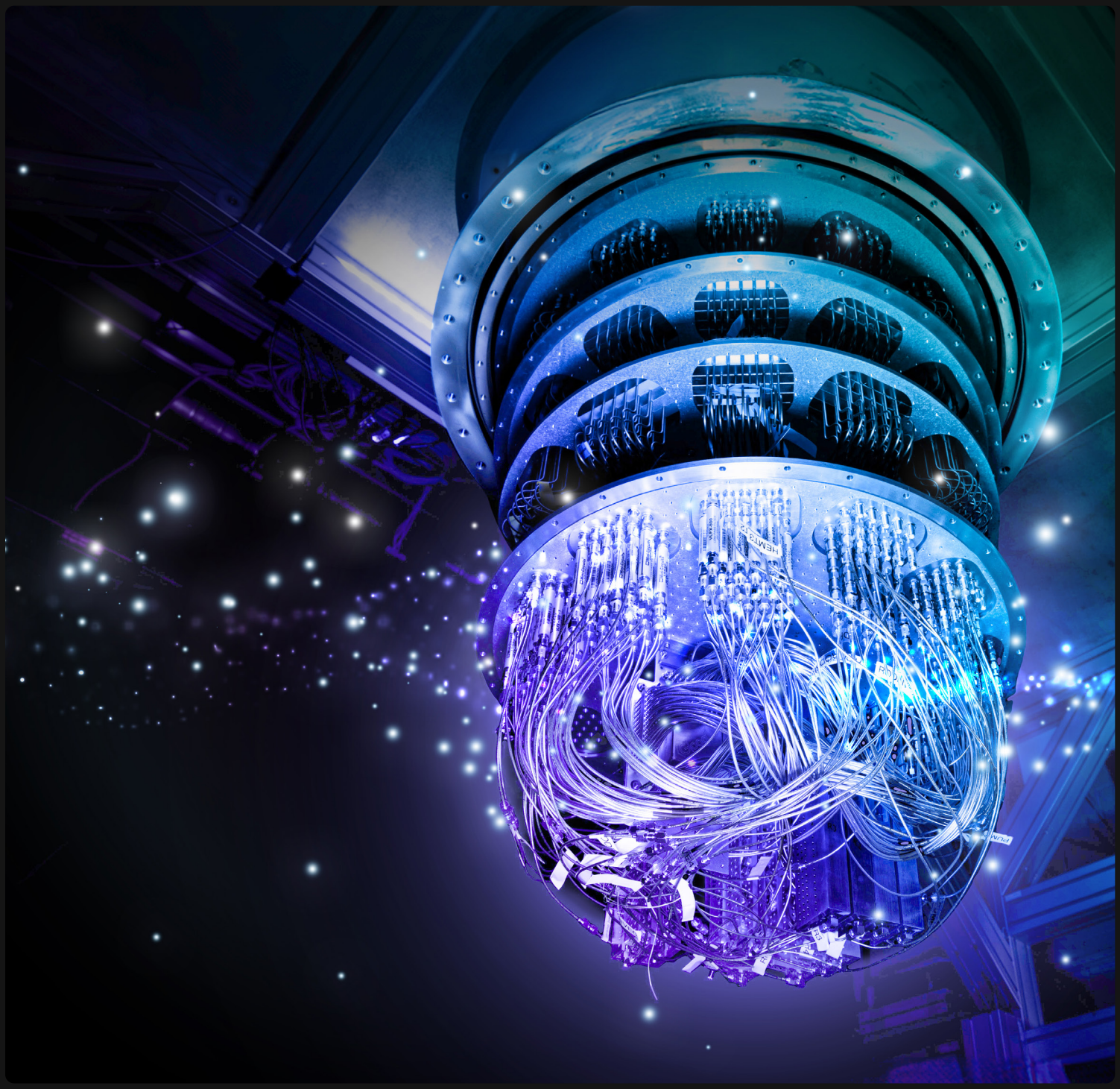
XPRIZE QUANTUM APPLICATIONS

Presenting Partner: gesda

Google Quantum AI



FINALIST TEAMS BOOK 2026

XPRIZE QUANTUM APPLICATIONS

MAY 2026

THESE FINALIST TEAMS REFLECT A POWERFUL TRUTH:

The world needs transformative solutions, and quantum is emerging as a tool that can unlock them. What we see here is evidence that quantum solutions are beginning to connect to real societal needs - from cleaner energy to better healthcare. XPRIZE is proud to help guide this transition from possibility to practicality, and I'm encouraged by the global, cross-sector collaboration driving this work forward.

- Anousheh Ansari, XPRIZE CEO

PRIZE OVERVIEW

Launched in 2024 as a 3-year, $5M global competition, XPRIZE Quantum Applications is designed to generate quantum computing algorithms that can be put into practice to help solve real-world challenges.

Quantum Computing is a multidisciplinary field at the intersection of computer science, physics, and mathematics that seeks to use the information processing power of quantum mechanics to solve otherwise difficult computational problems. Competing teams will develop new applications for quantum computers that address complex, global challenges – for example, predicting the activity and safety of drug molecules in the human body or allowing for more accurate modeling of new battery designs or fusion reactors. Winning contributions may take three forms:

Novel Algorithm: a new quantum algorithm for solving a new class of problems with quantum advantage.

New Application: Work showing how existing quantum algorithms can be used to solve previously unknown applications with a quantum advantage.

Enhanced Performance: Work significantly reducing the resources required for a quantum computer to reach quantum advantage for an already established algorithm or application.

INVESTMENT LANDSCAPE

The field also needs to nurture a robust and cross-functional talent pool to truly leverage the potential of quantum computing. While quantum computing is still in its nascence, the field has quickly gained momentum, driven initially by the widely publicized threat quantum computing poses to the world's encryption and cybersecurity. Major technology companies have ongoing efforts to develop their quantum capabilities – Amazon, IBM, Google, and Microsoft have launched commercial quantum-computing cloud services – and the universe of smaller companies and startups working on quantum has been robust overall. Government-funded quantum-focused projects total more than $42 billion in state-sponsored research and development initiatives worldwide.[11] Numerous big firms have created internal teams to investigate quantum applications and create pilot projects with quantum start-ups.

[1] McKinsey & Company. (2024). Quantum Technology Monitor 2024. Retrieved from mckinsey.com

XPRIZE QUANTUM APPLICATIONS

Selected from 195 submissions worldwide, Finalist teams advance to Phase II of the competition. XPRIZE Quantum Applications, a 3-year, $5M global competition supported by Google Quantum AI, Google.org, and GESDA, has announced the selection of 12 Finalist teams whose quantum algorithmic approaches demonstrate credible pathways toward potential real-world quantum impact. Competing teams are developing novel algorithms, new real-world applications of existing algorithms, or major performance gains that sharply reduce the resources needed to achieve quantum advantage. Finalist teams were selected through a thorough evaluation of their submissions, which demonstrated plausible pathways to quantum advantage, clear technical novelty, and strong algorithmic rigor. This milestone also underscores the value of XPRIZE's global competition model, with 909 created teams from 88 countries and 417 registered teams.

417
Registered Teams

→

195
Submissions

→

12
Finalists

Investors and prospective partners are encouraged to meet the teams and learn more at xprize.org.

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ACKNOWLEDGEMENTS

XPRIZE Quantum Applications is supported by Title Sponsor Google Quantum AI and Presenting Partner GESDA.

We extend our deep appreciation to Dr. Ryan Babbush (Google Quantum AI) for his invaluable expertise and support throughout the development of the competition. We also thank Geneva Science and Diplomacy Anticipator (GESDA), Sandro Giuliani, Marieke Hood, Daria Robinson, and advisors Dr. Matthias Troyer, Dr. Barry Sanders, Dr. Catherine Lefebvre, and Dr. Cornelius Hempel for their collaborative ideation and contributions to the prize design process.

Learn more about our sponsors, judges, and advisors.

XPRIZE QUANTUM APPLICATIONS

Presenting Partner: gesda

Google Quantum AI

FINALIST

TEAM PROFILES

COMPANY OVERVIEW

TEAM / COMPANY NAME
Calbee Quantum

ORGANIZATION TYPE
University Team

HQ LOCATION
Pasadena, CA, USA

YEAR FOUNDED
2025

NUMBER OF EMPLOYEES
0

NUMBER OF ACTIVE TEAM MEMBERS
2

LINKED PUBLICATIONS
A framework for robust quantum speedups(2025) - arxiv.org/abs/2508.15765

FUNDRAISING DETAILS

TECHNOLOGY READINESS LEVEL
TRL 2 - Technology Concept Formulated

COMMERCIAL STAGE
n/a

REVENUE RANGE
n/a

CAPITAL RAISED TO DATE
n/a

ACTIVELY RAISING CAPITAL FOR ANY PURPOSE?
Yes

TYPE OF CAPITAL SOUGHT
Corporate Equity, Philanthropy

TYPE OF INVESTORS SOUGHT
Angel, Corporate/Strategic, Family Office, Government, Private Equity, Venture Capital, Philanthropy

AMOUNT OF CAPITAL SOUGHT
$1M

CURRENT INVESTMENT STAGE
Philanthropic Funding

Garnet Chan
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CALBEE QUANTUM

COMPANY DESCRIPTION

The university team is developing quantum algorithms for humanity.

CORE INNOVATION

Rather than relying on fine-tuned examples to find quantum algorithms with advantage, we aim for use cases for quantum algorithms in a broad range of immediately impactful applications. In particular, we aim for substantial speedups for problems where classical quantum simulations are already being performed today. This includes many problems in the materials, chemical, and biochemical sciences and industries. Our approach reformulates the quantum simulation setting for electronic structure to enable these applications. We identify, in particular, materials simulation of inorganic semiconductors as an area where there is strong evidence for quantum advantage.

QUANTUM APPLICATIONS

Our algorithm promises to deliver speedups in real-world settings of chemical, materials, and biochemical simulation, particularly those of interest to the semiconductor industry (e.g. optoelectronic simulations). More generally, we are advancing a framework which speeds up many electronic structure simulations of relevance today across different industries.

LEADERSHIP TEAM

Garnet Chan is the Bren Professor of Chemistry at Caltech, the Director of the Marcus Center for Theoretical Chemistry, and a member of the US National Academy of Sciences. Jielun Chen is a graduate student in physics at Caltech.

COMPANY OVERVIEW

TEAM / COMPANY NAME
Gibbs Samplers

ORGANIZATION TYPE
Team at a Research Institute

HQ LOCATION
Budapest, Hungary

YEAR FOUNDED
2024

NUMBER OF EMPLOYEES
4

NUMBER OF ACTIVE TEAM MEMBERS
8

LINKED PUBLICATIONS
Quantum generalizations of Glauber and Metropolis dynamics (2024) - arxiv.org/abs/2405.20322

FUNDRAISING DETAILS

TECHNOLOGY READINESS LEVEL
TRL 2 - Technology Concept Formulated

COMMERCIAL STAGE
R&D

REVENUE RANGE
$13M

CAPITAL RAISED TO DATE
$2M

ACTIVELY RAISING CAPITAL FOR ANY PURPOSE?
Yes

TYPE OF CAPITAL SOUGHT
Transformative Philanthropic Gifts, Large Programmatic Grants, Elite Investigator Awards

TYPE OF INVESTORS SOUGHT
Single-donor, Family-foundation, Research Foundations

AMOUNT OF CAPITAL SOUGHT
Prefer not to say

CURRENT INVESTMENT STAGE
Research Grants

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GIBBS SAMPLERS

COMPANY DESCRIPTION

The HUN-REN Alfréd Rényi Institute of Mathematics has been the premier mathematical research institution of Hungary since its founding in 1950, globally recognized as a major center of excellence in mathematics. Alfréd Rényi, Imre Csiszár, Endre Szemerédi, and László Lovász built up a strong tradition in probability, information theory, and discrete mathematics, strengthened through collaborations with Paul Erdős. In recent years, new research groups were established in Artificial Intelligence, Quantum Information Theory, and Quantum Computing to tackle the most pressing scientific challenges of our time. The core of the team consists of the members of the Institute's Quantum Computing Research Group.

CORE INNOVATION

We developed cutting edge Quantum Markov Chain Monte Carlo algorithms that combine the power of classical randomized algorithms and traditional unitary quantum algorithms. These are especially useful in challenging quantum simulation problems, where one wishes to learn properties of physically relevant low-energy quantum states whose structure is not fully understood. The efficiency of traditional unitary quantum algorithms that try to approach these states by proceeding through a predetermined sequence of quantum states has been challenged. We incorporate random steps to overcome prior obstacles, which could lead to new discoveries related to high-temperature superconductors and in quantum chemistry.

QUANTUM APPLICATIONS

We plan to use our Quantum Markov Chain Monte Carlo algorithms to prepare Gibbs states and ground states with important applications in:

- Simulating physical models (e.g., Fermi-Hubbard) that are relevant for understanding high-temperature superconductivity.
- Understanding properties of exotic magnetic materials and spin liquids.
- Studying ground states of quantum chemical systems that could lead to a better understanding of reaction rates, bond energies, and molecular structures.
- Solving large semidefinite programs and other optimization problems.

These applications could be a major component in the discovery of next-generation materials by narrowing down search regions through accurate quantum simulations.

LEADERSHIP TEAM

The team lead, András Gilyén, is a renowned expert in quantum algorithms development who just won a major European research grant (ERC Starting) to study new applications of Quantum Markov Chain Monte Carlo and related algorithms. Michael Kastoryano from the University of Copenhagen is a leading expert in quantum thermodynamics. Chi-Fang (Anthony) Chen from UC Berkeley is a rising star in quantum many-body physics and computing, known for many revolutionary results. Zoltán Zimborás is a professor of quantum algorithms at the University of Helsinki and is a prominent expert on hardware-friendly solutions for near-term devices.

COMPANY OVERVIEW

TEAM / COMPANY NAME
Phasecraft - Materials Team

ORGANIZATION TYPE
For-Profit Private Company

HQ LOCATION
London, United Kingdom

YEAR FOUNDED
2019

NUMBER OF EMPLOYEES
43

NUMBER OF ACTIVE TEAM MEMBERS
10

LINKED PUBLICATIONS
Fermionic Dynamics on Trapped-Ion QC (2025) - arxiv.org/abs/2510.26300

2D Fermi-Hubbard Digital Simulation (2025) - arxiv.org/abs/2510.26845

Constant-Depth Correlation Functions (2024) - arxiv.org/abs/2406.03204

Time-Dependent Hamiltonian Simulation (2024) - arxiv.org/abs/2405.08441

Benchmarking Optimisers for VQE (2024) - arxiv.org/abs/2411.13742

Spin-Excitation Spectrum Extraction (2025) - arxiv.org/abs/2501.04649

Simulating Targeted Covalent Inhibitors (2024) - chemrxiv.org/engage/chemrxiv/article-details/68386c3ec1cb1ecda027ff85

FUNDRAISING DETAILS

TECHNOLOGY READINESS LEVEL
TRL 5 - Technology Validated in a Relevant Environment

COMMERCIAL STAGE
Early Commercial Demonstration

REVENUE RANGE
n/a

CAPITAL RAISED TO DATE
$50M

CURRENT INVESTMENT STAGE
Series B

Dr. Vishal Sharma
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phasecraft.io

PHASECRAFT - MATERIALS TEAM

COMPANY DESCRIPTION

Phasecraft is the quantum algorithms company. With offices in the UK (London and Bristol) and the US (Washington, DC), Phasecraft brings together a team of quantum scientists and engineers focusing on accelerating practical applications of quantum computing through the development of new theory, methods, and algorithms suitable for near-term quantum hardware. We work with users across numerous sectors and with leading quantum hardware providers to scale development of our IP, inform the development of next-generation quantum hardware, and accelerate commercialization of high-value breakthroughs.

CORE INNOVATION

The development of quantum algorithms has traditionally focussed on solving abstract mathematical problems. However, in order to use quantum computing to address the challenges that confront materials scientists and chemists engaged in materials design, we must also go beyond this. We have developed two complementary new quantum algorithm approaches that apply quantum computers to problems at the heart of materials modelling, whose output can feed directly into existing classical methods to deliver more accurate computations of physical properties of materials. The first approach uses quantum computers to enhance the accuracy of classical methods; the second tackles the core materials modelling problem directly on the quantum computer.

QUANTUM APPLICATIONS

Societal-scale adoption of clean energy technologies necessitates the discovery of new materials and catalysts to enable advancements, such as higher performance batteries, more efficient solar panels, the clean production of hydrogen fuels, and improved carbon capture processes. Current R&D approaches for discovering novel materials rely primarily on classical computational methods that are challenged with accurately modeling physical systems with quantum-mechanical properties and often make inaccurate predictions that are unsuitable for high-throughput screening.

Quantum computers have the ability to model quantum systems natively and can unlock modeling accuracy that cannot be achieved by classical computational techniques alone. Such use of quantum computers will enable increased levels of computational support to the materials discovery process that is necessary for accelerating societal-scale transition to clean energy sources. However, a significant level of innovation is still required in both quantum hardware, and crucially, quantum algorithms to achieve this.

Phasecraft has developed two new quantum algorithms for computing accurate electronic structure of materials. By offloading the hard quantum part of the computation to the quantum computer, these algorithms promise to achieve more accurate electronic structures than state-of-the-art classical methods.

LEADERSHIP TEAM

Professor Toby Cubitt (Co-Founder, Chief Technology Officer & Chief Science Officer) leads the project team for this submission and has worked in the field of quantum information and computing for over 20 years, specialising in complexity of quantum many-body systems, quantum Hamiltonian simulation and mathematical physics. He holds a PhD from the Max Planck Institute for Quantum Optics (Munich, Germany), supervised by Prof. Ignacio Cirac. He is Professor of Quantum Information at UCL, and head of the Quantum Lab in the Department of Computer Science there. Toby held a University Research Fellowship from the Royal Society from 2013-2022, was awarded the AHP-Birkhauser Prize in 2017, and a Whitehead Prize in 2019 by the London Mathematical Society.

COMPANY OVERVIEW

TEAM / COMPANY NAME
Q4Proteins

ORGANIZATION TYPE
University Team

HQ LOCATION
Zurich, Switzerland

YEAR FOUNDED
2024

NUMBER OF EMPLOYEES
0

NUMBER OF ACTIVE TEAM MEMBERS
14

LINKED PUBLICATIONS
Coming 2026

FUNDRAISING DETAILS

TECHNOLOGY READINESS LEVEL
TRL 4 - Technology Validated in the Lab

COMMERCIAL STAGE
R&D

REVENUE RANGE
n/a

CAPITAL RAISED TO DATE
n/a

ACTIVELY RAISING CAPITAL FOR ANY PURPOSE?
No

TYPE OF CAPITAL SOUGHT
Scientific Grants

TYPE OF INVESTORS SOUGHT
n/a

AMOUNT OF CAPITAL SOUGHT
Prefer not to say

CURRENT INVESTMENT STAGE
n/a

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Q4PROTEINS

COMPANY DESCRIPTION

We are a university team based at ETH Zurich and the University of Copenhagen.

CORE INNOVATION

The Q4Proteins team focuses on large, mostly weakly correlated systems, which will drive the research on quantum simulation of bimolecular systems into a new regime with potentially reduced circuit depth but larger qubit numbers, significantly extending the traditionally limited focus on small, highly correlated systems. We are developing a universal quantum-driven atomistic simulation approach for biochemical problems of importance to human health.

QUANTUM APPLICATIONS

The quantum computation of electronic energies for quantum subregions in a multi-layer embedding scheme will deliver energies with controllable accuracy. Machine learning will tie different data together. These developments will enable us to deliver a simulation pipeline that can be applied to large biochemical problems out of the box. Due to its first principles character, it will not be restricted to specific molecule classes and it can be applied to different tasks ranging from drug discovery and design to elucidating complex biomolecular machinery. We will demonstrate this value at the example of biomolecular condensates, which are notoriously difficult to model and thus to understand.

LEADERSHIP TEAM

Our team is led by four university professors with different key expertise, covering quantum information, quantum algorithms, quantum chemistry, and biochemical simulations.

Professor Markus Reiher (ETH Zurich, overall team lead)
Professor Matthias Christandl (University of Copenhagen)
Professor Gemma Solomon (University of Copenhagen)
Professor Kresten Lindorff-Larsen (University of Copenhagen)

COMPANY OVERVIEW

TEAM / COMPANY NAME
QuantumForGraphproblem

ORGANIZATION TYPE
University Team

HQ LOCATION
Houston, TX, USA

YEAR FOUNDED
2024

NUMBER OF EMPLOYEES
0

NUMBER OF ACTIVE TEAM MEMBERS
5

LINKED PUBLICATIONS
A New Quantum Linear System Algorithm Beyond the Condition Number (2025) - scirate.com/arxiv/2510.05588

FUNDRAISING DETAILS

TECHNOLOGY READINESS LEVEL
TRL 2 - Technology Concept Formulated

COMMERCIAL STAGE
R&D

REVENUE RANGE
n/a

CAPITAL RAISED TO DATE
n/a

ACTIVELY RAISING CAPITAL FOR ANY PURPOSE?
No

TYPE OF CAPITAL SOUGHT
Prefer not to say

TYPE OF INVESTORS SOUGHT
Prefer not to say

AMOUNT OF CAPITAL SOUGHT
Prefer not to say

CURRENT INVESTMENT STAGE
Pre-seed

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sites.google.com/view/quantumforgraphproblem/

QUANTUMFORGRAPHPROBLEM

COMPANY DESCRIPTION

The team of QuantumForGraphproblem has developed a new type of quantum algorithm for solving linear systems, which is an essential mathematical tool used across science, engineering, and machine learning. Unlike previous approaches, our algorithm leverages information about the specific problem instance to bypass a major bottleneck (the condition number) that limits existing quantum methods. As a result, it can run significantly faster, sometimes exponentially faster, on certain structured linear systems.

Leveraging this algorithm, we further designed an end-to-end framework for solving polynomial systems, a unifying formulation for numerous graph-theoretic and optimization problems. Our approach not only improves upon existing quantum linear system algorithms but also opens the door to achieving large quantum speedups in a wide range of applications where linear systems play a central role.

CORE INNOVATION

A new quantum linear system algorithm that opens up possibilities for a wide range of applications with significant quantum advantage.

QUANTUM APPLICATIONS

- Combinatorial Optimization: such as Quadratic Unconstrained Binary Optimization (QUBO) and Satisfiability (SAT)
- Graph problems: such as pathfinding, Maximum Independent Set.
- Nonlinear differential equations
- Ground state preparation

We are currently investigating the potential quantum advantage offered by our new algorithm in the above applications and examining how it can be linked to practical, real-world scenarios.

LEADERSHIP TEAM

A multidisciplinary group of researchers with over a decade of combined experience in quantum algorithms:

Jianqiang Li (Team Lead)
Nai-Hui Chia
Anastasios Kyrillidis
Tirthak Patel
Yuan Su

COMPANY OVERVIEW

TEAM / COMPANY NAME
The QuMIT

ORGANIZATION TYPE
Student Group

HQ LOCATION
Cambridge, MA, USA

YEAR FOUNDED
2024

NUMBER OF EMPLOYEES
0

NUMBER OF ACTIVE TEAM MEMBERS
2

LINKED PUBLICATIONS
Quartic quantum speedups for community detection (2025) - arxiv.org/abs/2510.08494

FUNDRAISING DETAILS

TECHNOLOGY READINESS LEVEL
TRL 2 - Technology Concept Formulated

COMMERCIAL STAGE
R&D

REVENUE RANGE
n/a

CAPITAL RAISED TO DATE
n/a

ACTIVELY RAISING CAPITAL FOR ANY PURPOSE?
Prefer not to say

TYPE OF CAPITAL SOUGHT
Prefer not to say

TYPE OF INVESTORS SOUGHT
Prefer not to say

AMOUNT OF CAPITAL SOUGHT
Prefer not to say

CURRENT INVESTMENT STAGE
n/a

Alexander Schmidhuber
alexsc@mit.edu

THE QUMIT

COMPANY DESCRIPTION

We work on quantum algorithms for fundamental tasks in data science with the goal of providing speedups for real-world datasets. Our algorithms are generically applicable to relational datasets such as those that might arise in biological or social networks, where simple rules fail to describe the complex interactions between members of the network. We anticipate that quantum speedups for such foundational problems would yield widespread impact in the applied sciences.

CORE INNOVATION

A novel quantum algorithm for community detection that achieves an end-to-end speedup over the best known classical algorithms for community detection.

QUANTUM APPLICATIONS

Our quantum algorithm obtains a polynomial speedup for hypergraph community detection when the communities are decided by nontrivial interactions that cannot be captured by looking at pairs of vertices. This property characterizes datasets in many domains, such as protein-protein interaction networks, genome networks, image segmentation, and recommendation systems.

LEADERSHIP TEAM

Alexander Schmidhuber (MIT) and Alexander Zlokapa (MIT)

COMPANY OVERVIEW

TEAM / COMPANY NAME
Xanadu

ORGANIZATION TYPE
For-Profit Private Company

HQ LOCATION
Toronto, Ontario, Canada

YEAR FOUNDED
2016

NUMBER OF EMPLOYEES
260

NUMBER OF ACTIVE TEAM MEMBERS
4

LINKED PUBLICATIONS
Quantum Algorithm for Vibronic Dynamics: Case Study on Singlet Fission Solar Cell Design - arxiv.org/abs/2411.13669

FUNDRAISING DETAILS

TECHNOLOGY READINESS LEVEL
TRL 4 - Technology Validated in the Lab

COMMERCIAL STAGE
Growth Stage

REVENUE RANGE
n/a

CAPITAL RAISED TO DATE
n/a

ACTIVELY RAISING CAPITAL FOR ANY PURPOSE?
Prefer not to say

TYPE OF CAPITAL SOUGHT
Prefer not to say

TYPE OF INVESTORS SOUGHT
Prefer not to say

AMOUNT OF CAPITAL SOUGHT
Prefer not to say

CURRENT INVESTMENT STAGE
Prefer not to say

Juan Miguel Arrazola
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XANADU

COMPANY DESCRIPTION

Xanadu is a Canadian quantum computing company founded in 2016 with the mission to build quantum computers that are useful and available to people everywhere. It is one of the world's leading quantum hardware and software companies.

CORE INNOVATION

We solve an extremely challenging simulation problem -- non-adiabatic quantum dynamics -- using a proprietary quantum algorithm requiring remarkably few qubits and gates. Our solution stands out by combining a low-cost quantum algorithm with a high-value application.

QUANTUM APPLICATIONS

Our work has broad impact in multiple areas, for example in photovoltaics, photodynamic therapies, and corrosion resistance. In particular, our submission focuses on how our efficient quantum algorithm can be used to assist in the discovery of more efficient organic solar cells.

LEADERSHIP TEAM

The team is led by Juan Miguel Arrazola (Director of Quantum Algorithms), with over a decade of academic and industry experience. Team members include Danial Motlagh (Senior Quantum Scientist), Robert Lang (Quantum Scientist) and Paarth Jain (Quantum Scientist).

COMPANY OVERVIEW

TEAM / COMPANY NAME
Nature

ORGANIZATION TYPE
University Group

HQ LOCATION
n/a

YEAR FOUNDED
n/a

NUMBER OF EMPLOYEES
n/a

NUMBER OF ACTIVE TEAM MEMBERS
5

LINKED PUBLICATIONS
Fault-tolerant fermionic quantum computing - arxiv.org/abs/2411.08955

Hybrid Oscillator-Qubit Quantum Processors: Simulating Fermions, Bosons, and Gauge Fields - arxiv.org/abs/2409.03747

FUNDRAISING DETAILS

TECHNOLOGY READINESS LEVEL
TRL 2 - Technology Concept Formulated

COMMERCIAL STAGE
n/a

REVENUE RANGE
n/a

CAPITAL RAISED TO DATE
n/a

ACTIVELY RAISING CAPITAL FOR ANY PURPOSE?
Prefer not to say

TYPE OF CAPITAL SOUGHT
Prefer not to say

TYPE OF INVESTORS SOUGHT
Prefer not to say

AMOUNT OF CAPITAL SOUGHT
Prefer not to say

CURRENT INVESTMENT STAGE
Prefer not to say

Eleanor Crane
ella.m.crane@gmail.com

NATURE

COMPANY DESCRIPTION

One of the biggest challenges in climate change is to find materials for carbon capture (e.g. synthetic photosynthesis), clean energy production (e.g. solar cells, fusion), storage (e.g. lithium ion batteries) and delivery (e.g. lossless electricity transport). Until now, trying to develop and improve these compounds has been done with trial and error. This could be avoided if we could predict their properties. At the heart of all of these properties lies interactions between fundamental particles of nature. These interactions abide by the laws of quantum mechanics. The quantum interactions between the particles makes them too hard to model on classical computers. Our team is introducing a new framework for simulating the properties by computing with the fundamental particles of nature directly. Although this should also be possible using only quantum bits, our framework promises to be far more efficient.

CORE INNOVATION

Our novel form of quantum computing avoids the large algorithmic costs of using quantum bits to model the interacting quantum particles. For the problem of simulating vibrations in materials for example, we have found that our framework uses orders of magnitude fewer resources than normal quantum computers which means that we could realistically overcome the trial and error approach far sooner than before.

QUANTUM APPLICATIONS

The leading applications of this work focus on the simulation of interacting quantum systems in quantum chemistry, specifically Hamiltonians with phonons coupled to electrons, and phonons coupled to excitons which are relevant to superconductivity and photosynthetic energy transfer, respectively. These regimes involve many bosonic modes with significant fluctuations, plus coupling to electrons that introduce strong non-linear fluctuations; well-suited for their boson-qubit platform. More broadly, their work may be applied to batteries, pharmaceutical drugs, industrial catalysis and displays.

LEADERSHIP TEAM

Eleanor Crane, Alexander Schuckert

COMPANY OVERVIEW

TEAM / COMPANY NAME
Q4B

ORGANIZATION TYPE
Startup

HQ LOCATION
n/a

YEAR FOUNDED
n/a

NUMBER OF EMPLOYEES
1

NUMBER OF ACTIVE TEAM MEMBERS
9

LINKED PUBLICATIONS
n/a

FUNDRAISING DETAILS

TECHNOLOGY READINESS LEVEL
TRL 2 - Technology Concept Formulated

COMMERCIAL STAGE
n/a

REVENUE RANGE
n/a

CAPITAL RAISED TO DATE
n/a

ACTIVELY RAISING CAPITAL FOR ANY PURPOSE?
Prefer not to say

TYPE OF CAPITAL SOUGHT
Prefer not to say

TYPE OF INVESTORS SOUGHT
Prefer not to say

AMOUNT OF CAPITAL SOUGHT
Prefer not to say

CURRENT INVESTMENT STAGE
Prefer not to say

Kushal Seetharam
kushalseetharam@gmail.com

Q4B

COMPANY DESCRIPTION

Our work establishes open quantum spin dynamics simulation as a plausible path to societally beneficial application by enabling experimental design and analysis of information-dense ZULF NMR experiments that bypass conventional molecular size bottlenecks in contexts relevant to therapeutic design.

CORE INNOVATION

Here the team proposes a computational pipeline combining Bayesian experimental design with quantum spin dynamics simulation to enable an interpretability to information density trade-off in the design and analysis of NMR experiments. This bypasses conventional limitations, opens a high-resolution window into biomolecular dynamics, and provides a combination of evidence for practical quantum advantage in therapeutic discovery.

QUANTUM APPLICATIONS

This work targets biodynamics as the critically relevant application to rational therapeutic design and related issues in global health. Fighting communicable and non-communicable diseases often requires a deeper understanding of biological macromolecules which often play a key role in the efficacy of vaccines and medicines. Their novel approach attempts to change the paradigm of conventional NMR experiments, offering a path to a platform capable of catalyzing the development of novel therapeutics for a wide span of illnesses.

LEADERSHIP TEAM

Kushal Seetharam

COMPANY OVERVIEW

TEAM / COMPANY NAME
Neutronium

ORGANIZATION TYPE
University Team

HQ LOCATION
College Park, Maryland, USA

YEAR FOUNDED
2024

NUMBER OF EMPLOYEES
0

NUMBER OF ACTIVE TEAM MEMBERS
5

LINKED PUBLICATIONS
Quantum Algorithms for Heterogeneous PDEs: The Neutron Diffusion Eigenvalue Problem - arxiv.org/abs/2604.05098

FUNDRAISING DETAILS

TECHNOLOGY READINESS LEVEL
TRL 2 - Technology Concept Formulated

COMMERCIAL STAGE
n/a

REVENUE RANGE
n/a

CAPITAL RAISED TO DATE
n/a

ACTIVELY RAISING CAPITAL FOR ANY PURPOSE?
No

TYPE OF CAPITAL SOUGHT
Scientfic Grants

TYPE OF INVESTORS SOUGHT
n/a

AMOUNT OF CAPITAL SOUGHT
Prefer not to say

CURRENT INVESTMENT STAGE
n/a

Mahathi Vempati
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NEUTRONIUM

COMPANY DESCRIPTION

Neutronium is a research team composed of quantum computing researchers from the University of Maryland and nuclear engineers from the University of Michigan. The goal of the partnership is to develop quantum algorithms to solve the massive systems of equations used in the nuclear engineering field, specifically the k-eigenvalue neutron diffusion equation and other related partial differential equations.

CORE INNOVATION

Our core innovation is two-fold.
1. We observe that standard numerical methods for solving partial differential equations in heterogeneous media result in large systems of equations even in low dimensions.
2. We show that using preconditioning methods, quantum algorithms can solve this resultant matrix eigenvalue problem significantly faster than classical algorithms.

QUANTUM APPLICATIONS

Our proof-of-concept application is solving for the k-eigenvalue of the neutron diffusion problem, which is used for determining the criticality of a nuclear reactor. The algorithm presents itself as a promising first step towards reducing the computational expense of these simulations. We are also looking to extend our techniques to other heterogeneous PDE's, particularly ones that have no classical shortcuts to solve them.

LEADERSHIP TEAM

Andrew Childs (UMD), Lincoln Johnston (UMich), Brian Kiedrowski (UMich), Mahathi Vempati (UMD), Jeffery Yu (UMD)

ALGORITHMIQ

COMPANY OVERVIEW

TEAM / COMPANY NAME
Algorithmiq

ORGANIZATION TYPE
For-Profit Private Company

HQ LOCATION
n/a

YEAR FOUNDED
2020

NUMBER OF EMPLOYEES
50

NUMBER OF ACTIVE TEAM MEMBERS
24

LINKED PUBLICATIONS
Quantum Computing Framework toward Practical Quantum Advantage: - https://algorithmiq.fi/publications/Q4Bio_Perspective_Paper.pdf

Quantum Circuit Optimization by means of Majorana Propagation - https://doi.org/10.48550/arXiv.2603.23444

Quantum Circuit Optimization by means of Majorana Propagation - https://doi.org/10.48550/arXiv.2511.02555

FUNDRAISING DETAILS

TECHNOLOGY READINESS LEVEL
TRL 6 - Technology demonstrated in a relevant environment

COMMERCIAL STAGE
Early Commercial Demonstration

REVENUE RANGE
$2.5-5M

CAPITAL RAISED TO DATE
$20M

ACTIVELY RAISING CAPITAL FOR ANY PURPOSE?
Prefer not to say

TYPE OF CAPITAL SOUGHT
Prefer not to say

TYPE OF INVESTORS SOUGHT
Prefer not to say

AMOUNT OF CAPITAL SOUGHT
Prefer not to say

CURRENT INVESTMENT STAGE
Series A

Stefan Knecht
stefan@algorithmiq.fi

COMPANY DESCRIPTION

Algorithmiq develops quantum software that makes quantum computers useful, enabling breakthroughs in chemistry, materials science, and life sciences through physically meaningful, energy-efficient quantum computation. Algorithmiq is the software counterpart to the world's leading quantum hardware players, working with the likes of Google, IBM, Microsoft, Rigetti, AWS, Cleveland Clinic, and CERN.

The company has a unique multidisciplinary team of world-class experts in the field of Quantum Information Theory, Quantum Chemistry, Computational Life Sciences, and Software Engineering. It is one of the 2024 Technology Pioneers of the World Economic Forum, awarded Top Innovator of the UpLink Quantum for Society Challenge 2025, and the sole winner of the Wellcome Leap Q4Bio challenge, 2026.

CORE INNOVATION

This team puts forward a scalable end-to-end hybrid classical-quantum molecular quantum chemistry simulation solution – suitable to be implemented on near-term quantum devices as well as on future fault-tolerant quantum computers – by integrating novel quantum state preparation and quantum measurement approaches with adaptive multiwavelet-based Hamiltonian formulations, enabling scalable and high-accuracy reaction chemistry modelling beyond the capabilities of classical computing alone.

QUANTUM APPLICATIONS

The flagship application of this platform is drug metabolism, targeting the complex reactions driven by cytochrome P450 enzymes that strongly influence drug safety, efficacy, and adverse reactions. By revealing reaction mechanisms at atomic resolution, the approach could help researchers identify metabolic liabilities earlier, design safer compounds, and reduce costly failures in drug development. More broadly, this work positions quantum computing as a new foundation for life-science simulation, with impact extending from metabolism to other hard chemical problems that classical tools struggle to capture reliably.

LEADERSHIP TEAM

Our cross-functional team combines world-class experts in physics, chemistry, life sciences, quantum information, computer science and engineering. Together, we are committed to transforming theoretical breakthroughs into practical quantum solutions for real world applications today. Stefan Knecht (Team Lead), Sabrina Maniscalco, Guillermo Garcia-Perez, Fabijan Pavosevic, Fabian Langkabel, Daniel Cavalcanti, Adam Glos, Matteo Rossi, Sergei Filippov, Boris Sokolov, Martina Stella, Walter Talarico, Elsi-Mari Borrelli.

COMPANY OVERVIEW

TEAM / COMPANY NAME
Pasqal

ORGANIZATION TYPE
Startup

HQ LOCATION
Palaiseau, France

YEAR FOUNDED
2019

NUMBER OF EMPLOYEES
300

NUMBER OF ACTIVE TEAM MEMBERS
4

LINKED PUBLICATIONS
One-to-one quantum simulation of a frustrated magnet with 256 qubits - arxiv.org/abs/2603.20372

Resource assessment of classical and quantum hardware for post-quench dynamics - arxiv.org/abs/2511.20388

Simulating dynamics of the two-dimensional transverse-field Ising model: - arxiv.org/abs/2511.19340

FUNDRAISING DETAILS

TECHNOLOGY READINESS LEVEL
TRL 5 - Technology Validated in a Relevant Environment

COMMERCIAL STAGE
n/a

REVENUE RANGE
n/a

CAPITAL RAISED TO DATE
n/a

ACTIVELY RAISING CAPITAL FOR ANY PURPOSE?
Prefer not to say

TYPE OF CAPITAL SOUGHT
Prefer not to say

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AMOUNT OF CAPITAL SOUGHT
Prefer not to say

CURRENT INVESTMENT STAGE
Prefer not to say

Constantin Dalyac
constantin@pasqal.com

PASQAL

COMPANY DESCRIPTION

We build quantum computers out of neutral atoms. We used our quantum computer to simulate a real crystal — and got results no supercomputer in the world can match.

CORE INNOVATION

This work turns a programmable neutral-atom quantum computer by Pasqal into a faithful, material-specific simulator for a real frustrated magnet, validating the results against independent lab measurements at the Los Alamos National Laboratory. The team studies the material's quantum phase transition, susceptibility, and most strikingly non-equilibrium post-quench dynamics that leading classical simulation methods fail to probe.

QUANTUM APPLICATIONS

The methods used with the neutral-atom quantum computer were applied first and foremost to $TmMgGaO_4$ (thulium magnesium gallium oxide), a compound that sits within the broader application area of two-dimensional frustrated quantum magnets. These are connected to some of the most actively studied phenomena in materials science, including spin liquid phases, which are candidates for intrinsically fault-tolerant quantum memory. Future extensions of their platform may allow the simulation and development of functional quantum materials with direct technological relevance.

LEADERSHIP TEAM

Constantin Dalyac (Team Leader), Loïc Henriet (CEO)

XPRIZE QUANTUM APPLICATIONS

Presenting Partner: gesda

Google Quantum AI

APPENDIX

CLARIFICATION

Employees versus Team Members

- Employees belong to the company or organization.
- Active team members are those currently working on the XPRIZE project.

TRL Levels

Technology Readiness Levels (TRL) are a type of measurement system used to assess the maturity level of a particular technology. Each technology project is evaluated against the parameters for each technology level and is then assigned a TRL rating based on the projects progress. There are nine technology readiness levels. TRL 1 is the lowest and TRL 9 is the highest.[2]

TRL 9	Actual system proven in operational environment
TRL 8	System completed and qualified
TRL 7	System prototype demonstrated in an operational environment
TRL 6	Technology demonstrated in a relevant environment
TRL 5	Technology validated in a relevant environment
TRL 4	Technology validated in the lab
TRL 3	Experimental proof of concept
TRL 2	Technology concept formulated
TRL 1	Basic principles observed

[2] NASA. (2010). *Technology Readiness Level Definitions* (NPR 7120.8). NASA Office of the Chief Engineer.

ABOUT XPRIZE

XPRIZE is the recognized global leader in designing and executing large-scale competitions to solve humanity's greatest challenges. With over $500 million in prizes over 30 years, our unique model has democratized crowdsourced innovation and scientifically scalable solutions that accelerate a more equitable and abundant future. Donate, learn more, and co-architect a world of abundance with us at xprize.org.

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Contribute

The work we do wouldn't be possible without the contributions of people like you. We offer a number of ways in which you can partner, sponsor, or donate to our foundation. To learn more, simply email us at getinvolved@xprize.org

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