

# Quantum Exponential Investor Presentation

Q2, 2023

- Quantum Tech VC Fund

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“We predict by 2027  
over \$16.4 Bn will  
be invested into  
quantum computing”

– IDC

Compared to under \$5Bn today



# Introduction

**Compared to today's technology, quantum technology offers significant advantages in terms of processing speed, security, and accuracy.**

In its fund, QE has constructed a portfolio of six companies (with another deal TBA) and has developed a reputation as an investor with thorough technical and fundamental due diligence. Expecting the majority of returns to come through traditional corporate M&A.

QE's management and advisory team have deep market knowledge of quantum. Together with significant venture capital experience, this enables them to access, invest and support high-growth companies in this important sector, resulting in QE seeing a significant amount of early-stage quantum deals.



# Our Investment Strategy

**Quantum Exponential expects a ten-fold increase in deals in the next 5 years due to increased investment in global academic innovations in the sector.** <sup>1, 2, 3</sup>

## Goals

- Continue to be a preferred investor of Quantum innovators
- Target seed, Series A and Series B initial entry points
- Prioritise deals with solid underlying science ready to be commercialised in the near future with realistic cash needs
- NATO-friendly markets, often co-investing with trusted partners
- Create a portfolio of 8 - 10 investments over a 5-year period
- Initial investments will be between £100k - £500k
- Follow on in portfolio winners
- QE expects to “harvest” deals, typically by trade sale, in years 7 to 10 of the fund
- Co-Investment Opportunities ad hoc

New LP fund:  
raise & deploy

<sup>1</sup> <https://pitchbook.com/news/articles/quantum-computing-venture-capital-funding>

<sup>2</sup> <https://www.bcg.com/press/21july2021-quantum-computing-transform-multiple-industries-create-850-billion-annual-value>

<sup>3</sup> <https://www.ucl.ac.uk/quantum/news/2022/jan/uk-needs-investment-maintain-its-quantum-advantage>





# Team

**Steven Metcalfe**, CEO. 30 years of experience in regulated markets, with a focus on fundraising and advising on listings and capital markets. Raised +£75m from HNW, funds, and other institutions. Seasoned board member.

**Stuart Nicol**, CIO. Expert in leading UK venture teams for +20 years. Invested in over 70 VC deals (incl. Octopus), prior FUM +£100m. Graduate of RMA Sandhurst and London Business School

**Stuart Woods**, COO. Extensive deep tech commercialisation experience, including quantum. Managing Director at Oxford Instruments and VP Survey Solutions at Hexagon Geosystems. Graduate of North Carolina State University

**Ian Pearson**, Non-Executive Chair. 20-year tenure in government and institutional roles including former Minister of Trade, Science Minister and Chief Secretary to the Treasury.



# Advisory Board

**Advisory Board** - In addition to its executive team, QE has strategically assembled an active Advisory Board covering Australia, Europe, and the US.

The Board includes **Martin Schwedler**, Senior Advisor Europe. Thirty years of TMT M&A and private equity investing amongst others with Lazard, GE Capital, Raiffeisen Investment Banking.

**Helen Reynolds**, a highly experienced VC investor, MD and CIO of the Bayes Entrepreneurship Fund at Bayes Business School, London, which invests in early-stage, high-growth UK businesses.

Other Advisers include the CEO of a publicly traded quantum company, the former Head of the UK Space Agency and senior university quantum scientists.

**QE** has created a broad-based diversified portfolio by company stage, target markets, technology type, and even method of quantum computing. All are achieving revenue and scaling their operations.

**A larger fund** would allow QE to expand our efforts and not only support the companies we have already selected but also find other investable quantum technology companies through our process of extensive technical and fundamental due diligence.





# The Quantum Landscape is Complex, Important and Valuable

**Quantum computers & processors**  
Combined funding \$ 3B

**Quantum computing software**  
Combined funding \$ 1.1B

**Quantum cryptography**  
Combined funding \$ 253M

**Post-quantum era encryption**  
Combined funding \$ 45M

**Quantum and AI for chemical and biotech fields**  
Combined funding \$ 64M

**Quantum communication**  
Combined funding \$ 22M

**Quantum sensing**  
Combined funding \$ 71M

**Photon detection & counting**  
Combined funding \$ 2.8M

**Photonic integrated circuits & photonics IP**  
Combined funding \$ 228M

**Quantum cascade lasers, laser tech for sensing & LiDAR**  
Combined funding \$ 17M

**Next gen laser & photonics**  
Combined funding \$ 27M

**You need an expert to evaluate these complex companies to determine what is investable**





# Global Landscape

- There is a Global Quantum “arms race” to develop and own this emerging and quickly establishing array of technology. The technology should be viewed as a critical enabler for industries in the future with applications including better cybersecurity, better methods of drug discovery and modelling financial markets amongst just a few examples <sup>1</sup>
- Quantum computing is a new technology that leverages the laws of quantum mechanics to produce exponentially higher performance for certain types of calculations, offering the possibility of major breakthroughs across several end markets
- Corporates are also increasing their activity in the quantum space. 70% of business leaders are using and developing real-life use cases for quantum computing and 91% are investing or planning to invest in quantum computing <sup>2</sup>
- CHIPS Act and National Quantum Initiative Supplement to the President's FY 2023 Budget <sup>3</sup>
- More than 2/3 of QC startups have been started in the last 5 years, signalling strong potential for growth of the sector <sup>4</sup>
- 17 countries have invested in national programs of quantum technology research and development with an estimated spending of over \$30B. China is leading followed by the EU. More than 150 countries still have no dedicated quantum program, risking a large quantum divide <sup>5,6</sup>

<sup>1</sup> <https://www.forbes.com/sites/forbestechcouncil/2021/07/30/four-ways-quantum-computing-could-change-the-world/?sh=518d70284602>

<sup>2</sup> <https://thequantuminsider.com/2022/11/16/openocean-iqm-lakestar-state-of-quantum-2022-63-of-business-leaders-believe-commercialised-quantum-computing-to-hit-market-in-five-years/>

<sup>3</sup> <https://www.whitehouse.gov/briefing-room/statements-releases/2022/05/04/national-security-memorandum-on-promoting-united-states-leadership-in-quantum-computing-while-mitigating-risks-to-vulnerable-cryptographic-systems/>

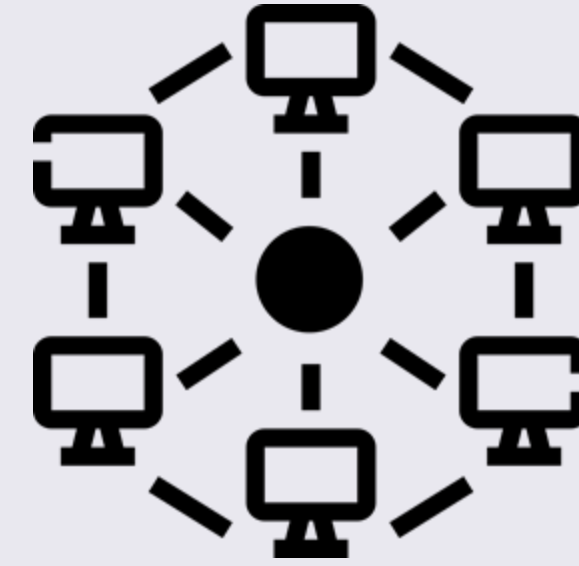
<sup>4</sup> Source

<sup>5</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1062486/Spring\\_Statement\\_2022\\_Web\\_Accessible.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1062486/Spring_Statement_2022_Web_Accessible.pdf)

<sup>6</sup> <https://www.gov.uk/government/news/budget-2021-what-you-need-to-know>



# Focus Areas



Quantum  
Computing



Quantum Imaging  
& Sensing

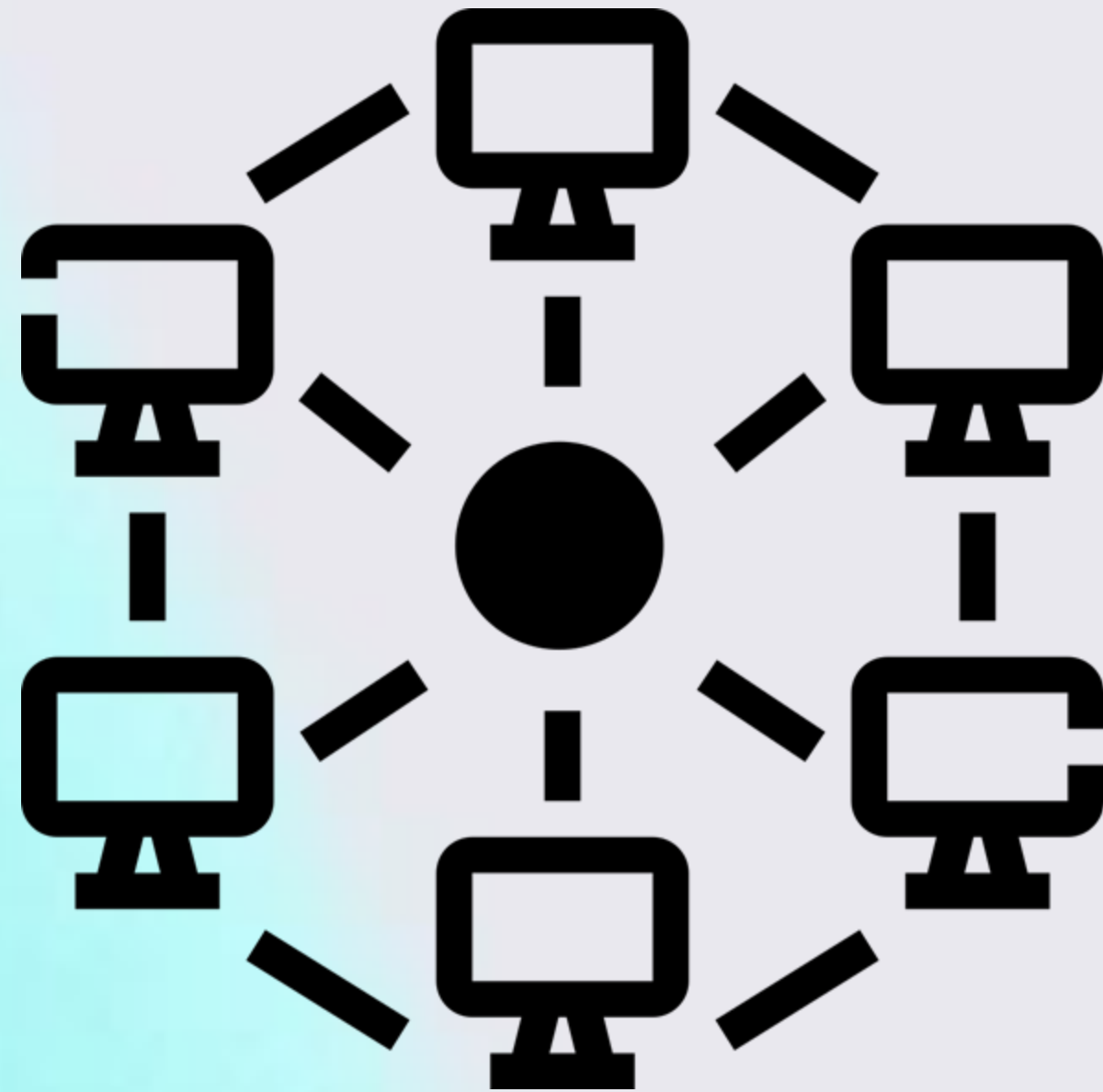


Quantum  
Communications  
& Security





# 1



## Quantum Computing

Quantum Computers rely on atomic level interactions to create systems that can simulate the real world at speed

Applications include creating new chemicals, manufacturing optimisation and financial markets simulation



# 2



## Quantum Imaging & Sensing

High-performance measurements of electric, magnetic, and gravitational fields, promising to greatly increasing the efficacy of today's tools

Application in navigation, timing, medical imaging, underground mapping, materials characterisation





# 3



## Quantum Communications & Security

Technologies can be used to create and distribute unhackable encryption keys through a range of processes

Future possible applications include a “Quantum Internet”, increasing security



# Solving Important Problems

## Climate Change

- “Quantum computing will revolutionize chemistry, enabling breakthrough innovations and advancements in low-carbon technologies.”
- “Use cases in quantum computing could account for a substantial amount of emissions reductions needed to achieve a 1.5°C pathway.”
- **QE’s QLM** has made substantial progress on this issue

Mckinsey, 2022

## Food Security

- “As we live in an age of data-driven [insights], classical computers are finding it much harder to handle the amount of information that comes their way. Quantum computers, on the other hand, can handle this complexity with ease.”
- “No longer would we see food wasted over route planning mistakes or badly designed traffic counter-flow simulations run on classical models.”

The Quantum Insider, 2020





# Solving Important Problems

## Defence

- “Given the potential implications of novel quantum technologies for defence and security, NATO has identified quantum as one of its key emerging and disruptive technologies.”
- “Quantum sensors have some promising military applications. For example, quantum sensors could be used to detect submarines and stealth aircraft, and quantum sensors could be used for Position, Navigation and Timing (PNT)”
- QE’s Arqit is the leader in quantum secure comms, a key application.  
NATO, 2021

## Future of Health

- Looking at the impact that pandemics have on society, economy, and healthcare, we can envision future use cases for the role of quantum computing in vaccine development, drug discovery, optimization solutions, and in identifying and managing the spread of viruses.
- QE’s Siloton has demonstrated the quantum benefit for healthcare applications through their macular degeneration use case

Capgemini, 2022



# Investments to date

## Quantum Computing



## Quantum Imaging & Sensing



## Quantum Communications & Security



QE's portfolio is diversified by stage, from pre-seed to Series B, and by technology.

All investments are generating revenue and scaling with ample opportunity for up-rounds in the near future.

An investee company has begun selling its beta product ahead of large-scale production in 2023.

Another, previously pre-revenue investee company, has since signed contracts for £67m in sales since QE invested.



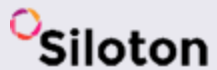


# QS

QE's network provides a unique high-quality deal flow through referrals, databases, universities, quantum centres of excellence, and organisations such as the Institute of Physics.

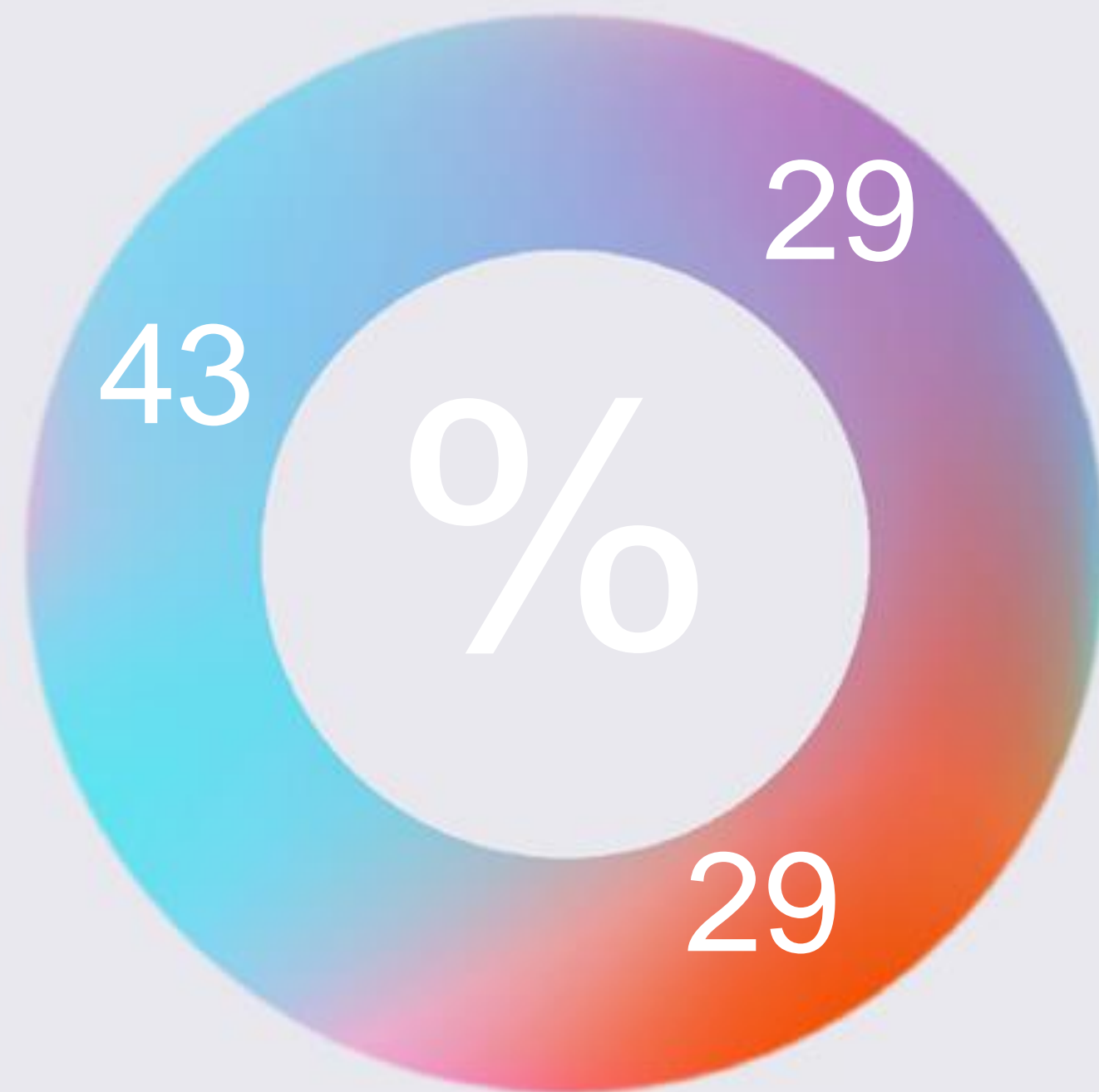
QE has identified over 500 potential deals globally from early to late stage source and has first sight of potential deals before they appear on third party databases. These are refined to produce a target list of potential investable opportunities consisting of a variety of stages, geographies, tech types, and other aspects.

QE's network



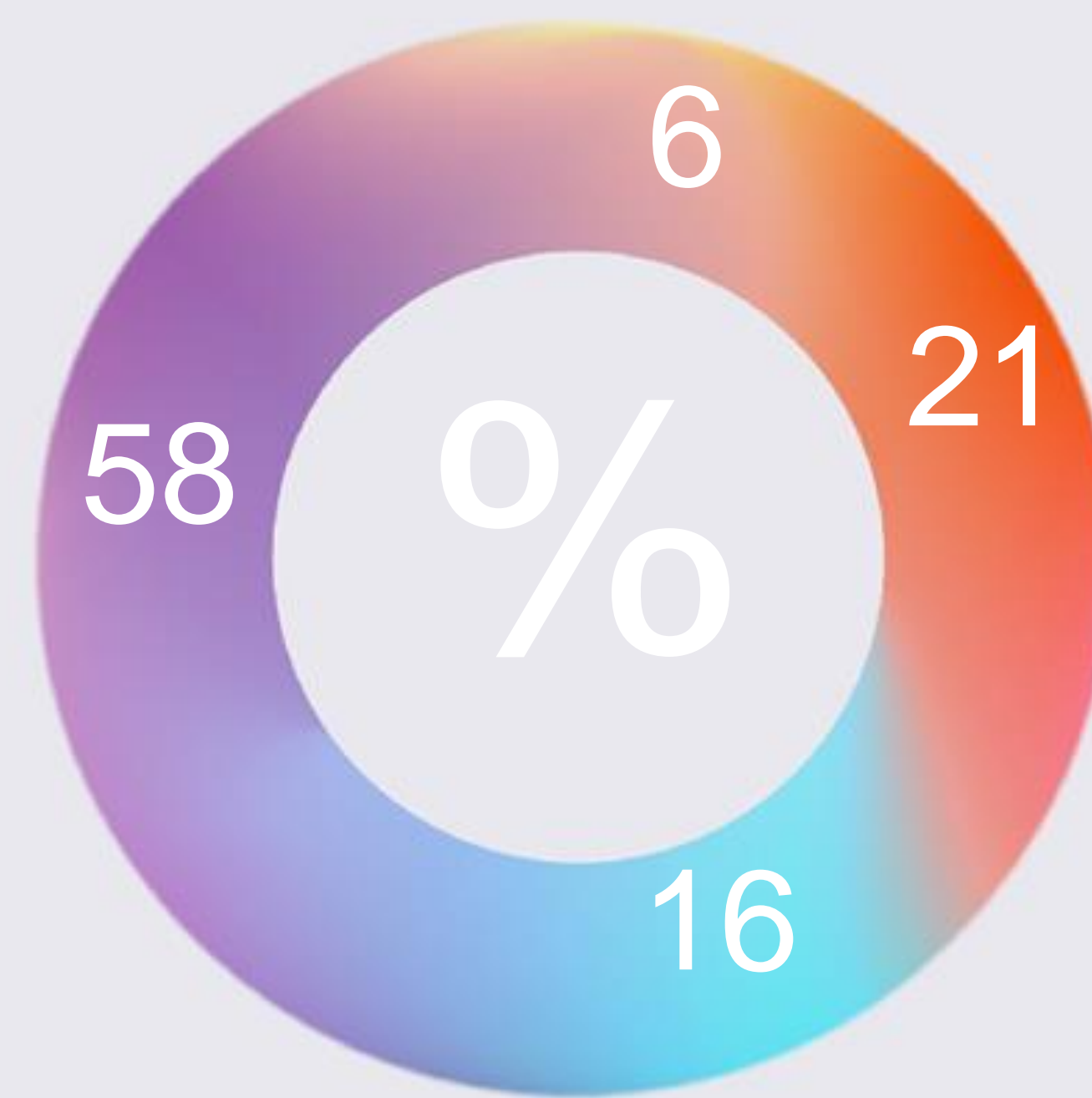
# Investment portfolio

02.2023



# Identified deal sourcing

02.2023



- Quantum Sensing & Imaging
- Quantum Communications & Security
- Quantum Computing
- Quantum - Other

QE's network





# Selected Pipeline

Sector	Description	Stage	Country
Comms & Security	Quantum Random Number Generators (QRNGs)	Series A	EU
Sensing & Imaging	Solutions to enable positioning and time, regardless of connectivity, for GPS	Seed	UK
Comms & Security	Quantum Memory	Preseed	UK
Software	Chemistry Algorithm Platform	Seed	EU
Comms & Security	Single-photon detectors	Seed	EU
Sensing & Imaging	Magnetometer	Series A	US
Computing	Silicon Spin Quantum Computing	Series A	APAC
Hardware	Dilution Refrigerator	Seed	NA
Hardware	QKD	Preseed	EU

Pipeline Sample



# The Investment Team

## Stuart Nicol

**Chief Investment Officer**

Overall responsibility for investments  
Extensive experience in leading VC teams, mentoring entrepreneurs & corporate finance.

Previous experience

- CIO at two regional UK venture funds
- Director at Octopus Investments & Crowdcube

## Stuart Woods

**Chief Operating and Strategy Officer**

COO. Extensive deep tech commercialisation experience, including quantum. Graduate of North Carolina State University.

Previous experience

- Managing Director at Oxford Instruments
- VP Survey Solutions at Hexagon Geosystems.

## Steve Metcalfe

**Chief Executive Officer**

30 years of experience in regulated markets. Extensive experience in advising on listings, fund raisings and capital markets in general.

Previous experience

- Board member of several companies





# The Investment Team

## Anthony Lyall

**Investment Manager**

Leads transaction execution  
Family Office Investor with extensive  
knowledge and investment experience  
regarding technology start-ups.  
Graduated New York University.

Previous experience

- Founder of several start-up  
companies
- Investor Relations Consultant

## Dr Oliver Cohen

**Quantum Physicist**

Provider of technical deal reviews  
PhD in Quantum Physics – numerous  
cited academic papers in quantum  
information. PhD in Quantum Physics  
from the University of London.

Previous experience

- 10 years in risk analysis for large  
financial institutions
- Arqit Quantum Inc employee  
seconded to Quantum Exponential

## Anna Spandl

**Investment Analyst**

Assisting with research and  
Investment Administration  
Supporting European  
expansion Fluency in German,  
English and Italian. Graduated  
University of Vienna.

Previous experience

- Legal graduate - Previously  
worked for a corporate law  
firm in Austria



# Our Investment Process

## Capturing the market opportunity effectively

Sourcing → Selecting → Growing → Exiting

Proven ability to source, approach & complete first-round equity deals.

Collaboration with Institute of Physics and other Quantum Institutions of excellence.

Access to proprietary data streams of The Quantum Insider and Notion Capital.

QE has invested in a portfolio of companies that have realistic cash requirements to reach profitability or exit.

QE expects the portfolio to contain a mix of companies that can deliver near-term applications to market or are likely to be acquired after certain product milestones are achieved through funding.

Scientific, operational and commercialisation expertise at QE is in place to support investee companies through their growth phase and internationalization activities.

Active participation in Boards via NED or Observer position & intra portfolio networking. Patent and IP consultation, support and advisory services.

Liquidity events are expected to be via sale to leading enterprises engaging in M&A (Trade) or strategic investors such as Private Equity.

IPOs can be considered as well (given our expertise in fundraising and capital markets) but is not part of the primary strategy





# Why Quantum Exponential?

Clear focus, quick identification of deals, trusted team with a reputation for adding value

## Focused

Quantum Tech sector is still relatively new to investment, but is predicted to see huge inflows of high-growth innovative companies as a result of the commercialisation of governments' research funding & market need

## Strong Team & Advisory Board

Strong team of industry advisors, entrepreneurs and tech investment professionals with excellent access to opportunities, networks and markets. Thorough understanding of investment process, portfolio selection, due diligence, deal structuring, team motivation & exit optimization. Cooperation in place with Institute of Physics, regional Universities & Quantum Hubs. Deal introductions from other Co-Investors & data advantage via Notion & Quantum Insider data sources

## Value Added Investor

At the outset we establish explicit ways to help the investee - such as commercial introductions, growth company admin, grant writing introductions, growth coaching, portfolio peer-to-peer networking among other value-adds. Follow-on investing & further investor introductions (subject to suitable progress being made)

## Diverse Geography (NATO-Friendly)

QE can invest in deals in any geography. This is being done in association with trusted partners, such as hubs and universities to rely on their local market knowledge and expertise.