




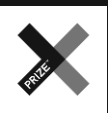
XPRIZE
QUANTUM
APPLICATIONS

Google
Quantum AI

Presented by: **gesda** 

Pushing the frontiers of quantum algorithms towards a
positive real-world impact





The mission of XPRIZE is to inspire and empower humanity to achieve breakthroughs that accelerate

A HOPEFUL FUTURE FOR ALL.



THE PRIZE THAT INSPIRED US

ORTEIG PRIZE + CHARLES LINDBERGH >>>

MAY 21, 1927 | \$25K

LAUNCHED
COMMERCIAL
AVIATION





THE PRIZE THAT PROVED OUR CONCEPT

ANSARI PRIZE >>>

OCT 04, 2004 | \$10M

**GALVANIZED NEW
ERA OF COMMERCIAL
SPACE TRAVEL**





OUR PRIZES

A Ansari 1996 - 2004 \$10M	NI Northrop Grumman Lunar Landing 2006 - 2009 \$2M	GI Google Lunar 2007 - 2018 \$40M	Pa Progressive Automotive 2008 - 2010 \$10M	Ag Archon Genomics Canceled \$10M	Oc Wendy Schmidt Oil Cleanup 2010 - 2011 \$1.4M	Ns Nokia Sensing 2012 - 2014 \$2.25M	Qt Qualcomm Tricorder 2012 - 2017 \$10M	Oh Wendy Schmidt Ocean Health 2013 - 2015 \$2M	
Gle Global Learning 2014 - 2019 \$15M	So Shell Ocean Discovery 2015 - 2019 \$7M	Bb Barbara Bush Fdn. Adult Learning 2015 - 2019 \$7M	Wa Water Abundance 2016 - 2018 \$1.75M	An Anu + Naveen Jain Women's Safety 2016 - 2018 \$1.2M	Nc NRG Cosia Carbon 2015 - 2020 \$20M	Ai IBM Watson Ai 2016 - 2020 \$5M	Nm Next Gen Mask 2020 \$1M	Rt Rapid COVID Testing 2020 - 2021 \$6M	
Pr Pandemic Response 2020 - 2021 \$500K	Aa ANA Avatar 2018 - 2022 \$10M	Rr Rapid Reskilling 2020 - 2023 \$5M	DI Digital Learning 2021 - 2023 \$1M	R Rainforest Active \$10M	Fb Feed the Next Billion Active \$15M	Cr Carbon Removal Active \$100M	Wf Wildfire Active \$11M	Hs Healthspan Active \$101M	Ws Water Scarcity Active \$119M

OUR REACH AND IMPACT

\$500M+

Cumulative Prize Purses
Launched

29

Prizes Launched

895

Patents Filed by XPRIZE
Teams

\$146M+

Awarded Prizes

592

Trademark Filings by
XPRIZE Teams

\$4B

Investment Capital
Raised by XPRIZE
Teams

\$350M+

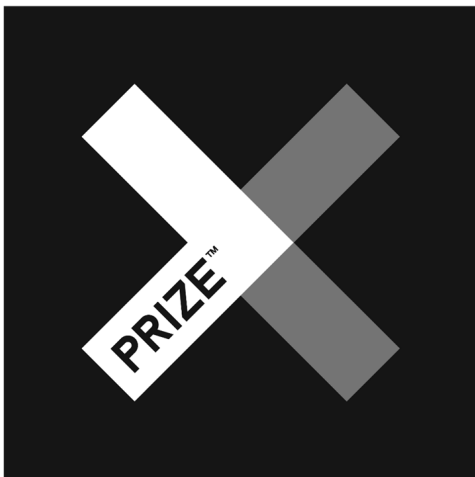
Prizes Currently In Development

1M+

Supporters Worldwide

1,046

Research Publications Citing
XPRIZE Competitions & Teams

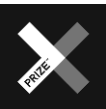


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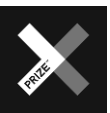
THE \$5 MILLION XPRIZE QUANTUM APPLICATIONS

supported Title Sponsor, **Google Quantum AI**, and Presenting Partner, **GESDA**, is a 3-year global competition designed to generate quantum computing algorithms that can be put into practice to help solve real-world challenges.



PRIZE COLLABORATORS



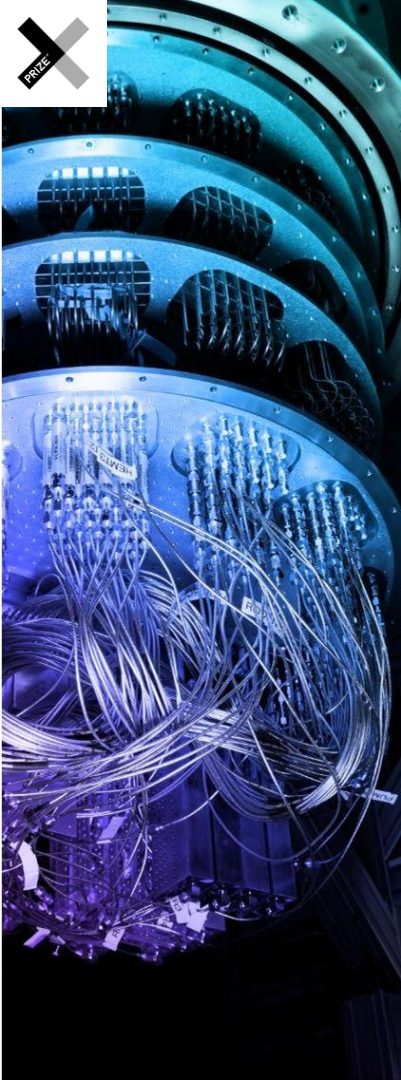


GRAND CHALLENGE

An emerging technology called **quantum computing** holds promise for addressing complex, societally important problems like those encompassed by the United Nations Sustainable Development Goals.

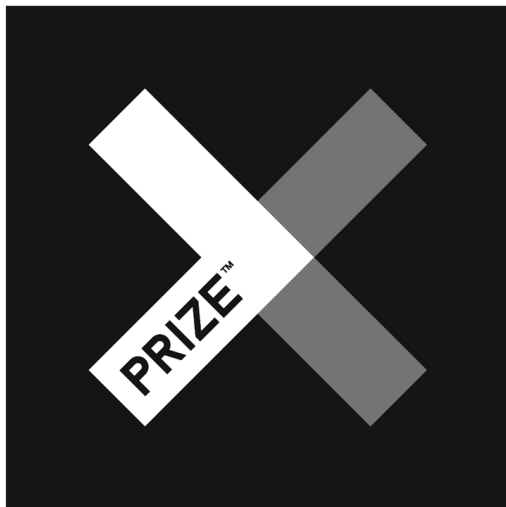
However, despite growing investment and innovation activity in quantum, the world is still awaiting a transformative, real-world application of quantum.





WHY AN XPRIZE IS NEEDED

- In anticipation of advanced quantum hardware around 2030, there is a critical opportunity *now* to advance state-of-the-art in applications.
- Currently lacking tangible research for real-world application scenarios.
- Commercial or geostrategic interests could deemphasize socially beneficial quantum computing use cases.
- The talent pool isn't robust enough & collaboration is lacking.
- Quantum expertise and resources are concentrated in certain countries
- Quantum is at risk of having a hype problem, increasing the potential for reduced funding and interest.
- Governments are not acting urgently enough to establish regulations, standards, and responsible uses



XPRIZE QUANTUM APPLICATIONS

Google
Quantum AI

ADVISORS

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Ryan Babbush | Google



XPRIZE QUANTUM APPLICATIONS

Google
Quantum AI

JUDGES

Chair - **Ryan Babbush** | Google

Amira Abbas | University of Amsterdam

Dominic Berry | Macquarie University

Earl Campbell | Riverlane

Di Fang | Duke University

Craig Gidney | Google

Christian Gogolin | Covestro

Guang Hao Low | Microsoft

Stephen Jordan | Google

Maria Schuld | Xanadu

Helmut Katzgraber | Amazon

Shelby Kimmel | Middlebury College

Joonho Lee | Harvard University

Norbert Schuch | University of Vienna

Barbara Terhal | Delft University

Sergio Boixo | Google



COMPETITION OVERVIEW

3 YEARS

Two technical submission phases over 3 years will bridge abstract ideas into concrete steps to implement powerful algorithms of the future.

OPEN

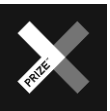
Teams can focus on any problem types and applications connected to social benefit, allowing for discovery of unexpected opportunities.

MULTI-MILLION \$ PRIZE PURSE

The competition cash incentives are the biggest ever offered for quantum algorithm development.

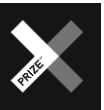
GLOBAL

The competition is open to global competitors and aims to engage participants from diverse countries and regions.

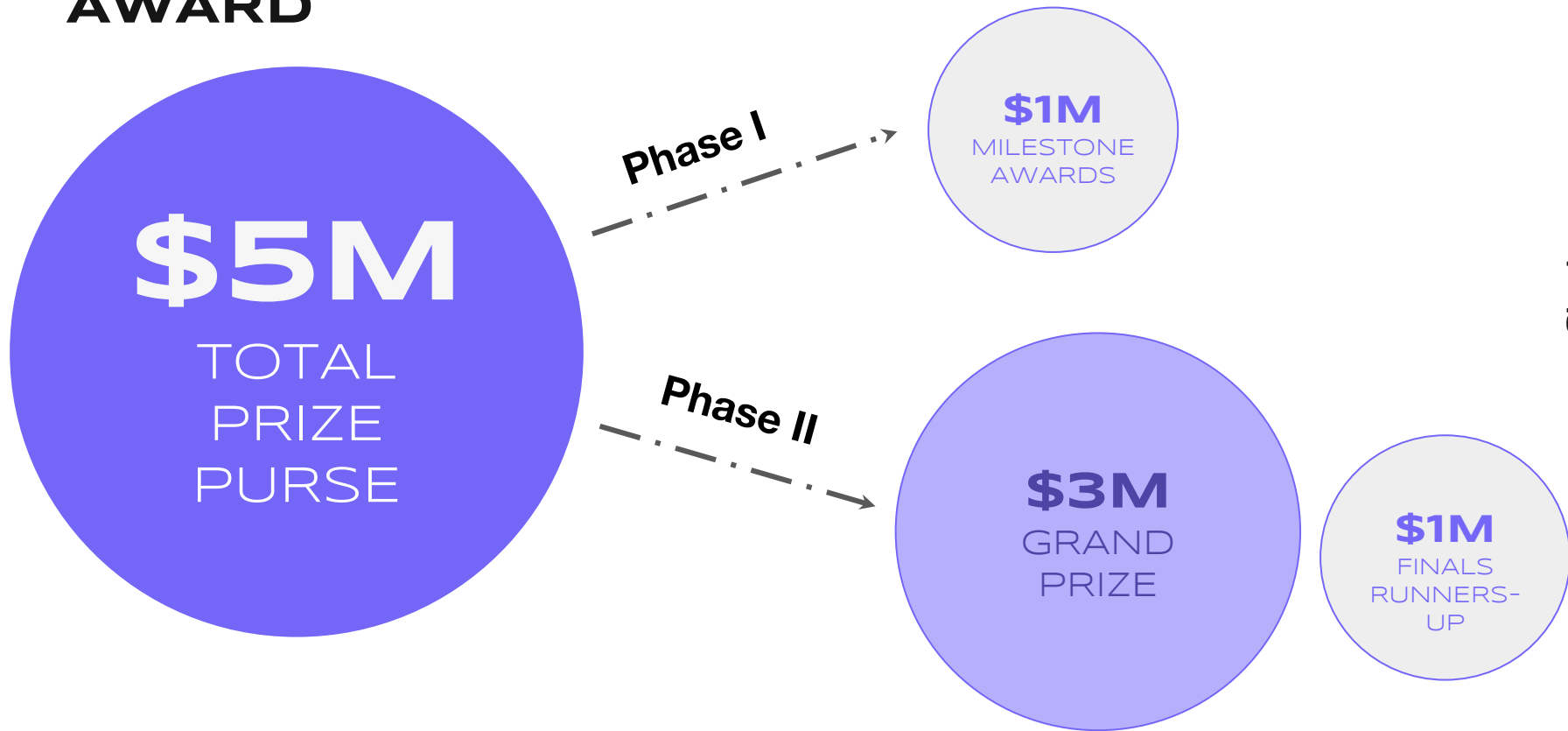


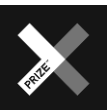
COMPETITION STAGES & ACTIVITIES





OPPORTUNITIES TO CLAIM AN AWARD





JUDGES WILL BE LOOKING FOR...

Submissions that most accelerate the field of quantum algorithms towards quantum advantage for positive real-world applications

Key criteria include:

- A. Projected magnitude of positive real-world impact
- A. Estimated quantum resources required for quantum advantage (i.e., how near-term?)
- A. The strength of the evidence supporting claims for (A) and (B)
- A. Novelty (i.e., magnitude of the “thought delta” introduced)



POSSIBLE CONTRIBUTION TYPES

01

NOVEL ALGORITHM

A new quantum algorithm for solving a new class of problems with quantum advantage

02

NEW APPLICATION

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

03

ENHANCED PERFORMANCE

Work significantly reducing the resources required for a quantum computer to reach quantum advantage for an already established algorithm/application



IMPACTFUL APPLICATIONS

UN SDG EXAMPLES



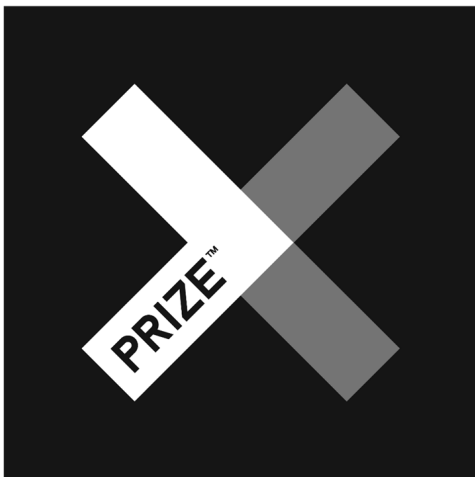
Sustainable nitrogen-fixation to feed the world



Improve and speed up drug design



Create more effective materials for carbon capture



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HOW TO GET INVOLVED

- 1. Registration for the Competition is Open!**

Visit xprize.org/prizes/qc-apps to register.

- 1. Preliminary Competition Guidelines are published for public comment.**

Submit feedback and questions to qc-apps@xprize.org by March 15, 2024.



THANK YOU

QUESTIONS?