



QAISys 2026

April 3 - Washington, DC

NSF WORKSHOP ON SYSTEMS RESEARCH AT THE QUANTUM-AI FRONTIER

Speakers

Andrew Cleland (UChicago)
Poulami Das (UT Austin)
Swaroop Ghosh (Penn State)
Costin Iancu (LBNL)
Shiheng Li (UChicago)
Junyi Liu (UMD)
Frank Mueller (NC State)
Michael Perlin (JPMC)
Patrick Rall (IBM)
Gokul Ravi Subramanian (Michigan)
Krysta Svore (NVIDIA)
Swamit Tannu (Wisconsin)
Runzhou Tao (UMD)

Organizers

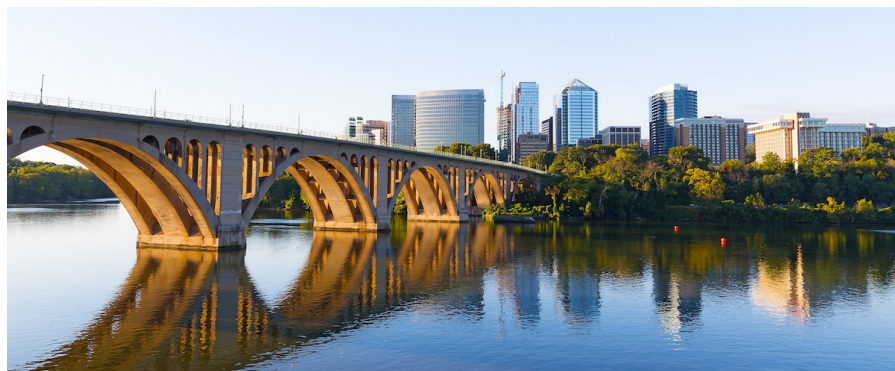
Yongshan Ding (Co-Chair), Yale
Yiran Chen (Co-Chair), Duke
Zheng Zhang, Rutgers
Yunong Shi, AWS/UMich
Frank Müller, NC State
Lin Zhong, Yale
Kenneth Brown, Duke

About the Workshop

Following the successful NSF QuantumOS workshop hosted in 2024 in Austin, TX, we invite you to attend the second workshop QAISys 2026 in Washington, DC.

QAISys (pronounced "Kay-see's") brings together researchers from quantum computing, computer systems, AI, and edge computing to surface open problems, challenge assumptions, and define the research agenda for integrated quantum-AI systems. The workshop features invited talks, lightning presentations, panel discussions, and collaborative breakout sessions organized around four research thrusts.

Hosted at Duke in DC - David M. Rubenstein Conference Center



QuantumInstitute.yale.edu/QAISys

National Science Foundation Award #2435033

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Agenda

April 2 – 6:30 pm – Reception

1201 Pennsylvania Ave. Rooftop Terrace

April 3 – 8 am – Check in

8:30 am – **Welcome and Introduction by the organizers**

SESSION 1: Quantum OS and Software Stack

8:50 am – **Keynote: Patrick Rall (IBM)**

Compilers Research at IBM Quantum

9:15 am – **Lightning Talk: Runzhou Tao (UMD)**

9:25 am – **Lightning Talk: Swaroop Ghosh (Penn State)**

sign Automation Challenges and Solutions for Fault Tolerant Quantum Computing

SESSION 2: Quantum-Edge System Co-design

9:35 am – **Keynote: Andrew Cleland/Shiheng Li (UChicago)**

Teaching a Large-Language Model to run Superconducting Qubit Experiments

10 am – **Lightning Talk: Gokul Ravi Subramanian (Michigan)**

Classical processing at the quantum edge

10:10 am – **Lightning Talk: Junyi Liu (UMD)**

10:20 am – Coffee

10:30 am – **Panel Discussion: Sessions 1 & 2**

Quantum Software-Hardware Integration

11:10 am – Lunch

SESSION 3: AI-Integrated System Adaptation

12:10 pm – **Keynote: Krysta Svore (NVIDIA)**

Designing the Accelerated Quantum Supercomputer:

AI-First, Real-Time Required

12:35 am – **Lightning Talk: Frank Mueller (NC State)**

AI in support of Quantum: Error Correction and Friends

12:45 pm – **Lightning Talk: Poulami Das (UT Austin)**

SESSION 4: Fault-Tolerant Quantum-Classical System Design

12:50 pm – **Keynote: Costin Iancu (LBNL)**

1:20 pm – **Lightning Talk: Swamit Tannu (Wisconsin)**

The Iron Law of Performance: A Guiding Principle for Fault-Tolerant Quantum Computing

1:30 pm – **Lightning Talk: Michael Perlin (JPMC)**

Fault-tolerant execution of error-corrected quantum algorithms

1:40 pm – **Panel Discussion: Sessions 3 & 4**

Quantum-AI Integration and Fault Tolerance

2:20 pm – Coffee

2:30 pm – **Breakout Discussions and White Paper Working Group**

4:30 pm – **Closing Remarks and Community Roadmap Discussion**

Poster Presentations (all day)

By order of submissions

Hybrid Quantum-Classical Modeling of Single-Cell Gene Expression under Genetic Perturbations

Yue Yu, Shashish V. Vasireddi, Niva Yadav and Victor S. Batista
Yale University

Are LLMs Good For Quantum Software, Architecture, and System Design?

Sourish Wawdhane and Poulami Das
The University of Texas at Austin

Toward Scalable Quantum Control with LUT-Based Neural Architectures

Muhammad Ali Farooq and Aman Arora
Arizona State University

Beyond Static Floorplans: Workload-Aware Resource Management for Fault-Tolerant Quantum Systems

Archisman Ghosh, Avimata Chatterjee and Swaroop Ghosh
Penn State

Near-Constant Latency QEC via Message-Passing Graph Compilation and Decoding

Alexandru Paler
Aalto University, Finland

Security Challenges in AI-based Quantum Control and Error Correction

Jakub Szefer
Northwestern University