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

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 Real-time Resource Management
8:50 am – **Keynote: Patrick Rall (IBM)**
Compilers Research at IBM Quantum
9:15 am – **Lightning Talk: Runzhou Tao (UMD)**
Title
9:25 am – **Lightning Talk: Swaroop Ghosh (Penn State)**
sign Automation Challenges and Solutions for Fault Tolerant Quantum Computing

SESSION 2: AI-Integrated Compilation and System Adaptation
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)**
Title
10:10 am – **Lightning Talk: Junyi Liu (UMD)**
Title

10:20 am – Coffee

10:30 am – **Panel Discussion: Sessions 1 & 2**
Quantum OS and AI Integration

11:10 am – Lunch

SESSION 3: Quantum-Edge System Co-design
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)**
Title

SESSION 4: Quantum-Edge System Co-design
12:50 pm – **Keynote: Costin Iancu (LBNL)**
Title
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 – **Parallel A: Poster Session**
2:30 pm – **Parallel A: Breakout Discussions and White Paper Working Group**

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

Poster Presentations
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, Avimita 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