obtaining raw materials that meet our quality standards;
- significantly increased freight charges, disruptions in shipping or reduced availability of freight transportation;
- imposition of, or increase in, tariffs, trade protection measures, or import and export controls by the United States or other countries;
- reduced access to raw materials due to suppliers entering into exclusivity arrangements with our competitors;
- other factors beyond our control or that we do not presently anticipate, could also affect our suppliers' ability to deliver components to us on a timely basis;
- a failure to develop our supply chain management capabilities and recruit and retain qualified professionals;
- a failure to adequately authorize procurement of inventory by our contract manufacturers; or
- a failure to appropriately cancel, reschedule, or adjust our requirements based on our business needs.

We have experienced supply chain issues in the past. If any of the aforementioned factors were to materialize, it could cause us to delay or halt production of our quantum computing and networking solutions and/or entail higher manufacturing costs, any of which could materially adversely affect our business, operating results, and financial condition and could materially damage customer relationships.

We may not be able to accurately estimate the future supply and demand for our quantum computers, which could result in a variety of inefficiencies in our business and hinder our ability to generate revenue. If we fail to accurately predict our manufacturing requirements, we could incur additional costs or experience delays.

It is difficult to predict our future revenues and appropriately budget for our expenses, and we may have limited insight into trends that may emerge and affect our business. From time to time we have been required to provide, and we anticipate being required to provide more consistently in the future, forecasts of our demand to our current and future suppliers prior to the scheduled delivery of products to potential customers. Currently, there is very little historical basis for making judgments on the demand for our quantum computers or our ability to design, develop, manufacture, and deliver quantum computers, or our profitability, if any, in the future. If we overestimate our requirements, our suppliers may have excess inventory, which indirectly would increase our costs. If we underestimate our requirements, our suppliers may have inadequate inventory, which could interrupt manufacturing of our products and result in delays in shipments and revenues. In addition, lead times for materials and components that our suppliers order may vary significantly and depend on factors such as the specific supplier, contract terms and demand for each component at a given time. If we fail to order sufficient quantities of product components in a timely manner, the delivery of quantum computers and related compute time to our potential customers could be delayed. We have previously failed, and may in the future fail, to accurately forecast customer demand, which resulted in, and may in the future result in, an excess or obsolescence of materials and supplies. Excess or obsolete materials and supplies may result in write-downs or write-offs. If we fail to effectively manage our forecasted supply and demand and on hand materials and supplies, our results of operations and financial condition could be adversely impacted, and it could result in loss of revenue, increased costs, or delays that could adversely impact customer success.

Our systems depend on the use of a particular isotope of an atomic element that provides qubits for our ion trap technology. If we are unable to procure these isotopically enriched atomic samples, or are unable to do so on a timely and cost-effective basis, and in sufficient quantities, we may incur significant costs or delays, which could negatively affect our operations and business.

There are limited suppliers to sources of isotopically enriched materials that may be necessary for the production of our ion trap technology. We currently purchase such materials through the National Isotope Development Center managed by the U.S. Department of Energy Isotope Program. We do not have any supplier agreements with the U.S. Department of Energy, and purchase the materials through a standard ordering process. While we are currently looking to engage additional suppliers, there is no guarantee we will be able to establish or maintain relationships with such additional suppliers on terms satisfactory to us. Reliance on any single supplier increases the risks associated with being unable to obtain the necessary atomic samples because the supplier may have laboratory constraints, can be subject to unanticipated shutdowns and/or may be affected by natural disasters and other catastrophic events. Some of these factors may be completely out of our and our suppliers' control. Failure to acquire sufficient quantities of the necessary isotopically enriched atomic samples in a timely or cost-effective manner could materially harm our business.

Our products may not achieve market success, but will still require significant costs to develop.

We believe that we must continue to dedicate significant resources to our research and development efforts before knowing whether there will be market acceptance of our quantum computing and networking technologies. Furthermore, the technology for our products is new, and the performance of these products is uncertain. Our quantum computing and networking technologies could fail to attain sufficient market acceptance, if at all, for many reasons, including:

- pricing and the perceived value of our systems relative to its cost;
- delays in releasing quantum computers with sufficient performance and scale to the market;
- failure to produce products of consistent quality that offer functionality comparable or superior to existing or new products;
- ability to produce products fit for their intended purpose;
- failures to accurately predict market or customer demands;
- defects, errors or failures in the design or performance of our quantum computing systems;
- negative publicity about the performance or effectiveness of our systems;
- strategic reaction of companies that market competitive products; and
- the introduction or anticipated introduction of competing technology.

To the extent we are unable to effectively develop and market a quantum computing system to address these challenges and attain market acceptance, our business, operating results and financial condition may be adversely affected.

If we cannot successfully execute on our strategy, including in response to changing customer needs and new technologies and other market requirements, or achieve our objectives in a timely manner, our business, financial condition and results of operations could be harmed.

The quantum computing and networking market is characterized by rapid technological change, changing user requirements, uncertain product lifecycles and evolving industry standards. We believe that the pace of innovation will continue to accelerate as technology changes and different approaches to quantum computing mature on a broad range of factors, including system architecture, error correction, performance and scale, integration with classical computing resources, ease of programming, user experience, markets addressed, types of data processed, and data governance and regulatory compliance. Our future success depends on our ability to continue to innovate and increase customer adoption of our quantum computers and networks. If we are unable to enhance our quantum computing system to keep pace with these rapidly evolving customer requirements, or if new technologies emerge that are able to deliver competitive products at lower prices, more efficiently, with better functionality, more conveniently, or more securely than our platform, our business, financial condition and results of operations could be adversely affected.

If we are unable to maintain our current strategic partnerships or we are unable to develop future collaborative partnerships, our future growth and development could be negatively impacted.

We have entered into, and may enter into, strategic partnerships to develop and commercialize our current and future research and development programs with other companies to accomplish one or more of the following:

- obtain expertise in relevant markets;

- obtain sales and marketing services or support;
- obtain equipment and facilities;
- develop relationships with potential future customers; and
- generate revenue.

We may not be successful in establishing or maintaining suitable partnerships, and we may not be able to negotiate collaboration agreements having terms satisfactory to us, or at all. Failure to make or maintain these arrangements or a delay or failure in a collaborative partner's performance under any such arrangements could harm our business and financial condition.

Our business depends on our customers' abilities to implement useful quantum algorithms and sufficient quantum resources for their business. If they are unable to do so, including due to their algorithmic challenge or other technical or personnel dilemmas, our growth may be negatively impacted.

We have entered into, and may enter into, contracts, partnerships and other arrangements with customers to develop, test and run quantum algorithms specific to their business. The success of these contracts and partnerships is dependent on our customer's ability to identify, implement, and realize useful and scalable algorithms for their portfolio at a speed commensurate with the pace of hardware, software, and technological development. These arrangements are also dependent on the availability of time and resources to develop and optimize these algorithms. The development and optimization of these algorithms is reliant on employing sufficient talent familiar with quantum computing and quantum networking, unique skills that require special training and education. If the market fails to train a sufficient number of engineers, researchers and other key quantum personnel, our customers may not find sufficient talent to partner with us to solve these problems. To the extent our customers are unable to effectively develop or utilize resources to advance algorithmic-use cases, our business, operating results and financial condition may be adversely impacted.

We are highly dependent on our key employees who have specialized knowledge, and our ability to attract and retain senior management and other key employees is critical to our success.

Our future success is highly dependent on our ability to attract and retain our executive officers, key employees and other qualified personnel, including our employees who have specialized knowledge and our employees from acquired businesses. We have experienced in the past, and as we build our brand and become more well known, there is increased risk that we may further experience in the future, competitors or other companies hiring our personnel. The loss of the services provided by these individuals could adversely impact the achievement of our business strategy. These individuals could leave our employment at any time, as they are "at will" employees. A loss of one of our key employees, particularly to a competitor, could also place us at a competitive disadvantage. Effective succession planning is important to our long-term success, and failure to ensure effective transfer of knowledge and smooth transitions involving key employees could hinder our strategic planning and execution.

Our future success also depends on our continuing ability to attract, develop, motivate and retain highly qualified and skilled employees. The market for highly skilled workers and leaders in the quantum computing industry is extremely competitive. In particular, hiring qualified personnel specializing in engineering, software development and sales, as well as other technical staff and research and development personnel is critical to our business and the development of our quantum computing and networking systems. Some of these professionals are hard to find and we may encounter significant competition in our efforts to hire them. Many of the other companies with which we compete for qualified personnel have greater financial and other resources than we do. The effective operation of our supply chain, including the acquisition of critical components and materials, the development of our quantum computing and networking technologies, the commercialization of our quantum computing and networking technologies and the effective operation of our managerial and operating systems all depend upon our ability to attract, train and retain qualified personnel in the aforementioned specialties. Additionally, changes in immigration and work permit laws and regulations or the administration or interpretation of such laws or regulations, including changes following the recent U.S. federal elections, could impair our ability to attract and retain highly qualified employees. If we cannot attract, train and retain qualified personnel, in this competitive environment, we may experience delays in the development of our quantum computing and networking technologies and be otherwise unable to develop and grow our business as projected, or even at all.

Much of our revenue is concentrated in a few customers, and if we lose any of these customers through contract terminations, acquisitions, or other means, our revenue may decrease substantially.

We have a high degree of revenue concentration, and we expect to continue to experience significant revenue concentration for the foreseeable future, including increasing revenue concentration among our major customers in the near term. Our customers' demand for our products may fluctuate due to factors beyond our control. A disruption in our relationship with any of our customers could adversely affect our business. Our inability to meet our customers' requirements or to qualify our products with them could

adversely impact our revenue. The loss of, or restrictions on our ability to sell to, one or more of our major customers, or any significant reduction in orders from customers could have a material adverse effect on our operating results and financial condition.

Our future growth and success depends in part on our ability to sell effectively to government entities and large enterprises.

Our customers and potential customers include domestic and international government agencies and large enterprises. Therefore, our future success will depend on our ability to effectively sell our products to such customers. Sales to these end-customers involve risks that may not be present (or that are present to a lesser extent) with sales to non-governmental agencies or smaller customers. These risks include, but are not limited to, (i) increased purchasing power and leverage held by such customers in negotiating contractual arrangements with us and (ii) longer sales cycles and the associated risk that substantial time and resources may be spent on a potential end-customer that elects not to purchase our solutions. Sales to government agencies can be priced as fixed fee development contracts, which involve additional risks. Cost-plus and time-and-materials contracts can adversely affect our results of operations and financial condition if our costs do not qualify as allowable costs under applicable regulations. In addition, government contracts generally include the ability of government agencies to terminate early which, if exercised, would result in a lower contract value and lower than anticipated revenues generated by such arrangement. Additionally, such government contracts may limit our ability to do business with foreign governments or prevent us from selling our products in certain countries.

Government agencies and large organizations often undertake a significant evaluation process that results in a lengthy sales cycle. Our contracts with government agencies are typically structured in phases, with each phase subject to satisfaction of certain conditions. As a result, the actual scope of work performed pursuant to any such contracts, in addition to related contract revenue, could be less than total contract value. In addition, product purchases by such organizations are frequently subject to budget constraints, multiple approvals and unanticipated administrative, processing and other delays. Finally, these organizations typically have longer implementation cycles, require greater product functionality and scalability, require a broader range of services, demand that vendors take on a larger share of risks, require acceptance provisions that can lead to a delay in revenue recognition and expect greater payment flexibility. All of these factors can add further risk to business conducted with these potential customers and could lead to lower revenue results than originally anticipated.

Additionally, changes in government spending could have adverse consequences on our financial position, results of operations and business. Our anticipated future revenues from the U.S. government result from contracts awarded under various U.S. government programs. Cost cutting, including through consolidation and elimination of duplicative organizations, has become a major initiative for certain departments within the U.S. government. The funding of our programs is subject to the overall U.S. government budget and appropriation decisions and processes, which are driven by numerous factors, including geo-political events and macroeconomic conditions.

Significant reduction in U.S. government spending could have long-term consequences for our size and structure. In addition, changes in government priorities and requirements could impact the funding, or the timing of funding, of our programs, which could negatively impact our results of operations and financial condition.

Contracts with domestic and international government and state agencies are subject to a number of challenges and risks.

Contracts with domestic and international government and state agencies are subject to a number of challenges and risks. The bidding process for government contracts can be highly competitive, expensive and time-consuming, often requiring significant up front time and expense without any assurance that these efforts will generate revenue.

We also must comply with both local and international laws and regulations relating to the formation, administration, and performance of contracts, which provide public sector customers rights, many of which are not typically found in commercial contracts. Any changes to the government regulations applicable to government contracts could affect our ability to enter into, or the profitability of, contracts with government entities.

In addition, other parties' perceptions of our relationship with the U.S. government could adversely affect our business prospects in certain non-U.S. geographies or with certain non-U.S. governments. Conversely, other parties' perceptions of our relationship with non-U.S. governments or government entities could adversely affect our business prospects with the U.S. government.

Accordingly, our business, financial condition, results of operations, and growth prospects may be adversely affected by certain events or activities, including, but not limited to:

- changes in government fiscal or procurement policies, or decreases in government funding available for procurement of goods and services generally, or for our federal government contracts specifically;
- changes in government programs or applicable requirements;

- restrictions in the grant of personnel security clearances to our employees;
- ability to maintain facility clearances required to perform on classified contracts for U.S. government and foreign government agencies, as applicable;
- changes in the political environment, including before or after a change to the leadership within the government administration, and any resulting uncertainty or changes in policy or priorities and resultant funding;
- changes in the government's attitude towards us as a company or our technology;
- appeals, disputes, or litigation relating to government procurement, including but not limited to bid protests by unsuccessful bidders on potential or actual awards of contracts to us or our partners by the government;
- the adoption of new laws or regulations or changes to existing laws or regulations;
- budgetary constraints, including automatic reductions as a result of "sequestration," operating under continuing resolutions, disruptions from government shutdowns, or similar measures and constraints imposed by any lapses in appropriations for the federal government or certain of its departments and agencies;
- influence by, or competition from, third parties with respect to pending, new, or existing contracts with government customers;
- changes in legal obligations or political or social attitudes with respect to security or privacy issues;
- potential delays or changes in the government appropriations or procurement processes, including as a result of events such as war, incidents of terrorism, natural disasters, and public health concerns; and
- increased or unexpected costs or unanticipated delays caused by other factors outside of our control.

Any such event or activity, among others, could cause governments and governmental agencies to delay or refrain from entering into contracts with us and/or purchasing our computers in the future, reduce the size or timing of payment with respect to our services to or purchases from existing or new government customers, or otherwise have an adverse effect on our business, results of operations, financial condition, and growth prospects.

If our information technology systems, data, or physical facilities, or those of third parties upon which we rely, are or were compromised, we could experience adverse business consequences resulting from such compromise.

In the ordinary course of business, we access, collect, receive, store, generate, use, transfer, disclose, make accessible, protect, secure, dispose of, transmit, share, and otherwise process personal data and other sensitive information, including intellectual property, proprietary and confidential business data, trade secrets, sensitive third-party data, business plans, transactions, and financial information of our own, our partners, our vendors and their own supply chains, our customers, or other third parties (collectively, "Sensitive Data").

We and the third parties upon which we rely process Sensitive Data, and, as a result, we and the third parties upon which we rely face a variety of evolving threats to our information technology systems, data, and physical facilities (such as those where our quantum computers are stored), including but not limited to ransomware attacks, advanced persistent threats, and other causes of security incidents. Additionally, Sensitive Data could be leaked, disclosed or revealed as a result of or in connection with our employees', contractors', consultants', affiliates', or vendors' use of generative artificial intelligence ("AI") technologies. Cyber-attacks, malicious internet-based activity, online and offline fraud, and other similar activities threaten the confidentiality, integrity, and availability of our Sensitive Data and information technology systems, and those of the third parties upon which we rely. Such threats are prevalent and continue to rise, are increasingly difficult to detect, and come from a variety of sources, including traditional computer "hackers," threat actors, "hacktivists," organized criminal threat actors, personnel (such as through theft or misuse), sophisticated nation states, and nation-state-supported actors. U.S. law enforcement agencies have indicated to us that quantum computing technology is of particular interest to certain threat actors, including nation state and other malicious actors, who may steal our Sensitive Data, including our intellectual property or other proprietary or confidential information, including our trade secrets. Our employees, contractors, affiliates, and/or related parties may have already been directly targeted by nation state actors and may be so targeted in the future.

Some actors now engage and are expected to continue to engage in cyber-attacks, including without limitation nation-state and nation-state-supported actors for geopolitical reasons and in conjunction with military conflicts and defense activities. During times of war and other geopolitical tensions or conflicts, we, the third parties upon which we rely, and our customers may be vulnerable to a heightened risk of these attacks, including retaliatory cyber-attacks, that could materially disrupt our systems and operations, supply chain, and ability to distribute our services.

We and the third parties upon which we rely are subject to a variety of evolving threats, including but not limited to social-engineering attacks (including through deep fakes, which may be increasingly difficult to identify as fake, and phishing attacks), malicious code (such as viruses and worms), malware (including as a result of advanced persistent threat intrusions), denial-of-service attacks (such as credential stuffing), credential harvesting, personnel misconduct or error, ransomware attacks, supply-chain attacks, software bugs, server malfunctions, software or hardware failures, loss or unavailability of data or other information technology assets, adware, telecommunications failures, earthquakes, fires, floods, and other similar threats.

In particular, severe ransomware attacks are becoming increasingly prevalent and could lead to significant interruptions in our operations, loss or unavailability of Sensitive Data and loss of income, reputational harm, and diversion of funds.

Extortion payments may alleviate the negative impact of a ransomware attack, but we may be unwilling or unable to make such payments due to, for example, applicable laws or regulations prohibiting such payments.

Additionally, we are incorporated into the supply chains of companies worldwide and, as a result, if our services are compromised, a significant number or, in some instances, all of our customers and their data could be simultaneously affected. The potential liability and associated consequences we could suffer as a result of such a large-scale event could be catastrophic and result in irreparable harm.

Remote work has become more common and has increased risks to our information technology systems and data, as more of our employees utilize network connections, computers, and devices outside our premises or network, including working at home, while in transit and in public locations. Additionally, future or past business transactions (such as acquisitions or integrations) could expose us to additional cybersecurity risks and vulnerabilities, as our systems could be negatively affected by vulnerabilities present in acquired or integrated entities' systems and technologies. Furthermore, we may discover security issues that were not found during due diligence of such acquired or integrated entities, and it may be difficult to integrate companies into our information technology environment and security program.

In addition, our reliance on third-party service providers could introduce new cybersecurity risks and vulnerabilities, including supply-chain attacks, and other threats to our business operations. Our platform is built to be accessed through third-party cloud providers, such as AWS's Amazon Braket, Microsoft's Azure Quantum, and Google's Cloud Marketplace, and we rely on these and other third-party service providers and technologies to operate critical business systems to process Sensitive Data in a variety of contexts, including, without limitation, other cloud-based infrastructure, data center facilities, encryption and authentication technology, employee email, content delivery to customers, and other functions. We also rely on third-party service providers to provide other products, services or parts, or otherwise to operate our business. There can be no assurance that our third-party service providers' security measures have been or will be effective to protect against various cybersecurity risks and vulnerabilities. If our third-party service providers experience a security incident or other interruption, we could experience adverse consequences. While we may be entitled to damages if our third-party service providers fail to satisfy their privacy or security-related obligations to us, any award may be insufficient to cover our damages, or we may be unable to recover such award. In addition, supply-chain attacks have increased in frequency and severity, and we cannot guarantee that third parties' infrastructure in our supply chain or our third-party partners' supply chains have not been compromised.

Any of the previously identified or similar threats could cause a security incident or other interruption that could result in unauthorized, unlawful, or accidental access to, or acquisition, modification, destruction, loss, alteration, encryption, disclosure, or other processing of our Sensitive Data (including proprietary information and intellectual property) or our information technology systems, or those of the third parties upon whom we rely. A security incident or other interruption could disrupt our ability (and that of third parties upon whom we rely) to provide our services.

We may expend significant resources or modify our business activities to try to protect against security incidents. Additionally, certain privacy and security obligations may require us to implement and maintain specific security measures or industry-standard or reasonable security measures to protect our information technology systems and Sensitive Data.

While we have implemented security measures designed to protect against security incidents and other interruptions, there can be no assurance that these measures will be effective. We take steps to detect and remediate vulnerabilities in our information technology systems (including in our services), but we may not be able to detect and remediate all vulnerabilities because the threats and techniques used to exploit vulnerabilities change frequently and are often sophisticated in nature. Therefore, such vulnerabilities could be exploited but may not be detected until after a security incident has occurred; and, we may not be able to anticipate or detect attacks or vulnerabilities. These vulnerabilities pose material risks to our business. Further, we may experience delays in developing and deploying remedial measures designed to address any such identified vulnerabilities. As a result, we may be unable to implement adequate preventative and responsive measures to stop or mitigate security incidents before or while they are occurring. Finally,

incidents that may appear to be minor when assessed individually, may become material, at a later date, when considered in the aggregate.

Applicable privacy and security obligations may require us to notify relevant stakeholders of security incidents. Such disclosures are costly, and the disclosure or the failure to comply with such requirements could lead to adverse consequences.

If we (or a third party upon whom we rely) experience a security incident or are perceived to have experienced a security incident, we may experience adverse consequences. These consequences may include: exposure, loss, unavailability, acquisition, or other unauthorized processing of Sensitive Data (including intellectual property or confidential or proprietary information); government enforcement actions (for example, investigations, fines, penalties, audits, and inspections); additional reporting requirements and/or oversight; restrictions on processing Sensitive Data (including personal data); litigation (including class claims); indemnification obligations; negative publicity; reputational harm; monetary fund diversions; interruptions in our operations (including availability of data); financial loss; and other similar harms. Security incidents and attendant consequences may cause customers to stop using our services, deter new customers from using our services, and negatively impact our ability to grow and operate our business. Our efforts to prevent and overcome these challenges could increase our expenses and may not be successful.

Our contracts may not contain limitations of liability, and even where they do, there can be no assurance that limitations of liability in our contracts are sufficient to protect us from liabilities, damages, or claims related to our privacy and security obligations. We cannot be sure that our insurance coverage will be adequate or sufficient to protect us from or to mitigate liabilities arising out of our privacy and security obligations, that such coverage will continue to be available on commercially reasonable terms or at all, or that such coverage will pay future claims.

In addition to experiencing a security incident, third parties may gather, collect, or infer sensitive information about us from public sources, data brokers, or other means that reveals competitively sensitive details about our organization and could be used to undermine our competitive advantage or market position.

Unfavorable conditions in our industry, the global economy, or other catastrophic events may disrupt our business, could limit our ability to grow, and negatively affect our results of operations.

Our results of operations may vary based on the impact of changes in our industry or the global economy on us or our customers and potential customers. The global economy, including credit and financial markets, has experienced extreme volatility and disruptions, including severely diminished liquidity and credit availability, declines in customer confidence, declines in economic growth, increases in unemployment rates, increases in inflation rates, higher interest rates and uncertainty about economic stability. For example, the COVID-19 pandemic resulted in widespread unemployment, economic slowdown and extreme volatility in the capital markets and any future public health crises could result in similar impacts on the global economy. Similarly, geopolitical tensions in and around Ukraine, Israel and other areas of the world have created extreme volatility in the global capital markets and are expected to have further global economic consequences, including disruptions of the global supply chain and energy markets, and further acts of war, terror, or responses to each could result in similar or increased impacts on the global economy. Increased inflation rates can adversely affect us by increasing our costs, including labor and employee benefit costs. Employee salaries and benefits expenses have increased as a result of economic growth, increased demand for business services, increased competition for trained and talented employees, among other wage-inflationary pressures and we cannot assure that they will not continue to rise. In addition, higher inflation also could increase our customers' operating costs, which could result in reduced budgets for our customers and potentially less demand for our platform and the development of quantum technologies. Any significant increases in inflation and related increase in interest rates could have a material adverse effect on our business, results of operations and financial condition.

In addition, in challenging economic times, our current or potential future customers may experience cash flow problems and as a result may modify, delay or cancel plans to purchase our products and services. Additionally, if our customers are not successful in generating sufficient revenue or are unable to secure financing, they may not be able to pay, or may delay payment of, accounts receivable due to us. Moreover, our key suppliers may reduce their output or become insolvent, thereby adversely impacting our ability to manufacture our products. Furthermore, uncertain economic conditions may make it more difficult for us to raise funds through borrowings or private or public sales of debt or equity securities. We cannot predict the timing, location, strength or duration of any economic slowdown, instability or recovery, generally or within any particular industry.

Furthermore, a disruption or failure of our systems or operations because of an earthquake, weather event, cyberattack, terrorist attack, pandemic, or other catastrophic event could cause delays in providing services or performing other critical functions, which could also delay commercial deals and the associated revenue recognition for those deals. Our quantum computing manufacturing facility and a significant portion of our research and development activities, and certain other essential business operations are located in the Seattle, Washington area, which is a seismically active region. A catastrophic event that results in the destruction or disruption

of any of our critical business or IT systems, or the infrastructure or systems they rely on could harm our ability to conduct normal business operations.

Government actions and regulations, such as tariffs and trade protection measures, especially in China and the United States, may adversely impact our business, including our ability to obtain products from our suppliers.

Political challenges between the United States and countries in our supply chain, including China, and changes to trade policies, including tariff rates and customs duties, trade relations between the United States and China and other macroeconomic issues could adversely impact our business. Specifically, United States-China trade relations remain uncertain. The United States administration has continued to impose tariffs on certain products imported into the United States with China as the country of origin, and China has imposed tariffs in response to the actions of the United States. The likelihood of a further increase in tariffs on goods from China and the imposition of tariffs on goods sourced from other countries has materially increased in light of comments by the new U.S. presidential administration, which has repeatedly communicated an intention to impose additional duties on imports from China, as well as on imports from other countries. The U.S. government continues to add additional entities, in China and elsewhere, to restricted party lists impacting the ability of U.S. companies to provide products and technology, and, in certain cases, services, to these entities and, in some cases, to receive products, technology or services from these entities. The U.S. government also continues to increase end-use restrictions on the provision of products, technology and services to China and other countries including end-uses related to advanced computing. The new U.S. presidential administration has signaled its intention to use U.S. trade policy, including tariffs and other trade restrictions, as an important foreign policy tool presenting uncertainty regarding the impact of future trade policies on our business. There is also a possibility of future tariffs, trade protection measures or other restrictions imposed on our products or on our customers by the United States, China or other countries that could have a material adverse effect on our business. In addition, the Chinese government exercises significant control over China's economy through the allocation of resources, control of the incurrence and payment of foreign currency-denominated obligations, setting of monetary policy and provision of preferential treatment to particular industries or companies. Changes in any of these policies, laws and regulations could adversely affect the overall economy in China or our Chinese suppliers, which could harm our business through higher supply costs, reduced availability or both.

Also, due to concerns with the security of products and services from certain telecommunications equipment and services companies based in China, U.S. Congress has enacted bans on the use of certain Chinese-origin components or systems either in items sold to the U.S. government or in the internal networks of government contractors and subcontractors (even if those networks are not used for government-related projects). Further, the Chinese government has responded to these U.S. actions by developing an unreliable entity list, which may limit the ability of companies on the list to engage in business with Chinese counterparties.

In June 2022, the import restrictions contained in the Uyghur Forced Labor Prevention Act ("UFLPA") became effective. The UFLPA creates a rebuttable presumption that any goods mined, produced or manufactured, wholly or in part, in the Xinjiang Uyghur Autonomous Region ("XUAR") of China, or produced by a listed entity, were made with forced labor and would therefore not be entitled to entry at any U.S. port. Importers may be required to present clear and convincing evidence that such goods are not made with forced labor. While we do not source items from the XUAR or from listed parties, and we have increased our supply chain diligence, there is risk that our ability to import components and products may be adversely affected by the UFLPA.

Given the relatively fluid regulatory environment in China and the United States and uncertainty regarding how the U.S. government or Chinese and other foreign governments will act with respect to tariffs and international trade agreements and policies, a trade war, further governmental action related to tariffs or international trade policies, or additional tax or other regulatory changes in the future could directly and adversely impact our financial results and results of operations. We cannot predict what actions may ultimately be taken with respect to trade relations between the United States and China or other countries, what products may be subject to such actions or what actions may be taken by the other countries in retaliation. If we are unable to obtain or use components for inclusion in our products, if component prices increase significantly or if we are unable to export or sell our products to any of our customers, our business, liquidity, financial condition and/or results of operations would be materially and adversely affected.

We are subject to governmental export and import controls and trade and economic sanctions that could impair our ability to compete in global markets and subject us to liability if we are not in full compliance with applicable laws and other controls.

Our products, technology, and services are subject to various restrictions under U.S. export controls, import laws and regulations, and economic sanctions, including the U.S. Export Administration Regulations administered by the U.S. Department of Commerce, U.S. Customs regulations, and trade and economic sanctions administered by the U.S. Department of Treasury's Office of Foreign Assets Control. U.S. export controls and trade and economic sanctions include restrictions or prohibitions on the sale or supply of certain products, technologies, and services to U.S. embargoed or sanctioned countries and governments of these countries, as well as other persons and entities. Additionally, under these current and future laws and regulations, exports of our products, technology, and services as well as the underlying technology may require export authorizations, including by license, a license

exception, or other appropriate government authorizations, and the filing of a classification request or self-classification report to use a license exception, as applicable. Customers may defer or decline their purchases of our products due to uncertainty about export controls, and as a result, our business could be materially adversely affected.

Should we violate existing or similar future export controls or sanctions, we may be subject to substantial monetary fines or suffer reputational damage and other penalties that could negatively impact our business. If we need to obtain any necessary export licenses or other authorizations for a particular sale, the process may be time-consuming and may result in the delay or loss of opportunities to sell our products.

We take precautions to prevent our products and services and the underlying technology from being provided, deployed or used in violation of export controls and sanctions. However, we cannot provide assurance that our policies and procedures relating to export control and sanctions compliance will prevent violations in the future by us or our partners or agents. Any violation of U.S. sanctions or export controls, including failure to obtain appropriate import, export, or re-export licenses or authorization, could result in significant penalties and government investigations, delays in approving or denials of export licenses, and reputational harm and loss of business.

In addition to the United States, various other countries regulate the import and export of certain encryption and other technology, including import and export licensing requirements, and have enacted laws that could limit our ability to distribute our products, technologies, and services or could limit our clients' ability to implement our products, technologies, and services in those countries. The United States, United Kingdom, France, Spain, Germany, Denmark, Finland, Norway, Slovenia, Japan, Canada, and the Netherlands have recently enacted export controls on quantum computing hardware and related software and technology at specified levels of technological advancement. We will continue to review our existing compliance measures to ensure compliance with any applicable regulatory changes. Changes in our products, or future changes in export and import regulations, may create delays in the introduction of our products and the underlying technology in international markets, prevent our clients with global operations from deploying our products globally, adversely affect our ability to hire personnel from certain countries to work on our products, or, in some cases, prevent the export or import of our products to certain countries, governments, or persons altogether.

Any change in export or import controls, economic sanctions or related legislation, shift in the enforcement or scope of existing laws and regulations, or change in the countries, governments, persons, or technologies targeted by such regulations, could result in decreased use of our products by, or in our decreased ability to export or sell our products to, existing or potential customers. Any decreased use of our products or limitation on our ability to export or sell our products in major international markets could adversely affect our business, financial condition, and results of operations.

We expect to incur significant costs in complying with these regulations. Regulations related to quantum computing are currently evolving and we may face additional risks associated with changes to these regulations as well as increased licensing requirements and other restrictions.

Acquisitions, divestitures, strategic investments and strategic partnerships could disrupt our business and harm our financial condition and operating results.

We have pursued and we may continue to pursue growth opportunities by acquiring complementary businesses, solutions or technologies through strategic transactions, investments or partnerships. The identification of suitable acquisition, strategic investment or strategic partnership candidates can be costly and time consuming and can distract our management team from our current operations. If such strategic transactions require us to seek additional debt or equity financing, we may not be able to obtain such financing on terms favorable to us or at all, and such transactions may adversely affect our liquidity and capital structure. To the extent we issue equity and/or convertible securities as consideration in such strategic transactions, our stockholders may experience substantial dilution. Any strategic transaction might not strengthen our competitive position, may increase some of our risks, and may be viewed negatively by our customers, partners or investors. Even if we successfully complete a strategic transaction, we may not be able to effectively integrate the acquired business, technology, systems, control environment, solutions, personnel or operations into our business. We may experience unexpected changes in how we are required to account for strategic transactions pursuant to U.S. GAAP and may not achieve the anticipated benefits of any strategic transaction. We may incur unexpected costs, claims or liabilities that we incur during the strategic transaction or that we assume from the acquired company, or we may discover adverse conditions post acquisition for which we have limited or no recourse.

Risks Related to Our International Expansion and Future Operations

Because our success depends, in part, on our ability to expand sales internationally, our business will be susceptible to risks associated with international operations.

We currently maintain offices and/or have personnel in the United States and other international locations. We expect to continue to expand our international operations by developing our sales and operations presence internationally, which may include opening offices in new jurisdictions. Any additional international expansion efforts that we are undertaking and may undertake may not be successful. In addition, conducting international operations subjects us to new risks, some of which we have not generally faced in the United States or other countries where we currently operate. These risks include, among other things:

- lack of familiarity and burdens of complying with foreign laws, legal standards, privacy and cybersecurity standards, regulatory requirements, tariffs and other barriers, and the risk of penalties to our customers and individual members of management or employees if our practices are deemed to not be in compliance;
- practical difficulties of enforcing intellectual property rights in countries with varying laws and standards and reduced or varied protection for intellectual property rights in some countries;
- an evolving legal framework and additional legal or regulatory requirements for privacy and cybersecurity, which may necessitate the establishment of systems to maintain data in local markets, requiring us to invest in additional data centers and network infrastructure, and the implementation of additional employee privacy documentation (including locally compliant privacy notices and policies), all of which may involve substantial expense and may cause us to need to divert resources from other aspects of our business, all of which may adversely affect our business;
- unexpected changes in regulatory requirements, taxes, trade laws, tariffs, export quotas, custom duties or other trade restrictions;
- difficulties in managing systems integrators and partners;
- increased or unexpected supply chain challenges or delays;
- differing technology standards;
- different pricing environments, longer sales cycles, longer accounts receivable payment cycles and difficulties in collecting accounts receivable;
- increased financial accounting and reporting burdens and complexities;
- difficulties in managing and staffing international operations including the proper classification of independent contractors and other contingent workers, differing employer/employee relationships and local employment laws;
- increased costs involved with recruiting and retaining an expanded employee population, including highly skilled workers and leaders in the quantum computing industry, outside the United States through cash and equity-based incentive programs, and legal costs and regulatory restrictions in issuing our shares to employees outside the United States;
- global political and regulatory changes that may lead to restrictions on immigration and travel for our employees;
- fluctuations in exchange rates that may decrease the value of our foreign-based revenue or increase the cost of our foreign operations;
- global public health threats or geopolitical events such as tensions in and around Ukraine, Israel and other areas of the world;
- degradation in U.S. relationships with targeted countries that could result in those countries disfavoring doing business with U.S. companies;
- potentially adverse tax consequences, including the complexities of foreign value added tax (or other tax) systems, restrictions on the repatriation of earnings, and transfer pricing requirements; and
- permanent establishment risks and complexities in connection with international payroll, tax and social security requirements for international employees.

Additionally, operating in international markets also requires significant management attention and financial resources. We cannot be certain that the investment and additional resources required in establishing operations in other countries will produce desired levels of revenue or profitability.

Compliance with laws and regulations applicable to our global operations also substantially increases our cost of doing business in foreign jurisdictions. We have limited experience in marketing, selling and supporting our platform outside of the United States. Our limited experience in operating our business internationally increases the risk that any potential future expansion efforts that we may undertake will not be successful. If we invest substantial time and resources to expand our international operations and are unable to do so successfully, in a timely manner, our business, financial condition, revenues, results of operations or cash flows will suffer. We may be unable to keep current with changes in government requirements as they change from time to time. Failure to comply with these regulations could harm our business. In many countries, it is common for others to engage in business practices that are prohibited by our internal policies and procedures or other regulations applicable to us. Although we have implemented policies and procedures designed to ensure compliance with these laws and policies, there can be no assurance that all of our employees, contractors, partners and agents will comply with these laws and policies. Violations of laws or key control policies by our employees, contractors, partners or agents could result in delays in revenue recognition, financial reporting misstatements, enforcement actions, reputational harm, disgorgement of profits, fines, civil and criminal penalties, damages, injunctions, other collateral consequences or the prohibition of the importation or exportation of our solutions and could harm our business, financial condition, revenues, results of operations or cash flows.

Our international sales and operations subject us to additional risks and costs exposure to foreign currency exchange rate fluctuations, that can adversely affect our business, financial condition, revenues, results of operations or cash flows.

We are continuing to expand our international operations as part of our growth strategy. However, there are a variety of risks and costs associated with our international sales and operations, which include making investments prior to the sales or use of quantum computers, the cost of conducting our business internationally and hiring and training international employees and the costs associated with complying with local law. Furthermore, we cannot predict the rate at which our quantum computers will be accepted in international markets by potential customers.

Our sales, support and engineering organization outside the United States is substantially smaller than our U.S. sales organization. We believe our ability to attract new customers to subscribe to our platform or to attract existing customers to renew or expand their use of our platform is directly correlated to the level of engagement we obtain with the customer. To the extent we are unable to effectively engage with non-U.S. customers due to our limited sales force capacity, we may be unable to effectively grow in international markets.

As our international operations expand, our exposure to the effects of fluctuations in currency exchange rates grows. While we have primarily transacted with customers in U.S. dollars historically, we expect to continue to expand the number of transactions with our customers that are denominated in foreign currencies in the future. Additionally, fluctuations in the value of the U.S. dollar and foreign currencies may make our products and services more expensive for international customers, which could harm our business. Additionally, we incur expenses for employee compensation and other operating expenses for our non-U.S. employees in the local currency for such locations. Fluctuations in the exchange rates between the U.S. dollar and other currencies could result in an increase to the U.S. dollar equivalent of such expenses. These fluctuations could cause our results of operations to differ from our expectations or the expectations of our investors. Additionally, such foreign currency exchange rate fluctuations could make it more difficult to detect underlying trends in our business and results of operations. We may attempt to mitigate a portion of these risks through foreign currency hedging based on our judgment of the appropriate trade-offs among risk, opportunity, and exposure. Any future hedging activities may not offset the full, or in some cases any, adverse financial impact resulting from unfavorable movement in foreign currency exchange rates, which could adversely affect our financial condition and results of operations.

Our international operations may subject us to greater than anticipated tax liabilities.

The amount of taxes we may pay in different jurisdictions depends on the application of the tax laws of various jurisdictions, including the United States, to our international business activities, changes in tax rates, new or revised tax laws or interpretations of existing tax laws and policies, and our ability to operate our business in a manner consistent with our corporate structure and intercompany arrangements. The taxing authorities of the jurisdictions in which we operate may challenge our methodologies for pricing intercompany transactions pursuant to any future intercompany arrangement or disagree with our determinations as to the income and expenses attributable to specific jurisdictions. If such a challenge or disagreement were to occur, and our position was not sustained, we could be required to pay additional taxes, interest and penalties, which could result in one-time tax charges, higher effective tax rates, reduced cash flows, and lower overall profitability of our operations. Our consolidated financial statements could fail to reflect adequate reserves to cover such a contingency. Similarly, a taxing authority could assert that we are subject to tax in a jurisdiction where we believe we have not established a taxable connection, often referred to as a "permanent establishment" under international tax treaties, and such an assertion, if successful, could increase our expected tax liability in one or more jurisdictions.

Risks Related to Litigation and Government Regulation

Our business is exposed to risks associated with litigation, investigations and regulatory proceedings.

We may face legal, administrative and regulatory proceedings, claims, demands and/or investigations involving stockholders, customers, competition and/or other issues relating to our business. Litigation and regulatory proceedings are inherently uncertain, and adverse rulings could occur, including monetary damages, or an injunction stopping us from engaging in certain business practices, or requiring other remedies, such as compulsory licensing of patents.

In May 2022, a securities class action complaint captioned Leacock v. IonQ, Inc. et al., Case No. 8:22-cv-01306, was filed by a stockholder of the Company in the United States District Court for the District of Maryland (the "Leacock Litigation") against the Company and certain of the Company's current officers. In June 2022, a securities class action complaint captioned Fisher v. IonQ, Inc., Case No. 8:22-cv-01306-DLB (the "Fisher Litigation") was filed by a stockholder against the Company and certain of the Company's current officers ("IonQ Defendants"). Both the Leacock Litigation and Fisher Litigation, which have been consolidated into a single action, allege violations of Section 10(b) of the Exchange Act, and Rule 10b-5 promulgated thereunder, and Section 20(a) of the Exchange Act and seek damages. In September 2022, the Court appointed lead plaintiffs and counsel for lead plaintiffs, and ordered lead plaintiffs to file a consolidated amended complaint. The consolidated amended complaint was filed on November 22, 2022. As part of the consolidated amended complaint, certain members of the Company's board of directors as well as other dMY-related defendants ("Additional Defendants") have been added as defendants to the case. On February 7, 2023, the IonQ Defendants and the Additional Defendants each filed a motion to dismiss the consolidated amended complaint. On March 23, 2023, lead plaintiffs filed their omnibus opposition to the motions to dismiss. On April 26, 2023, the IonQ Defendants and the Additional Defendants each filed a reply in support of the motions to dismiss. On September 28, 2023, the District Court of Maryland issued an order dismissing plaintiffs' claims against the IonQ Defendants and the Additional Defendants with prejudice and directed the clerk to close the case. On October 26, 2023, the plaintiffs filed a motion for post-judgment relief, seeking to amend their consolidated amended complaint. The IonQ Defendants and Additional Defendants filed oppositions to plaintiffs' motion on December 1, 2023, and plaintiffs filed their reply on January 8, 2024. On July 10, 2024, the plaintiffs' motion for post-judgment relief was denied and the District Court of Maryland directed the clerk to close the case. On July 26, 2024, the plaintiffs filed a Notice of Appeal with the Fourth Circuit Court of Appeals seeking to review the trial court's decision. Plaintiffs filed their Opening Brief in the Fourth Circuit on September 9, 2024. A response brief by IonQ Defendants was filed on October 8, 2024 and plaintiffs' reply brief was filed on October 29, 2024. Oral argument in the Fourth Circuit occurred on January 31, 2025. Given the uncertainty of litigation and the legal standards that must be met for, among other things, success on the case merits, the Company cannot reasonably estimate the possible loss or range of loss, if any, that may result from the associated suit.

These proceedings and any additional investigations, inquiries or litigation by various regulators may harm our reputation regardless of the outcome of any such action. The outcome of any litigation, regardless of its merits, is inherently uncertain. Any claims and lawsuits, and the disposition of such claims and lawsuits, could be time-consuming and expensive to resolve, divert management attention and resources, and lead to attempts on the part of other parties to pursue similar claims. Negative perceptions of our business may result in additional regulation, enforcement actions by the government and increased litigation, or harm to our ability to attract or retain customers or strategic partners, any of which may affect our business. Any damage to our reputation, including from publicity related to legal proceedings against us or companies that work within our industry, governmental proceedings, unfavorable media coverage or class action could adversely affect our business, financial condition and results of operations.

An unfavorable outcome or settlement or any other legal, administrative and regulatory proceeding may result in a material adverse impact on our business, results of operations, financial position and overall trends. In addition, regardless of the outcome, litigation can be costly, time-consuming, and disruptive to our operations. Any claims or litigation, even if fully indemnified or insured, could damage our reputation and make it more difficult to compete effectively or to obtain adequate insurance in the future.

In addition, the laws and regulations our business is subject to are complex and change frequently. We may be required to incur significant expense to comply with changes in, or remedy violations of, these laws and regulations.

Furthermore, while we maintain insurance for certain potential liabilities, such insurance does not cover all types and amounts of potential liabilities and is subject to various exclusions as well as caps on amounts recoverable. Even if we believe a claim is covered by insurance, insurers may dispute our entitlement to recovery for a variety of potential reasons, which may affect the timing and, if the insurers prevail, the amount of our recovery.

We may become subject to product liability claims, which could harm our financial condition and liquidity if we are not able to successfully defend or insure against such claims.

We may become subject to product liability claims, even those without merit, which could harm our business prospects, operating results, and financial condition. We may face inherent risk of exposure to claims in the event our quantum computers do not perform as expected or malfunction. A successful product liability claim against us could require us to pay a substantial monetary award. Moreover, a product liability claim could generate substantial negative publicity about our quantum computers and business and inhibit or prevent commercialization of other future quantum computers, which would have material adverse effects on our brand, business, prospects and operating results. Any insurance coverage might not be sufficient to cover all potential product liability claims. Any lawsuit seeking significant monetary damages either in excess of our coverage, or outside of our coverage, may have a material adverse effect on our reputation, business and financial condition. We may not be able to secure additional product liability insurance coverage on commercially acceptable terms or at reasonable costs when needed, particularly if we do face liability for our products and are forced to make a claim under our policy.

Contracts with government entities subject us to risks, including early termination, audits, investigations, sanctions and penalties.

As part of our business strategy, we have entered into and may enter into additional contracts with state and federal government entities, which subjects our business to statutes and regulations applicable to companies doing business with the government, including the Federal Acquisition Regulation. These government contracts customarily contain provisions that give the government substantial rights and remedies, many of which are not typically found in commercial contracts and which are unfavorable to contractors. For instance, most U.S. government agencies include provisions that allow the government to unilaterally terminate or modify contracts for convenience, and in that event, the counterparty to the contract may generally recover only its incurred or committed costs and settlement expenses and profit on work completed prior to the termination. If the government terminates a contract for default, the defaulting party may be liable for any extra costs incurred by the government in procuring undelivered items from another source.

In addition, government contracts normally contain additional requirements that may increase our costs of doing business, reduce our profits, and expose us to liability for failure to comply with these terms and conditions. These requirements could include, for example:

- specialized disclosure and accounting requirements unique to government contracts;
- financial and compliance audits of our cost structure, accounting controls and procedures and adequacy of our policies and systems to meet Federal Acquisition Regulation requirements. These audits may result in potential liability for price adjustments, recoupment of government funds after such funds have been spent, civil and criminal penalties, or administrative sanctions such as suspension or debarment from doing business with the U.S. government;
- granting the U.S. government certain rights to inventions, data, software codes and related material that we develop under government-funded contracts and subcontracts, which may permit the U.S. government to disclose or license this information to third parties, including, in some instances, our competitors;
- requirements to fulfill government contracts assigned ratings under the Defense Priorities and Allocations System Program ahead of our commercial contracts, which could prevent us from meeting our commercial customer contracts' requirements or schedules;
- public disclosures of certain contract and company information;
- mandatory security and privacy framework compliance requirements, including the handling of controlled unclassified information; and
- mandatory socioeconomic compliance requirements, including labor requirements, non-discrimination and affirmative action programs and environmental compliance requirements.

Government contracts are also generally subject to greater scrutiny by the government than commercial contracts are by commercial customers. For example, government agencies can initiate reviews, audits and investigations regarding our compliance with government contract requirements. In addition, if we fail to comply with government contracting laws, regulations and contract requirements, our contracts may be subject to termination, and we may be subject to financial and/or other liability under our contracts, the Federal Civil False Claims Act (including treble damages and other penalties), or criminal law. In particular, the False Claims Act's "whistleblower" provisions also allow private individuals, including present and former employees, to sue on behalf of the U.S. government. Any penalties, fines, suspension, or damages could adversely affect our ability to operate our business and our financial results. Responding to any investigation or action relating to government contracts could result in a significant diversion of management's attention and resources and significant defense costs and other professional fees.

Our customers also include non-U.S. governments. Similar procurement, budgetary, contract, and audit risks that apply in the context of U.S. government contracting may also apply to our doing business with these entities. In addition, compliance with complex regulations and contracting provisions in a variety of jurisdictions can be expensive and consume significant management resources.

Certain of our activities are subject to regulations relating to use of radioactive material, compliance with which may be costly, and a failure to comply with these regulations may materially and adversely affect our business.

Various atomic species are used in trapped-ion systems in academic and commercial settings, including isotopes of elemental ions. Some of these atomic isotopes are radioactive. We use certain radioactive materials in our research, development, and production activities. As a result of our utilization of radioactive material, we and some of our suppliers, distributors, and customers are subject to regulation by United States governmental authorities, such as the Food and Drug Administration ("FDA"), the Nuclear Regulatory Commission ("NRC"), and state and local regulatory agencies, which regulate products and activities which emit, produce, or control radiation. These regulations govern, among other things, the design, development, testing, manufacturing, packaging, labeling, distribution, import/export, sale, marketing, and disposal of our products. We are also subject to international laws and regulations that apply to the utilization of radioactive materials. These are often comparable to, if not more stringent than, the equivalent regulations in the United States. Agency reviews of radioactivity-related applications that we are required to make in order to design, develop, test, manufacture, package, distribute, import, export, sell, market or dispose of radioactive materials may be lengthy or unsuccessful, and as a result our ability to sell our products or operate in certain jurisdictions may be impaired. Although we believe that our safety procedures for handling such materials comply with the standards prescribed by such laws and regulations, the risk of accidental contamination or injury from these materials may not be completely eliminated, and as a result we could incur related liabilities or expenses.

We are subject to requirements relating to environmental and safety regulations and environmental remediation matters, which could adversely affect our business, results of operation and reputation.

We are subject to numerous federal, state and local environmental laws and regulations governing, among other things, solid and hazardous waste storage, treatment and disposal, and remediation of releases of hazardous materials. There are significant capital, operating and other costs associated with compliance with these environmental laws and regulations. Environmental laws and regulations may become more stringent in the future, which could increase costs of compliance or require us to manufacture with alternative technologies and materials.

Federal, state and local authorities also regulate a variety of matters, including, but not limited to, health, safety and permitting in addition to the environmental matters discussed above. New legislation and regulations may require us to make material changes to our operations, resulting in significant increases to the cost of production.

Our manufacturing process will have hazards such as, but not limited to, hazardous materials, machines with moving parts, and high voltage and/or high current electrical systems typical of large manufacturing equipment and related safety incidents. There may be safety incidents that damage machinery or product, slow or stop production, or harm employees. Consequences may include litigation, regulation, fines, increased insurance premiums, mandates to temporarily halt production, workers' compensation claims, or other actions that impact the company brand, finances, or ability to operate.

We are subject to stringent and evolving U.S. and foreign laws, regulations, rules, contractual obligations, policies and other obligations related to privacy, data protection and security. Our actual or perceived failure to comply with such obligations could lead to adverse business consequences.

Our data storage and processing activities, including the establishment and operation of future quantum data centers, may subject us to numerous privacy, data protection and security obligations, such as various laws, regulations, guidance, industry standards, external and internal privacy and security policies, contractual requirements and other obligations relating to privacy, data

localization and security. Laws and regulations governing privacy, data protection and data sovereignty are rapidly evolving, extensive, complex, and include inconsistencies and uncertainties that may conflict with other rules or our practices. Further, new laws, rules, and regulations could be enacted with which we are not familiar or with which our practices do not comply.

In the United States, federal, state, and local governments have enacted numerous privacy and security laws, including data breach notification laws, personal data privacy laws, consumer protection laws (e.g., Section 5 of the Federal Trade Commission Act), and other similar laws (e.g., wiretapping laws). For example, the California Consumer Privacy Act of 2018, as amended by the California Privacy Rights Act (collectively, the "CCPA") applies to personal information of California consumers and imposes various requirements on businesses, including to provide specific disclosures in privacy notices and honor requests of California consumers to exercise certain privacy rights. The CCPA provides for civil penalties of up to $7,500 per violation and allows private litigants affected by certain data breaches to recover significant statutory damages. Numerous other states have enacted, are in the process of enacting, are proposing to enact or are considering comprehensive state-level privacy laws. Such laws are also being considered at the federal and local levels.

Our employees and personnel use generative AI technologies to perform their work, and the disclosure and use of personal information in generative AI technologies is subject to various evolving laws, regulations, guidance, industry standards, and other obligations. Additionally, several states and localities have enacted measures related to the use of artificial intelligence and machine learning in products and services. Generally, we understand the use of AI for employee productivity also presents emerging ethical and social issues and may draw public scrutiny or controversy, and may also create or assist in producing output that appear correct but are factually inaccurate, incomplete, misleading, biased, or otherwise flawed, or produce other discriminatory or unexpected results, errors, or inadequacies, any of which may not be easily detectable. These circumstances and developments may further complicate compliance efforts, and may increase legal risk and compliance costs for us, the third parties upon whom we rely, and our customers.

Outside the United States, an increasing number of laws, regulations, industry standards and other obligations may govern privacy, data protection and security. For example, the European Union's General Data Protection Regulation ("EU GDPR"), the United Kingdom's General Data Protection Regulation ("UK GDPR"), Brazil's General Data Protection Law (Lei Geral de Proteção de Dados Pessoais, or "LGPD") (Law No. 13,709/2018), and China's Personal Information Protection Law ("PIPL") impose strict requirements for processing personal data.

For example, under the EU GDPR, companies may face temporary or definitive bans on data processing and other corrective actions; fines of up to 20 million Euros or 4% of annual global revenue, whichever is greater; or private litigation related to processing of personal data brought by classes of data subjects or consumer protection organizations authorized at law to represent their interests. Additionally, we also target customers in Asia and may be subject to new and emerging data protection and privacy regimes in Asia, including China's PIPL, Japan's Act on the Protection of Personal Information, and Singapore's Personal Data Protection Act.

In addition, we may be unable to transfer personal data from Europe and other jurisdictions to the United States or other countries due to data localization requirements or limitations on cross-border data flows. Europe and other jurisdictions have enacted laws requiring data to be localized or limiting the transfer of personal data to other countries. In particular, the European Economic Area ("EEA") and the United Kingdom ("UK") each has significantly restricted the transfer of personal data to the United States and other countries whose privacy laws it believes are inadequate. Other jurisdictions may adopt similarly stringent interpretations of their data localization and cross-border data transfer laws. Although various mechanisms may be used to transfer personal data from the EEA and UK to the United States in compliance with law, such as the EEA's and UK's respective standard contractual clauses, the EU-U.S. Data Privacy Framework, the United Kingdom extension to the EU-U.S. Data Privacy Framework, and the Swiss-U.S. Data Privacy Framework, these mechanisms are subject to legal challenges, and there is no assurance that we can satisfy or rely on these measures to lawfully transfer personal data to the United States. If there is no lawful manner for us to transfer personal data from the EEA, the UK, or other jurisdictions to the United States, or if the requirements for a legally-compliant transfer are too onerous, we could face significant adverse consequences, including the interruption or degradation of our operations, the need to relocate part of or all of our business or data processing activities to other jurisdictions at significant expense, increased exposure to regulatory actions, substantial fines and penalties, the inability to transfer data and work with partners, vendors and other third parties, and injunctions against our transferring or other processing of personal data necessary to operate our business. Additionally, companies that transfer personal data out of the EEA and UK to other jurisdictions, particularly to the United States, are subject to increased scrutiny from regulators, individual litigators, and activist groups. Some European regulators have ordered certain companies to suspend or permanently cease certain transfers of personal data out of Europe for allegedly violating the EU GDPR's cross-border data transfer limitations.

In addition to privacy, data protection and security laws, we are contractually subject to industry standards adopted by industry groups and may become subject to additional obligations in the future. We are also bound by other contractual obligations related to privacy, data protection and security, and our efforts to comply with such obligations may not be successful. For example, certain laws

addressing privacy, data protection and security, such as the EU GDPR, Switzerland Federal Act on Data Protection (FADP), UK GDPR and CCPA, require our customers to impose specific contractual restrictions on their service providers. Additionally, some of our customers may require us to host personal data locally.

We publish privacy policies, marketing materials, and other statements, such as compliance with certain certifications or self-regulatory principles, regarding privacy, data protection and security. If these policies, materials or statements are or are perceived to be deficient, lacking in transparency, deceptive, unfair, or misrepresentative of our practices, we may be subject to investigation, enforcement actions by regulators, or other adverse consequences.

Obligations related to privacy, data protection and security are quickly changing, becoming increasingly stringent, and creating regulatory uncertainty. Additionally, these obligations may be subject to differing applications and interpretations, which may be inconsistent or conflict among jurisdictions. Preparing for and complying with these obligations requires us to devote significant resources and may necessitate changes to our services, information technologies, systems, and practices and to those of any third parties that process personal data on our behalf.

We may at times fail, or be perceived to have failed, in our efforts to comply with our privacy, data protection or security obligations. Moreover, despite our efforts, our personnel or third parties on whom we rely may fail, or be perceived to have failed, to comply with such obligations, which could negatively impact our business operations. If we or the third parties on which we rely fail, or are perceived to have failed, to address or comply with applicable privacy, data protection or security obligations, we could face significant consequences, including but not limited to: government enforcement actions (e.g., investigations, fines, penalties, audits, inspections, and similar events); litigation (including class-action claims); additional reporting requirements and/or oversight; bans on processing personal data; and orders to destroy or not use personal data. Any of these events could have a material adverse effect on our reputation, business, or financial condition, including but not limited to: loss of customers; inability to process personal data or to operate in certain jurisdictions; interruptions or stoppages in our business operations or data collection; limited ability to develop or commercialize our products; expenditure of time and resources to defend any claim or inquiry; adverse publicity; or substantial changes to our business model or operations.

We are 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.

We are subject to the U.S. Foreign Corrupt Practices Act of 1977, as amended, the U.S. domestic bribery statute contained in 18 U.S.C. § 201, the U.S. Travel Act, and other anti-bribery, and anti-corruption laws in countries in which we conduct activities. Anti-corruption and anti-bribery laws have been enforced aggressively in recent years and are interpreted broadly to generally prohibit companies, their employees, and their third-party intermediaries from authorizing, promising, offering, providing, soliciting, or accepting, directly or indirectly, improper payments or benefits to or from any person whether in the public or private sector. We may engage with partners and third-party intermediaries to conduct our business abroad, including marketing our services and obtaining necessary permits, licenses, and other regulatory approvals. In addition, we or our third-party intermediaries may have direct or indirect interactions with officials and employees of government agencies or state-owned or affiliated entities. We can be held liable for the corrupt or other illegal activities of these third-party intermediaries, and of our employees, representatives, contractors, partners, and agents, even if we do not explicitly authorize such activities. These laws also require that we keep accurate books and records and maintain internal controls and compliance procedures designed to prevent any such actions. We cannot provide any assurance that all of our employees and agents will not take actions in violation of our policies and applicable law, for which we may be ultimately held responsible.

Detecting, investigating, and resolving actual or alleged violations of anti-corruption laws can require a significant diversion of time, resources, and attention from senior management. In addition, noncompliance with anti-corruption or anti-bribery laws could subject us to whistleblower complaints, investigations, sanctions, settlements, prosecution, enforcement actions, fines, damages, other civil or criminal penalties, injunctions, suspension or debarment from contracting with certain persons, reputational harm, adverse media coverage, and other collateral consequences.

Changes in tax laws could have a material adverse effect on our business, cash flow, results of operations or financial conditions.

New income, sales, use or other tax laws, statutes, rules, regulations or ordinances could be enacted at any time, which could affect the tax treatment of our domestic and foreign financial results. Any new taxes could adversely affect our domestic and international business operations, and our business and financial performance. Further, existing tax laws, statutes, rules, regulations or ordinances could be interpreted, changed, modified or applied adversely to us. For example, in August 2022, as part of the Inflation Reduction Act of 2022, the United States enacted a 1% excise tax on stock buybacks and a 15% alternative minimum tax on adjusted financial statement income. Additionally, beginning in 2022, the Code eliminated the right to deduct research and development expenditures and instead requires taxpayers to capitalize and amortize U.S. and foreign research and development expenditures over

five and 15 tax years, respectively. To the extent applicable, we have accounted for these changes in accordance with our understanding of the guidance available as of the date of this filing and as described in more detail in our financial statements.

Many countries, as well as organizations such as the Organization for Economic Cooperation and Development, have implemented or proposed changes to existing tax laws, including a 15% global minimum tax. Any of these developments or changes in U.S. federal, state or international tax laws or tax rulings could adversely affect our effective tax rate and our operating results. There can be no assurance that our effective tax rates, tax payments or tax credits and incentives will not be adversely affected by these or other developments or changes in law.

Risks Related to our Intellectual Property

Licensing of intellectual property is of critical importance to our business. For example, we license 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 we acquired or licensed, or will acquire or license, material intellectual property rights is terminated, we could lose our rights to use key technologies to develop and operate our business.

We are heavily reliant upon licenses to certain patent rights and other intellectual property from third parties that are important or necessary to the development of our products. In particular, our quantum computing technology is dependent on our license agreement with University of Maryland and Duke University, or the Universities. Pursuant to the license agreement with the Universities, we were granted an exclusive, worldwide, royalty-free, sublicensable license for certain patents, know-how (on a non-exclusive basis) and other intellectual property to develop, manufacture and commercialize products for use in certain licensed fields, the scope of which includes the application of the licensed intellectual property in ion trap quantum computing.

Our existing license agreement with the Universities imposes, and we expect that any future license agreements will impose, upon us various commercial and development obligations. If we fail to comply with our obligations under these agreements, or we are subject to an insolvency-related event, the licensor may have the right to terminate these agreements, in which event we would not be able to develop, market or otherwise commercialize products covered by these agreements, including if any of the foregoing were to occur with respect to our license agreement with the Universities. Our business could significantly suffer, for example, if any current or future licenses terminate, if the licensors fail to abide by the terms of the license, or if we are unable to enter into necessary licenses on acceptable terms.

Licensing of intellectual property is of critical importance to our business and involves complex legal, business and scientific issues, and certain provisions in intellectual property license agreements may be susceptible to multiple interpretations. Disputes may arise between us and our licensors regarding intellectual property subject to a license agreement, including:

- the scope of rights granted under the license agreement and other interpretation-related issues;
- whether and the extent to which our technology and processes infringe on intellectual property of the licensor that is not subject to the licensing agreement;
- our right to sublicense patent and other rights to third parties;
- our diligence obligations with respect to the use of the licensed technology in relation to our development and commercialization of our product and technology, and what activities satisfy those diligence obligations;
- the ownership of inventions and know-how resulting from the joint creation or use of intellectual property by our licensors and the company;
- our right to transfer or assign the license; and
- the effects of termination.

The resolution of any contract interpretation disagreement that may arise could narrow what we believe to be the scope of our rights to the relevant intellectual property or technology, or increase what we believe to be our financial or other obligations under the relevant agreement, either of which could harm our business, financial condition and results of operations. Moreover, if disputes over intellectual property that we have licensed prevent or impair our ability to maintain our current licensing arrangements on acceptable terms, we may be unable to successfully develop and commercialize our products or technology.

While we would expect to exercise all rights and remedies available to us, including seeking to cure any breach by us, and otherwise seek to preserve our rights under the license agreement, we may not be able to do so in a timely manner, at an acceptable cost or at all.

If we are unable to obtain and maintain patent protection for our products and technology, or if the scope of the patent protection obtained is not sufficiently broad or robust, our competitors could develop and commercialize products and technology similar or identical to ours, and our ability to successfully commercialize our products and technology may be adversely affected. Moreover, our trade secrets could be compromised, which could cause us to lose the competitive advantage resulting from these trade secrets.

Our success depends, in significant part, on our ability to obtain, maintain, enforce and defend patents and other intellectual property rights, including trade secrets, with respect to our products and technology and to operate our business without infringing, misappropriating, or otherwise violating the intellectual property rights of others. We may not be able to prevent unauthorized use of our intellectual property. We rely upon a combination of the intellectual property protections afforded by patent, copyright, trademark and trade secret laws in the United States and other jurisdictions, as well as license agreements and other contractual protections, to establish, maintain and enforce rights in our proprietary technologies. In addition, we seek to protect our intellectual property rights through nondisclosure and invention assignment agreements with our employees and consultants, and through non-disclosure agreements with business partners and other third parties, however, our employees and consultants may not abide by, and not all of them have always abided by, their obligations under their nondisclosure and invention assignment agreements. Our trade secrets may also be compromised, which could cause us to lose the competitive advantage from such trade secrets. Despite our efforts to protect our proprietary rights, third parties may attempt to copy or otherwise obtain and use our intellectual property. Monitoring unauthorized use of our intellectual property is difficult and costly, and the steps we have taken or will take to prevent misappropriation may not be sufficient. Any enforcement efforts we undertake, including litigation, could be time-consuming and expensive and could divert management's attention, which could harm our business, results of operations and financial condition. In addition, existing intellectual property laws and contractual remedies may afford less protection than needed to safeguard our intellectual property portfolio.

Patent, copyright, trademark and trade secret laws vary significantly throughout the world. A number of foreign countries do not protect intellectual property rights to the same extent as do the laws of the United States. Therefore, our intellectual property rights may not be as strong or as easily enforced outside of the United States and efforts to protect against the unauthorized use of our intellectual property rights, technology and other proprietary rights may be more expensive and difficult outside of the United States. Failure to adequately protect our intellectual property rights could result in our competitors using our intellectual property to offer products, potentially resulting in the loss of some of our competitive advantage and a decrease in our revenue, which would adversely affect our business, financial condition and operating results.

Our patent applications may not result in issued patents or our patent rights may be contested, circumvented, invalidated or limited in scope, any of which could have a material adverse effect on our ability to prevent others from interfering with our commercialization of our products.

Our patent applications may not result in issued patents, which may have a material adverse effect on our ability to prevent others from commercially exploiting products similar to ours. The status of patents involves complex legal and factual questions and the breadth of claims allowed is uncertain. As a result, we cannot be certain that the patent applications that we file will result in patents being issued, or that our patents and any patents that may be issued to us will afford protection against competitors with similar technology. Numerous patents and pending patent applications owned by others exist in the fields in which we have developed and are developing our technology. In addition to those who may have patents or patent applications directed to relevant technology with an effective filing date earlier than any of our existing patents or pending patent applications, any of our existing or pending patents may also be challenged by others on the basis that they are otherwise invalid or unenforceable. Furthermore, patent applications filed in foreign countries are subject to laws, rules and procedures that differ from those of the United States, and thus we cannot be certain that foreign patent applications related to issued U.S. patents will be issued.

Even if our patent applications succeed and we are issued patents in accordance with them, it is still uncertain whether these patents – including any of the issued patents exclusively licensed to us – will be contested, circumvented, invalidated, found to be unenforceable or limited in scope in the future. The rights granted under any issued patents may not provide us with meaningful protection or competitive advantages, and some foreign countries provide significantly less effective patent enforcement than in the United States. In addition, the claims under any patents that issue from our patent applications may not be broad enough to prevent others from developing technologies that are similar or that achieve results similar to ours. The intellectual property rights of others could also bar us from licensing and exploiting any patents that issue from our pending applications. In addition, patents issued to us may be infringed upon or designed around by others and others may obtain patents that we need to license or design around, either of which would increase costs and may adversely affect our business, prospects, financial condition and operating results.

We 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.

We may become subject to intellectual property disputes. Our success depends, in part, on our ability to develop and commercialize our products, services and technologies without infringing, misappropriating or otherwise violating the intellectual property rights of third parties. However, we may not be aware that our products, services or technologies are infringing, misappropriating or otherwise violating third-party intellectual property rights and such third parties may bring claims alleging such infringement, misappropriation or violation. For example, there may be issued patents of which we are unaware, held by third parties that, if found to be valid and enforceable, could be alleged to be infringed by our current or future products, services or technologies. There also may be pending patent applications of which we are not aware that may result in issued patents, which could be alleged to be infringed by our current or future products, services or technologies. Because patent applications can take years to issue and are often afforded confidentiality for some period of time there may currently be pending applications, unknown to us, that later result in issued patents that could cover our current or future products, services or technologies. Lawsuits can be time-consuming and expensive to resolve, and they divert management's time and attention. Numerous patents and pending patent applications owned by others exist in the fields in which we have developed and are developing our technology. Companies that have developed and are developing technology are often required to defend against litigation claims based on allegations of infringement, misappropriation or other violations of intellectual property rights. Our products, services or technologies may not be able to withstand any third-party claims against their use. In addition, many companies have the capability to dedicate substantially greater resources to enforce their intellectual property rights and to defend claims that may be brought against them. In a patent infringement claim against us, we may assert, as a defense, that we do not infringe the relevant patent claims, that the patent is invalid or both. The strength of our defenses will depend on the patents asserted, the interpretation of these patents, and our ability to invalidate the asserted patents. However, we could be unsuccessful in advancing non-infringement and/or invalidity arguments in our defense. In the United States, issued patents enjoy a presumption of validity, and the party challenging the validity of a patent claim must present clear and convincing evidence of invalidity, which is a high burden of proof. Conversely, the patent owner need only prove infringement by a preponderance of the evidence, which is a lower burden of proof. Our patent portfolio may not be large enough to deter patent infringement claims, and our competitors and others may now and in the future have significantly larger and more mature patent portfolios. Any litigation may also involve patent holding companies or other adverse patent owners that have no relevant solution revenue, and therefore, our patent portfolio may provide little or no deterrence as we would not be able to assert our patents against such entities or individuals. If a third party is able to obtain an injunction preventing us from accessing such third-party intellectual property rights, or if we cannot license or develop alternative technology for any infringing aspect of our business, we may be forced to limit or stop sales of our products, services or technologies or cease business activities related to such intellectual property.

Although we carry general liability insurance, our insurance may not cover potential claims of this type or may not be adequate to indemnify us for all liability that may be imposed. We cannot predict the outcome of lawsuits and cannot ensure that the results of any such actions will not have an adverse effect on our business, financial condition or results of operations. Any intellectual property litigation to which we might become a party, or for which we are required to provide indemnification, regardless of the merit of the claim or our defenses, may require us to do one or more of the following:

- cease selling or using solutions or services that incorporate the intellectual property rights that allegedly infringe, misappropriate or violate the intellectual property of a third party;
- make substantial payments for legal fees, settlement payments or other costs or damages;
- obtain a license, which may not be available on reasonable terms or at all, to sell or use the relevant technology;
- redesign the allegedly infringing solutions to avoid infringement, misappropriation or violation, which could be costly, time-consuming or impossible; or
- indemnify organizations using our platform or third-party service providers.

Even if the claims do not result in litigation or are resolved in our favor, these claims, and the time and resources necessary to resolve them, could divert the resources of our management and harm our business and operating results. Moreover, there could be public announcements of the results of hearings, motions or other interim proceedings or developments and if securities analysts or investors perceive these results to be negative, it could have a substantial adverse effect on the price of our common stock. The occurrence of infringement claims may grow as the market for our products, services and technologies grows. Accordingly, our exposure to damages resulting from infringement claims could increase and this could further exhaust our financial and management resources.

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 rights for the U.S. government or imposing certain obligations on us, such as a license to the U.S.

government covered by such intellectual property, "march-in" rights, certain reporting requirements and a preference for U.S.-based companies, and compliance with such regulations may limit our exclusive rights and our ability to contract with non-U.S. manufacturers.

Certain intellectual property rights that have been in-licensed pursuant to the license agreement with the Universities have been generated through the use of U.S. government funding and are therefore subject to certain federal regulations. As a result, the U.S. government may have certain rights to intellectual property embodied in our current or future product candidates pursuant to the Bayh-Dole Act of 1980, or the Patent and Trademark Law Amendment. These U.S. government rights include a non-exclusive, non-transferable, irrevocable worldwide license to use inventions for any governmental purpose. In addition, the U.S. government has the right, under certain limited circumstances, to require the licensor to grant exclusive, partially exclusive or non-exclusive licenses to any of these inventions to a third party if it determines that: (1) adequate steps have not been taken to commercialize the invention, (2) government action is necessary to meet public health or safety needs or (3) government action is necessary to meet requirements for public use under federal regulations (also referred to as "march-in rights"). The U.S. government also has the right to take title to these inventions if the licensor fails to disclose the invention to the government or fails to file an application to register the intellectual property within specified time limits. Intellectual property generated under a government funded program is also subject to certain reporting requirements, compliance with which may require us to expend substantial resources. In addition, the U.S. government requires that any products embodying any of these inventions or produced through the use of any of these inventions be manufactured substantially in the U.S., and the license agreement with the Universities requires that we comply with this requirement. This preference for U.S. industry may be waived by the federal agency that provided the funding if the owner or assignee of the intellectual property can show that reasonable but unsuccessful efforts have been made to grant licenses on similar terms to potential licensees that would be likely to manufacture the products substantially in the United States or that under the circumstances domestic manufacture is not commercially feasible. To the extent any of our owned or licensed future intellectual property is also generated through the use of U.S. government funding, the provisions of the Bayh-Dole Act may similarly apply.

Risks Related to an Investment in our Securities and Other General Matters

The market price of shares of our common stock or public warrants may be volatile, which could cause the value of your investment to decline.

If you purchase shares of our common stock or warrants to purchase common stock, you may not be able to resell those shares or warrants at or above the price you paid. The market price of our common stock may be highly volatile and may fluctuate or decline significantly in response to numerous factors, some of which are beyond our control. It is possible that an active trading market will not be sustained. The securities markets have experienced and continue to experience significant volatility. Market volatility, as well as general economic, market or political conditions, could reduce the market price of shares of our common stock or warrants to purchase common stock regardless of our operating performance. Our operating results could be below the expectations of public market analysts and investors due to a number of potential factors, including:

- variations in quarterly operating results or dividends, if any, to stockholders;
- additions or departures of key management personnel;
- publication of research reports about our industry;
- rumors and market speculation involving us or other companies in our industry, which may include short seller reports;
- litigation and government investigations;
- changes or proposed changes in laws or regulations or differing interpretations or enforcement of laws or regulations affecting our business;
- adverse market reaction to any indebtedness incurred or securities issued in the future;
- changes in market valuations of similar companies;
- announcements by competitors of significant contracts, acquisitions, dispositions, strategic partnerships, joint ventures, or capital commitments;
- the impact of any future bank failures, public health crises or geopolitical events such as tensions in and around Ukraine, Israel and other areas of the world; and
- the impact of any of the foregoing on our management, employees, partners, customers, and operating results.

Following periods of volatility in the overall market and the market price of a company's securities, securities class action litigation has often been instituted against such company. Such litigation could result in substantial costs and a diversion of

management's attention and resources. See also "*—Risks Related to Litigation and Government Regulation—Our business is exposed to risks associated with litigation, investigations and regulatory proceedings*."

If our operating and financial performance in any given period does not meet the guidance provided to the public or the expectations of investment analysts, the market price of our common stock may decline.

We have historically and may continue to, but are not obligated to, provide public guidance on our expected operating and financial results for future periods. Any such guidance will consist of forward-looking statements, subject to the risks and uncertainties described in this filing and in our other public filings and public statements. Our actual results may not always be in line with or exceed any guidance we have provided, especially in times of economic uncertainty. Further, our lengthy sales cycle may contribute to substantial fluctuations in our quarterly or annual operating results as significant sales can be delayed to subsequent periods. If, in the future, our operating or financial results for a particular period do not meet any guidance provided or the expectations of investment analysts, or if we reduce our guidance for future periods, the market price of our common stock may decline as well. There can be no assurance that we will continue to issue public guidance in the future.

Our quarterly operating results may fluctuate significantly and could fall below the expectations of securities analysts and investors due to several factors, some of which are beyond our control, resulting in a decline in our stock price.

Our quarterly operating results may fluctuate significantly because of several factors, including:

- labor availability and costs for hourly and management personnel;
- profitability of our products, especially in new markets;
- changes in interest rates;
- impairment of long-lived assets;
- macroeconomic conditions, both nationally and locally;
- size and scope of our revenue arrangements with our customers;
- negative publicity relating to our products;
- changes in customer preferences and competitive conditions;
- the loss of strategic relationships or existing contracts with any customer;
- lengthy customer sales cycle, leading to difficulty in forecasting the timing of purchasing decisions;
- expansion to new markets; and
- fluctuations in commodity prices.

Short sellers may engage in manipulative activity intended to drive down the market price of our common stock, which could also result in related regulatory and governmental scrutiny, among other effects.

Short selling is the practice of selling securities that the seller does not own but rather has borrowed or intends to borrow from a third party with the intention of later buying lower priced identical securities to return to the lender. Accordingly, it is in the interest of a short seller of our common stock for the price to decline. At any time, short sellers may publish, or arrange for the publication of, opinions or characterizations that are intended to create negative market momentum. Issuers, like us, whose securities have historically had limited trading history or volumes and/or have been susceptible to relatively high volatility levels can be vulnerable to such short seller attacks. Short selling reports can cause increased volatility in an issuer's stock price, and result in regulatory and governmental inquiries. On May 3, 2022, a short seller report was published about us, which contained certain allegations against us. Any inquiry or formal investigation from a governmental organization or other regulatory body, including any inquiry from the SEC or the U.S. Department of Justice, could result in a material diversion of our management's time and could have a material adverse effect on our business and results of operations.

Our ability to timely raise capital in the future may be limited, or may be unavailable on acceptable terms, if at all. The failure to raise capital when needed could harm our business, operating results and financial condition. Debt or equity issued to raise additional capital may reduce the value of our common stock.

We cannot be certain when or if the operations of our business will generate sufficient cash to fund our ongoing operations or the growth of our business. We intend to make investments to support our current business and may require additional funds to

respond to business challenges, including the need to develop or enhance our technology, improve our operating infrastructure or acquire complementary businesses and technologies. Additional financing may not be available on favorable terms, if at all. In addition, we may not be able to access a portion of our existing cash, cash equivalents and investments due to market conditions. For example, on March 10, 2023, the Federal Deposit Insurance Corporation ("FDIC") took control and was appointed receiver of Silicon Valley Bank ("SVB"). Similarly, on March 12, 2023, Signature Bank and Silvergate Capital Corp. were each swept into receivership. If other banks and financial institutions enter receivership or become insolvent in the future in response to financial conditions affecting the banking system and financial markets, our ability to access our existing cash, cash equivalents and investments may be threatened and could have a material adverse effect on our business and financial condition. Additionally, weakness and volatility in capital markets and the economy, in general or as a result of bank failures or macroeconomic conditions such as rising inflation, could limit our access to capital markets and increase our costs of borrowing. If adequate funds are not available on acceptable terms, we may be unable to invest in future growth opportunities, which could harm our business, operating results and financial condition. If we incur debt, the debt holders could have rights senior to holders of our common stock to make claims on our assets. The terms of any debt could restrict our operations, including our ability to pay dividends on our common stock. If we issue additional equity securities, stockholders will experience dilution, and the new equity securities could have rights senior to those of our common stock.

Because the decision to issue securities in the future offering will depend on numerous considerations, including factors beyond our control, we cannot predict or estimate the amount, timing or nature of any future issuances of debt or equity securities. As a result, stockholders will bear the risk of future issuances of debt or equity securities reducing the value of their common stock and diluting their interest.

There can be no assurance that we will be able to comply with the continued listing standards of the New York Stock Exchange ("NYSE").

If we fail to satisfy the continued listing requirements of NYSE, such as the corporate governance requirements or the minimum share price requirement, NYSE may take steps to delist our securities. Such a delisting would likely have a negative effect on the price of the securities and would impair your ability to sell or purchase the securities when you wish to do so. In the event of a delisting, we can provide no assurance that any action taken by us to restore compliance with listing requirements would allow our securities to become listed again, stabilize the market price or improve the liquidity of our securities, prevent our securities from dropping below the NYSE minimum share price requirement or prevent future non-compliance with NYSE's listing requirements. Additionally, if our securities are not listed on, or become delisted from the NYSE, for any reason, and are quoted on the OTC Bulletin Board, an inter-dealer automated quotation system for equity securities that is not a national securities exchange, the liquidity and price of our securities may be more limited than if we were quoted or listed on the NYSE or another national securities exchange. You may be unable to sell your securities unless a market can be established or sustained.

If we are unable to maintain effective internal control over financial reporting, investors may lose confidence in the accuracy and completeness of financial reports, and the market price of our common stock may decline.

We are required to maintain internal controls over financial reporting and to report any material weaknesses in such internal controls. The process of designing, implementing, and testing the internal control over financial reporting required to comply with this obligation is time-consuming, costly, and complicated. There can be no assurance that the controls put in place will remain effective or that any additional controls needed will be designed and implemented timely to prevent material misstatements in our consolidated financial statements in future periods. If we identify material weaknesses in our internal control over financial reporting in the future, if we are unable to comply with the requirements of Section 404 of Sarbanes-Oxley Act of 2002 in a timely manner, or if we are unable to assert that our internal control over financial reporting is effective, we will be unable to certify that our internal control over financial reporting is effective. We cannot assure you that there will not be material weaknesses or significant deficiencies in our internal control over financial reporting in the future. Any failure to maintain internal control over financial reporting could severely inhibit our ability to accurately report our financial condition or results of operations. If we are unable to conclude that our internal control over financial reporting is effective, investors may lose confidence in the accuracy and completeness of our financial reports and the market price of our common stock could decline. We could become subject to investigations by the NYSE, the SEC or other regulatory authorities, which could require additional financial and management resources.

We will continue to incur significant increased expenses and administrative burdens as a public company, which could negatively impact our business, financial condition and results of operations.

We face increased legal, accounting, insurance, administrative and other costs and expenses as a public company. Sarbanes-Oxley, including the requirements of Section 404, as well as rules and regulations subsequently implemented by the SEC, the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 and the rules and regulations promulgated and to be promulgated thereunder, the Public Company Accounting Oversight Board ("PCAOB") and the securities exchanges, impose additional reporting

and other obligations on public companies. Compliance with public company requirements will continue to increase costs and make certain activities more time-consuming.

If any issues in complying with SEC reporting requirements are identified (for example, if we identify a material weakness or significant deficiency in the internal control over financial reporting), we could incur additional costs rectifying those issues, and the existence of those issues could harm our reputation or investor perceptions of us. Further, the costs to maintain our director and officer liability insurance may rise. Risks associated with our status as a public company may make it more difficult to attract and retain qualified persons to serve on our Board or as executive officers. The additional reporting and other obligations imposed by these rules and regulations will increase legal and financial compliance costs and the costs of related legal, accounting and administrative activities. These increased costs will require us to divert a significant amount of money that could otherwise be used to expand our business and achieve strategic objectives. Advocacy efforts by stockholders and third parties may also prompt additional changes in governance and reporting requirements, which could further increase costs.

We may issue additional shares of common stock or other equity securities without your approval, which would dilute your ownership interests and may depress the market price of our common stock.

As of December 31, 2024, we had warrants outstanding to purchase an aggregate of 2,863,848 shares of common stock. Pursuant to our employee benefit plans, we may issue an aggregate of up to 27,886,379 shares of common stock, which amount may be subject to increase from time to time. We may also issue additional shares of common stock or other equity securities of equal or senior rank in the future in connection with, among other things, future acquisitions or repayment of outstanding indebtedness, without stockholder approval, in a number of circumstances.

The issuance of additional shares or other equity securities of equal or senior rank would have the following effects:

- existing stockholders' proportionate ownership interest in us will decrease;
- the amount of cash available per share, including for payment of dividends, if any, may decrease;
- the relative voting strength of each previously outstanding share of common stock may be diminished; and
- the market price of our common stock may decline.

There is no guarantee that the public warrants will be in the money at any specific point in time, and they may expire worthless.

The exercise price for our public warrants is $11.50 per share of common stock. There is no guarantee that the public warrants will be in the money at any specific point in time prior to their expiration, and as such, the public warrants may expire worthless. The public warrants expire on September 30, 2026.

We may amend the terms of the public warrants in a manner that may be adverse to holders with the approval by the holders of at least 50% of the then-outstanding public warrants. As a result, the exercise price of your public warrants could be increased, the exercise period could be shortened and the number of shares of our common stock purchasable upon exercise of a public warrant could be decreased, all without your approval.

Our public warrants are issued in registered form under the Warrant Agreement between the warrant agent and us. The Warrant Agreement provides that the terms of the public warrants may be amended without the consent of any holder to cure any ambiguity or correct any defective provision, but requires the approval by the holders of at least 50% of the then-outstanding public warrants to make any change that adversely affects the interests of the registered holders of public warrants. Accordingly, we may amend the terms of the public warrants in a manner adverse to a holder if holders of at least 50% of the then-outstanding public warrants approve of such amendment. Although our ability to amend the terms of the public warrants with the consent of at least 50% of the then-outstanding public warrants is unlimited, examples of such amendments could be amendments to, among other things, increase the exercise price of the warrants, convert the public warrants into cash or stock (at a ratio different than initially provided), shorten the exercise period or decrease the number of shares of our common stock purchasable upon exercise of a public warrant.

We may redeem unexpired public warrants prior to their exercise at a time that is disadvantageous to warrant holders, thereby making such warrants worthless.

We have the ability to redeem outstanding public warrants prior to their expiration, at a price of $0.01 per warrant, provided that the last reported sales price of our common stock equals or exceeds $18.00 per share (as adjusted for stock splits, stock dividends, reorganizations, recapitalizations and the like) for any 20 trading days within a 30-trading day period ending on the third trading day prior to the date on which we give proper notice of such redemption and provided certain other conditions are met. While the public

warrants are redeemable by us, we may exercise our redemption right even if we are unable to register or qualify the underlying securities for sale under all applicable state securities laws. Redemption of the outstanding public warrants could force you (1) to exercise your public warrants and pay the exercise price at a time when it may be disadvantageous for you to do so, (2) to sell your public warrants at the then-current market price when you might otherwise wish to hold your public warrants or (3) to accept the nominal redemption price which, at the time the outstanding public warrants are called for redemption, is likely to be substantially less than the market value of your public warrants.

In addition, we may redeem the public warrants prior to their expiration, at a price of $0.10 per warrant, provided that the last reported sales price of our common stock equals or exceeds $10.00 per share (as adjusted for stock splits, stock dividends, reorganizations, recapitalizations and the like) for any 20 trading days within a 30-trading day period ending on the third trading day prior to the date on which we give proper notice of such redemption, provided that the warrants can be exercised on a cashless basis prior to redemption for a number of shares of common stock determined based on the redemption date and the fair market value of our common stock, and provided certain other conditions are met. Any such redemption may have similar consequences to a cash redemption described above. In addition, such redemption may occur at a time when the public warrants are "out-of-the-money," in which case, you would lose any potential embedded value from a subsequent increase in the value of our common stock had your public warrants remained outstanding.

We have no current plans to pay cash dividends on our common stock; as a result, stockholders may not receive any return on investment unless they sell their common stock for a price greater than the purchase price.

We have no current plans to pay dividends on our common stock. Any future determination to pay dividends will be made at the discretion of our Board, subject to applicable laws. It will depend on a number of factors, including our financial condition, results of operations, capital requirements, contractual, legal, tax and regulatory restrictions, general business conditions, and other factors that the Board may deem relevant. In addition, the ability to pay cash dividends may be restricted by the terms of debt financing arrangements, as any future debt financing arrangement likely will contain terms restricting or limiting the amount of dividends that may be declared or paid on our common stock. As a result, stockholders may not receive any return on an investment in our common stock unless they sell their shares for a price greater than what they paid for them.

Provisions in our organizational documents and certain rules imposed by regulatory authorities may delay or prevent an acquisition by a third party that could otherwise be in the interests of stockholders.

Our second amended and restated certificate of incorporation ("Certificate of Incorporation") and amended and restated bylaws ("Bylaws") contain several provisions that may make it more difficult or expensive for a third party to acquire control of us without the approval of the Board. These provisions, which may delay, prevent or deter a merger, acquisition, tender offer, proxy contest, or other transaction that stockholders may consider favorable, include the following:

- a classified board;
- advance notice for nominations of directors by stockholders and for stockholders to include matters to be considered at our annual meetings;
- certain limitations on convening special stockholder meetings;
- limiting the persons who may call special meetings of stockholders;
- limiting the ability of stockholders to act by written consent;
- restrictions on business combinations with an interested stockholder;
- in certain cases, the approval of holders representing at least 66 2/3% of the total voting power of the shares entitled to vote generally in the election of directors will be required for stockholders to adopt, amend or repeal the Bylaws, or amend or repeal certain provisions of the Certificate of Incorporation;
- no cumulative voting;
- the required approval of holders representing at least 66 2/3% of the total voting power of the shares entitled to vote at an election of the directors to remove directors; and
- the ability of the Board to designate the terms of and issue new series of preferred stock without stockholder approval, which could be used, among other things, to institute a rights plan that would have the effect of significantly diluting the stock ownership of a potential hostile acquirer, likely preventing acquisitions.

These provisions of our Certificate of Incorporation and Bylaws could discourage potential takeover attempts and reduce the price that investors might be willing to pay for shares of our common stock in the future, which could reduce the market price of our common stock.

The provision of our Certificate of Incorporation requiring exclusive venue in the Court of Chancery in the State of Delaware and the federal district courts of the United States for certain types of lawsuits may have the effect of discouraging lawsuits against directors and officers.

Our Certificate of Incorporation provides that, unless we consent in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware shall be the sole and exclusive forum for:

- any derivative action or proceeding brought on behalf of us;
- any action asserting a claim of breach of fiduciary duty owed by any director, officer, agent or other employee or stockholder to us or our stockholders;
- any action asserting a claim arising pursuant to any provision of the Delaware General Corporation Law (the "DGCL"), the Certificate of Incorporation or Bylaws or as to which the DGCL confers jurisdiction on the Court of Chancery of the State of Delaware;
- any claim or cause of action seeking to interpret, apply, enforce or determine the validity of the Certificate of Incorporation or the Bylaws; or
- any action asserting a claim governed by the internal affairs doctrine, in each case subject to such Court of Chancery having personal jurisdiction over the indispensable parties named as defendants therein. It further provides that, unless we consent in writing to the selection of an alternative forum, the federal district courts of the United States shall, to the fullest extent permitted by law, be the sole and exclusive forum for the resolutions of any complaint asserting a cause of action arising under the Securities Act. The exclusive forum clauses described above shall not apply to suits brought to enforce a duty or liability created by the Exchange Act, or any other claim for which the federal courts have exclusive jurisdiction. Although these provisions are expected to benefit us by providing increased consistency in the application of applicable law in the types of lawsuits to which they apply, the provisions may have the effect of discouraging lawsuits against directors and officers. The enforceability of similar choice of forum provisions in other companies' certificates of incorporation have been challenged in legal proceedings and there is uncertainty as to whether a court would enforce such provisions. In addition, investors cannot waive compliance with the federal securities laws and the rules and regulations thereunder. It is possible that, in connection with any applicable action brought against us, a court could find the choice of forum provisions contained in our Certificate of Incorporation to be inapplicable or unenforceable in such action. If so, we may incur additional costs associated with resolving such action in other jurisdictions, which could harm our business, financial condition or results of operations.

These provisions of our Certificate of Incorporation and Bylaws could discourage lawsuits against directors and officers, which could reduce the market price of our common stock.

Item 1B. Unresolved Staff Comments.

None.

Item 1C. Cybersecurity.

Cybersecurity Risk Management and Strategy

We recognize the importance of identifying and managing cybersecurity risks and have integrated cybersecurity risk management into our overall risk management processes. We have implemented processes to identify, assess, detect, evaluate, and mitigate ongoing security threats to our information technology systems and data as well as those of third parties upon which we rely.

We conduct periodic and ad-hoc risk assessments to identify cybersecurity threats, as well as assessments in the event of a material change in our business practices that may affect information systems that are vulnerable to such cybersecurity threats. These risk assessments include identification of reasonably foreseeable internal and external risks, the likelihood and potential damage that could result from such risks, and the sufficiency of existing policies, procedures, systems, and safeguards in place to manage such risks.

As part of our risk management process, we conduct application security and vulnerability assessments, undergo third-party penetration testing of both our digital and physical assets, maintain ongoing risk assessments, and monitor various third-party risk feeds. Our risk management processes also assess third party risks, and we perform third-party risk management to identify and mitigate risks from third parties such as vendors, suppliers, and other business partners. In evaluating our response to our application security assessments, penetration tests, and risk feeds, our team collaborates with technical and business stakeholders to further analyze the risk to the company, and form detection, mitigation and remediation strategies to enhance our current security program. Our security program is aligned to the National Institute of Standards and Technology Cybersecurity Framework Special Publication (NIST) 800-53 standard, and we have obtained a SOC 2 Type 2 Certification. Although we refer to such frameworks in developing our cybersecurity risk management approaches, our use of them as guides is not intended to suggest that we meet any particular technical standards, specifications, or requirements set forth therein.

We maintain an incident response plan which includes, among other areas, prioritization guidelines, data collection and evidence handling, communication channels and partners, and if required, law enforcement engagement. We maintain relationships with both local and national law enforcement agencies. We evaluate security incidents on a scale of severity to determine the appropriate incident handling protocols.

We require all employees to undertake data protection and security training at least annually. We provide specialized training to targeted groups of employees depending on their role and the larger threat landscape. We are briefed regularly by national law enforcement, and work with external consulting firms on custom training and evaluations.

While we have experienced cybersecurity incidents in the past, to date, none have materially affected the Company or our financial position, results of operations, or cash flows. We continue to invest in the cybersecurity and resiliency of our systems and networks and to enhance our internal controls and processes, which are designed to help protect our systems and infrastructure, and the information they contain. Additional information about cybersecurity risks we face is discussed in Item 1A of Part I, “Risk Factors,” under the heading “If our information technology systems, data, or physical facilities, or those of third parties upon which we rely, are or were compromised, we could experience adverse business consequences resulting from such compromise,” which should be read in conjunction with the information contained within Item 1C, Cybersecurity.

Cybersecurity Governance

The Company’s Board of Directors oversees the overall risk management process, including cybersecurity risks, directly and through its committees. Our Audit Committee is responsible for the oversight of cybersecurity risks, including our assessment of potential vulnerabilities and threats, evaluation of incidents, and monitoring of the implementation of key actions and/or projects to further enhance our ability to detect and manage ongoing security threats. Key members of management, including our security officer, provide updates to our Audit Committee on at least a semi annual basis. In addition to committee updates, our security officer also meets with the full Board of Directors at least annually to discuss the Company’s overall risk profile and associated ongoing mitigation efforts. The briefings provided to our Audit Committee and Board of Directors include updates on the Company’s key cyber risks and threats, the status of projects to strengthen our information security systems and incident readiness programs, assessments of the information security program and our key assets, as well as the emerging threat landscape.

Our security officer has over a decade of management and executive level information technology experience and reports to our SVP of Engineering and Technology. Our security officer is a member of the senior leadership team, collaborates closely with key members of management including our Chief Executive Officer, Chief Financial Officer, Chief Legal Officer, SVP of Engineering and Technology, and SVP of Product to continuously monitor and evaluate our ongoing risk profile and mitigation strategies. Our security officer also provides ad hoc updates to management on cybersecurity-related news and events and discusses any updates to our cybersecurity risk management and strategy programs as a result of these matters. Where in the past we leveraged an outside fractional Chief Information Security Officer (“CISO”), during the year we transitioned to an in-house security leadership team. Our team includes personnel for supply chain security, governance risk and compliance and security engineering. We continue to leverage external industry partners in key areas including penetration testing, forensics, and for our security operations center. We use industry standard security tools across our program and reevaluate these annually as we digest the evolving threat landscape.

The Company’s overall risks and assessments are monitored via a cross functional team composed of members of senior management, security, legal, and financial reporting. A partnership exists between these aforementioned individuals and departments so that identified issues are addressed in a timely manner and incidents are escalated to the appropriate parties as required.

Item 2. Properties.

Our principal facility is our corporate headquarters, located in College Park, Maryland, where we lease approximately 32,000 square feet of space from the University of Maryland under an agreement that expires in 2030. This facility is used for research and

development, servicing customers, and corporate functions. We also lease approximately 101,000 square feet of space in Bothell, Washington under an agreement that expires in 2030. Most of the facility is used for manufacturing, research and development, servicing customers, and general office space. We also lease approximately 13,000 square feet of space in Arlesheim, Switzerland under an agreement that expires in 2029. Most of the facility is used for servicing customers and general office space. We believe that our facilities are sufficient to meet our current needs and we will be able to obtain additional space as needed under commercially reasonable terms.

Item 3. Legal Proceedings.

From time to time, we may become involved in legal proceedings relating to claims arising from the ordinary course of business. Future litigation may be necessary to defend ourselves. The results of any current or future litigation cannot be predicted with certainty, and regardless of the outcome, litigation can have an adverse impact on us because of defense and settlement costs, diversion of management resources and other factors.

In May 2022, a securities class action complaint captioned Leacock v. IonQ, Inc. et al., Case No. 8:22-cv-01306, was filed by a stockholder of the Company in the United States District Court for the District of Maryland (the "Leacock Litigation") against the Company and certain of the Company's current officers. In June 2022, a securities class action complaint captioned Fisher v. IonQ, Inc., Case No. 8:22-cv-01306-DLB (the "Fisher Litigation") was filed by a stockholder against the Company and certain of the Company's current officers ("IonQ Defendants"). Both the Leacock Litigation and Fisher Litigation, which have been consolidated into a single action, allege violations of Section 10(b) of the Exchange Act, and Rule 10b-5 promulgated thereunder, and Section 20(a) of the Exchange Act and seek damages. In September 2022, the Court appointed lead plaintiffs and counsel for lead plaintiffs, and ordered lead plaintiffs to file a consolidated amended complaint. The consolidated amended complaint was filed on November 22, 2022. As part of the consolidated amended complaint, certain members of the Company's board of directors as well as other dMY-related defendants ("Additional Defendants") have been added as defendants to the case. On February 7, 2023, the IonQ Defendants and the Additional Defendants each filed a motion to dismiss the consolidated amended complaint. On March 23, 2023, lead plaintiffs filed their omnibus opposition to the motions to dismiss. On April 26, 2023, the IonQ Defendants and the Additional Defendants each filed a reply in support of the motions to dismiss. On September 28, 2023, the District Court of Maryland issued an order dismissing plaintiffs' claims against the IonQ Defendants and the Additional Defendants with prejudice and directed the clerk to close the case. On October 26, 2023, the plaintiffs filed a motion for post-judgment relief, seeking to amend their consolidated amended complaint. The IonQ Defendants and Additional Defendants filed oppositions to plaintiffs' motion on December 1, 2023, and plaintiffs filed their reply on January 8, 2024. On July 10, 2024, the plaintiffs' motion for post-judgment relief was denied and the District Court of Maryland directed the clerk to close the case. On July 26, 2024, the plaintiffs filed a Notice of Appeal with the Fourth Circuit Court of Appeals seeking to review the trial court's decision. Plaintiffs filed their Opening Brief in the Fourth Circuit on September 9, 2024. A response brief by IonQ Defendants was filed on October 8, 2024 and plaintiffs' reply brief was filed on October 29, 2024. Oral argument in the Fourth Circuit occurred on January 31, 2025. Given the uncertainty of litigation and the legal standards that must be met for, among other things, success on the case merits, the Company cannot reasonably estimate the possible loss or range of loss, if any, that may result from the associated suit.

Refer to Note 11, Commitments and Contingencies, to the consolidated financial statements included in this Annual Report for further details on current legal proceedings.

Item 4. Mine Safety Disclosures.

Not applicable.

PART II

Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities.

Market Information

Our common stock and public warrants are traded on the NYSE under the symbols "IONQ" and "IONQ WS," respectively.

Holders

As of February 19, 2025, there were approximately 27 stockholders of record. The actual number of stockholders is greater than this number of record holders, and includes stockholders who are beneficial owners, but whose shares are held in street name by brokers and other nominees. This number of holders of record also does not include stockholders whose shares may be held in trust by other entities.

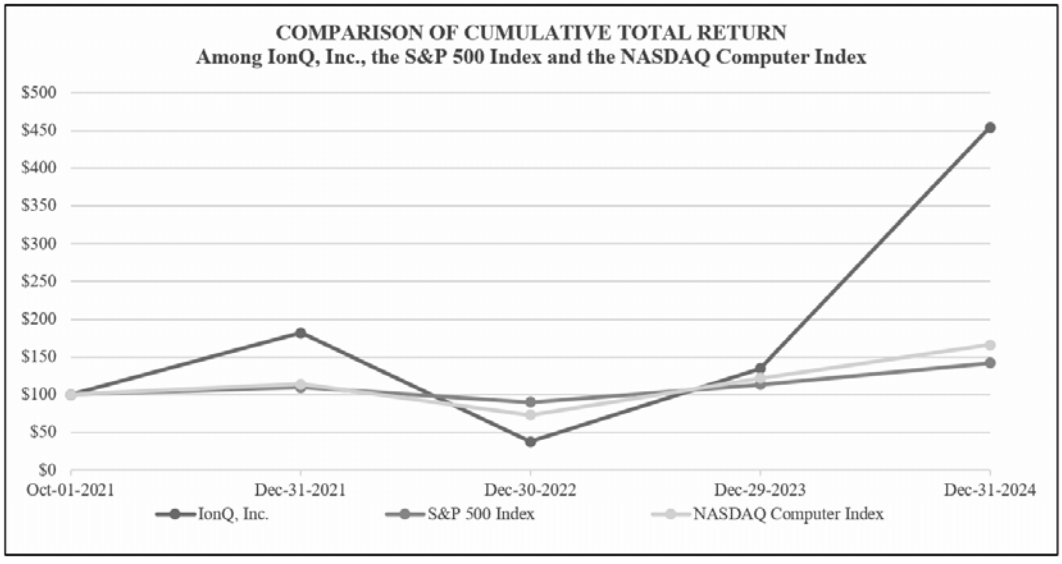
Dividend Policy

We have never declared or paid any cash dividends on our capital stock and do not anticipate paying any cash dividends in the foreseeable future. Payment of cash dividends, if any, in the future will be at the discretion of our Board and will depend on then-existing conditions, including our financial condition, operating results, contractual restrictions, capital requirements, business prospects and other factors our Board may deem relevant.

Stock Performance Graph

This performance graph shall not be deemed "soliciting material" or"filed" with the SEC for purposes of Section 18 of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), or otherwise subject to the liabilities under that Section or incorporated by reference into any filing of IonQ, Inc. under the Securities Act of 1933, as amended (the "Securities Act"), or the Exchange Act, except as shall be expressly set forth by specific reference in such filing.

The following graph depicts the cumulative total shareholder return from October 1, 2021 (the first day on which the Company's common stock traded on the NYSE) through December 31, 2024 for the Company, the S&P 500 Index and the Nasdaq Computer Index. The graph assumes $100 was invested in each of the Company's common stock, the S&P 500 Index and the Nasdaq Computer Index as of market close on October 1, 2021. Data for the S&P 500 Index and Nasdaq Computer Index assumes reinvestment of the full amount of all dividends. No dividends have been declared on our common stock. The comparisons in the graph below are based upon historical data and are not indicative of, nor intended to forecast, future performance of our common stock.



Recent Sales of Unregistered Equity Securities

None.

Purchases of Equity Securities by the Issuer and Affiliated Purchasers

None.

Item 6. [Reserved].

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations.

This Annual Report contains statements that may constitute "forward-looking statements" within the meaning of Section 27A of the Securities Act of 1933, as amended (the "Securities Act"), and Section 21E of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), that involve substantial risks and uncertainties. All statements contained in this Annual Report other than statements of historical fact, including statements regarding our future results of operations and financial position, our business strategy and plans, and our objectives for future operations, are forward-looking statements. The words "believes," "expects," "intends," "estimates," "projects," "anticipates," "will," "plan," "may," "should," "could," or similar language are intended to identify forward-looking statements.

It is routine for our internal projections and expectations to change throughout the year, and any forward-looking statements based upon these projections or expectations may change prior to the end of the next quarter or year. Readers of this Annual Report are cautioned not to place undue reliance on any such forward-looking statements. As a result of a number of known and unknown risks and uncertainties, our actual results or performance may be materially different from those expressed or implied by these forward-looking statements. Risks and uncertainties are identified under "Risk Factors" in Item 1A herein and in our other filings with the Securities and Exchange Commission (the "SEC"). All forward-looking statements included herein are made only as of the date hereof. Unless otherwise required by law, we do not undertake, and specifically disclaim, any obligation to update any forward-looking statement, whether as a result of new information, future events, or otherwise after the date of such statement.

You should read the following discussion and analysis of our financial condition and results of operations together with our audited consolidated financial statements and related notes included elsewhere in this Annual Report. Unless the context otherwise requires, the terms "IonQ," "Legacy IonQ" "we," "us," "our" and similar terms refer to IonQ Quantum, Inc. prior to the consummation of the Business Combination and IonQ, Inc. and its wholly owned subsidiaries after the consummation of the Business Combination. References to "dMY" refer to the predecessor company prior to the consummation of the Business Combination.

This section provides an analysis of our financial condition and results of operations for the year ended December 31, 2024, compared to the year ended December 31, 2023. A discussion of our financial condition and results of operations for the year ended December 31, 2023 compared to the year ended December 31, 2022 can be found under Item 7 in our Annual Report on Form 10-K for the year ended December 31, 2023, filed on February 28, 2024, which is available free of charge on the SEC's website at www.sec.gov and our investor relations website at investors.ionq.com.

Overview

We are developing quantum computers and networks designed to solve some of the world's most complex problems, and transform business, society and the planet for the better. We believe that our proprietary technology, our architecture, and the technology exclusively available to us through license agreements will offer us advantages both in terms of research and development, as well as the commercial value of our intended product offerings.

Today, we sell specialized quantum computing and networking hardware together with related maintenance and support. We also sell access to several quantum computers of various qubit capacities and are in the process of researching and developing technologies for quantum computers with increasing computational capabilities. We currently make access to our quantum computers available via three major cloud platforms, Amazon Web Services' ("AWS") Amazon Braket, Microsoft's Azure Quantum and Google's Cloud Marketplace, and also to select customers via our own cloud service. This cloud-based approach enables the broad availability of quantum-computing-as-a-service ("QCaaS").

We supplement our offerings with professional services focused on assisting our customers in applying quantum computing and networking to their businesses. We also expect to sell full quantum computing systems to customers, either over the cloud or for local access. We also offer quantum networking products which offer customers secure communication networks and enable networked quantum computing.

We are still in the early stages of commercial growth. Since our inception, we have incurred significant operating losses. Our ability to generate revenue sufficient to achieve profitability will depend heavily on the successful development and further commercialization of our quantum computing systems. Our net losses were $331.6 million, $157.8 million and $48.5 million, for the years ended December 31, 2024, 2023 and 2022, respectively. As of December 31, 2024, we had an accumulated deficit of $683.7 million. We expect to continue to incur significant losses for the foreseeable future as we prioritize reaching the technical milestones necessary to achieve an increasingly higher number of algorithmic qubits and higher levels of fidelity than presently exists—prerequisites for quantum computing to reach broad quantum advantage.

The Merger Agreement

On March 7, 2021, Legacy IonQ, dMY and Ion Trap Acquisition Inc. (the "Merger Sub") entered into an Agreement and Plan of Merger (the "Merger Agreement"). Pursuant to the Merger Agreement, at the closing, the Merger Sub was merged with and into Legacy IonQ, with Legacy IonQ continuing as the surviving corporation following the merger, being a wholly owned subsidiary of dMY and the separate corporate existence of the Merger Sub ceased (the "Business Combination"). Contemporaneously with the Business Combination, dMY changed its name to IonQ, Inc. and Legacy IonQ changed its name to IonQ Quantum, Inc. IonQ became the successor registrant with the SEC, meaning that Legacy IonQ's financial statements for previous periods have been disclosed in the registrant's periodic reports filed with the SEC.

Impact of the Macroeconomic Climate on Our Business

Inflationary factors, interest rates and overhead costs may adversely affect our operating results. High interest and inflation rates also present a recent challenge impacting the U.S. economy and could make it more difficult for us to obtain traditional financing on acceptable terms, if at all, in the future. Although we do not believe that inflation has had a material impact on our financial position or results of operations to date, we may experience increases in the future on our operating costs, including due to supply chain constraints, consequences associated with bank failures, geopolitical tensions in and around Ukraine, Israel and other areas of the world, and employee availability and wage increases, which may result in additional stress on our working capital resources.

Key Components of Results of Operations

Revenue

We derive revenue from contracts associated with the design, development, construction and sale of specialized quantum computing hardware together with related maintenance and support, from contracts providing access to QCaaS, and from consulting services related to co-developing algorithms on quantum computing systems.In arrangements with the cloud service providers, the cloud service provider is considered the customer and we do not have any contractual relationships with the cloud service providers' end users.

Certain of our contracts contain multiple performance obligations, most commonly in contracts for the sale of specialized quantum computing hardware together with related maintenance and support. Such contracts may also include access to our QCaaS. A contract's transaction price is allocated to each distinct performance obligation and recognized as revenue when or as the performance obligation is satisfied. When there are multiple performance obligations in a contract, we allocate the transaction price to each performance obligation based on its standalone selling price when available. We determine standalone selling price based on the observable price of a product or service when we sell the products or services separately in similar circumstances and to similar customers. Certain products and services have limited or no history of being sold on a standalone basis, requiring us to estimate the standalone selling price. To date, we have estimated the standalone selling price based on other contracts for similar products and services adjusted for differing terms than the contract being evaluated, as well as internal pricing guidelines and market factors. In addition, we take into consideration the estimated costs to be incurred to satisfy the performance obligation plus an appropriate profit margin. In limited situations, for certain contracts executed in prior years, when the standalone selling price was not known, due to it being either highly variable or uncertain, we allocated the transaction price using the residual approach. Estimates related to standalone selling price have not had a material impact on revenue recognized in recent periods.

We have determined that our QCaaS contracts represent a combined, stand-ready performance obligation to provide access to our quantum computing systems together with related maintenance and support. The transaction price generally consists of a fixed fee for a minimum volume of usage to be made available over a defined period of access. Fixed fee arrangements may also include a variable component whereby customers pay an amount for usage over contractual minimums contained in the contracts. For performance obligations related to providing QCaaS access, fixed fees are recognized on a straight-line basis over the access period. Variable usage fees are recognized in the period they occur. We have determined that contracts that contain consulting services related to co-developing quantum computing algorithms and the ability to use our quantum computing systems to run such algorithms represent a combined performance obligation that is satisfied over-time.

Performance obligations are satisfied over time if the customer receives the benefits as we perform the work, if the customer controls the asset as it is being produced (continuous transfer of control), or if the product being produced for the customer has no alternative use and we have a contractual right to payment for performance to date. For performance obligations related to specialized quantum computing hardware and consulting services, revenue is recognized over time based on the efforts incurred to date relative to the total expected effort, primarily based on a cost-to-cost input measure. We apply judgment to determine a reasonable method to measure progress and to estimate total expected effort. Factors considered in these estimates include our historical performance, the availability, productivity and cost of labor, the nature and complexity of work to be performed, the effect of change orders, availability and cost of materials and the effect of any delays in performance.

Operating Costs and Expenses

Cost of revenue

Cost of revenue primarily consists of expenses related to construction of specialized quantum computing hardware and delivery of our services, including personnel-related expenses, hardware costs, allocated overhead costs for customer facing functions, and costs associated with maintaining our in-service quantum computing systems to ensure proper calibration as well as costs incurred for maintaining the cloud on which the QCaaS resides. Personnel-related expenses include salaries, benefits, and stock-based compensation. Cost of revenue excludes depreciation and amortization related to our quantum computing systems and related software.

Research and development

Research and development expenses consist of personnel-related expenses, including salaries, benefits and stock-based compensation, and allocated overhead costs for our research and development functions. Unlike a standard computer, design and development efforts continue throughout the useful life of our quantum computing systems to ensure proper calibration and optimal functionality. Research and development expenses also include purchased hardware and software costs related to quantum computing systems constructed for research purposes that are not probable of providing a future economic benefit and have no alternate future use as well as costs associated with third-party research and development arrangements.

Sales and marketing

Sales and marketing expenses consist of personnel-related expenses, including salaries, commissions, benefits and stock-based compensation, costs for direct advertising, marketing and promotional expenditures and allocated overhead costs for our sales and marketing functions. We expect to continue to make the necessary sales and marketing investments to enable us to increase our market penetration and expand our customer base.

General and administrative

General and administrative expenses consist of personnel-related expenses, including salaries, benefits and stock-based compensation, and allocated overhead costs for our corporate, executive, finance, and other administrative functions. General and administrative expenses also include expenses for outside professional services, including legal, auditing and accounting services, recruitment expenses, information technology, travel expenses, certain non-income taxes, insurance, and other administrative expenses. We expect our general and administrative expenses to increase for the foreseeable future as we scale our support functions with the growth of our business.

Depreciation and amortization

Depreciation and amortization expense results from depreciation and amortization of our property and equipment, including our quantum computing systems, and intangible assets that are recognized over their estimated lives.

Nonoperating Costs and Expenses

Gain (loss) on change in fair value of warrant liabilities

The gain (loss) on change in fair value of warrant liabilities consists of mark-to-market fair value adjustments recorded associated with the public warrants assumed as part of the Business Combination.

Interest income, net

Interest income, net consists of income earned on our money market funds and other available-for-sale investments.

Other income (expense), net

Other income (expense), net consists of gains and losses that arise from fluctuations in foreign currency exchange rates and certain other nonoperating expenses.

Income tax benefit (expense)

Income tax expense consists of income taxes related to foreign jurisdictions in which we conduct business.

Results of Operations

The following table sets forth our consolidated statements of operations for the periods indicated:

	Year Ended December 31,	
	2024	2023
	(in thousands)	
Revenue	$ 43,073	$ 22,042
Costs and expenses:		
Cost of revenue (excluding depreciation and amortization)(1)	20,597	8,108
Research and development(1)	136,827	92,321
Sales and marketing(1)	28,395	18,270
General and administrative(1)	71,055	50,722
Depreciation and amortization	18,654	10,375
Total operating costs and expenses	275,528	179,796
Loss from operations	(232,455)	(157,754)
Gain (loss) on change in fair value of warrant liabilities	(117,107)	(19,206)
Interest income, net	18,249	19,322
Other income (expense), net	(275)	(85)
Loss before income tax expense	(331,588)	(157,723)
Income tax benefit (expense)	(59)	(48)
Net loss	**$ (331,647)**	**$ (157,771)**

(1) Cost of revenue, research and development, sales and marketing, and general and administrative expenses for the periods include stock-based compensation expense as follows:

	Year Ended December 31,	
	2024	2023
	(in thousands)	
Cost of revenue	$ 4,740	$ 2,819
Research and development	58,696	40,103
Sales and marketing	13,788	6,762
General and administrative	29,654	20,059

Comparison of the Years Ended December 31, 2024 and 2023

Revenue

	Year Ended December 31,		$	%
	2024	2023	Change	Change
	(in thousands)			
Revenue	$ 43,073	$ 22,042	$ 21,031	95%

Revenue increased by $21.0 million, or 95%, to $43.1 million for the year ended December 31, 2024, from $22.0 million for the year ended December 31, 2023 . The increase was primarily driven by progress on our arrangements to build specialized quantum computing hardware, as well as new revenue contracts under which we provided services during the year ended December 31, 2024.

Cost of revenue

	Year Ended December 31,		$	%
	2024	2023	Change	Change
	(in thousands)			
Cost of revenue (excluding depreciation and amortization)	$ 20,597	$ 8,108	$ 12,489	154%

Cost of revenue increased by $12.5 million, or 154%, to $20.6 million for the year ended December 31, 2024, from $8.1 million for the year ended December 31, 2023. The increase was driven primarily by an increase in hardware costs used in the construction of specialized quantum computing hardware, as well as an increase in labor costs to service contracts, for the year ended December 31, 2024.

Research and development

	Year Ended December 31,		$	%
	2024	2023	Change	Change
	(in thousands)			
Research and development	$ 136,827	$ 92,321	$ 44,506	48%

Research and development expense increased by $44.5 million, or 48%, to $136.8 million for the year ended December 31, 2024, from $92.3 million for the year ended December 31, 2023. The increase was primarily driven by an increase of $33.7 million in payroll-related expenses, including an increase in stock-based compensation of $18.1 million, as a result of increased headcount and new equity grants, and a $5.0 million increase in materials, supplies and equipment costs. The remaining increase is due to an increase in costs to support research and development initiatives, including a $1.9 million increase in professional service fees and a $2.3 million increase in allocated overhead costs.

Sales and marketing

	Year Ended December 31,		$	%
	2024	2023	Change	Change
	(in thousands)			
Sales and marketing	$ 28,395	$ 18,270	$ 10,125	55%

Sales and marketing expense increased by $10.1 million, or 55%, to $28.4 million for the year ended December 31, 2024, from $18.3 million for the year ended December 31, 2023. The increase was primarily driven by an increase of $10.0 million of payroll-related expenses, including an increase in stock-based compensation of $7.0 million, as a result of increased headcount and new equity grants.

General and administrative

	Year Ended December 31,		$	%
	2024	2023	Change	Change
	(in thousands)			
General and administrative	$ 71,055	$ 50,722	$ 20,333	40%

General and administrative expenses increased by $20.3 million, or 40%, to $71.1 million for the year ended December 31, 2024, from $50.7 million for the year ended December 31, 2023. The increase was primarily driven by an increase of $21.4 million of payroll-related expenses, including a $10.0 million cash incentive award for the Company's chief executive officer and an increase in stock-based compensation of $9.6 million, offset by decreases of $0.6 million in professional service fees and allocated overhead costs and $0.5 million in director and officer liability insurance costs.

Depreciation and amortization

	Year Ended December 31,		$	%
	2024	2023	Change	Change
	(in thousands)			
Depreciation and amortization	$ 18,654	$ 10,375	$ 8,279	80%

Depreciation and amortization expenses increased by $8.3 million, or 80%, to $18.7 million for the year ended December 31, 2024, from $10.4 million for the year ended December 31, 2023. The increase was primarily driven by an increase of $3.1 million and $2.8 million in depreciation expense associated with capitalized quantum computing system costs and other property and equipment, respectively, and an increase of $2.4 million due to amortization of capitalized internal-use software.

Gain (loss) on change in fair value of warrant liabilities

	Year Ended December 31,		$	%
	2024	2023	Change	Change
	(in thousands)			
Gain (loss) on change in fair value of warrant liabilities	$ (117,107)	$ (19,206)	$ (97,901)	(510)%

The change in fair value of warrant liabilities decreased by $97.9 million, or 510%, to a loss of $117.1 million for the year ended December 31, 2024, from a loss of $19.2 million for the year ended December 31, 2023. The decrease was due to mark-to-market adjustments based on changes in the trading price for our public warrants.

Interest income, net

	Year Ended December 31,		$	%
	2024	2023	Change	Change
	(in thousands)			
Interest income, net	$ 18,249	$ 19,322	$ (1,073)	(6)%

Interest income, net decreased by $1.1 million, or 6%, to $18.2 million for the year ended December 31, 2024, from $19.3 million for the year ended December 31, 2023. The decrease was primarily driven by a decrease in the available-for-sale investments balance, offset by higher interest rates.

Liquidity and Capital Resources

As of December 31, 2024, we had cash, cash equivalents and available-for-sale securities of $363.8 million. Excluded from our available liquidity is $2.4 million of restricted cash, which is primarily recorded in other noncurrent assets in our consolidated balance sheets. We believe that our cash, cash equivalents and investments as of December 31, 2024, will be sufficient to meet our working capital and capital expenditure needs for the next 12 months. We believe we will meet longer term expected future cash requirements and obligations through a combination of cash flows from operating activities and available funds from our cash, cash equivalents and investment balances. However, this determination is based upon internal projections and is subject to changes in market and business conditions. We have incurred significant losses since our inception and as of December 31, 2024, we had an accumulated deficit of $683.7 million. During the year ended December 31, 2024, we incurred net losses of $331.6 million. We expect to incur significant losses and higher operating expenses for the foreseeable future.

Future Funding Requirements

We expect our principal sources of liquidity will continue to be our cash, cash equivalents and investments and any additional capital we may obtain through additional equity or debt financings. Our future capital requirements will depend on many factors, including investments in growth and technology. We may, in the future, enter into arrangements to acquire or invest in complementary businesses, services, and technologies, which may require us to seek additional equity or debt financing.

Our primary uses of cash and investments are to fund our operations as we continue to grow our business and our investing activities, including capital expenditures and potential acquisitions. We require a significant amount of cash for expenditures as we invest in ongoing research and development and commercialization of our products. Until such time as we can generate significant revenue from commercializing our quantum computing and networking technology, if ever, we expect to finance our liquidity needs

through our cash, cash equivalents and investments, as well as equity or debt financings or other capital sources, including potential collaborations and other similar arrangements. However, we may be unable to raise additional funds or enter into such other arrangements when needed on favorable terms or at all. To the extent that we raise additional capital through the sale of equity or convertible debt securities, the ownership interest of our stockholders will be or could be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect the rights of our stockholders. Debt financing and equity financing, if available, may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures, or declaring dividends. If we raise funds through collaborations, or other similar arrangements with third parties, we may have to relinquish valuable rights to our quantum computing and networking technology on terms that may not be favorable to us and/or may reduce the value of our common stock. If we are unable to raise additional funds through equity or debt financings when needed, we may be required to delay, limit, reduce or terminate our quantum computing and networking development efforts. Our future capital requirements and the adequacy of available funds will depend on many factors, including those set forth in the section titled "Risk Factors."

Our material contractual commitments as of December 31, 2024, primarily relate to operating lease commitments. As of December 31, 2024, we have total operating lease obligations of $21.9 million, with $3.7 million payable within 12 months. Other than operating lease commitments, cash requirements for fiscal year 2025 are expected to consist primarily of operating expenses and continued investment in our quantum computers.

Cash flows

The following table summarizes our cash flows for the period indicated:

	Year Ended December 31,		
	2024	2023	2022
		(in thousands)	
Net cash provided by (used in) operating activities	$ (105,683)	$ (78,811)	$ (44,698)
Net cash provided by (used in) investing activities	82,730	68,766	(309,056)
Net cash provided by (used in) financing activities	41,687	1,761	1,096

Cash flows from operating activities

Our cash flows from operating activities are significantly affected by the growth of our business, primarily related to research and development, sales and marketing, and general and administrative activities. Our operating cash flows are also affected by our working capital needs to support growth in personnel-related expenditures and fluctuations in accounts payable and other current assets and liabilities.

Net cash used in operating activities during the year ended December 31, 2024, was $105.7 million, resulting primarily from a net loss of $331.6 million, adjusted for non-cash activity, primarily related to stock-based compensation, the loss recorded as a result of mark-to-market activity for our public warrants, depreciation and amortization, and other working capital activities. The increase in net cash used in operations from the prior year period was primarily related to increased research and development activities and increased compensation costs.

Net cash used in operating activities during the year ended December 31, 2023, was $78.8 million, resulting primarily from a net loss of $157.8 million, adjusted for non-cash activity, primarily related to stock-based compensation, the loss recorded as a result of mark-to-market activity for our public warrants, depreciation and amortization, and other working capital activities.

Cash flows from investing activities

Net cash provided by investing activities during the year ended December 31, 2024, was $82.7 million, primarily resulting from cash received from maturities of available-for-sale securities of $418.1 million, offset by purchases of available-for-sale securities of $296.3 million, additions of $18.0 million to property and equipment primarily related to leasehold improvements, the development of our quantum computing systems, and other supporting equipment, cash paid of $15.5 million for businesses acquired, and additions of $3.9 million related to capitalized software development costs.

Net cash provided by investing activities during the year ended December 31, 2023, was $68.8 million, primarily resulting from maturities of available-for-sale securities of $386.8 million, offset by purchases of available-for-sale securities of $298.4 million, additions of $13.7 million to property and equipment primarily related to the development of our quantum computing systems, and additions of $4.6 million related to capitalized software development costs.

Cash flows from financing activities

Net cash provided by financing activities during the year ended December 31, 2024, was $41.7 million, primarily resulting from proceeds from warrants and stock options exercised.

Net cash provided by financing activities during the year ended December 31, 2023, was $1.8 million, primarily resulting from proceeds from stock options exercised.

Critical Accounting Estimates

This discussion and analysis of financial condition and results of operations is based upon the Company's consolidated financial statements, which have been prepared in accordance with U.S. GAAP. The preparation of these consolidated financial statements requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities. We also make estimates and assumptions on revenue generated and reported expenses incurred during the reporting periods. Our estimates are based on our historical experience and on various other factors that we believe are reasonable under the circumstances. The results of these estimates form the basis for making judgments about the carrying value of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates. Our critical accounting policies are described in greater detail in Note 2 to our audited consolidated financial statements included in this Annual Report.

Critical accounting estimates are defined as those reflective of significant judgments, estimates and uncertainties, which may result in materially different results under different assumptions and conditions. We have listed below our critical accounting estimates that we believe to have the greatest potential impact on our consolidated financial statements. Historically, our assumptions, judgments and estimates relative to our critical accounting estimates have not differed materially from actual results.

Revenue recognition

We derive revenue from contracts associated with the design, development, construction and sale of specialized quantum computing hardware together with related maintenance and support, from contracts providing access to QCaaS, and from consulting services related to co-developing algorithms on quantum computing systems.

For arrangements with multiple performance obligations, judgment is applied to determine the relative standalone selling price of each performance obligation as this is used to allocate the transaction price to each performance obligation within the contract. We determine standalone selling price based on the observable price of a product or service when we sell the products or services separately in similar circumstances and to similar customers. Certain products and services have limited or no history of being sold on a standalone basis, requiring us to estimate the standalone selling price. To date, we have estimated the standalone selling price based on other contracts for similar products and services adjusted for differing terms than the contract being evaluated, as well as internal pricing guidelines and market factors. In addition, we take into consideration the estimated costs to be incurred to satisfy the performance obligation plus an appropriate profit margin. In limited situations, for certain contracts executed in prior years, when the standalone selling price was not known, due to it being either highly variable or uncertain, we allocated the transaction price using the residual approach. Estimates related to standalone selling price in recent contracts did not have a material impact on revenue recognized.

Contracts with customers are evaluated at the time of execution and may vary in terms. The amount of revenue recognized in a period may vary with respect to the allocation of arrangement consideration to performance obligations with different revenue recognition patterns and changes to existing contract terms.

For certain contracts, revenue is recognized over time based on the efforts incurred to date relative to the total expected effort, primarily based on a cost-to-cost input measure. We apply judgment to determine a reasonable method to measure progress and to estimate total expected effort. Factors considered in these estimates include our historical performance, the availability, productivity and cost of labor, the nature and complexity of work to be performed, the effect of change orders, availability and cost of materials and the effect of any delays in performance. Changes in these estimates can have a significant impact on revenue recognition, which could result in material changes to reported revenue.

Quantum computing systems

Quantum computing systems are included within property and equipment, net on the consolidated balance sheets. Hardware and labor costs associated with the building of such quantum computing systems are capitalized in the period the costs are incurred. Costs to maintain quantum computing systems are expensed as incurred.

Judgment is used to determine when hardware and labor costs incurred for our quantum computing systems should be capitalized as a result of our assessment of whether the system will provide a probable future economic benefit and whether or not the costs represent activities necessary to build the systems, maintain the systems or to perform certain research and development functions.

We also estimate the useful life of our quantum computing systems, both at the time the assets are placed in service and periodically whenever events or changes in circumstances indicate that the useful life may have changed. In assessing useful lives, we consider, among other factors, the use of the asset, changes in technology, and the competitive environment. Changes in these estimates can have a significant impact on the assessment of capitalized costs and depreciation expense, which could result in material changes to reported property and equipment, net.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk.

Interest Rate Risk

We had cash, cash equivalents and available-for-sale securities of $363.8 million as of December 31, 2024. We hold our cash and cash equivalents for working capital purposes. Our cash and cash equivalents are held in cash and checking deposits, money market funds, and U.S government and agency securities. Our investments are held in corporate notes and bonds and U.S. government and agency securities. The primary objective of our investment activities is to preserve principal while at the same time maximizing yields without significantly increased risk. To achieve this objective, we invest in highly liquid securities depending on our strategic cash needs. Due to the nature of these instruments, we believe that we do not have any material exposure to changes in the fair value due to changes in interest rates. Declines in interest rates, however, would reduce our future interest income. Further, in the event of a significant decline in interest rates, we would consider taking actions to further mitigate our exposure to the change.

Concentration of Credit Risk

We deposit our cash, cash equivalents, restricted cash and investments with large, reputable financial institutions, and, at times, such balances may exceed federally insured limits.

Item 8. Consolidated Financial Statements and Supplementary Data.

The consolidated financial statements, together with the report of our independent registered public accounting firm, required by this item are set forth beginning on page F-1 of this Annual Report.

Item 9. Changes in and Disagreements With Accountants on Accounting and Financial Disclosure.

None.

Item 9A. Controls and Procedures.

Evaluation of Disclosure Controls and Procedures

We maintain “disclosure controls and procedures,” as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act that are designed to ensure that information required to be disclosed in the reports that we file or submit under the Exchange Act is (1) recorded, processed, summarized and reported, within the time periods specified in the SEC’s rules and forms and (2) accumulated and communicated to our management, including our principal executive officer and principal financial officer, to allow timely decisions regarding required disclosure. Management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives and management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures.

Our management, with the participation of our Chief Executive Officer and Chief Financial Officer, evaluated the effectiveness of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act), as of the end of the period covered by this Annual Report. Based on such evaluation, our Chief Executive Officer and Chief Financial Officer have concluded that as of December 31, 2024, our disclosure controls and procedures were effective in providing reasonable assurance that information required to be disclosed in our reports filed under the Exchange Act was recorded, processed, summarized and reported within the time periods prescribed by SEC rules and regulations, and that such information was accumulated and communicated to our management to allow timely decisions regarding required disclosure. Accordingly, we believe that the consolidated financial statements included in this Annual Report do fairly present, in all material respects, our financial position, results of operations and cash flows for the periods presented.

Management's Annual Report on Internal Control Over Financial Reporting

Management is responsible for establishing and maintaining adequate internal control over financial reporting for the Company. We conducted an evaluation of the effectiveness of our internal control over financial reporting based on the framework in *Internal Control—Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in 2013. This evaluation included review of the documentation of controls, evaluation of the design effectiveness of controls, testing of the operating effectiveness of controls and a conclusion on this evaluation. Based on our evaluation, we have concluded that our internal control over financial reporting was effective as of December 31, 2024.

Attestation Report of the Independent Registered Public Accounting Firm

The report of our independent registered public accounting firm regarding internal control over financial reporting is set forth beginning on page F-1 of this Annual Report.

Changes in Internal Control over Financial Reporting

There were no changes in our internal control over financial reporting identified in connection with the evaluation required by Rule 13a-15(d) and 15d-15(d) of the Exchange Act that occurred during the three months ended December 31, 2024, that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information.

Rule 10b5-1 Trading Plans

During the three months ended December 31, 2024, none of our directors or officers (as defined in Rule 16a-1(f) of the Exchange Act) adopted, terminated or modified the amount, pricing or timing provisions of a "Rule 10b5-1 trading arrangement" or "non-Rule 10b5-1 trading arrangement," as each term is defined in Item 408(c) of Regulation S-K.

Item 9C. Disclosure Regarding Foreign Jurisdictions that Prevent Inspections.

Not applicable.

PART III

Certain information required by Part III is omitted from this report because we will file with the SEC a definitive proxy statement pursuant to Regulation 14A (the "Proxy Statement"), no later than 120 days after the end of our fiscal year, and certain information included therein is incorporated herein by reference.

Item 10. Directors, Executive Officers and Corporate Governance.

The information required by this item will be contained in the Proxy Statement and is incorporated in this Annual Report on Form 10-K by reference.

Item 11. Executive Compensation.

The information required by this item will be contained in the Proxy Statement and is incorporated in this Annual Report on Form 10-K by reference.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters.

The information required by this item will be contained in the Proxy Statement and is incorporated in this Annual Report on Form 10-K by reference.

Item 13. Certain Relationships and Related Transactions, and Director Independence.

The information required by this item will be contained in the Proxy Statement and is incorporated in this Annual Report on Form 10-K by reference.

Item 14. Principal Accountant Fees and Services.

The information required by this item will be contained in the Proxy Statement and is incorporated in this Annual Report on Form 10-K by reference.

PART IV

Item 15. Exhibit and Consolidated Financial Statements Schedules.

The consolidated financial statements schedules and exhibits filed as part of this Annual Report are as follows:

(a)(1) Consolidated Financial Statements

(a)(2) Consolidated Financial Statements Schedules

All other consolidated financial statements schedules are omitted because they are not required or the required information is included in the consolidated financial statements or notes thereto.

(a)(3) Exhibits

The exhibits required to be filed as part of this Annual Report on Form 10-K are listed in the Exhibit List attached hereto and are incorporated herein by reference.

Exhibit	Description Form	Filed Herewith	Incorporated by Reference	Form	Exhibit	Filing Date
2.1^	Agreement and Plan of Merger, dated as of March 7, 2021, by and among dMY Technology Group, Inc. III, IonQ, Inc. and IonQ Trap Acquisition Inc.		X	8-K	2.1	March 8, 2021
3.1	Amended and Restated Certificate of Incorporation of IonQ, Inc.		X	8-K	3.1	October 4, 2021
3.2	Amended and Restated Bylaws of IonQ, Inc.		X	10-Q	3.2	November 9, 2023
4.1	Specimen Common Stock Certificate		X	S-4/A	4.4	August 11, 2021
4.2	Warrant Agreement, dated November 12, 2020, between Continental Stock Transfer & Trust Company and IonQ, Inc.		X	8-K	4.1	November 17, 2020
4.3	Description of the Registrant's Securities		X	10-K	4.3	March 28, 2022
10.1	Amended and Restated Registration Rights Agreement, dated September 30, 2021, between and among the investors party thereto and IonQ, Inc.		X	8-K	10.1	October 4, 2021
10.2+	Executive Severance Plan and Summary Plan Description (as amended December 3, 2024)		X	8-K	10.1	December 6, 2024
10.3+	Form of Indemnification Agreement of IonQ, Inc.		X	8-K	10.13	October 4, 2021
10.4+	2015 Equity Incentive Plan		X	8-K	10.14	October 4, 2021
10.5+	Forms of Stock Option Grant Notice and Option Agreement under 2015 Equity Incentive Plan		X	8-K	10.15	October 4, 2021
10.6+	2021 Equity Incentive Plan		X	8-K	10.16	October 4, 2021
10.7+	Forms of Option Grant Notice and Option Agreement under 2021 Equity Incentive Plan		X	10-K	10.14	March 30, 2023
10.8+	Form of Restricted Stock Unit Grant Notice and Unit Award Agreement under 2021 Equity Incentive Plan		X	10-Q	10.1	August 15, 2022

Exhibit	Description Form	Filed Herewith	Incorporated by Reference	Form	Exhibit	Filing Date
10.9+†	Form of Performance-Based Award Grant Package (as amended December 3, 2024)		X	8-K	10.2	December 6, 2024
10.10+	2021 Employee Stock Purchase Plan		X	8-K	10.19	October 4, 2021
10.11	Amended and Restated Office Lease, by and between University of Maryland – College Park and IonQ, Inc.		X	8-K	10.20	October 4, 2021
10.12†	Warrant to Purchase Shares, dated November 27, 2019, issued to Amazon.com NV Investment Holdings LLC by IonQ, Inc.		X	S-4/A	10.33	July 16, 2021
10.13†	License Agreement, dated July 19, 2016, among the University of Maryland, Duke University and IonQ, Inc.		X	S-4/A	10.20	June 17, 2021
10.14†	Amendment No. 1 to Exclusive License Agreement, dated September 22, 2017, between Duke University and the Registrant		X	S-4/A	10.21	June 17, 2021
10.15†	Amendment No. 1 to Exclusive License Agreement, dated October 11, 2017, between the University of Maryland and IonQ, Inc.		X	S-4/A	10.22	June 17, 2021
10.16†	Amendment No. 2 to Exclusive License Agreement, dated October 4, 2018, between Duke University and IonQ, Inc.		X	S-4/A	10.23	June 17, 2021
10.17†	Amendment No. 2 to Exclusive License Agreement, dated October 9, 2018, between the University of Maryland and IonQ, Inc.		X	S-4/A	10.24	June 17, 2021
10.18†	Amendment No. 3 to Exclusive License Agreement, dated April 27, 2021, between Duke University, the University of Maryland and IonQ, Inc.		X	S-4/A	10.25	June 17, 2021
10.19†	Amendment No. 3 to Exclusive License Agreement, dated February 1, 2021, between the University of Maryland and IonQ, Inc.		X	10-Q	10.2	May 16, 2022
10.20†	Amendment No. 4 to Exclusive License Agreement, dated April 27, 2021, between Duke University, the University of Maryland and IonQ, Inc.		X	S-4/A	10.26	June 17, 2022
10.21†	Amendment No. 4 to Exclusive License Agreement, dated February 1, 2021, between the University of Maryland and IonQ, Inc.		X	10-Q	10.3	May 16, 2022
10.22†	Amendment No. 5 to Exclusive License Agreement, dated September 10, 2021, between Duke University and IonQ, Inc		X	10-K	10.29	March 28, 2022
10.23†	Amendment No. 5 to Exclusive License Agreement, dated September 24, 2021, between the University of Maryland and IonQ, Inc.		X	10-K	10.30	March 28, 2022
10.24†	Amendment No. 6 to Exclusive License Agreement, dated January 23, 2023, between Duke University and IonQ, Inc.		X	10-K	10.30	March 30, 2023
10.25†	Amendment No. 7 to Exclusive License Agreement, dated February 2, 2024, between Duke University and IonQ, Inc.		X	10-K	10.31	February 28, 2024
10.26†	Exclusive Option Agreement, dated July 15, 2016, between Duke University and IonQ, Inc.		X	S-4/A	10.27	June 17, 2021
10.27	First Amendment to Option Agreement, dated December 18, 2020, between Duke University and IonQ, Inc.		X	S-4/A	10.28	June 17, 2021
10.28	Second Amendment to Option Agreement, dated March 19, 2021, between Duke University and IonQ, Inc.		X	S-4/A	10.29	June 17, 2021
10.29	Amended and Restated Non-Employee Director Compensation Policy		X	10-Q	10.1	November 6, 2024
10.30+	Amended and Restated Offer Letter Agreement for Peter Chapman, dated September 8, 2021		X	10-Q	10.2	May 10, 2024
10.31+	Amended and Restated Offer Letter Agreement for Thomas Kramer, dated September 8, 2021		X	10-Q	10.3	May 10, 2024

Exhibit	Description Form	Filed Herewith	Incorporated by Reference	Form	Exhibit	Filing Date
10.32+	Employment Offer between the Company and Rima Alameddine, dated October 26, 2022		X	10-Q	10.4	May 10, 2024
10.33+	Bonus Agreement between the Company and Peter Chapman, dated December 16, 2024	X				
19.1†	IonQ, Inc. Insider Trading Policy	X				
21.1	List of Subsidiaries of the Company	X				
23.1	Consent of Ernst & Young LLP, an Independent Registered Public Accounting Firm.	X				
24.1	Power of Attorney (included on the signature page to this report).	X				
31.1	Certification of Principal Executive Officer Pursuant to Rules 13a-14(a) and 15d-14(a) under the Securities Exchange Act of 1934, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.	X				
31.2	Certification of Principal Financial Officer Pursuant to Rules 13a-14(a) and 15d-14(a) under the Securities Exchange Act of 1934, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.	X				
32.1	Certification of Principal Executive Officer and Principal Financial Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.	X				
97	Incentive Compensation Recoupment Policy		X	10-K	97	February 28, 2024
101.INS	Inline XBRL Instance Document—the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL Document.	X				
101.SCH	Inline XBRL Taxonomy Extension Schema With Embedded Linkbase Documents.	X				
104	Cover Page Interactive Data File (formatted as inline XBRL with applicable taxonomy extension information contained in Exhibit 101).	X				

* Furnished herewith and not deemed to be "filed" for purposes of Section 18 of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and shall not be deemed to be incorporated by reference into any filing under the Securities Act or the Exchange Act (whether made before or after the date of the Form10-K), irrespective of any general incorporation language contained in such filing.
+ Indicates a management contract or compensatory plan.
† Certain of the exhibits and schedules to this Exhibit have been omitted in accordance with Regulation S-K Item 601(b)(10)(iv). The Registrant agrees to furnish a copy of all omitted exhibits and schedules to the SEC upon its request.
^ Certain of the exhibits and schedules to this exhibit have been omitted in accordance with Regulation S-K Item 601(a)(5). The Registrant agrees to furnish a copy of all omitted exhibits and schedules to the SEC upon its request.

Item 16. Form 10-K Summary

None.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, as amended, the Registrant has duly caused this report on Form 10-K to be signed on its behalf by the undersigned, thereunto duly authorized.

IonQ, Inc.

February 26, 2025

BY: /s/ Peter Chapman
Peter Chapman
President and Chief Executive Officer
(*Principal Executive Officer*)

POWER OF ATTORNEY

Each person whose individual signature appears below hereby authorizes and appoints Peter Chapman and Thomas Kramer, and each of them, with full power of substitution and resubstitution and full power to act without the other, as his or her true and lawful attorney-in-fact and agent to act in his or her name, place and stead and to execute in the name and on behalf of each person, individually and in each capacity stated below, and to file any and all amendments to this report on Form 10-K, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing, ratifying and confirming all that said attorneys-in-fact and agents or any of them or their or his substitute or substitutes may lawfully do or cause to be done by virtue thereof.

Pursuant to the requirements of the Securities Exchange Act of 1934, as amended, this Annual Report on Form 10-K has been signed below by the following persons on behalf of the Registrant in the capacities and on the dates indicated.

Name	Title	Date
/s/ Peter Chapman Peter Chapman	President and Chief Executive Officer and Director (Principal Executive Officer)	February 26, 2025
/s/ Thomas Kramer Thomas Kramer	Chief Financial Officer (Principal Financial and Accounting Officer)	February 26, 2025
/s/ Robert Cardillo Robert Cardillo	Director	February 26, 2025
/s/ Kathryn Chou Kathryn Chou	Director	February 26, 2025
/s/ Niccolo de Masi Niccolo de Masi	Director	February 26, 2025
/s/ William Scannell William Scannell	Director	February 26, 2025
/s/ Inder M. Singh Inder M. Singh	Director	February 26, 2025
/s/ Wendy Thomas Wendy Thomas	Director	February 26, 2025
/s/ Gabrielle Toledano Gabrielle Toledano	Director	February 26, 2025
/s/ Harry You Harry You	Director	February 26, 2025

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

Report of Independent Registered Public Accounting Firm

To the Stockholders and the Board of Directors of IonQ, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of IonQ, Inc. (the Company) as of December 31, 2024 and 2023, the related consolidated statements of operations, comprehensive loss, changes in stockholders' equity and cash flows for each of the three years in the period ended December 31, 2024, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2024 and 2023, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2024, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2024, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) and our report dated February 26, 2025 expressed an unqualified opinion thereon.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matter

The critical audit matter communicated below is a matter arising from the current period audit of the financial statements that was communicated or required to be communicated to the audit committee and that: (1) relates to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of the critical audit matter does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

Capitalized internal-use software development costs

Description of the Matter	As discussed in Note 2 and Note 7 to the consolidated financial statements, the Company capitalizes certain costs related to internal-use software incurred during the application development stage. The Company capitalized $6.8 million of internal-use software costs in the year ended December 31, 2024 and had total capitalized internal-use software costs, net of accumulated amortization, of $10.6 million as of December 31, 2024. Capitalized internal-use software is recorded within intangible assets, net on the consolidated balance sheets. Auditing the Company's capitalization of internal-use software development costs was especially challenging because management's determination of which development activities qualify for capitalization requires significant judgment, as only those costs incurred in certain stages of software development and which result in additional functionality can be capitalized in accordance with the applicable accounting standards.
How We Addressed the Matter in Our Audit	To test the Company's capitalization of internal-use software development costs, we performed audit procedures that included, among others, testing a sample of capitalized internal-use software development costs related to upgrades and enhancements to existing internal-use software projects. For each sample, we inspected underlying documentation to evaluate whether the development activities were capitalizable under

the applicable accounting standards. In addition, we inquired of a sample of the individuals performing the internal-use software development activities, and their supervisors, regarding the specific nature, stage of development, and time incurred on the projects selected for testing.

/s/ Ernst & Young LLP

We have served as the Company's auditor since 2020.

Tysons, Virginia

February 26, 2025

Report of Independent Registered Public Accounting Firm

To the Stockholders and the Board of Directors of IonQ, Inc.

Opinion on Internal Control Over Financing Reporting

We have audited IonQ, Inc.'s internal control over financial reporting as of December 31, 2024, based on criteria established in Internal Control—Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (the COSO criteria). In our opinion, IonQ, Inc. (the Company) maintained, in all material respects, effective internal control over financial reporting as of December 31, 2024, based on the COSO criteria.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of the Company as of December 31, 2024 and 2023, the related consolidated statements of operations, comprehensive loss, changes in stockholders' equity and cash flows for each of the three years in the period ended December 31, 2024, and the related notes and our report dated February 26, 2025 expressed an unqualified opinion thereon.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting included in the accompanying Annual Report on Internal Control over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects.

Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control Over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ Ernst & Young LLP

Tysons, Virginia

February 26, 2025

IonQ, Inc.
Consolidated Balance Sheets
(in thousands, except share and per share data)

	December 31, 2024	December 31, 2023
Assets		
Current assets:		
Cash and cash equivalents	$ 54,393	$ 35,665
Short-term investments	285,896	319,776
Accounts receivable	10,188	11,467
Prepaid expenses and other current assets	28,325	23,081
Total current assets	378,802	389,989
Long-term investments	23,545	100,489
Property and equipment, net	52,761	37,515
Operating lease right-of-use assets	9,470	4,613
Intangible assets, net	29,469	15,077
Goodwill	9,904	742
Other noncurrent assets	4,437	5,155
Total Assets	**$ 508,388**	**$ 553,580**
Liabilities and Stockholders' Equity		
Current liabilities:		
Accounts payable	$ 5,230	$ 5,599
Accrued expenses and other current liabilities	16,424	18,376
Current portion of operating lease liabilities	3,366	710
Unearned revenue	10,678	12,087
Current portion of stock option early exercise liabilities	387	392
Total current liabilities	36,085	37,164
Operating lease liabilities, net of current portion	14,359	7,395
Unearned revenue, net of current portion	—	447
Stock option early exercise liabilities, net of current portion	61	448
Warrant liabilities	70,688	23,004
Other noncurrent liabilities	3,333	128
Total liabilities	$ 124,526	$ 68,586
Commitments and contingencies (see Note 11)		
Stockholders' equity:		
Common stock $0.0001 par value; 1,000,000,000 shares authorized; 221,919,191 and 206,611,704 shares issued and outstanding as of December 31, 2024 and December 31, 2023, respectively	$ 22	$ 20
Additional paid-in capital	1,067,403	839,014
Accumulated deficit	(683,720)	(352,073)
Accumulated other comprehensive income (loss)	157	(1,967)
Total stockholders' equity	$ 383,862	$ 484,994
Total Liabilities and Stockholders' Equity	**$ 508,388**	**$ 553,580**

The accompanying notes are an integral part of these consolidated financial statements.

IonQ, Inc.
Consolidated Statements of Operations
(in thousands, except share and per share data)

	Year Ended December 31,		
	2024	**2023**	**2022**
Revenue	$ 43,073	$ 22,042	$ 11,131
Costs and expenses:			
Cost of revenue (excluding depreciation and amortization)	20,597	8,108	2,944
Research and development	136,827	92,321	43,978
Sales and marketing	28,395	18,270	8,385
General and administrative	71,055	50,722	35,966
Depreciation and amortization	18,654	10,375	5,604
Total operating costs and expenses	275,528	179,796	96,877
Loss from operations	(232,455)	(157,754)	(85,746)
Gain (loss) on change in fair value of warrant liabilities	(117,107)	(19,206)	30,136
Interest income, net	18,249	19,322	7,093
Other income (expense), net	(275)	(85)	6
Loss before income tax expense	(331,588)	(157,723)	(48,511)
Income tax benefit (expense)	(59)	(48)	—
Net loss	**$ (331,647)**	**$ (157,771)**	**$ (48,511)**
Net loss per share attributable to common stockholders—basic and diluted	**$ (1.56)**	**$ (0.78)**	**$ (0.25)**
Weighted average shares used in computing net loss per share attributable to common stockholders—basic and diluted	213,029,365	202,576,492	197,727,642

The accompanying notes are an integral part of these consolidated financial statements.

IonQ, Inc.
Consolidated Statements of Comprehensive Loss
(in thousands)

	Year Ended December 31,		
	2024	**2023**	**2022**
Net loss	$ (331,647)	$ (157,771)	$ (48,511)
Other comprehensive income (loss), net of reclassification adjustments:			
Change in unrealized gain (loss) on available-for-sale securities, net	2,127	5,398	(7,207)
Currency translation adjustments	(3)	(10)	—
Total other comprehensive income (loss)	2,124	5,388	(7,207)
Total comprehensive loss	**$ (329,523)**	**$ (152,383)**	**$ (55,718)**

The accompanying notes are an integral part of these consolidated financial statements.

IonQ, Inc.
Consolidated Statements of Changes in Stockholders' Equity
(in thousands, except share data)

	Stockholders' Equity					
	Common Stock		Additional Paid-in Capital	Accumulated Deficit	Accumulated Other Comprehensive Income (Loss)	Total Stockholders' Equity
	Shares	Amount				
Balance, December 31, 2021	**195,630,975**	**$ 19**	**$ 737,150**	**$ (145,791)**	**$ (148)**	**$ 591,230**
Net loss	—	—	—	(48,511)	—	(48,511)
Other comprehensive income (loss)	—	—	—	—	(7,207)	(7,207)
Stock options exercised	2,239,490	1	1,058	—	—	1,059
Vesting of restricted common stock	515,534	—	1,162	—	—	1,162
Issuance of common stock from the settlement of restricted stock units	1,474,592	—	473	—	—	473
Stock-based compensation	—	—	29,980	—	—	29,980
Warrants exercised	1,532	—	25	—	—	25
Balance, December 31, 2022	**199,862,123**	**$ 20**	**$ 769,848**	**$ (194,302)**	**$ (7,355)**	**$ 568,211**
Net loss	—	—	—	(157,771)	—	(157,771)
Other comprehensive income (loss)	—	—	—	—	5,388	5,388
Stock options exercised	1,778,090	—	1,954	—	—	1,954
Vesting of restricted common stock	501,364	—	1,128	—	—	1,128
Issuance of common stock from the settlement of restricted stock units	4,466,894	—	3,923	—	—	3,923
Stock-based compensation	—	—	62,104	—	—	62,104
Warrants exercised	3,233	—	57	—	—	57
Balance, December 31, 2023	**206,611,704**	**$ 20**	**$ 839,014**	**$ (352,073)**	**$ (1,967)**	**$ 484,994**
Net loss	—	—	—	(331,647)	—	(331,647)
Other comprehensive income (loss)	—	—	—	—	2,124	2,124
Stock options exercised	4,818,974	—	8,012	—	—	8,012
Vesting of restricted common stock	192,580	—	392	—	—	392
Issuance of common stock from the settlement of restricted stock units	7,388,376	2	11,442	—	—	11,444
Stock-based compensation	—	—	105,683	—	—	105,683
Warrants exercised	2,907,557	—	102,860	—	—	102,860
Balance, December 31, 2024	**221,919,191**	**$ 22**	**$ 1,067,403**	**$ (683,720)**	**$ 157**	**$ 383,862**

The accompanying notes are an integral part of these consolidated financial statements.

IonQ, Inc.
Consolidated Statements of Cash Flows
(in thousands)

	Year Ended December 31,		
	2024	2023	2022
Cash flows from operating activities:			
Net loss	$ (331,647)	$ (157,771)	$ (48,511)
Adjustments to reconcile net loss to net cash used in operating activities:			
Depreciation and amortization	18,654	10,375	5,604
Non-cash research and development arrangements	520	520	520
Stock-based compensation	106,878	69,743	31,456
(Gain) loss on change in fair value of warrant liabilities	117,107	19,206	(30,136)
Amortization of premiums and accretion of discounts on available-for-sale securities	(8,804)	(9,746)	(1,577)
Other, net	4,803	1,474	441
Changes in operating assets and liabilities:			
Accounts receivable	1,609	(8,175)	(1,510)
Prepaid expenses and other current assets	(15,200)	(14,413)	(7,012)
Accounts payable	(601)	2,188	1,060
Accrued expenses and other current liabilities	(411)	3,319	1,344
Unearned revenue	(1,752)	2,604	3,892
Other assets and liabilities	3,161	1,865	(269)
Net cash provided by (used in) operating activities	$ (105,683)	$ (78,811)	$ (44,698)
Cash flows from investing activities:			
Purchases of property and equipment	(17,992)	(13,703)	(9,336)
Capitalized software development costs	(3,905)	(4,558)	(2,179)
Intangible asset acquisition costs	(1,672)	(1,288)	(1,049)
Purchases of available-for-sale securities	(296,329)	(298,445)	(605,689)
Maturities of available-for-sale securities	418,082	386,760	310,045
Businesses acquired	(15,454)	—	(848)
Net cash provided by (used in) investing activities	$ 82,730	$ 68,766	$ (309,056)
Cash flows from financing activities:			
Proceeds from stock options exercised	8,012	1,954	1,059
Proceeds from public warrants exercised	33,437	37	17
Other financing, net	238	(230)	20
Net cash provided by (used in) financing activities	$ 41,687	$ 1,761	$ 1,096
Effect of foreign exchange rate changes on cash, cash equivalents and restricted cash	25	(2)	—
Net change in cash, cash equivalents and restricted cash	18,759	(8,286)	(352,658)
Cash, cash equivalents and restricted cash at the beginning of the period	38,081	46,367	399,025
Cash, cash equivalents and restricted cash at the end of the period	**$ 56,840**	**$ 38,081**	**$ 46,367**
Supplemental disclosures of non-cash investing and financing transactions			
Property and equipment purchases in accounts payable and accrued expenses	$ 1,060	$ 773	$ 485
Intangible asset purchases in accounts payable and accrued expenses	77	254	164
Operating lease right-of-use assets subject to lease liability	6,129	2,380	—
Remeasurement of operating lease right-of-use assets due to lease modification	—	(849)	—
Noncash reclassification of warrant liabilities to equity upon exercise	69,423	20	8
Bonus settled in restricted stock units	11,443	3,923	473
Net share settled stock option exercises	1,016	291	—

The accompanying notes are an integral part of these consolidated financial statements.

1. DESCRIPTION OF BUSINESS

IonQ, Inc. (“IonQ” or the “Company”), formerly known as dMY Technology Group, Inc. III (“dMY”), was incorporated in the state of Delaware in September 2020 and formed as a special purpose acquisition company for the purpose of effecting a merger, capital stock exchange, asset acquisition, stock purchase, reorganization, or similar business combination with one or more businesses. IonQ Quantum, Inc. (formerly known as IonQ, Inc., and referred to as “Legacy IonQ” herein), was incorporated in the state of Delaware in September 2015 and is headquartered in College Park, Maryland.

On March 7, 2021, Legacy IonQ entered into an Agreement and Plan of Merger (the “Merger Agreement”) with dMY and Ion Trap Acquisition Inc. (“Merger Sub”), a direct, wholly owned subsidiary of dMY. Pursuant to the Merger Agreement, on September 30, 2021 (“the Closing Date”), the Merger Sub was merged with and into Legacy IonQ with Legacy IonQ continuing as the surviving corporation following the merger, becoming a wholly owned subsidiary of dMY and the separate corporate existence of the Merger Sub ceased (the “Business Combination”). Contemporaneously with the Business Combination, dMY changed its name to IonQ, Inc. and Legacy IonQ changed its name to IonQ Quantum, Inc.

IonQ develops quantum computers and networks designed to solve some of the world’s most complex problems, and transform business, society, and the planet for the better. To operate the quantum computers and networks, the Company has developed custom hardware, custom firmware, and an operating system to orchestrate the quantum computers.

2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Basis of Preparation

The accompanying consolidated financial statements have been prepared in accordance with U.S. generally accepted accounting principles ("U.S. GAAP") as determined by the Financial Accounting Standards Board (“FASB”). Such consolidated financial statements include the accounts of IonQ and its wholly owned subsidiaries. All intercompany transactions and balances have been eliminated in consolidation.

Use of Estimates

The preparation of consolidated financial statements in conformity with U.S. GAAP and the rules and regulations of the SEC require management to make estimates and assumptions that affect the amounts reported in these consolidated financial statements and accompanying notes.

Significant estimates and assumptions are inherent in the analysis and measurement of items including, but not limited to: total expected costs for revenue arrangements recognized over time, capitalization of quantum computing system costs, useful lives for quantum computing systems, estimates of the fair value of intangible assets acquired in business combinations, and stock-based compensation for awards with performance and market conditions. Management bases its estimates and assumptions on historical experience, expectations, forecasts, and on various other factors that are believed to be reasonable under the circumstances. Due to the inherent uncertainty involved in making estimates, actual results reported in future periods may differ and be affected by changes in those estimates.

Foreign Currency

The reporting currency of the Company is the U.S. dollar. Financial statements of subsidiaries whose functional currency is not the U.S. dollar are translated at exchange rates in effect at the balance sheet date for assets and liabilities and at average exchange rates for revenues and expenses for the respective periods. Translation adjustments are recorded in accumulated other comprehensive income (loss) in the consolidated balance sheets.

The Company is exposed to foreign currency risk to the extent that it enters into transactions denominated in currencies other than its subsidiaries’ respective functional currencies. Transactions denominated in currencies other than subsidiaries’ functional currencies are recorded based on exchange rates at the time such transactions arise. Changes in exchange rates with respect to amounts recorded in the Company’s consolidated balance sheets related to these items will result in unrealized foreign currency transaction gains and losses based upon period-end exchange rates. The Company also records realized foreign currency transaction gains and losses upon settlement of the transactions. Foreign currency transaction gains and losses resulting from the conversion of the transaction currency to functional currency are included in other income (expense), net in the consolidated statements of operations.

Fair Value Measurements

The Company evaluates the fair value of certain assets and liabilities using the fair value hierarchy. Fair value is an exit price representing the amount that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. Fair value is estimated by applying the following hierarchy, which prioritizes the inputs used to measure fair value into three levels and bases the categorization within the hierarchy upon the lowest level of input that is available and significant to the fair value measurement:

- Level 1—Observable inputs, which include quoted prices in active markets;
- Level 2—Observable inputs other than the quoted prices in active markets that are observable either directly or indirectly, such as quoted prices in markets that are not active, or other inputs such as broker quotes, benchmark yield curves, credit spreads and market interest rates for similar securities that are observable or can be corroborated by observable market data for substantially the full term of the assets or liabilities;
- Level 3—Unobservable inputs that are supported by little or no market activity and that are based on management's assumptions, including fair value measurements determined using pricing models, discounted cash flow methodologies or similar techniques.

The Company's assessment of the significance of a particular input to the fair value measurements requires judgment and may affect the valuation of the assets and liabilities being measured and their placement within the fair value hierarchy.

For assets that are measured using quoted prices in active markets, the total fair value is the published market price per unit multiplied by the number of units held, without consideration of transaction costs. Assets and liabilities that are measured using significant other observable inputs are primarily valued by reference to quoted prices of similar assets or liabilities in active markets, adjusted for any terms specific to that asset or liability.

Assets and liabilities that are measured at fair value on a non-recurring basis include property and equipment, intangible assets, and goodwill. The Company recognizes these items at fair value upon initial recognition when acquired through a business combination or an asset acquisition or when they are considered to be impaired. The fair value of these assets and liabilities are determined with valuation techniques using the best information available and may include quoted market prices, market comparables and discounted cash flow models.

Due to their short-term nature, the carrying amounts reported in the Company's consolidated financial statements approximate the fair value for cash and cash equivalents, accounts receivable, accounts payable and accrued expenses.

Cash, Cash Equivalents and Restricted Cash

Cash and cash equivalents include cash and checking deposits, money market funds, and U.S. government and agency securities. The Company considers all short-term highly liquid investments with an original maturity at the date of purchase of three months or less to be cash equivalents. Restricted cash for collateralizing letters of credit and corporate credit cards is included in other noncurrent assets in the consolidated balance sheets. The Company issues letters of credit in the ordinary course of business, including for lease arrangements. As of December 31, 2024 and 2023, letters of credit totaling $2.1 million were outstanding.

The following table provides a reconciliation of cash, cash equivalents and restricted cash included in the consolidated balance sheets to the amounts included in the consolidated statements of cash flows (in thousands):

	December 31, 2024	December 31, 2023
Cash and cash equivalents	$ 54,393	$ 35,665
Restricted cash	2,447	2,416
Total cash, cash equivalents and restricted cash in the consolidated statements of cash flows	$ 56,840	$ 38,081

Accounts Receivable and Allowance for Credit Losses

Accounts receivable are non-interest bearing and represent amounts billed and currently due from customers at the gross invoiced amount as well as unbilled amounts related to unconditional rights for consideration to be received for services performed

but not yet invoiced. A receivable is recorded when the Company has an unconditional right to receive payment. Accounts receivable consists of the following (in thousands):

	December 31, 2024	December 31, 2023
Billed accounts receivable	$ 6,516	$ 8,564
Unbilled accounts receivable	3,672	2,903
Total accounts receivable	$ 10,188	$ 11,467

On a periodic basis, management evaluates its accounts receivable and determines whether to provide an allowance for credit losses. This assessment is based on management's evaluation of relevant information about past events, including historical experience, current conditions and reasonable and supportable forecasts that affect the collectability of the receivable.

The Company did not have any allowance for credit losses as of either December 31, 2024 or 2023.

Materials and Supplies, Net

Materials and supplies, including spare parts, are carried at average cost and recorded in prepaid expenses and other current assets in the consolidated balance sheets. Materials and supplies used in the production of quantum computing systems to be made commercially available are capitalized to property and equipment when installed. Materials and supplies used to support customer contracts, for maintenance, or for research and development efforts are expensed when consumed. The Company capitalized $7.2 million, $3.6 million and $1.3 million of materials and supplies to property and equipment for the years ended December 31, 2024, 2023 and 2022, respectively.

Materials and supplies are evaluated regularly for excess quantities and obsolescence. This evaluation includes analysis of the Company's current and future strategic plans, risk of technological obsolescence, and general market conditions. Excess and obsolescence charges were $1.3 million during the year ended December 31, 2024, and less than $0.1 million during the years ended December 31, 2023 and 2022.

The following table summarizes the activity in the Company's excess and obsolescence reserve against materials and supplies (in thousands):

	2024	2023
Beginning balance	$ 65	$ —
Provisions	1,331	65
Recoveries	(55)	—
Ending balance	$ 1,341	$ 65

Investments

Management determines the appropriate classification of investments at the time of purchase based upon management's intent with regard to such investments. The Company primarily invests in debt securities and classifies its investments as available-for-sale at the time of purchase if they are available to support either current or future operations. This classification is re-evaluated at each balance sheet date. Investments not considered cash equivalents, with remaining contractual maturities of one year or less from the balance sheet date are classified as short-term investments, and those with remaining contractual maturities greater than one year from the balance sheet date are classified as long-term investments. All investments are recorded at their estimated fair value, and any unrealized gains and losses are recorded in the consolidated balance sheets in accumulated other comprehensive loss. Realized gains and losses on sales and maturities of investments are determined based on the specific identification method and are recognized in the consolidated statements of operations in other income (expense), net. Accrued interest receivable on available-for-sale investments is recorded in the consolidated balance sheets in prepaid expenses and other current assets.

The Company performs periodic evaluations to determine whether any declines in the fair value of investments below amortized cost are credit losses or impairments. The evaluation consists of qualitative and quantitative factors regarding the severity of the unrealized loss, as well as the Company's ability and intent to hold the investments until a forecasted recovery occurs. Declines in fair value are considered to be credit losses if they are related to deterioration in credit risk or are considered impairments if it is likely that the underlying securities will be sold prior to a full recovery of their cost basis. Credit losses and impairments are determined based on the specific identification method and are reported in other income (expense), net in the consolidated statements of operations.

Property and Equipment, Net

Property and equipment, net is stated at cost less accumulated depreciation. Historical cost of fixed assets is the cost as of the date acquired. Hardware and labor costs associated with the building of quantum computing systems and supporting equipment are capitalized in the period the costs are incurred when it is probable that such costs will provide future economic benefit. The costs of quantum computing systems and supporting equipment that are used in research and development activities and have alternative future uses are capitalized. Costs to maintain quantum computing systems are expensed as incurred.

Depreciation is calculated using the straight-line method over the estimated useful lives of the assets. Useful lives are as follows:

Computer equipment and acquired computer software	3 – 5 years
Machinery, equipment, furniture and fixtures	4 – 7 years
Quantum computing systems	3 years
Leasehold improvements	Shorter of the lease term or the estimated useful life of the related asset

The Company evaluates the useful life of its assets periodically and whenever events or changes in circumstances indicate that the useful life may have changed. In assessing useful lives, the Company considers, among other factors, the use of the asset, changes in technology, and the competitive environment.

Leases

The Company determines if an arrangement is a lease at inception. Operating leases are included in operating lease right-of-use ("ROU") assets and current operating lease liabilities and operating lease liabilities, net of current portion on the Company's consolidated balance sheets. As of December 31, 2024 and 2023, the Company has no financing lease arrangements. The Company recognizes lease expense for its operating leases on a straight-line basis over the term of the lease.

The Company records a ROU asset and lease liability in connection with its operating leases. The Company's lease portfolio is comprised primarily of real estate leases, which are accounted for as operating leases. The Company elected the practical expedient to not separate lease and non-lease components for all leases.

ROU assets and lease liabilities are recognized at the lease commencement date based on the present value of the future minimum lease payments, including the impact of any lease incentives, as applicable, over the lease term. An amendment to a lease is assessed to determine if it represents a lease modification or a separate contract. Lease modifications are reassessed as of the effective date of the modification using an incremental borrowing rate based on the information available at the commencement date. For modified leases the Company also reassesses the lease classification as of the effective date of the modification.

The interest rate used to determine the present value of the future lease payments is the Company's incremental borrowing rate, because the interest rate implicit in the Company's leases is not readily determinable. The incremental borrowing rate is estimated to approximate the interest rate on a collateralized basis with similar terms and payments, and in economic environments where the leased asset is located.

The Company's lease terms include periods under options to extend or terminate the lease when it is reasonably certain that the Company will exercise that option. The Company considers contractual-based factors such as the nature and terms of the renewal or termination, asset-based factors such as physical location of the asset and entity-based factors such as the importance of the leased asset to the Company's operations to determine the lease term. The Company generally uses the base non-cancelable lease term when determining the ROU assets and lease liabilities.

Intangible Assets, Net

The Company's intangible assets include website domain costs, patents, intellectual property, customer relationships, developed technology and trademarks. Intangible assets with identifiable useful lives are initially valued at acquisition cost and are amortized over their estimated useful lives using the straight-line method. With respect to patents, acquisition costs include external legal and patent application costs. Intangible assets with indefinite useful lives, such as trademarks, are assessed for impairment at least annually.

Software Development Costs

The Company incurs software development costs for internal-use software, which the Company primarily uses to provide services to its customers, as well as for external-use software that will be part of a product to be sold, leased, or marketed.

Internal-Use Software

The costs to purchase and develop internal-use software are capitalized from the time that the preliminary project stage is completed, and it is considered probable that the software will be used to perform the function intended, until the time the software is placed in service for its intended use. Any costs incurred during subsequent efforts to upgrade and enhance the functionality of the software are also capitalized. Once this software is ready for its intended use, these costs are amortized on a straight-line basis over the estimated useful life of the software, which is typically assessed to be three years. Capitalized internal-use software is recorded within intangible assets, net, in the consolidated balance sheets. During the years ended December 31, 2024, 2023 and 2022, the Company capitalized $6.8 million, $8.0 million and $3.2 million in internal-use software costs, respectively. The Company amortized $5.3 million, $2.9 million and $1.5 million of capitalized internal-use software costs during the years ended December 31, 2024, 2023 and 2022, respectively.

External-Use Software

Costs incurred in researching and developing external-use software are expensed as incurred until technological feasibility is established. Once technological feasibility is established, software costs are capitalized until the product is available for general release to customers. Judgment is required in determining when technological feasibility of a product is established. Generally, this occurs shortly before the products are released to production. No external-use software costs were capitalized during any of the years ended December 31, 2024, 2023 and 2022.

Goodwill

Goodwill is the excess of the purchase price over the fair values assigned to the net assets acquired in a business combination. The Company tests goodwill for impairment on an annual basis, which it has determined to be the first day of the fourth quarter, and whenever events or changes in circumstances indicate that the carrying amount may not be recoverable. The Company tests goodwill qualitatively, or quantitatively by comparing the fair value of the reporting unit with the unit’s carrying amount. No impairment loss was recognized for any of the years ended December 31, 2024, 2023 and 2022.

Business Combinations

The Company recognizes and measures the assets acquired and liabilities assumed in a business combination based on their estimated fair values at the acquisition date. Goodwill as of the acquisition date represents the excess of the purchase consideration of an acquired business over the fair value of the underlying net tangible and intangible assets acquired net of liabilities assumed. The purchase consideration is determined based on the fair value of the assets transferred and liabilities assumed after considering any transactions that are separate from the business combination. Any adjustments to provisional amounts that are identified during the measurement period, not to exceed one year from the date of acquisition, are recorded in the reporting period in which the adjustment amounts are determined. Upon the conclusion of the measurement period, any subsequent adjustments are recorded in the Company’s consolidated statements of operations.

Impairment of Long-Lived Assets

Long-lived assets, such as property and equipment and other long-term assets, are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset or asset group may not be recoverable. If circumstances require a long-lived asset or asset group be tested for possible impairment, the Company first compares undiscounted cash flows expected to be generated by that asset or asset group to its carrying amount. If the carrying amount of the long-lived asset or asset group is not recoverable on an undiscounted cash flow basis, an impairment is recognized to the extent the carrying amount of the underlying asset exceeds its fair value. No impairment loss was recognized for any of the years ended December 31, 2024, 2023 and 2022.

Early Exercise of Stock Options

Stock options granted under the Company's 2015 Equity Incentive Plan provide employee option holders, if approved by the Board, the right to exercise unvested options in exchange for restricted common stock, which is subject to a repurchase right held by the Company at the lower of (i) the fair market value of its common stock on the date of repurchase or (ii) the original purchase price. Early exercises of options are not deemed to be substantive exercises for accounting purposes and accordingly, amounts received for

early exercises are recorded as a liability. These amounts are reclassified to common stock and additional paid-in capital as the underlying shares vest.

Warrant Liabilities

The Company evaluates its financial instruments to determine if such instruments are derivatives or contain features that qualify as embedded derivatives in accordance with ASC Topic 815, "Derivatives and Hedging." For derivative financial instruments that are accounted for as liabilities, the derivative instrument is initially recorded at its fair value on the grant date and is then re-valued upon exercise or at each reporting date for the unexercised warrants, with changes in the fair value reported in the consolidated statements of operations. The classification of derivative instruments, including whether such instruments should be recorded as liabilities or as equity, is evaluated at the end of each reporting period. The warrants of dMY assumed in the Business Combination are classified as liabilities and remeasured at each reporting period (as more fully described in Note 14). Derivative warrant liabilities are classified as non-current liabilities as their liquidation is not reasonably expected to require the use of current assets or require the creation of current liabilities.

Revenue Recognition

The Company derives revenue from the design, development, construction and sale of specialized quantum computing hardware together with related maintenance and support, from providing access to its quantum-computing-as-a-service ("QCaaS" or "Platform" services), and from consulting services related to co-developing algorithms on the quantum computing systems. The Company applies the provisions of the FASB Accounting Standards Update ("ASU"), Revenue from Contracts with Customers ("ASC 606"), and all related applicable guidance. The core principle of ASC 606 is that an entity shall recognize revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services.

To support this core principle, the Company applies the following five step approach:

1. Identify the contract with the customer
2. Identify the performance obligations
3. Determine the transaction price
4. Allocate the transaction price to the performance obligations
5. Recognize revenue when (or as) the entity satisfies a performance obligation

Certain of the Company's contracts contain multiple performance obligations, most commonly in contracts for the sale of specialized quantum computing hardware together with related maintenance and support. Such contracts may also include access to the Company's QCaaS. A contract's transaction price is allocated to each distinct performance obligation and recognized as revenue when or as the performance obligation is satisfied. When there are multiple performance obligations in a contract, the Company allocates the transaction price to each performance obligation based on its standalone selling price when available. The Company determines standalone selling price based on the observable price of a product or service when it sells the products or services separately in similar circumstances and to similar customers. Certain products and services have limited or no history of being sold on a standalone basis, requiring the Company to estimate the standalone selling price. To date, the Company has estimated the standalone selling price based on other contracts for similar products and services adjusted for differing terms than the contract being evaluated, as well as internal pricing guidelines and market factors. In addition, the Company takes into consideration the estimated costs to be incurred to satisfy the performance obligation plus an appropriate profit margin. In limited situations, for certain contracts executed in prior years, when the standalone selling price was not known, due to it being either highly variable or uncertain, the Company allocated the transaction price using the residual approach. Estimates related to standalone selling price have not had a material impact on revenue recognized in recent periods.

The Company has determined that its QCaaS contracts represent a combined, stand-ready performance obligation to provide access to its quantum computing systems together with related maintenance and support. The transaction price generally consists of a fixed fee for a minimum volume of usage to be made available over a defined period of access. Fixed fee arrangements may also include a variable component whereby customers pay an amount for usage over contractual minimums contained in the contracts. For performance obligations related to providing QCaaS access, fixed fees are recognized on a straight-line basis over the access period. Variable usage fees are recognized in the period they occur. The Company has determined that contracts that contain consulting services related to co-developing quantum computing algorithms and the ability to use its quantum computing systems to run such algorithms represent a combined performance obligation that is satisfied over-time.

Performance obligations are satisfied over time if the customer receives the benefits as the Company performs the work, if the customer controls the asset as it is being produced (continuous transfer of control), or if the product being produced for the customer has no alternative use and the Company has a contractual right to payment for performance to date. For performance obligations related to specialized quantum computing hardware and consulting services, revenue is recognized over time based on the efforts incurred to date relative to the total expected effort, primarily based on a cost-to-cost input measure. The Company applies judgment to determine a reasonable method to measure progress and to estimate total expected effort. Factors considered in these estimates include the Company's historical performance, the availability, productivity and cost of labor, the nature and complexity of work to be performed, the effect of change orders, availability and cost of materials, and the effect of any delays in performance.

For the years ended December 31, 2024, 2023 and 2022, substantially all revenue was recognized based on transfer of service over time. Revenues recognized at a point in time were not material. In arrangements with cloud service providers, the cloud service provider is considered the customer and IonQ does not have any contractual relationships with the cloud service providers' end users. For these arrangements, revenue is recognized at the amount charged to the cloud service provider and does not reflect any mark-up to the end user.

The Company may enter into multiple contracts with a single counterparty at or near the same time. The Company will combine contracts and account for them as a single contract when one or more of the following criteria are met: (i) the contracts are negotiated as a package with a single commercial objective; (ii) consideration to be paid in one contract depends on the price or performance of the other contract; and (iii) goods or services promised are a single performance obligation. Consideration payable to a customer includes cash amounts that an entity pays, or expects to pay, to the customer. For arrangements that contain consideration payable to a customer, the Company uses judgment in determining whether such payments are a reduction of the transaction price or a payment to the customer for a distinct good or service.

The variable fees associated with the QCaaS are generally billed a month in arrears. Customers also have the ability to make advance payments. Advance payments are recorded as a contract liability until services are delivered or obligations are met and revenue is earned. Contract liabilities to be recognized in the succeeding 12-month period are classified as current and the remaining amounts are classified as non-current liabilities in the Company's consolidated balance sheets.

Assets Recognized from Costs to Obtain a Contract

Sales commissions paid to employees and third parties are considered incremental costs to obtain a contract with a customer. These costs are capitalized in the period a customer contract is executed and are amortized as an expense consistent with the transfer of the goods or services to the customer. Capitalized costs are recorded in prepaid expenses and other current assets and other noncurrent assets in the consolidated balance sheets. Applying the practical expedient, the Company recognizes the incremental costs of obtaining contracts as an expense when incurred if the amortization period of the assets is one year or less. As of December 31, 2024 and 2023, total capitalized costs were $2.4 million and $2.8 million, respectively. Amortization expense was $1.7 million, $0.6 million and less than $0.1 million for the years ended December 31, 2024, 2023 and 2022, respectively, and is included in sales and marketing in the consolidated statements of operations.

Cost of Revenue

Cost of revenue primarily consists of expenses related to construction of specialized quantum computing hardware and delivery of our services, including personnel-related expenses, hardware costs, allocated overhead costs for customer facing functions, and costs associated with maintaining the Company's in-service quantum computing systems to ensure proper calibration as well as costs incurred for maintaining the cloud on which the QCaaS resides. Personnel-related expenses include salaries, benefits, and stock-based compensation. Cost of revenue excludes depreciation and amortization related to our quantum computing systems and related software.

Research and Development

Research and development expenses consist of personnel-related costs, including salaries, benefits and stock-based compensation, and allocated overhead costs for the Company's research and development function. Unlike a standard computer, design and development efforts continue throughout the useful life of the Company's quantum computing systems to ensure proper calibration and optimal functionality. Research and development expenses also include purchased hardware and software costs related to quantum computing systems constructed for research purposes that are not probable of providing future economic benefit and have no alternate future use, as well as costs associated with third-party research and development arrangements.

Under an agreement with Duke University ("Duke"), the Company issued common shares to Duke in consideration for research and development services through July 15, 2026. The agreement is considered a research and development service arrangement and is

recorded as a prepayment based on the fair value of the common stock issued and is amortized over the term of the arrangement as services are received and is recognized in research and development in the consolidated statements of operations.

Refer to Note 9 for further information on the Duke agreements.

Advertising Costs

Advertising costs are expensed as incurred and are included in sales and marketing expenses in the consolidated statements of operations. These costs were $0.2 million, $0.9 million and $1.3 million for the years ended December 31, 2024, 2023 and 2022, respectively.

Stock-Based Compensation

The Company measures and records the expense related to stock-based awards based on the fair value of those awards as determined on the date of grant. The Company recognizes stock-based compensation expense over the requisite service period of the individual grant, generally equal to the vesting period and uses the straight-line method to recognize stock-based compensation. The Company uses the Black-Scholes-Merton ("Black-Scholes") option-pricing model to determine the estimated fair value for stock options. The Black-Scholes option-pricing model requires the use of subjective assumptions, which determine the fair value of stock option awards, including the option's expected term, the price volatility of the underlying common stock, risk-free interest rates, and the expected dividend yield of the common stock. The assumptions used to determine the fair value of the stock options represent management's best estimates. These estimates involve inherent uncertainties and the application of management's judgment. The Company records forfeitures as they occur.

Stock-based compensation cost for restricted stock units and performance-based restricted stock units is measured based on the fair value of the Company's common stock on the grant date. The fair value of performance-based restricted stock units with a market condition is estimated on the date of grant using the Monte Carlo simulation model. The Monte Carlo simulation model requires the use of subjective assumptions, which determine the fair value of these awards, including price volatility, contractual term, discount rate, risk-free interest rates, and the expected dividend yield of the common stock. The assumptions used to determine the fair value of the performance-based restricted stock awards represent management's best estimates. These estimates involve inherent uncertainties and the application of management's judgment. For awards with a performance-based vesting condition, including those with a market condition, the Company records stock-based compensation cost if it is probable that the performance conditions will be achieved. Stock-based compensation cost will be recognized if the performance condition is satisfied, even if the market condition is not met and the award does not vest. At each reporting period, the Company reassesses the probability of the achievement of the performance conditions and any change in expense resulting from an adjustment in the estimated shares to be released is treated as a cumulative catch-up in the period of the adjustment.

The Company records stock-based compensation expense for incentive compensation liabilities based on estimated payments to employees for which the Company expects to settle the liability by granting restricted stock units. For these awards, stock-based compensation expense is accrued commencing at the service inception date, which generally precedes the grant date, through the end of the requisite service period.

Income Taxes

Income taxes are accounted for using the asset and liability method. Deferred income taxes are provided for temporary differences in recognizing certain income, expense and credit items for financial reporting purposes and tax reporting purposes. Such deferred income taxes primarily relate to the difference between the tax bases of assets and liabilities and their financial reporting amounts. Deferred tax assets and liabilities are measured by applying enacted statutory tax rates applicable to the future years in which deferred tax assets or liabilities are expected to be settled or realized. Excess tax benefits or tax deficiencies from stock option exercises are recognized in the income tax provision in the period in which they occur.

The Company records a valuation allowance when it determines, based on available positive and negative evidence, that it is not more-likely-than-not that some portion or all of its deferred tax assets will be realized.

For certain income tax positions, the Company uses a more-likely-than-not threshold based on the technical merits of the tax position taken. Tax positions that meet the more-likely-than-not recognition threshold are measured at the largest amount of tax benefits determined on a cumulative probability basis, which are more-likely-than-not to be realized upon ultimate settlement in the consolidated financial statements. The Company's policy is to recognize interest and penalties related to income tax matters in income tax expense. There were no amounts recognized relating to interest and penalties in the consolidated statements of operations for any

of the years ended December 31, 2024, 2023 and 2022. The Company had no uncertain income tax positions as of either December 31, 2024 or 2023.

Concentrations of Credit Risk

Financial instruments that potentially subject the Company to concentrations of credit risk consist primarily of cash, cash equivalents, restricted cash, investments, and trade accounts receivable. The Company maintains the majority of its cash, cash equivalents, restricted cash and investments with three financial institutions. The Company's deposits routinely exceed amounts guaranteed by the Federal Deposit Insurance Corporation.

The Company's accounts receivable are derived from customers primarily located in the U.S., including the U.S. government. The Company performs periodic evaluations of its customers' financial condition and generally does not require its customers to provide collateral or other security to support accounts receivable and maintains an allowance for credit losses. Credit losses historically have not been material.

Significant customers are those that represent more than 10% of the Company's total revenue. For the year ended December 31, 2024, the Company had two significant customers that accounted for 77% of total revenue. For the year ended December 31, 2023, the Company had two significant customers that accounted for 58% of total revenue. For the year ended December 31, 2022, the Company had three significant customers that accounted for 70% of total revenue.

Earnings (Loss) Per Share

Basic earnings (loss) per share is computed by dividing net income (loss) by the weighted-average number of shares of common stock outstanding for the period. Diluted earnings per share is computed by dividing net income (loss) by the weighted average number of shares of common stock during the period, plus common stock equivalents, outstanding during the period. If the Company reports a net loss, the computation of diluted loss per share excludes the effect of dilutive common stock equivalents, as their effect would be antidilutive.

The following table sets forth the computation of basic and diluted loss per share attributable to common stockholders (in thousands, except share and per share data):

	Year Ended December 31,		
Numerator:	**2024**	**2023**	**2022**
Net loss attributable to common stockholders	$ (331,647)	$ (157,771)	$ (48,511)
Denominator:			
Weighted average shares used in computing net loss per share attributable to common stockholders—basic and diluted	213,029,365	202,576,492	197,727,642
Net loss per share attributable to common stockholders—basic and diluted	$ (1.56)	$ (0.78)	$ (0.25)

In periods with a reported net loss, the effect of stock options, warrants, unvested restricted stock units, unvested performance-based restricted stock units, and unvested common stock (including unvested restricted common stock) are excluded and diluted loss per share is equal to basic loss per share. The following is a summary of the weighted average common stock equivalents for the securities outstanding during the respective periods that have been excluded from the computation of diluted net loss per common share:

	Year Ended December 31,		
	2024	**2023**	**2022**
Common stock options outstanding	19,147,636	23,518,426	22,951,439
Warrants to purchase common stock	7,559,312	8,301,202	8,301,202
Public warrants	5,014,121	5,230,613	5,231,750
Unvested restricted stock units	16,203,257	13,726,782	4,418,852
Unvested performance-based restricted stock units	1,980,589	542,905	—
Unvested common stock	307,473	654,442	1,158,095
Total	50,212,388	51,974,370	42,061,338

Recently Adopted Accounting Standards

In November 2023, the FASB issued ASU 2023-07, Segment Reporting (Topic 280): Improvements to Reportable Segment Disclosures to improve reportable segment disclosure requirements, primarily through enhanced disclosures about significant segment expenses. The Company adopted this standard for the year ended December 31, 2024, and has applied the standard retrospectively to all prior periods presented in the consolidated financial statements. Refer to Note 22 for further details.

Recently Issued Accounting Standards Not Yet Adopted

In December 2023, the FASB issued ASU 2023-09, Income Taxes (Topic 740): Improvement to Income Tax Disclosures to enhance the transparency and decision usefulness of income tax disclosures. ASU 2023-09 is effective for annual periods beginning after December 15, 2024, on a prospective basis, with early adoption permitted. The Company is currently evaluating the impact of this accounting standard update on its consolidated financial statements and related disclosures.

In November 2024, the FASB issued ASU 2024-03, Income Statement -- Reporting Comprehensive Income -- Expense Disaggregation Disclosures (Subtopic 220-40): Disaggregation of Income Statement Expenses, which requires additional expense disclosures by public business entities in the notes to the financial statements. ASU 2024-03 is effective for annual periods beginning after December 15, 2026, and interim periods beginning after December 15, 2027, with early adoption permitted. The Company is currently evaluating the impact of this accounting standard update on its financial statement disclosures.

3. BUSINESS COMBINATIONS

Qubitekk Federal, LLC

On December 27, 2024, the Company acquired Qubitekk Federal, LLC (“Qubitekk”) for total consideration of approximately $22.1 million of cash consideration, of which $15.5 million was paid at closing, with the remainder to be paid over the next eighteen months, subject to reductions for indemnities, working capital adjustments, and certain other conditions that existed at the acquisition date. The holdback liabilities are recorded in accrued expenses and other current liabilities and other noncurrent liabilities on the consolidated balance sheets. The acquisition supports the Company’s quantum networking capabilities by expanding its quantum networking expertise and technology portfolio. The Company incurred approximately $1.5 million in acquisition costs, which were primarily related to fees associated with financial and legal advisors and were recorded in general and administrative expenses in the consolidated statements of operations for the year ended December 31, 2024.

The Company utilized a benchmarking approach based on comparable transactions within the Company's industry peer group to determine the preliminary fair values of intangible assets acquired. Upon completion of the final purchase price allocation, the final fair values of assets acquired and resulting goodwill may differ materially from the preliminary assessment.

The following table summarizes the preliminary fair values of Qubitekk assets acquired as of the acquisition date (in thousands):

Accounts receivable	$	400
Prepaid expenses and other current assets		531
Intangible assets		11,900
Goodwill		9,220
Other noncurrent assets		3
Total fair value of net assets acquired	$	22,054

The goodwill of $9.2 million is primarily attributable to Qubitekk's specialized assembled workforce and expected future synergies from combining operations. We expect the goodwill from this acquisition will be deductible for income tax purposes. Identifiable intangibles recognized consists of $7.7 million in customer relationships and $4.0 million in developed technology, each with useful lives of 5 years, and $0.2 million in trademarks with an indefinite useful life.

The Company has included the revenue and expenses of Qubitekk in its consolidated financial statements from the date of acquisition. Qubitekk's financial results are not material to the Company's results of operations. No summarized unaudited pro forma results are provided for the Qubitekk acquisition due to the immateriality of this acquisition relative to the Company's consolidated financial position and results of operations.

4. CASH, CASH EQUIVALENTS, RESTRICTED CASH AND INVESTMENTS

The following table summarizes the Company's unrealized gains and losses and estimated fair value of cash, cash equivalents, restricted cash and investments in available-for-sale securities recorded in the consolidated balance sheets (in thousands):

	As of December 31, 2024				As of December 31, 2023			
	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Estimated Fair Value	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Estimated Fair Value
Cash and money market funds	$ 33,204	$ —	$ —	$ 33,204	$ 25,131	$ —	$ —	$ 25,131
Commercial paper	—	—	—	—	16,374	—	(14)	16,360
Corporate notes and bonds	45,823	22	(53)	45,792	176,793	38	(1,854)	174,977
Municipal bonds	—	—	—	—	4,990	—	(43)	4,947
US government and agency	287,084	319	(118)	287,285	237,015	311	(395)	236,931
Total cash, cash equivalents, restricted cash and investments	$ 366,111	$ 341	$ (171)	$ 366,281	$ 460,303	$ 349	$ (2,306)	$ 458,346

Unrealized losses related to investments were primarily a result of interest rate fluctuations. The following tables present information about the Company's investments in available-for-sale securities with gross unrealized losses and the length of time that individual securities have been in a continuous unrealized loss position (in thousands):

	As of December 31, 2024					
	Less than 12 Months		12 Months or Longer		Total	
	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Loses
Corporate notes and bonds	$ —	$ —	$ 24,396	$ (53)	$ 24,396	$ (53)
US government and agency	67,600	(111)	3,987	(7)	71,587	(118)
Total	$ 67,600	$ (111)	$ 28,383	$ (60)	$ 95,983	$ (171)

	As of December 31, 2023					
	Less than 12 Months		12 Months or Longer		Total	
	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Loses
Commercial paper	$ 16,360	$ (14)	$ —	$ —	$ 16,360	$ (14)
Corporate notes and bonds	11,074	(58)	151,174	(1,796)	162,248	(1,854)
Municipal bonds	—	—	4,947	(43)	4,947	(43)
US government and agency	109,540	(192)	24,795	(203)	134,335	(395)
Total	$ 136,974	$ (264)	$ 180,916	$ (2,042)	$ 317,890	$ (2,306)

The Company did not have any allowance for credit losses as of either December 31, 2024 or 2023. The Company neither intends to nor believes that it is more likely than not that it will be required to sell the investments in an unrealized loss position before the recovery of the associated amortized cost basis.

The estimated fair value of the Company's cash, cash equivalents, restricted cash and investments in available-for-sale securities as of December 31, 2024, aggregated by investment category and classified by contractual maturity date, is as follows (in thousands):

	1 Year or Less	Greater than 1 Year	Total
Cash and money market funds	$ 30,799	$ 2,405	$ 33,204
Corporate notes and bonds	43,868	1,924	45,792
US government and agency	265,664	21,621	287,285
Total	$ 340,331	$ 25,950	$ 366,281

5. FAIR VALUE MEASUREMENTS

The Company's financial assets and liabilities subject to fair value measurements on a recurring basis and the level of inputs used for such measurements were as follows (in thousands):

	Fair Value Measured as of December 31, 2024			
	Level 1	Level 2	Level 3	Total
Assets				
Cash, cash equivalents and restricted cash:				
Cash and money market funds[1]	$ 33,204	$ —	$ —	$ 33,204
US government and agency	—	23,636	—	23,636
Total cash, cash equivalents and restricted cash	$ 33,204	$ 23,636	$ —	$ 56,840
Short-term investments:				
Corporate notes and bonds	—	43,868	—	43,868
US government and agency	—	242,028	—	242,028
Total short-term investments	$ —	$ 285,896	$ —	$ 285,896
Long-term investments:				
Corporate notes and bonds	—	1,924	—	1,924
US government and agency	—	21,621	—	21,621
Total long-term investments	$ —	$ 23,545	$ —	$ 23,545
Total assets	$ 33,204	$ 333,077	$ —	$ 366,281
Liabilities				
Public warrants	$ 70,688	$ —	$ —	$ 70,688

	Fair Value Measured as of December 31, 2023			
	Level 1	Level 2	Level 3	Total
Assets				
Cash, cash equivalents and restricted cash:				
Cash and money market funds[1]	$ 25,131	$ —	$ —	$ 25,131
US government and agency	—	12,950	—	12,950
Total cash, cash equivalents and restricted cash	$ 25,131	$ 12,950	$ —	$ 38,081
Short-term investments:				
Commercial paper	—	16,360	—	16,360
Corporate notes and bonds	—	130,423	—	130,423
Municipal bonds	—	4,947	—	4,947
US government and agency	—	168,046	—	168,046
Total short-term investments	$ —	$ 319,776	$ —	$ 319,776
Long-term investments:				
Corporate notes and bonds	—	44,554	—	44,554
US government and agency	—	55,935	—	55,935
Total long-term investments	$ —	$ 100,489	$ —	$ 100,489
Total assets	$ 25,131	$ 433,215	$ —	$ 458,346
Liabilities				
Public warrants	$ 23,004	$ —	$ —	$ 23,004

(1) Includes money market funds associated with the Company's overnight investment sweep account and cash collateralizing the Company's letter of credit and corporate credit cards.

Transfers to/from Levels 1, 2 and 3 are recognized at the beginning of the reporting period. There were no transfers between levels during the current period. On December 31, 2024, the closing trading price of the public warrants was $30.46 per warrant.

6. PROPERTY AND EQUIPMENT, NET

Property and equipment, net is composed of the following (in thousands):

	December 31, 2024	December 31, 2023
Quantum computing systems	$ 38,374	$ 28,296
Leasehold improvements	17,921	10,043
Machinery, equipment, furniture and fixtures	16,683	9,238
Computer equipment and acquired computer software	7,395	4,537
Gross property and equipment	80,373	52,114
Less: accumulated depreciation	(27,612)	(14,599)
Total property and equipment, net	$ 52,761	$ 37,515

Depreciation expense for the years ended December 31, 2024, 2023 and 2022, was $13.0 million, $7.2 million and $4.0 million, respectively.

7. INTANGIBLE ASSETS, NET

Intangible assets, net is composed of the following (in thousands, except as otherwise noted):

	December 31, 2024			
	Weighted Average Remaining Useful Life (Years)	Gross Carrying Amount	Accumulated Amortization	Net Amount
Internal-use software	2.1	$ 21,301	$ (10,701)	$ 10,600
Customer relationships	5.0	7,700	—	7,700
Patents	15.1	7,112	(487)	6,625
Developed technology	5.0	4,293	(293)	4,000
Trademark	Indefinite	377	—	377
Website and other	7.9	227	(60)	167
Total		$ 41,010	$ (11,541)	$ 29,469

	December 31, 2023			
	Weighted Average Remaining Useful Life (Years)	Gross Carrying Amount	Accumulated Amortization	Net Amount
Internal-use software	2.3	$ 14,524	$ (5,445)	$ 9,079
Patents	15.9	5,783	(287)	5,496
Developed technology	1.0	318	(159)	159
Trademark	Indefinite	154	—	154
Website and other	8.9	227	(38)	189
Total		$ 21,006	$ (5,929)	$ 15,077

Total amortization expense for intangible assets for the years ended December 31, 2024, 2023 and 2022, was $5.6 million, $3.2 million and $1.6 million, respectively. As of December 31, 2024, the projected annual amortization expense for the Company's intangible assets is as follows (in thousands):

	Amount
Year ending December 31,	
2025	$ 8,164
2026	6,495
2027	3,660
2028	2,573
2029	2,570
Thereafter	5,630
Total amortization expense	$ 29,092

8. GOODWILL

Changes in the carrying amount of goodwill for the years ended December 31, 2024 and 2023, were as follows:

	2024	2023
Beginning balance	$ 742	$ 742
Acquisitions	9,220	—
Foreign currency translation	(58)	—
Ending balance	$ 9,904	$ 742

9. AGREEMENTS WITH UNIVERSITY OF MARYLAND AND DUKE UNIVERSITY

Exclusive License Agreement

The Company entered into an exclusive license agreement ("License Agreement") in July 2016 with the University of Maryland ("UMD") and Duke University ("Duke"). The License Agreement grants to the Company an exclusive, perpetual license ("Initial Patents") to certain patents, know-how and other intellectual property utilized in trapped-ion quantum computing systems. The license granted to the Company is exclusive for all patents (and non-exclusive for other types of intellectual property), subject to certain governmental rights and retained rights by UMD and Duke and other non-profit institutions to use and practice the Licensed Patents (as defined below) and technology for internal research and other non-profit purposes. In exchange for the Initial Patents, UMD and Duke received an aggregate of 142,886 shares of common stock.

On February 1, 2021, the Company and UMD executed two amendments to the License Agreement granting exclusive rights to license additional intellectual property in exchange for a total of 257,198 shares of common stock. Management evaluated the amendments and concluded that the arrangements qualify as equity-classified instruments and recorded an intangible asset and additional paid-in capital based on the fair value of the shares at the date the amendments were executed of $1.6 million. The shares for each executed amendment were issued during the year ended December 31, 2021.

Exclusive Option Agreements

The Company also entered into an exclusive option agreement (the "Option Agreement") with each of UMD and Duke in 2016 whereby on the anniversary of the effective date of the License Agreement for a period of 5 years, the Company has the right to exclusively license additional intellectual property developed by UMD and Duke (the "Additional Patents" and together with the Initial Patents, the "Licensed Patents") by exercising an annual option and issuing shares of common stock each to Duke and UMD in consideration for the Additional Patents. The amount issued to UMD and Duke pursuant to the Option Agreement over the 5-year term was equal to an aggregate of 642,995 shares of common stock to each university. The Company may elect not to exercise the option if there was not a minimum number of intellectual property developed in a given year and then the Option Agreement would extend another year.

In December 2020, the Company amended its Option Agreement with Duke, and under this amendment, the Company issued 1,214,317 shares of common stock to Duke in consideration for research and development services through July 15, 2026. Under the terms of the amended Option Agreement, the issuance of shares is a nonrefundable upfront payment in exchange for research and development services by Duke whereby the Company will obtain rights to any potential future intellectual property developed during

the term. As such, the fair value of the shares of common stock was recorded as a prepaid expense and is being amortized over the term of the arrangement as services are received. The Company recognized $0.5 million of research and development expense related to the agreement with Duke during each of the years ended December 31, 2024, 2023 and 2022.

The useful life of the Licensed Patents derived from the License Agreement and the Option Agreement is the remaining legal life at the time of acquisition. The value of the Licensed Patents is based on the fair value of the common stock given as consideration on the effective date of each agreement and exercise of option. The asset is amortized over the useful life of the Licensed Patents.

10. OTHER BALANCE SHEET ACCOUNTS

Prepaid expenses and other current assets are composed of the following (in thousands):

	December 31, 2024	December 31, 2023
Materials and supplies	$ 18,658	$ 12,476
Prepaid expenses	4,890	5,696
Accrued interest receivable	2,221	2,109
Other current assets	2,556	2,800
Total prepaid expenses and other current assets	$ 28,325	$ 23,081

Accrued expenses and other current liabilities are composed of the following (in thousands):

	December 31, 2024	December 31, 2023
Accrued salaries and other payroll liabilities	$ 10,368	$ 15,950
Acquisition holdback liabilities	3,300	—
Accrued professional services	936	605
Accrued equipment and services liabilities for research and development	534	112
Accrued expenses—other	1,286	1,709
Total accrued expenses and other current liabilities	$ 16,424	$ 18,376

11. COMMITMENTS AND CONTINGENCIES

Warranties and Indemnification

The Company's commercial services are typically warranted to perform in a manner consistent with general industry standards that are reasonably applicable and materially in accordance with the Company's documentation under normal use and circumstances.

The Company's arrangements generally include certain provisions for indemnifying customers against liabilities if its products or services infringe third- party intellectual property rights. To date, the Company has not incurred any material costs as a result of such obligations and has not accrued any liabilities related to such obligations in the accompanying consolidated financial statements.

Stockholder Lawsuit

In May 2022, a securities class action complaint captioned Leacock v. IonQ, Inc. et al., Case No. 8:22-cv-01306, was filed by a stockholder of the Company in the United States District Court for the District of Maryland (the "Leacock Litigation") against the Company and certain of the Company's current officers. In June 2022, a securities class action complaint captioned Fisher v. IonQ, Inc., Case No. 8:22-cv-01306-DLB (the "Fisher Litigation") was filed by a stockholder against the Company and certain of the Company's current officers ("IonQ Defendants"). Both the Leacock Litigation and Fisher Litigation, which have been consolidated into a single action, allege violations of Section 10(b) of the Exchange Act, and Rule 10b-5 promulgated thereunder, and Section 20(a) of the Exchange Act and seek damages. In September 2022, the Court appointed lead plaintiffs and counsel for lead plaintiffs, and ordered lead plaintiffs to file a consolidated amended complaint. The consolidated amended complaint was filed on November 22, 2022. As part of the consolidated amended complaint, certain members of the Company's board of directors as well as other dMY-related defendants ("Additional Defendants") have been added as defendants to the case. On February 7, 2023, the IonQ Defendants and the Additional Defendants each filed a motion to dismiss the consolidated amended complaint. On March 23, 2023, lead plaintiffs filed their omnibus opposition to the motions to dismiss. On April 26, 2023, the IonQ Defendants and the Additional Defendants each filed a reply in support of the motions to dismiss. On September 28, 2023, the District Court of Maryland issued an order dismissing plaintiffs' claims against the IonQ Defendants and the Additional Defendants with prejudice and directed the clerk to close the case. On October 26, 2023, the plaintiffs filed a motion for post-judgment relief, seeking to amend their consolidated amended complaint.

The IonQ Defendants and Additional Defendants filed oppositions to plaintiffs' motion on December 1, 2023, and plaintiffs filed their reply on January 8, 2024. On July 10, 2024, the plaintiffs' motion for post-judgment relief was denied and the District Court of Maryland directed the clerk to close the case. On July 26, 2024, the plaintiffs filed a Notice of Appeal with the Fourth Circuit Court of Appeals seeking to review the trial court's decision. Plaintiffs filed their Opening Brief in the Fourth Circuit on September 9, 2024. A response brief by IonQ Defendants was filed on October 8, 2024 and plaintiffs' reply brief was filed on October 29, 2024. Oral argument in the Fourth Circuit occurred on January 31, 2025. Given the uncertainty of litigation and the legal standards that must be met for, among other things, success on the case merits, the Company cannot reasonably estimate the possible loss or range of loss, if any, that may result from the associated suit.

12. STOCKHOLDERS' EQUITY

Our second amended and restated certificate of incorporation authorizes us to issue up to 1,000,000,000 shares of common stock, $0.0001 par value per share, and 20,000,000 shares of preferred stock, par value $0.0001 per share.

Preferred Stock

Under our second amended and restated certificate of incorporation, our board of directors may, without further action by our stockholders, fix the rights, preferences, privileges and restrictions of up to an aggregate of 20,000,000 shares of preferred stock in one or more series and authorize their issuance. These rights, preferences and privileges could include dividend rights, conversion rights, voting rights, terms of redemption, liquidation preferences and the number of shares constituting any series or the designation of such series, any or all of which may be greater than the rights of common stock. Any issuance of preferred stock could adversely affect the voting power of holders of common stock and the likelihood that such holders would receive dividend payments and payments on liquidation. In addition, the issuance of preferred stock could have the effect of delaying, deterring or preventing a change of control or other corporate action. No shares of preferred stock have been issued as of December 31, 2024.

Common Stock

The terms, rights, preference, and privileges of the common stock are as follows:

Voting Rights

Except as otherwise required by law or as otherwise provided in any certificate of designation for any series of preferred stock, each holder of common stock possess all voting power for the election of our directors and all other matters requiring stockholder action. Holders of common stock are entitled to one vote per share on matters to be voted on by stockholders. The Company's second amended and restated certificate of incorporation and bylaws do not provide for cumulative voting rights.

Dividends

Subject to preferences that may be applicable to any then outstanding preferred stock, the holders of common stock may be entitled to receive dividends out of legally available funds if the board of directors, in its discretion, determines to issue dividends and then only at the times and in the amounts that the board of directors may determine. We do not anticipate paying any cash dividends in the foreseeable future.

Liquidation

In the event of our voluntary or involuntary liquidation, dissolution, distribution of assets or winding-up, the holders of common stock will be entitled to receive an equal amount per share of all of our assets of whatever kind available for distribution to stockholders, after the rights of the holders of the preferred stock, if any, have been satisfied.

Rights and Preference

Holders of the Company's common stock have no preemptive or other subscription rights, and there are no sinking fund or redemption provisions applicable to the common stock. The rights, preferences, and privileges of the holders of common stock are subject to, and may be adversely affected by, the rights of the holders of shares of any series of the Company's preferred stock that may be issued.

Common Stock Reserved for Issuance

The Company's common stock reserved for future issuances are as follows:

	As of December 31,	
	2024	2023
Stock options outstanding	16,687,129	21,664,377
Warrants to acquire common stock	543,152	8,301,202
Public warrants outstanding	2,320,696	5,228,253
Restricted stock units outstanding	14,509,717	15,107,535
Performance-based restricted stock units grants	11,916,771	12,923,499
Shares available for grant under the 2021 Equity Incentive Plan	22,532,379	14,075,832
Shares available for issuance under the Employee Stock Purchase Plan	5,354,000	5,354,000
Total common stock reserved	73,863,844	82,654,698

13. WARRANT TRANSACTION AGREEMENT

In November 2019, contemporaneously with a revenue arrangement, the Company entered into a contract, pursuant to which the Company agreed to issue warrants to acquire shares of Legacy IonQ Series B-1 preferred stock (the "Warrant Shares") to a customer, subject to certain vesting events. Upon closing of the Business Combination, these warrants exercisable for Legacy IonQ Series B-1 preferred stock were assumed by the Company and converted into a warrant to purchase shares of common stock. Except as specifically provided in the Merger Agreement, the Warrant Shares will have the same terms and be subject to the same conditions (including applicable vesting conditions) as set forth in the Legacy IonQ warrant agreement. The contract allowed for the customer to acquire up to 8,301,202 shares of common stock in the Company. The fair value of the Warrant Shares at the date of issuance was determined to be $8.7 million.

As the Warrant Shares were issued in connection with an existing commercial agreement with a customer, the value of the Warrant Shares was determined to be consideration payable to the customer and consequently was treated as a reduction to revenue recognized under the corresponding revenue arrangement.

In August 2020, 543,152 of the Warrant Shares vested and became immediately exercisable. The exercise price for the vested Warrant Shares is $1.38 per share and the warrant is exercisable through November 2029. As of December 31, 2024, no additional Warrant Shares can be vested pursuant to the terms of the warrant agreement and accordingly, the remaining 7,758,050 unvested Warrant Shares were forfeited.

14. WARRANT LIABILITIES

The Company assumed 7,500,000 public warrants on September 30, 2021 as part of the Business Combination. As of December 31, 2024, there were 2,320,696 public warrants to purchase common stock outstanding. Each warrant entitles the registered holder to purchase one share of common stock at a price of $11.50 per share.

Public warrants

The public warrants may be exercised on the later of (a) 30 days after the completion of a Business Combination or (b) 12 months from the closing of the Initial Public Offering of dMY; provided in each case that the Company has an effective registration statement under the Securities Act covering the shares of common stock issuable upon exercise of the public warrants and a current prospectus relating to them is available (or the Company permits holders to exercise their public warrants on a cashless basis and such cashless exercise is exempt from registration under the Securities Act). The public warrants became exercisable on November 17, 2021.

Redemption of warrants when the price per share of common stock equals or exceeds $18.00:

Once the warrants become exercisable, the Company may redeem the outstanding warrants for cash:

- in whole and not in part;
- at a price of $0.01 per warrant;
- upon a minimum of 30 days' prior written notice of redemption; and

- if, and only if, the closing price of common stock equals or exceeds $18.00 per share (as adjusted) for any 20 trading days within a 30-trading day period ending on the third trading day prior to the date on which the Company sends the notice of redemption to the warrant holders.

Redemption of warrants for when the price per share of common stock equals or exceeds $10.00:

Once the warrants become exercisable, the Company may redeem the outstanding warrants:

- in whole and not in part;
- at $0.10 per warrant upon a minimum of 30 days' prior written notice of redemption provided that holders will be able to exercise their warrants on a cashless basis prior to redemption and receive that number of shares determined by reference to an agreed table based on the redemption date and the fair market value (as defined within the warrant agreement) of the common stock except as otherwise described within the warrant agreement; and upon a minimum of 30 days' prior written notice of redemption; and
- if, and only if, the closing price of common stock equals or exceeds $10.00 per public share (as adjusted) for any 20 trading days within the 30-trading day period ending three trading days before the Company sends notice of redemption to the warrant holders.

No public warrants have been redeemed by the Company as of December 31, 2024.

15. REVENUE

Disaggregated Revenue

The Company's revenues disaggregated by revenue source is as follows (in thousands):

	Year Ended December 31,		
	2024	2023	2022
Specialized quantum computing hardware	$ 21,594	$ 7,083	$ 239
Platform, consulting and support services	21,479	14,959	10,892
Total revenue	$ 43,073	$ 22,042	$ 11,131

The Company's revenues disaggregated by customer location is as follows (in thousands):

	Year Ended December 31,		
	2024	2023	2022
United States	$ 40,714	$ 18,703	$ 9,175
International	2,359	3,339	1,956
Total revenue	$ 43,073	$ 22,042	$ 11,131

Remaining Performance Obligations

As of December 31, 2024, approximately $77.2 million of revenue is expected to be recognized from remaining performance obligations that are unsatisfied (or partially unsatisfied), including both funded (firm orders for which funding has been both authorized and appropriated by the customer) and unfunded (firm orders for which funding has not been appropriated) orders. Unexercised contract options are not included in remaining performance obligations until the time the option is exercised. The

Company expects approximately 40% of the remaining performance obligations to be recognized as revenue within the next twelve months.

Unearned Revenue

The following table summarizes the changes in unearned revenue for the years ended December 31, 2024, 2023 and 2022 (in thousands):

	2024	2023	2022
Beginning balance	$ 12,534	$ 9,930	$ 4,963
Revenue recognized	(11,911)	(8,660)	(4,216)
New deferrals, net	10,055	11,264	9,183
Ending balance	$ 10,678	$ 12,534	$ 9,930

16. STOCK-BASED COMPENSATION

Equity Incentive Plans

The Company has a 2015 Equity Incentive Plan (the "2015 Plan"), which provided for the grant of share-based compensation to certain officers, directors, employees, consultants, and advisors. Upon the closing of the Business Combination, no further awards were made pursuant to the 2015 Plan and all outstanding Legacy IonQ stock options under the 2015 Plan were assumed by the Company. Such stock options granted under the 2015 Plan will continue to be governed by the terms of the 2015 Plan and the stock option agreements thereunder, until such outstanding options are exercised or until they terminate or expire by their terms. For awards granted under the 2015 Plan, vesting generally occurs over four to five years from the date of grant.

In August 2021, the Company's board of directors adopted the 2021 Equity Incentive Plan (the "2021 Plan"), which was subsequently approved by the Company's stockholders in September 2021, and became effective upon the closing of the Business Combination. The 2021 Plan provides for the grant of stock options, stock appreciation rights, restricted stock awards, restricted stock unit awards ("RSU"), performance awards and other forms of awards to employees, directors, and consultants. The number of shares of the Company's common stock reserved for issuance under the 2021 Plan automatically increases on January 1 of each year, through and including January 1, 2031, by 5% of the Fully Diluted Common Stock (as defined in the 2021 Plan) outstanding on December 31 of the preceding year, or a lesser number of shares determined by the Company's board of directors prior to such increase. As of January 1, 2025, the number of shares reserved for issuance under the 2021 Plan increased by 14,532,010. For awards granted under the 2021 Plan, vesting terms range from one to four years from the date of grant. As of December 31, 2024, the Company had 22,532,379 shares available for grant under the 2021 Plan.

Under both equity incentive plans, all options granted have a contractual term of 10 years.

Stock Options

The Company estimates the fair value of stock options on the date of grant using the Black-Scholes option-pricing model. The Black-Scholes option-pricing model requires estimates of highly subjective assumptions, which affect the fair value of each stock option. For stock options granted during the years ended December 31, 2024, 2023 and 2022, the assumptions for the Black-Scholes option-pricing model were developed as follows:

Expected Volatility—The expected volatility was based on the average historical stock price volatility of comparable publicly-traded companies in the Company's industry peer group, financial, and market capitalization data, due to the limited history of a public market for the Company's common stock prior to closing the Business Combination relative to the expected term of the options.

Expected Term—The expected term of the Company's options represents the period that the stock options are expected to be outstanding.

The Company has estimated the expected term of its employee stock option awards using the SAB Topic 14 Simplified Method allowed by the FASB and SEC for calculating expected term, as it has limited historical exercise data to provide a reasonable basis upon which to otherwise estimate expected term. Certain of the Company's stock options began vesting prior to the grant date, in which case the Company uses the remaining vesting term at the grant date in the expected term calculation.

Risk-Free Interest Rate—The Company estimates its risk-free interest rate by using the yield on actively traded non-inflation-indexed U.S. treasury securities with contract maturities equal to the expected term.

Dividend Yield—The Company has not declared or paid dividends to date and does not anticipate declaring dividends. As such, the dividend yield has been estimated to be zero.

Fair Value of Underlying Common Stock—The Company utilizes the closing stock price on the date of grant as the fair value of the common stock underlying such stock options in the Black-Scholes option-pricing model.

The assumptions used to estimate the fair value of stock options granted are as follows:

	Year Ended December 31,		
	2024	2023	2022
Risk-free interest rate	4.31%	4.09%	2.60%
Expected term (in years)	6.00	5.50	5.82
Expected volatility	79.33%	80.63%	75.82%
Dividend yield	—%	—%	—%

The stock option activity is summarized in the following table:

	Number of Option Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Term (Years)	Aggregate Intrinsic Value (in millions)
Outstanding as of December 31, 2023	21,664,377	$ 2.26		
Granted	52,640	11.24		
Exercised	(4,918,156)	1.84		
Cancelled/ Forfeited	(111,732)	4.81		
Outstanding as of December 31, 2024	16,687,129	$ 2.40	5.42	$ 656.98
Exercisable as of December 31, 2024	13,651,675	$ 1.81	5.08	$ 545.49
Exercisable and expected to vest as of December 31, 2024	16,687,129	$ 2.40	5.42	$ 656.98

The following table summarizes additional information on stock option grants, vesting and exercises (in millions, except per share amounts):

	Year Ended December 31,		
	2024	2023	2022
Total intrinsic value of options exercised	$ 58.8	$ 18.6	$ 6.7
Aggregate grant-date fair value of options vested	$ 12.5	$ 15.5	$ 9.9
Weighted-average grant date fair value per share for options granted	$ 7.98	$ 9.38	$ 5.58

Early Exercised Stock Options

As of December 31, 2024 and 2023, there were 211,184 and 403,764 shares, respectively, subject to repurchase related to stock options early exercised and unvested. As of December 31, 2024 and 2023, the Company recorded a liability related to these shares subject to repurchase in the amount of $0.4 million and $0.8 million, respectively, in its consolidated balance sheets.

Restricted Stock Units

The RSU activity is summarized in the following table:

	Number of RSUs	Weighted Average Grant Date Fair Value	Weighted Average Remaining Contractual Term (Years)	Aggregate Fair Value (in millions)
Outstanding as of December 31, 2023	15,107,535	$ 8.90		
Granted	8,856,201	10.36		
Vested	(7,388,376)	9.15		
Forfeited	(2,065,643)	9.78		
Outstanding as of December 31, 2024	14,509,717	$ 9.54	2.58	$ 606.07
Expected to vest after December 31, 2024	14,489,217	$ 9.53	2.58	$ 605.21

The following table summarizes additional information on RSU grants and vesting (in millions, except per share amounts):

	Year Ended December 31,		
	2024	2023	2022
Total fair value of RSUs that vested	$ 102.0	$ 63.4	$ 8.6
Weighted-average grant date fair value per share for RSUs granted	$ 10.36	$ 9.97	$ 7.34

During the years ended December 31, 2024, 2023 and 2022, the Company released 1,064,518, 566,389 and 81,134 RSUs, respectively, related to the settlement of an accrued bonus liability.

Performance-Based Restricted Stock Units

The Company grants performance-based restricted stock unit awards (“PSU”) to certain officers and employees, which vest over approximately two to four years. The number of shares that can be earned will range from 0% to 300% of the target number of shares, based on the Company's achievement of certain financial and technical goals, as well as a stock price hurdle requirement for a portion of the awards. In the event that the stock price hurdle is not met at the time the PSUs vest, the maximum PSU opportunity shall be limited to target (100%) performance. The number of PSUs expected to vest and for which compensation cost has been recognized is based on the number of awards that the Company believes are probable of vesting as of December 31, 2024.

For the portion of the PSUs subject to the stock price hurdle, the fair value was determined using a Monte Carlo simulation model. The Monte Carlo simulation model requires estimates of subjective assumptions, which affect the fair value of each PSU. For PSUs granted during the years ended December 31, 2024, 2023 and 2022, the assumptions for the Monte Carlo simulation model were developed as follows:

Expected Volatility—The expected volatility in 2024 was determined based on the Company's historical and implied stock price volatility. The expected volatility in 2023 was based on the average historical stock price volatility of comparable publicly traded companies in the Company's industry peer group, financial, and market capitalization data, due to the limited history of a public market for the Company's common stock prior to closing the Business Combination.

Contractual Term—The Company utilizes the remaining performance period on the date of grant as the contractual term, which represents the period that the PSUs are expected to be outstanding.

Risk-Free Interest Rate—The Company estimates its risk-free interest rate by using the yield on actively traded non-inflation-indexed U.S. treasury securities with contract maturities equal to the expected term.

Dividend Yield—The Company has not declared or paid dividends to date and does not anticipate declaring dividends. As such, the dividend yield has been estimated to be zero.

Fair Value of Underlying Common Stock—The Company utilizes the closing stock price on the date of grant as the fair value of the common stock underlying such PSUs in the Monte Carlo simulation model.

The assumptions used to estimate the fair value of PSUs subject to the stock price hurdle are as follows:

	Year Ended December 31,		
	2024	2023	2022
Risk-free interest rate	4.63%	4.59%	—%
Contractual term (in years)	2.46	3.37	—
Expected volatility	89.98%	80.00%	—%
Dividend yield	—%	—%	—%

The PSU activity is summarized in the following table, based on awards at target:

	Number of PSUs	Weighted Average Grant Date Fair Value	Weighted Average Remaining Contractual Term (Years)	Aggregate Fair Value (in millions)
Outstanding as of December 31, 2023	4,307,833	$ 15.75		
Granted	565,498	18.41		
Forfeited	(901,074)	15.56		
Outstanding as of December 31, 2024	3,972,257	$ 16.17	2.16	$ 165.92
Expected to vest after December 31, 2024[(1)]	9,930,643	$ 14.93	2.16	$ 414.80

(1) Represents the number of PSUs expected to vest, which may exceed the target number of shares, based on the Company's probability assessment of expected performance during the performance period.

The following table summarizes additional information on PSU grants:

	Year Ended December 31,		
	2024	2023	2022
Weighted-average grant date fair value per share for PSUs granted	$ 18.41	$ 15.74	$ —

Stock-Based Compensation Expense

Total stock-based compensation expense for stock option awards, RSUs and PSUs, which are included in the consolidated financial statements, is as follows (in thousands):

	Year Ended December 31,		
	2024	2023	2022
Cost of revenue	$ 4,740	$ 2,819	$ 902
Research and development	58,696	40,103	13,472
Sales and marketing	13,788	6,762	1,298
General and administrative	29,654	20,059	15,784
Stock-based compensation, net of amounts capitalized	$ 106,878	$ 69,743	$ 31,456
Capitalized stock-based compensation—Intangibles and fixed assets	5,188	4,702	1,741
Total stock-based compensation	$ 112,066	$ 74,445	$ 33,197

Unrecognized Stock-Based Compensation

A summary of the Company's remaining unrecognized compensation expense and the weighted-average remaining amortization period as of December 31, 2024, related to its non-vested RSUs, PSUs, and stock option awards is presented below (in millions, except time period amounts):

	Unrecognized Expense	Weighted-Average Amortization Period (Years)
Restricted stock units	$ 130.1	2.7
Performance-based restricted stock units	$ 98.3	2.2
Stock options	$ 14.4	1.3

Employee Stock Purchase Plan

In August 2021, the Company's board of directors adopted the Employee Stock Purchase Plan (the "ESPP"), which was subsequently approved by the Company's stockholders in September 2021, and became effective upon the closing of the Business Combination. The ESPP is intended to qualify as an "employee stock purchase plan" within the meaning of Section 423 of the U.S. Internal Revenue Code of 1986, as amended (the "Code"). The number of shares of common stock initially reserved for issuance under the ESPP was 5,354,000 shares. The ESPP provides for an annual increase on January 1 of each year and continuing through and including January 1, 2031, equal to the lesser of (i) 1% of the fully diluted shares of common stock outstanding on the last day of the prior fiscal year, (ii) 10,708,000 shares, or (iii) a lesser number of shares determined by the Company's board of directors prior to such increase. The board of directors elected not to approve the annual increase of ESPP shares on January 1, 2025.

Under the terms of the ESPP, eligible employees can elect to acquire shares of the Company's common stock through periodic payroll deductions during a series of offering periods. Purchases under the ESPP are affected on the last business day of each offering period at a 15% discount to the lower of closing price on that day or the closing price on the first day of the offering period. As of December 31, 2024, no shares of common stock had been issued under the ESPP and no offering period had been set by the board of directors.

17. INCOME TAXES

The current and deferred components of the provision for income taxes for federal, state and foreign jurisdictions are as follows (in thousands):

	Year Ended December 31,		
	2024	2023	2022
Current:			
Federal	$ —	$ —	$ —
State	—	—	—
Foreign	59	48	—
Total current tax expense (benefit)	$ 59	$ 48	$ —
Deferred:			
Federal	—	—	—
State	—	—	—
Foreign	—	—	—
Total deferred tax expense (benefit)	$ —	$ —	$ —
Total tax expense (benefit)	$ 59	$ 48	$ —

The Company's provision for income taxes differs from the amount determined by applying the applicable federal statutory tax rate to the loss before income taxes due to the valuation allowance for the net deferred income tax assets. A reconciliation of the U.S. statutory tax rate to our effective tax rate is presented below:

	Year Ended December 31,		
	2024	2023	2022
U.S. federal statutory income tax rate	21.0%	21.0%	21.0%
State and local income taxes	3.2%	4.5%	7.4%
R&D tax credits	5.3%	3.1%	5.9%
Compensation	0.7%	2.6%	(5.1)%
Warrant (gain) loss	(7.4)%	(2.5)%	13.0%
Change in tax rates	0.0%	(0.4)%	0.4%
Provision to return and deferred tax adjustments	0.1%	(0.2)%	10.9%
Valuation allowance	(22.9)%	(28.0)%	(53.4)%
Other	0.0%	(0.1)%	(0.1)%
Effective tax rate	0.0%	0.0%	0.0%

Deferred income taxes reflect the net tax effects of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes. Significant components of the Company's deferred tax assets and liabilities are as follows (in thousands):

	December 31, 2024	December 31, 2023
Deferred tax assets:		
Accrued bonus	$ 2,036	$ 3,652
Unearned revenue	158	1,233
Stock-based compensation	9,793	7,308
Depreciation and amortization	3,109	2,843
Capitalized R&D costs	62,939	27,432
Lease liabilities	4,483	2,031
R&D credit carryforwards	29,800	11,428
Net operating loss carryforwards	56,204	36,197
Other	677	686
Total deferred tax assets	$ 169,199	$ 92,810
Valuation allowance	(166,287)	(90,963)
Total deferred tax assets, net of valuation allowance	$ 2,912	$ 1,847
Deferred tax liabilities:		
Right of use assets	(2,386)	(1,142)
Other	(526)	(705)
Total deferred tax liabilities	$ (2,912)	$ (1,847)
Net deferred tax assets (liabilities)	$ —	$ —

The following table summarizes the activity in the Company's valuation allowance against its gross deferred tax assets (in thousands):

	2024	2023	2022
Beginning balance	$ 90,963	$ 48,212	$ 20,388
Charged to costs and expenses	75,780	44,123	25,925
Charged (credited) to other accounts	(456)	(1,372)	1,899
Ending balance	$ 166,287	$ 90,963	$ 48,212

The Company had U.S. federal and state net operating loss carryforwards of approximately $224.2 million and $148.1 million, respectively, as of December 31, 2024. The Company's net operating loss carryforwards generated prior to January 1, 2018 of $1.1 million will begin to expire, if not utilized, in 2036. The Company's net operating loss carry forwards generated after December 31, 2017, will carryforward indefinitely. As of December 31, 2024, the Company had U.S. federal and state tax credit carryforwards of $30.0 million. The tax credit carryforwards will expire between 2025 and 2044.

The deductibility of such credits and net operating losses ("NOL") may be limited. Under Sections 383 and 382 of the Internal Revenue Code of 1986, as amended (the "Code"), and corresponding provisions of state law, if a corporation undergoes an "ownership change," which generally occurs if the percentage of the corporation's stock owned by 5% stockholders increases by more than 50% over a three-year period, the corporation's ability to use its pre-change credits and NOL carryforwards and other pre-change tax attributes to offset its post-change income, may be limited. The Company has not determined if it has experienced Section 383/382 ownership changes in the past and if a portion of its NOL and tax credit carryforwards are subject to an annual limitation. In addition, the Company may experience ownership changes in the future as a result of subsequent shifts in its stock ownership, some of which may be outside of its control. If the Company determines that an ownership change has occurred and its ability to use its historical NOL and tax credit carryforwards is significantly limited, it would harm the Company's future operating results by effectively increasing its future tax obligations.

The Company has evaluated the positive and negative evidence bearing upon the realizability of its deferred tax assets. Based on the Company's history of operating losses, including a three-year cumulative loss position as of December 31, 2024 and 2023, the Company has concluded that it is not more likely than not that its net deferred income tax assets will be realized. Accordingly, the Company has provided a full valuation allowance as of December 31, 2024 and 2023. The net increase in the valuation allowance of $75.3 million is due to the impact of capitalized research and development and current year operating losses.

The Company is generally subject to a three-year statute of limitations by major tax jurisdictions. The current tax years that are subject for examination are tax years 2021 through 2023, although tax years dating back to 2016 remain open up to the tax attribute amounts carried forward for future use.

18. LEASES

The Company has operating leases for its various facilities, including its primary locations in College Park, Maryland; Bothell, Washington; and Arlesheim, Switzerland. The College Park, Maryland facility is used for research and development, servicing customers and corporate functions and is leased from UMD. The Bothell, Washington facility is used for manufacturing, research and development, servicing customers, and general office space. The Arlesheim, Switzerland facility is used for servicing customers and general office space. Both the College Park, Maryland, and Bothell, Washington, leases expire in 2030 and the Arlesheim, Switzerland lease expires in 2029. As of December 31, 2024 and 2023, the Company's weighted-average remaining lease term was 5.2 years and 6.5 years, respectively, and the weighted-average discount rate was 8.2% and 9.0%, respectively.

The Bothell, Washington facility lease includes a landlord-provided tenant improvement allowance to offset a portion of the costs of the construction of leasehold improvements. The Company determined that the leasehold improvements will be Company-owned, and as such, reflected the lease incentive as a reduction of lease payments used to measure the operating lease liability and ROU asset as of the lease commencement date.

The components of lease cost were as follows (in thousands):

	Year Ended December 31,		
	2024	2023	2022
Operating lease cost[(1)]			
Fixed lease cost	$ 2,522	$ 1,458	$ 763
Short-term cost	221	145	79
Total operating lease cost	$ 2,743	$ 1,603	$ 842

(1) The lease costs are reflected in the consolidated statements of operations as follows (in thousands):

	Year Ended December 31,		
	2024	2023	2022
Cost of revenue	$ 254	$ 145	$ 53
Research and development	1,670	722	612
Sales and marketing	175	84	46
General and administrative	644	652	131
Total operating lease cost	$ 2,743	$ 1,603	$ 842

Supplemental cash flow and other information related to operating leases was as follows (in thousands):

	Year Ended December 31,		
	2024	2023	2022
Cash payments (receipts) included in the measurement of operating lease liabilities, net	$ (2,251)	$ (1,790)	$ 644

As of December 31, 2024, maturities of operating lease liabilities are as follows (in thousands):

	Amount
Year Ending December 31,	
2025	$ 3,663
2026	4,193
2027	4,257
2028	4,358
2029	3,933
Thereafter	1,511
Total lease payments	$ 21,915
Less: imputed interest	(4,190)
Present value of operating lease liabilities	$ 17,725

19. EMPLOYEE BENEFIT PLAN

The Company has a 401(k) savings plan (the "401(k) Plan"), which qualifies as a deferred salary arrangement under Section 401(k) of the Internal Revenue Code. Under the 401(k) Plan, participating employees may elect to contribute up to 100% of their eligible compensation, subject to certain limitations. The 401(k) Plan provides for a discretionary employer-matching contribution. The Company made a matching contribution of $2.4 million, $1.6 million and $0.9 million to the 401(k) Plan for the years ended December 31, 2024, 2023 and 2022, respectively.

20. RELATED PARTY TRANSACTIONS

Transactions with University of Maryland

The Company has contracts with UMD, including contracts to provide certain quantum computing services and facility access, to provide customized quantum computing hardware, and an operating lease. Following the departure of the Company's Chief Scientist, UMD is no longer considered a related party as of January 1, 2024. Revenue recognized from contracts entered into while UMD was a related party was $3.5 million, $4.6 million and $4.0 million for the years ended December 31, 2024, 2023 and 2022, respectively.

The Company had the following balances related to contracts entered into while UMD was a related party, as reflected in the consolidated balance sheets (in thousands):

	December 31, 2024	December 31, 2023
Assets		
Operating lease right-of-use asset	$ 3,120	$ 3,452
Liabilities		
Current portion of operating lease liabilities	$ 681	$ 661
Unearned revenue	204	2,670
Operating lease liabilities, net of current portion	2,843	3,181

Transactions with Duke University

In July 2016, the Company entered into an exclusive license agreement (the "License Agreement") and an exclusive option agreement (the "Option Agreement") with Duke whereby the Company, in the normal course of business, has licensed certain intellectual property and, in the case of the amendments to the Option Agreement, has purchased research and development services. Following the departure of the Company's Chief Technology Officer, Duke is no longer considered a related party as of July 1, 2024.

The Company has the following balances related to agreements entered into while Duke was a related party, as reflected in the consolidated balance sheets (in thousands):

	December 31, 2024	December 31, 2023
Assets		
Prepaid expenses and other current assets	$ 520	$ 520
Other noncurrent assets	285	805

21. GEOGRAPHIC INFORMATION

The following table summarizes long-lived asset balances, which includes property and equipment, net and operating lease right-of-use assets, for geographic areas that individually accounted for 10% or more of the respective totals, as well as aggregate amounts for the remaining geographic areas (in thousands):

	December 31, 2024	December 31, 2023
United States	$ 52,723	$ 41,955
Switzerland	9,357	—
Other international	151	173
Total long-lived assets	$ 62,231	$ 42,128

22. SEGMENT INFORMATION

The Company operates as one operating segment as its chief executive officer, who is the chief operating decision maker, reviews financial information on a consolidated basis for purposes of making operating decisions, allocating resources, and evaluating financial performance. Consolidated net loss as reported on the consolidated statements of operations is used to evaluate performance and allocate resources. The chief operating decision maker evaluates actual results compared to forecasted results for consolidated net loss, including significant expenses, when making decisions about allocating resources.

The following table presents revenue, significant expenses, and segment profit and loss (in thousands):

	Year Ended December 31,		
	2024	2023	2022
Revenue	$ 43,073	$ 22,042	$ 11,131
Less:			
Operating costs and expenses excluding stock-based compensation:			
Cost of revenue (excluding depreciation and amortization)	15,857	5,289	2,042
Research and development	78,131	52,218	30,506
Sales and marketing	14,607	11,508	7,087
General and administrative	41,401	30,663	20,182
Stock-based compensation	106,878	69,743	31,456
Depreciation and amortization	18,654	10,375	5,604
Other segment items:			
(Gain) loss on change in fair value of warrant liabilities	117,107	19,206	(30,136)
Interest income, net	(18,249)	(19,322)	(7,093)
Other (income) expense, net	275	85	(6)
Income tax (benefit) expense	59	48	—
Net loss	$ (331,647)	$ (157,771)	$ (48,511)

23. SUBSEQUENT EVENTS

In February 2025, the Company entered into a definitive agreement to acquire a controlling stake of ID Quantique SA, a global leader in quantum networking and sensing, headquartered in Geneva, Switzerland, in an all-stock transaction for up to approximately 5.2 million shares of common stock. The transaction is expected to close in the next nine months, subject to customary closing conditions.

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EXECUTIVE OFFICERS

Peter Chapman
Executive Chair

Niccolo de Masi
President & Chief Executive Officer

Thomas Kramer
Chief Financial Officer

Rima Alameddine
Chief Revenue Officer

BOARD OF DIRECTORS

Robert Cardillo
Chief Strategist
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Senior Vice President of SaaS Engineering
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Dell Technologies, Inc.

Inder M. Singh
Former Executive Vice President & Chief Financial Officer
Arm Limited

Wendy Thomas
Former Chief Executive Officer
SecureWorks Corp.

Gabrielle Toledano
Chief Operating Officer
Keystone Strategy

LISTING

Our common stock and publicly traded warrants are listed on the New York Stock Exchange under the ticker symbols "IONQ" and "IONQ WS," respectively.

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LEGAL COUNSEL

Wilson Sonsini Goodrich & Rosati, P.C., Washington, DC

ANNUAL MEETING

June 17, 2025, at 1:00 p.m. Eastern time

Virtual Meeting Access at:
www.proxydocs.com/IONQ

FORM 10-K

A copy of our Form 10-K filed with the SEC will be made available to all stockholders at no charge.

The Form 10-K also can be accessed through the SEC website at **www.sec.gov**, or through our Investor website at **investors.ionq.com**.

To receive a copy by mail please contact:

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IONQ