

INSIGHTS BRIEF

Early Signals from the ASCET–Chicago Quantum Exchange (CQE) March 2026 Workshop

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Participant Snapshot

On March 31, 2026, the Chicago Quantum Exchange (CQE) and the Advancing Standardization for Critical and Emerging Technologies (ASCET) Center of Excellence convened participants in Chicago for a focused workshop on standardization activities for quantum technologies.

Participants of the CQE workshop represented multiple key stakeholder groups, including representatives from academia, research institutions, and private-sector companies. Participants also originated from government agencies and public sector bodies, as well as standards organizations and industry consortia. Attendees represented a cross-section of the quantum ecosystem, including quantum computing, sensing, networking, materials, cybersecurity, and related fields. Together, these stakeholders bring a range of perspectives spanning research, policy, engineering, and market-driven considerations.

Workshop Focus and Context

During the workshop, participants discussed structured questions designed to surface priorities, barriers, and actionable directions for quantum standardization. The CQE workshop served as the starting point for ASCET's deeper engagement with the Chicago Quantum Exchange community.

Panel and Presentation Summary

The workshop opened with presentations by David Awschalom (Liew Family Professor of Quantum Engineering and Physics, University of Chicago; Director, Chicago Quantum Exchange; Senior Scientist, Argonne National Laboratory) and Brad Rachmiel (Managing Director, Chicago Office Market Leader, Protiviti), followed by a panel discussion that covered contemporary topics in quantum standards and participation.

INDUSTRY PANEL DISCUSSION

Panelists:

- **Glauci Fernandes**, Senior Program Manager, Software-Enabled Products, Autonomy and Robotics (SEPAR), UL Standards & Engagement
- **Konstantinos Karagiannis**, Senior Director of Quantum Computing Services, Protiviti
- **Martin Suchara**, Director of Quantum Applications, IonQ
- **Moderator:** James Dickerson, ASCET Director

The panelists emphasized utilizing standards to accelerate quantum adoption by focusing on interfaces, benchmarking methods, and safety and interoperability guardrails while leaving room for diversity among hardware architectures. Panelists

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were asked both targeted and general questions on a range of topics, including law and governance, international competition, small business access, public-private IP, quantum-ready procurement, and energy and sustainability.

Key themes included:

- Standards should target interfaces (hardware–software, quantum–classical) and measurement/definitions, not early “winner-picking” hardware architectures.
- Standardize where scale and multi-party integration are already emerging (e.g. cloud delivery, networking, cross-vendor toolchains)
- Consensus can be a strength when evaluation is evidence-driven (e.g. cryptography), but emerging tech may benefit from pre-standards outputs (white papers, hazard frameworks) until the field stabilizes.
- Benchmarking is necessary for trust and comparability but must account for modality differences and full-stack performance (hardware + compiler/software effects).
- Open source may standardize common algorithms and libraries, while proprietary differentiation will likely persist at application/solution layers.
- Long-term focus areas include interoperability/safety guardrails and cross-layer standards for error correction as systems move toward fault tolerance.

Future Opportunities:

- Prioritize near-term standards efforts around interfaces: quantum IR/compiler boundaries, control APIs, and quantum–classical workflow integration points.
- Develop or align upon benchmarks and comparability metrics that are application-oriented and reflect real use cases.
- Use pre-standardization deliverables (white papers, hazard/safety frameworks) for areas where consensus standards are premature.
- Coordinate across organizations to avoid fragmented national approaches that could create downstream interoperability and compliance burdens.
- Monitor and plan for international divergence (especially in cryptography) by mapping interoperability dependencies and migration paths.
- Track readiness triggers (repeatable customer deployments, networking needs, manufacturing/test maturity) to time when to formalize standards versus iterate informally.
- Begin scoping cross-layer requirements for error-corrected/fault-tolerant systems (how error correction information and guarantees flow across hardware, firmware, and software).

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STANDARDS 101: INTRODUCTION TO STANDARDIZATION

This presentation explored what standards are, why they matter for safety, interoperability, and trade, and how consensus-based standardization works in practice. A key takeaway was that standards work is an ongoing lifecycle of idea formation, drafting, balloting/consensus, publication, and sustained maintenance, which necessitates long-term participation. Action items for the audience members to consider for their organizations included determining what standardization model fits an organization's goals (national body, direct participation in a standards organization, or consortia); learning the procedural basics (balloting, due process, appeals, meeting norms) of a standards committee; and building an internal team with strong technical expertise that is paired with refined stakeholder-engagement skills.

STANDARDS READINESS AND PARTICIPATION

The readiness discussion posited that quantum standards should be pursued in tandem with other technical advancements across computing, sensing, and networking because shared terminology, performance metrics, and system interfaces are prerequisites for efficient integration and market growth. This portion of the workshop reinforced that standards strengthen ecosystems and are shaped by those who participate. Immediate action items are to inventory where workflows depend on cross-organization alignment, pick an existing effort to join, and commit resources to ongoing participation.

Stakeholder Engagement Workshop

The stakeholder engagement phase of the CQE workshop was designed to explore:

- Challenges in comparability within a variety of quantum industry verticals
- Whether quantum technologies were ready to embark on standardization and, if so, what technological areas might be first to begin the journey
- The difficulties in integrating quantum and classical technologies
- Barriers and enabling factors impacting standards participation among subject matter experts, decision makers, and other stakeholders

Facilitated discussions among breakout groups, organized around quantum industry verticals, emphasized ecosystem listening and gap identification.

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QUESTION 1: COMPARABILITY GAPS IN QUANTUM PERFORMANCE CLAIMS

Where do you see the greatest lack of comparability today in quantum — performance claims, benchmarks, measurement conditions, or system description?

Key themes included:

- **The Undefined Logical Qubit and Error Rate Standards:** No theme surfaced more consistently than the need to standardize the definition of a logical qubit and how logical error rates are measured.
- **Hardware-Agnostic, Bias-Free Benchmarking for Quantum Computing:** There was broad consensus that any benchmark for quantum computing systems must be multidimensional, hardware-agnostic, and should facilitate innovation.
- **Ambiguous Terminology in Quantum Networking:** A current lack of clarity exists in foundational vocabulary for many aspects of quantum technology, including networking and communications, leading to conditions for costly intellectual property litigation.

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QUESTION 2: READINESS FOR STANDARDIZATION ACROSS QUANTUM DOMAINS

Across quantum sensing, networking, and computing, which areas feel too early for standardization — and which feel ready for shared definitions or coordination?

Key themes included:

- **Areas Viewed as Ready for Coordination:** Taxonomy and foundational terminology are ready and urgently needed for standardization now. Classical-to-quantum integration interfaces were also identified as a near-term opportunity.
- **Areas Too Early for Standards:** Wavelength-specific specifications and fault-tolerant computing architectures were viewed as premature for formal standardization because the technology is evolving too quickly and is still too architecture-dependent. Benchmarking at the system modality level, particularly across incompatible hardware approaches, was also viewed as premature without a clearer shared taxonomy.
- **The Urgency Argument:** On the other hand, there are critical areas in which standards are needed sooner rather than later, as captured in the phrase “Early is on Time; On Time is Late.” A recurring sentiment across this question was that the quantum community’s instinct to wait for technological stability before developing consistent standards may be counterproductive.

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QUESTION 3: INTEGRATION FRICTION BETWEEN QUANTUM AND CLASSICAL SYSTEMS

Where do integration challenges between hardware, software, networks, or classical systems create the most friction today?

Key themes included:

- **Classical-to-Quantum System Integration:** There is a challenge connecting quantum devices, sensors, computing units, and network components to existing classical infrastructure.
- **Cybersecurity and Forward Security:** Participants emphasized the need to swap out cryptographic protocols and ensure forward security as quantum capabilities mature.
- **Organizational and Cultural Barriers:** Participants noted misalignment between academia, which tends to deprioritize standardization, and industry, which needs standards to achieve ROI.

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QUESTION 4: BARRIERS TO STANDARDS PARTICIPATION

What makes standards participation feel inaccessible or misaligned with how quantum organizations actually operate today?

Key themes included:

- **Cost and Scope as Structural Barriers:** Membership fees, travel expenses, and the significant commitment required to participate meaningfully are prohibitive for resource-constrained organizations. The scope of existing standards organizations is often too broad, making it difficult to focus on the specific subdomain issues that matter most to any given quantum company.
- **The Startup Dilemma:** Quantum startups are overwhelmingly focused on building and selling a product, leaving little bandwidth for standards committees.
- **Lack of a Structural Roadmap:** Beyond cost and capacity, there is not a clear, accessible quantum standardization roadmap that tells a quantum organization where to engage, when to engage, and what is at stake if it does not.

What are the Next Steps?

The Chicago workshop reinforced a central message: **the quantum standardization moment is now**. Participants consistently signaled that foundational terminology, benchmarking frameworks, and integration interface standards are urgently needed, and that the window for meaningful participation by startups and smaller companies is narrowing. Participants from the workshop can continue advancing standards by getting started on specific near-term actions, including :

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- 1 Frame the Opportunity.** Identify which standards currently impact your organization's products, services, and market access—or where your organization might be able to influence future requirements. Seeing the full picture will allow you to prioritize and allocate resources for standardization activities.
- 2 Choose an Engagement Path.** Target the most relevant Standards Development Organizations (SDOs), committees, working groups, or consortia for potential engagement, based on your business priorities and available resources and staff capacity. Take the time to learn the organization's rules and procedures for standards activities—via their website, training materials, voting policies, and related documents—to understand the level of commitment required.
- 3 Commit to Collaborate.** Once you have joined an SDO or committee, connect with other members to seek alignment, understand differences, and begin to build long-term relationships. Also look for opportunities to bring your expertise to bear quickly by volunteering for task groups, assisting with research tasks, and contributing to first drafts of standards or revisions.
- 4 Stay Engaged.** As with any new endeavor, the more you put into it your standardization journey, the more you will get out of it. Crafting critical and accurate consensus-based standards requires subject matter expertise and industry knowledge, but it also takes important “people skills” like persuasion, compromise, and negotiation to be effective.

Continuing the Momentum

ASCET will use the themes captured and next steps identified in this brief to shape future pre-standardization engagement activities, sector readiness assessments, and workforce capacity-building initiatives. Stakeholders interested in engaging with quantum standardization efforts are encouraged to visit [ASCET.com](https://ascet.com) to learn more about ASCET's activities and explore opportunities to participate in upcoming workshops, technical working groups, and standards committees. Information about the greater quantum standardization ecosystem can be found in [ASCET's Environmental Standardization Scan: Quantum Technologies](#), accessible on [ASCET.com](https://ascet.com).

Looking for a place to start? [ASCET's Participating in Standards Activities for Quantum Technologies: Quick Start Guide](#) provides a practical roadmap for organizations and individuals seeking to engage in quantum standardization. The guide outlines key standards organizations, pre-standardization forums, participation pathways, and best practices for effective engagement across the quantum ecosystem.

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