

CHICAGO QUANTUM EXCHANGE



Lessons Learned from CQE

- 1. Integrate discovery to development and deployment with industry**
- 2. First mover advantage is real** – but capital intensive
- 3. Leverage your full assets** – across all IHE, sectors, and other firms
- 4. Government is needed to scale** – physical (states) and programmatic (federal) infrastructure
- 5. Insights should enable action and** drive national QISE development

The Chicago Quantum Exchange is creating a quantum future in the Quantum Prairie by integrating **leading research**, preparing the **future workforce** , and driving **economic innovation** across the region and U.S.

The CQE: a discovery-to-deployment integrated ecosystem

Founded in 2017, with an eye toward industry collaboration



Advancing Research and Discovery



Driving the Quantum Economy



Preparing the Quantum Workforce

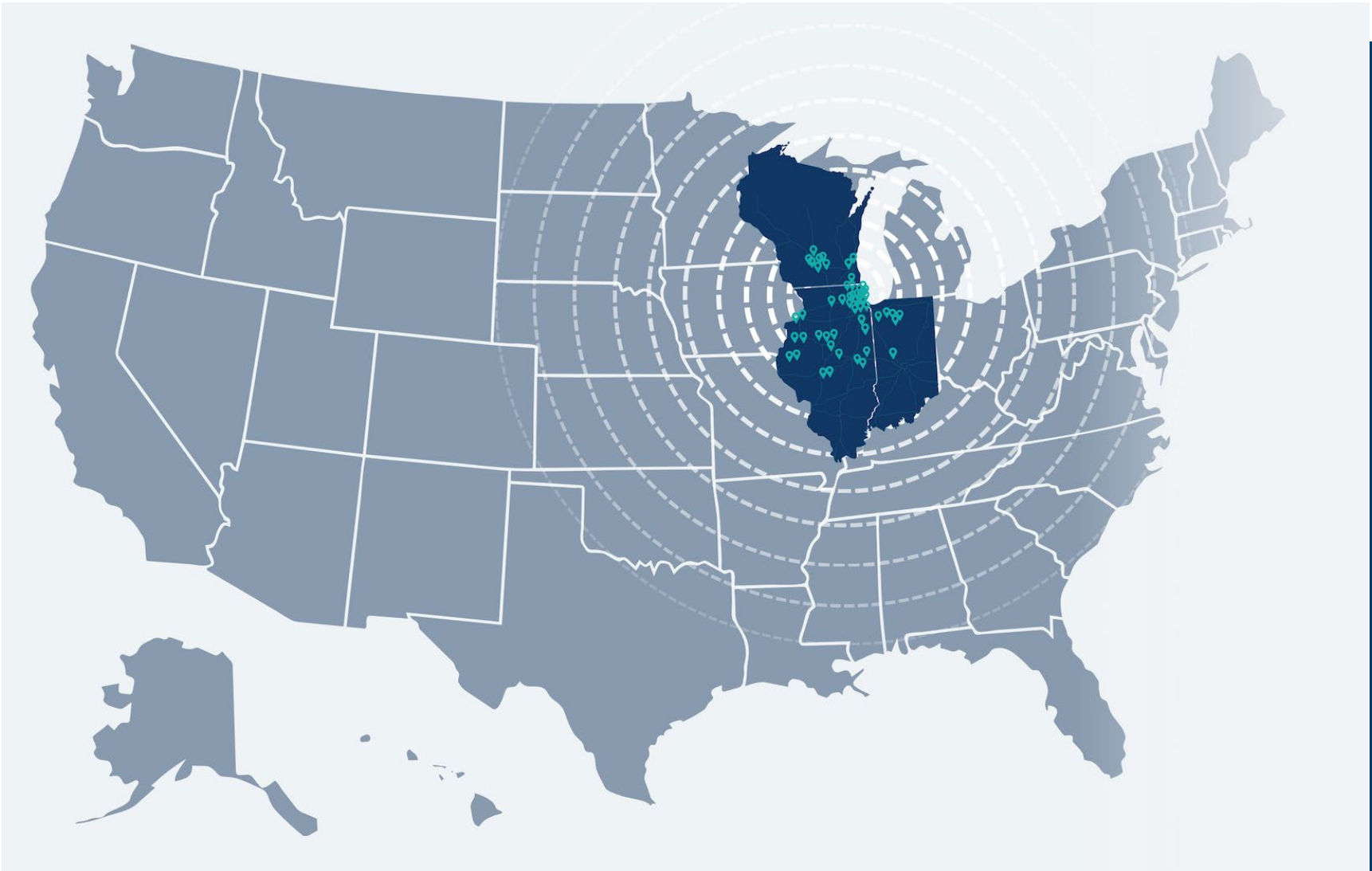
Leveraging decades of QISE research

Ripe for regional harvesting

Leading universities and DOE national labs

- 300+ quantum researchers at universities, national labs
- IL, IN, WI produce 10% of quantum publications
- UChicago and Purdue in top 10 publishing universities in U.S.

Top QISE academic patent producers

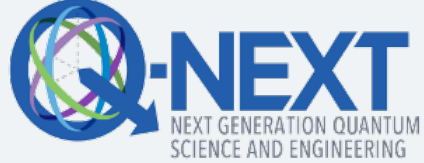


Supporting National Quantum Initiative Act Research

4 of 10 centers NSF and DOE Centers



NSF Quantum Leap Challenge Institutes and DOE QISE Research Centers

	 Hybrid Quantum Architectures and Networks   UNIVERSITY OF ILLINOIS URBANA - CHAMPAIGN	   THE UNIVERSITY OF CHICAGO
 U.S. DEPARTMENT OF ENERGY	 NEXT GENERATION QUANTUM SCIENCE AND ENGINEERING  Argonne NATIONAL LABORATORY	 SUPERCONDUCTING QUANTUM MATERIALS & SYSTEMS CENTER  Fermilab

Advancing Research and Workforce Development with Industry

Partnerships with 50+ companies across sectors



**denotes core corporate partners*



CQE cross-sector research

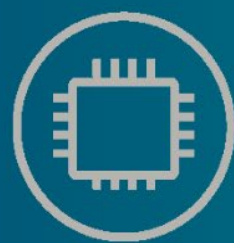
Seeding workshops and 100+ of collaborations with industry



TOSHIBA



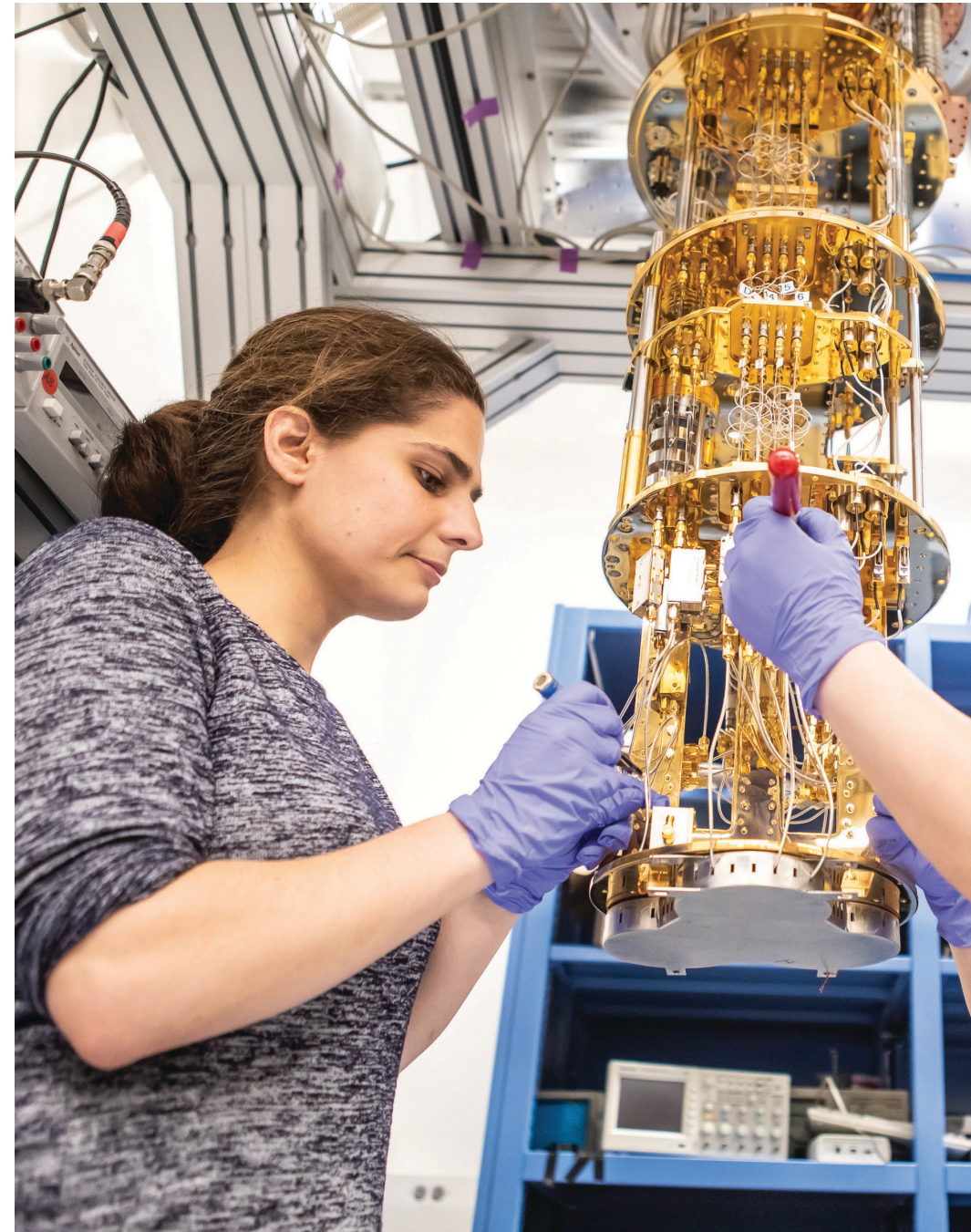
Communication



Computing



Sensing



Fields

- Condensed matter physics
- Atomic, molecular, and optical physics
- Quantum chemistry
- Quantum information
- Quantum optics
- Materials
- Topological physics
- Device physics
- High-energy and particle physics

Translating science into startups

The first steps to building a culture of QISE innovation

Duality Quantum Accelerator

- The first quantum accelerator in the United States exclusively focused on supporting innovative quantum startups
- Supported 28 startups

Chain Reactions Innovations

- Two-year Argonne fellowship program for innovators focused on energy and science technologies.
- Supported six QISE innovators to-date

CQE Founder Platform

- Proactive and on-call supports to accelerate the growth of quantum companies in the Illinois-Wisconsin-Indiana region
- Supports the 30+ quantum companies growing in IL-WI-IN

<DUALITY>

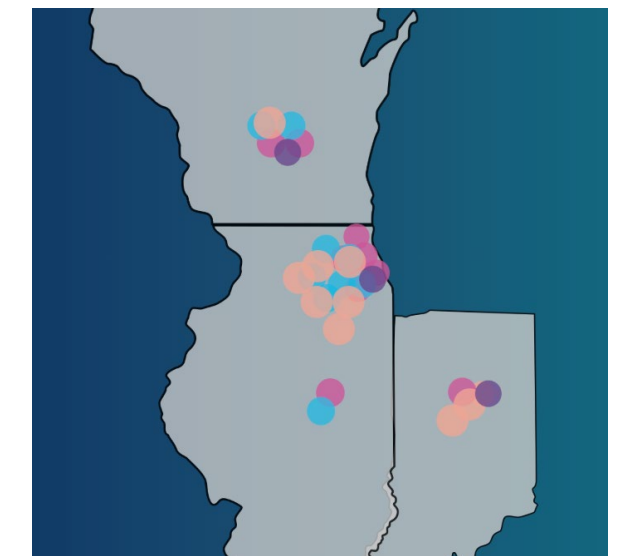
Accelerating Quantum Startups



**CHAIN REACTION
INNOVATIONS**
Entrepreneurship at Argonne



The Founder Platform

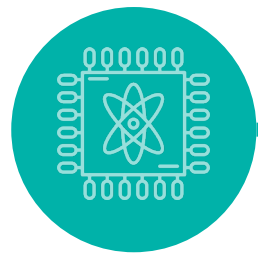


Engage the full innovation assets

Building Midwest Quantum Core facilities for scale

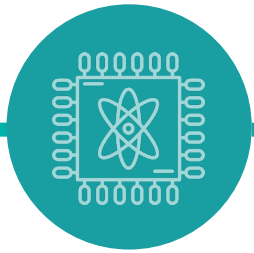


1985



NCSA @ UIUC

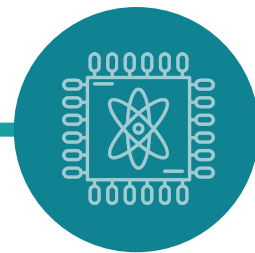
1996–2006



ALCF, CNM, &
APS @ Argonne

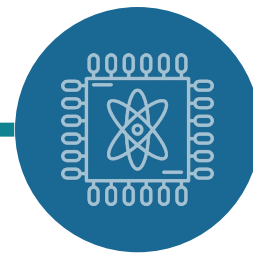


2015

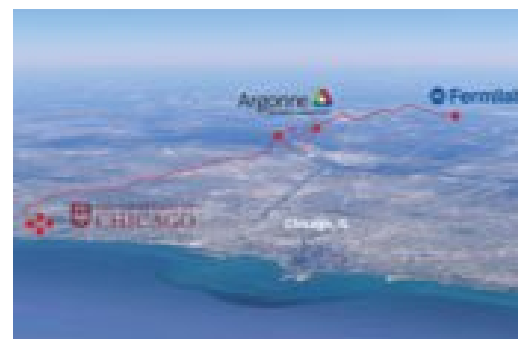


Pritzker
Nanofabrication Lab
@ UChicago

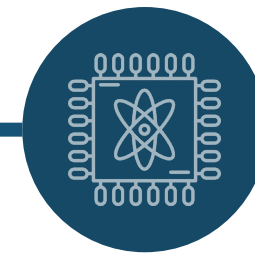
2020



Quantum Fiber
(with aims to grow)

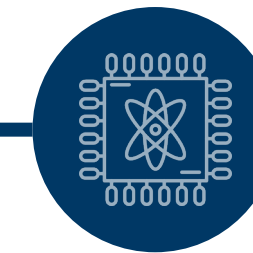


2025



Bluefors Labs @
mHub and Hyde
Park Labs

2025–2026

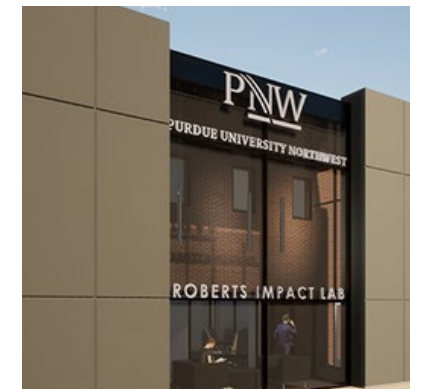


Shared Equipment,
IBM System 2 @
HPLabs, Ion Q Tempo

UNDER
DEVELOPMENT



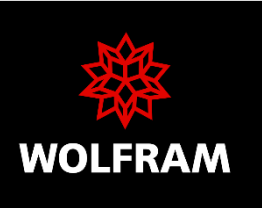
Illinois Quantum &
Microelectronics Park



Roberts Impact Lab at
Purdue Northwest

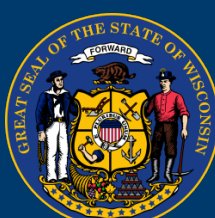
Integrate a full QISE supply chain

Spanning networking and communications, sensing, computing, and enabling tech

Materials / Processing	Components / Infrastructure	Subsystems	Systems
   Semiconductor 			
Enabling and Applications Software			
			

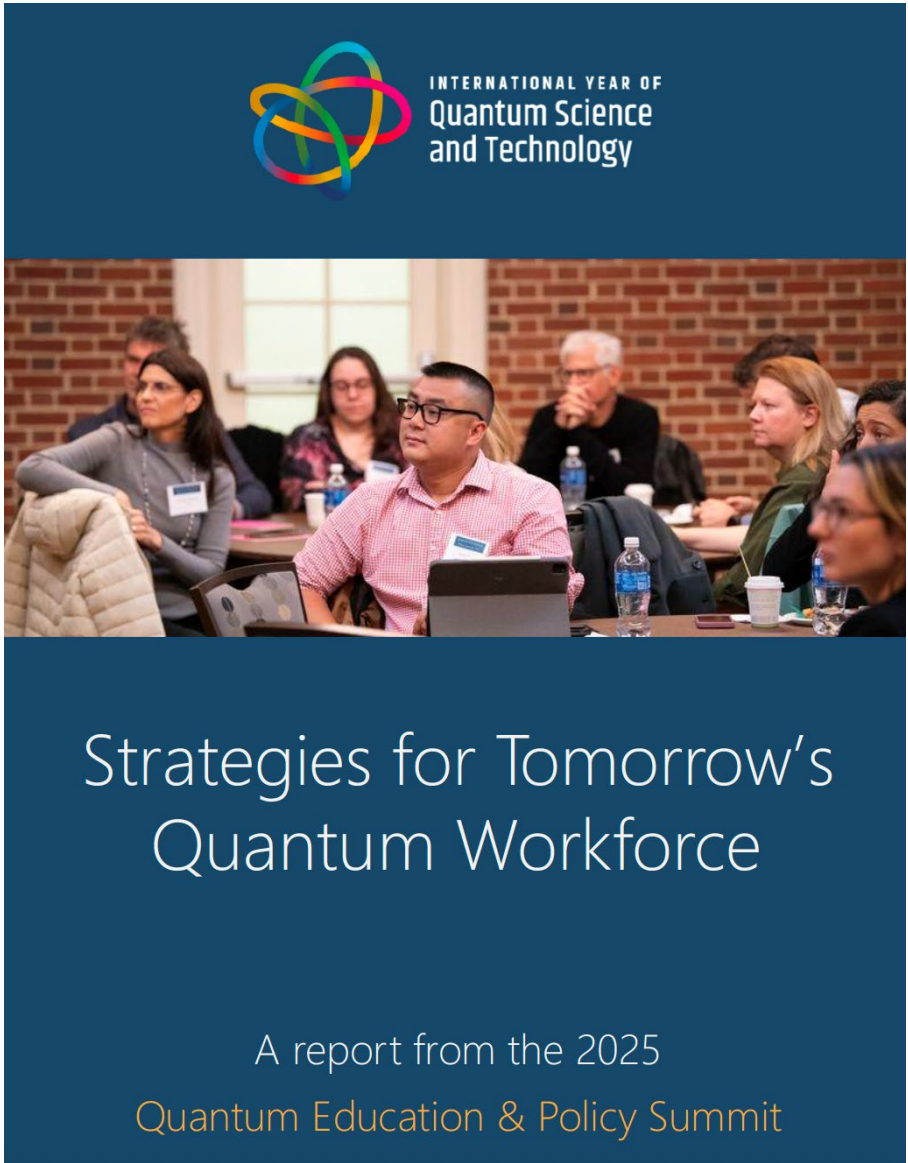
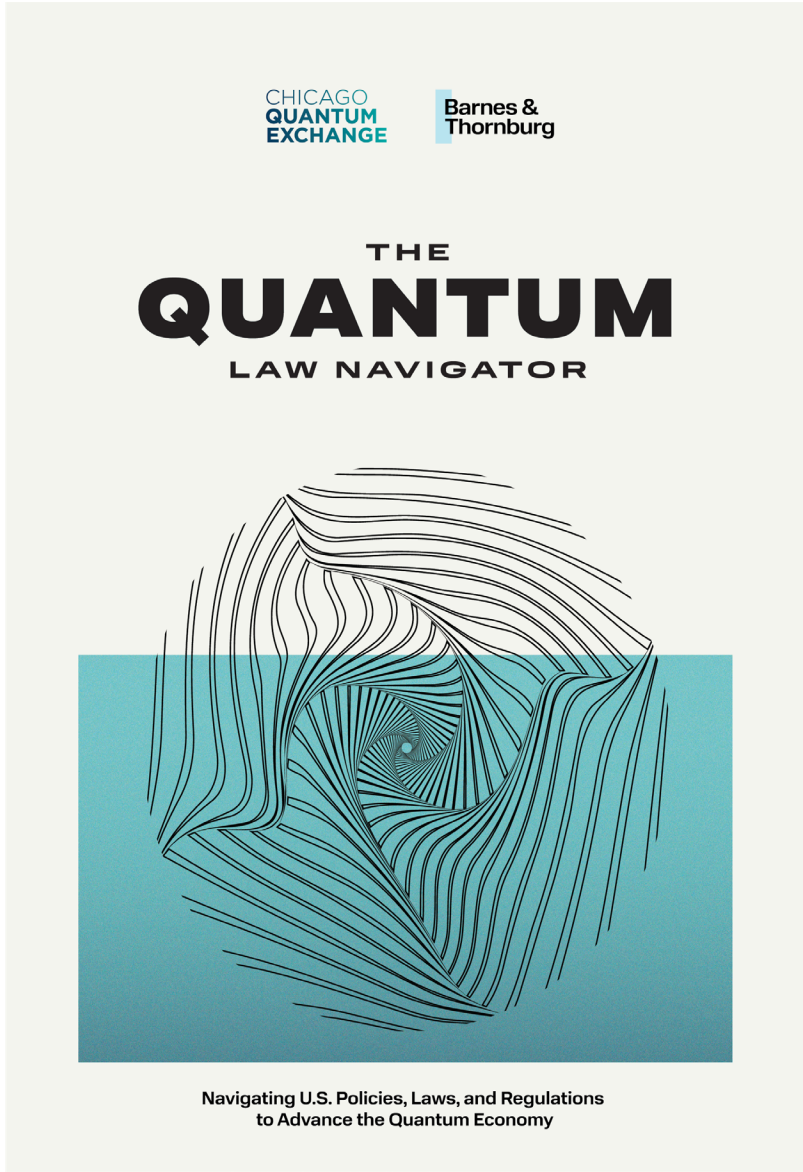
Integrating QISE needs with state policies

To increase industry-engaged research, education, and workforce development

 ILLINOIS	 INDIANA	 WISCONSIN
 - First-in-nation state-level economic development plan to include quantum \$700M commitment to develop quantum science facilities with UChicago and UIUC at IonQ Center for Engineering and Science (2019) and Illinois Quantum and Microelectronics Park (2024) - Economic Development Zone designation and incentives	- First-in-nation regional Comprehensive Economic Development Strategy (CEDS) to include quantum - HB 1601 tax incentives for QIST innovation infrastructure 	Wisconsin Frontier Technology Consortium awarded Ignite Frontier grant through Wisconsin Economic Development Council, including quantum technologies

Data and coordination to guide growth

Regional and globally-relevant reporting to enable strategic and informed growth



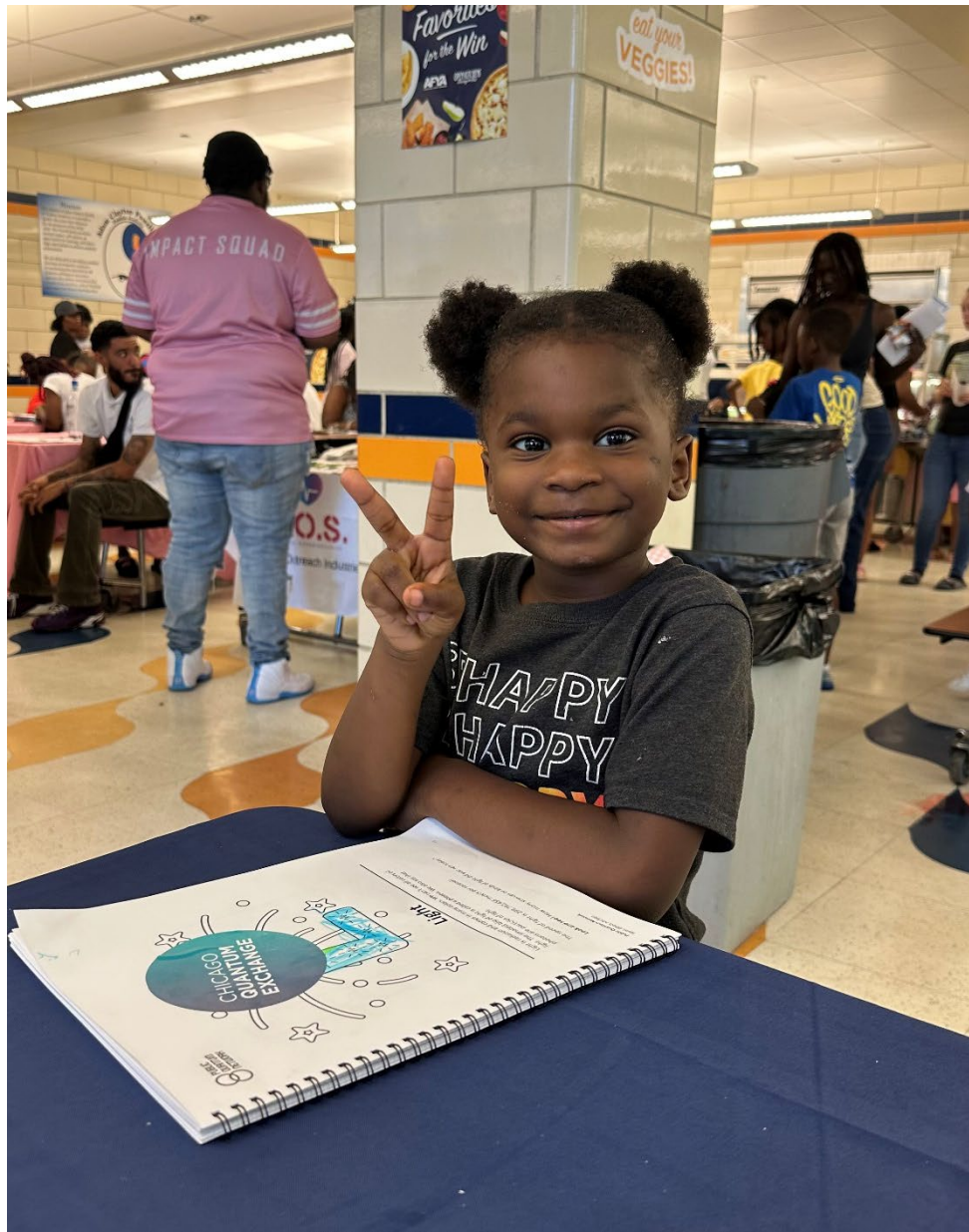
What is included?



- Developed from stakeholder engagement and community workshops tied to the **2024 NSF Regional Innovation Engines Development Award**
- Built around the region's **existing quantum assets**, including federally funded quantum research centers, universities, national labs, and community college networks
- Includes **eight quantum workforce role profiles** that outline job titles, salary ranges, educational backgrounds, key skill sets, and potential career pathways

Awareness

Expand quantum learning in and outside classrooms with coordinated activities, teacher training, and workforce education



Context:

1. 5+ teacher professional development programs offered by regional and national partners
2. Structured and ad hoc outreach activities for students, families and the public

Next Steps:

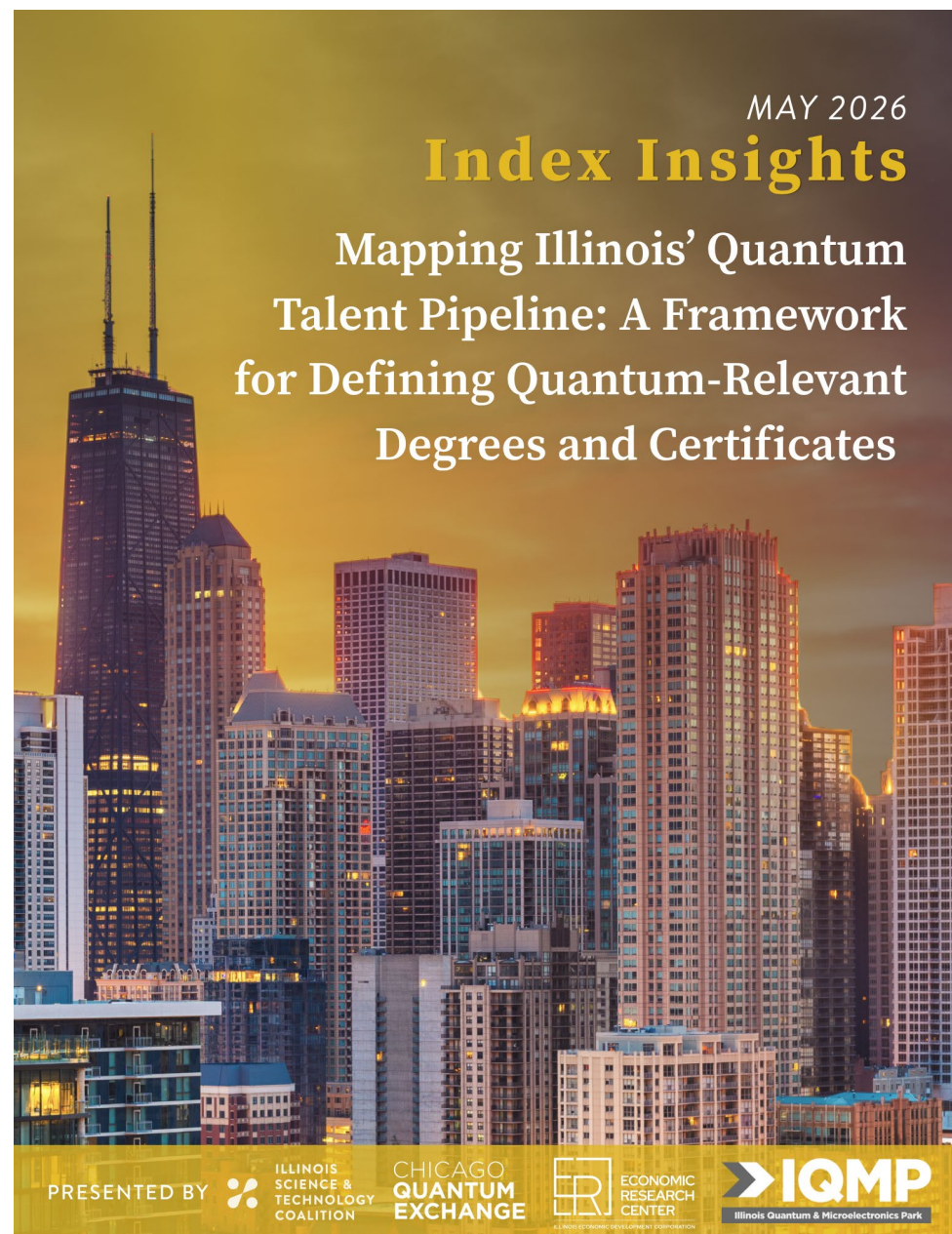
1. Scale regional teacher professional development programs and align with state-level credentials
2. Use data to address gaps and needs

Recommendations:

1. Build assessment and available tracking into everything
2. Leverage national resources to speed build time
3. Champion good work whenever possible

Preparation

Build out and clearly communicate coursework & training opportunities across the region, including equipment for hands-on learning and experiential learning



Context:

1. 600+ courses statewide, primarily at R1 institutions and 10+ new programs
2. Constraints around access to hardware and fundamental knowledge needed for DIY learning

Next Steps:

1. Expand course tracking to include feeder lists
2. Aim to connect preparation pathways across institutions
3. Leverage national data to understand talent supply

Recommendations:

1. Find courses and teachers with focused and feeder coursework, specifically at non-R1
2. Provide resources and access to faculty interested in teaching
3. Leverage large-scale internship programs as regional opportunities grow

Mobility

Facilitate career progression through institutional partnerships and transfer agreements, funded fellowships and internships, coordinated professional development, apprenticeships, and upskilling initiatives



Context:

1. Priority on non-graduate degree holders, with training still clustered at R1 institutions
2. Lack of hands-on learning opportunities in rural areas and broader, accessible education for the current workforce
3. Decrease in graduate student funding

Next Steps:

1. Strengthen and focus articulation agreements across institutions in feeder fields
2. Develop accessible training and education for current workforce, with focus on roles that support future growth

Recommendations:

1. Connect with educational administrators in transfer, advising, and career services
2. Identify the right level of trainer for new champions

Employer Leadership

Launch a quantum employer collaborative to coordinate regional hiring, align tax incentives, communicate learning opportunities, and support talent matching



Context:

1. Employers need support for hiring, often with similar needs in small numbers across organizations
2. Workforce trainers and institutions struggle to identify needs, demand, and skills

Next Steps:

1. Bring employers together to identify shared needs across organizations
2. Integrate with business development teams to provide workforce incentives and tracking mechanisms
3. Leverage Talent Portal as a talent matching agency for employers

Recommendations:

1. Leverage all available data and workforce incentives at the regional and state level
2. Identify and create opportunities for each type of contributor in your ecosystem

Coordination

Collaborate to coordinate funding, track progress via shared indicators, incorporate industry feedback, and expand talent development across the region



Context:

1. Individual, siloed, small-scale efforts will fail to scale
2. Data on supply and demand not yet developed

Next Steps:

1. Establish clear, interstate tracking mechanisms that leverage current reporting
2. Partner closely with convening organization to maximize reach
3. **Identify additional states to partner with**

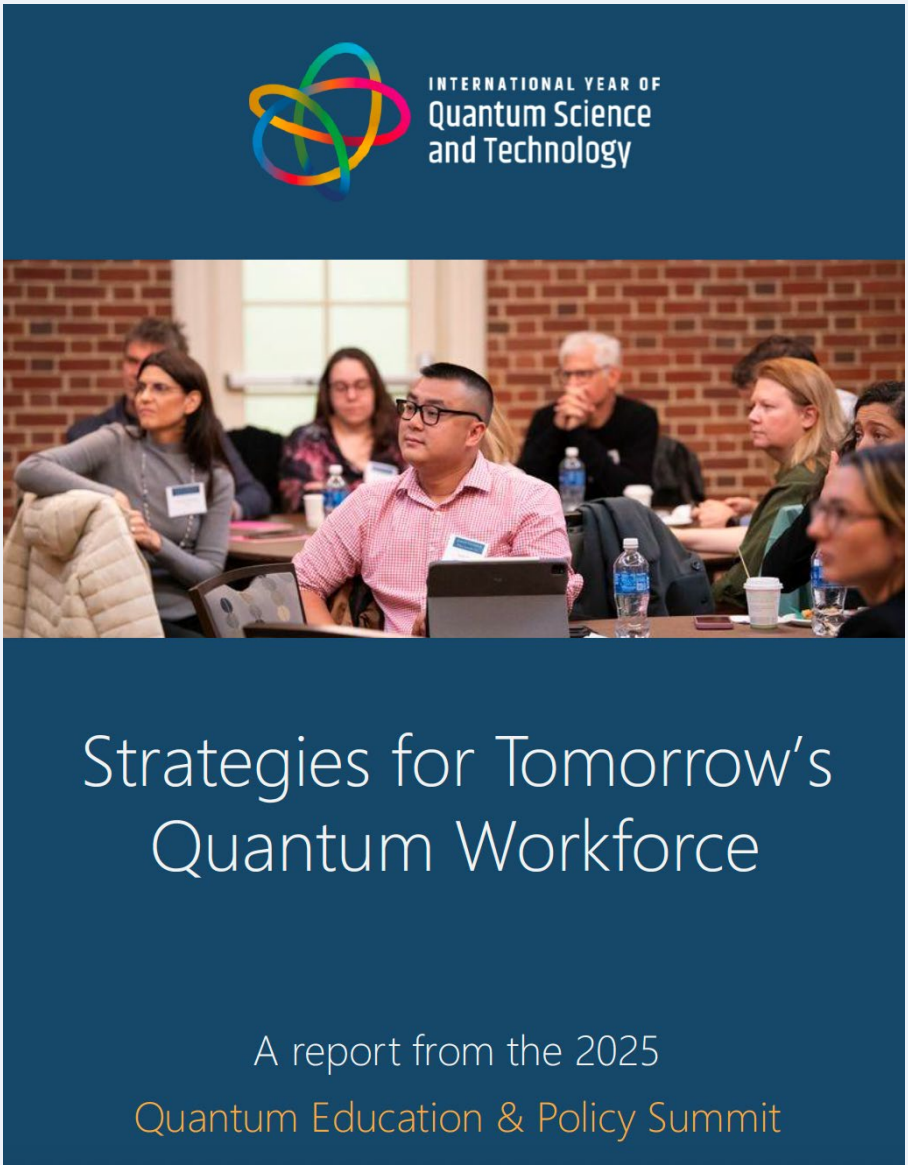
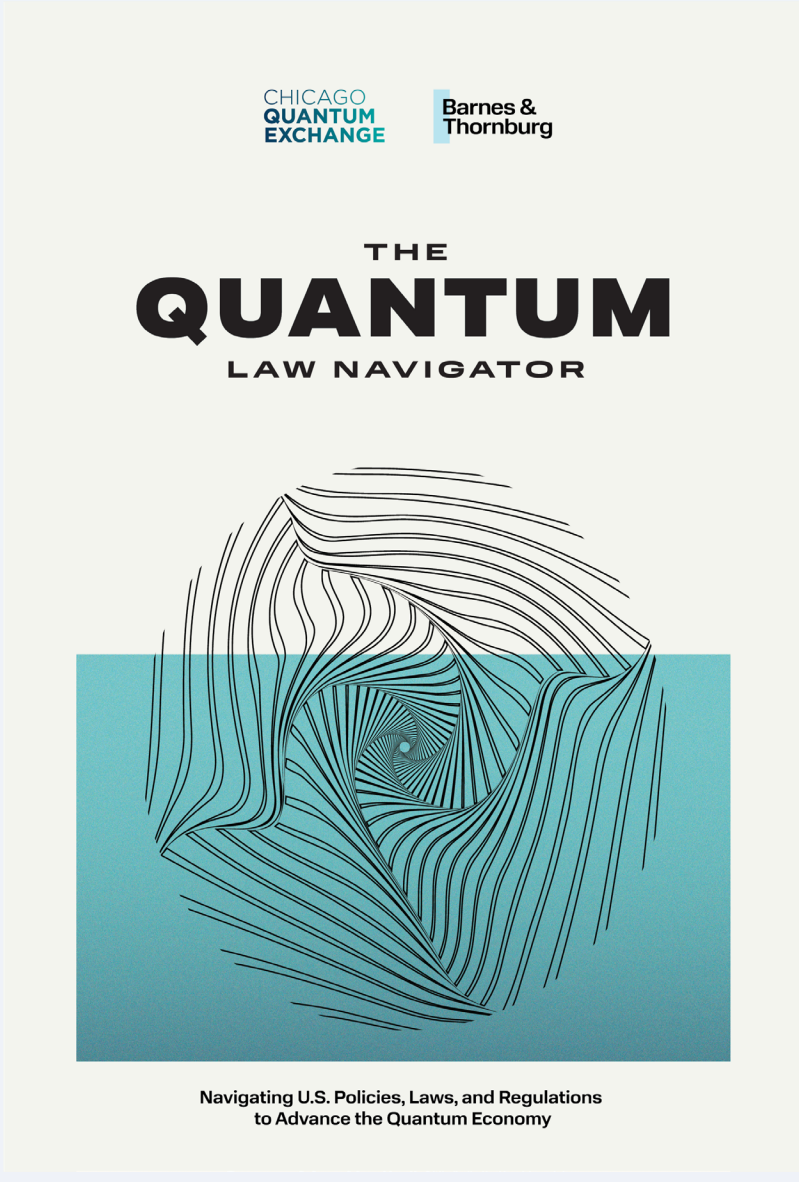
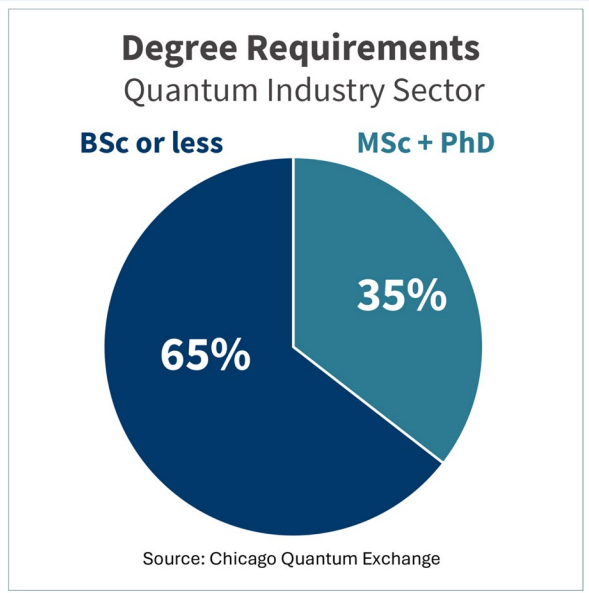
Recommendations:

1. Figure out who is tracking what and how that connects to quantum
2. Develop a public talk with clear takeaways and next steps to bring more folks on board
3. Celebrate success at the regional and state-wide level

Data and coordination to guide growth

Regional and globally-relevant reporting to enable strategic and informed growth

REGIONAL AND NATIONAL ANALYSES AND STRATEGIES



COMING
APRIL 2026

CHICAGO QUANTUM EXCHANGE



A unified strategy for quantum careers

Mobility II: Reduce barriers between educational stages and employment, experiential learning opportunities

- **Open Quantum Initiative** — 10-week summer QISE research fellowships for undergraduates
- **Q-Ready** — Free regional professional development to prepare students for quantum careers
- **Annual Quantum Recruiting Forum** — Annual event that connects quantum employers with talent

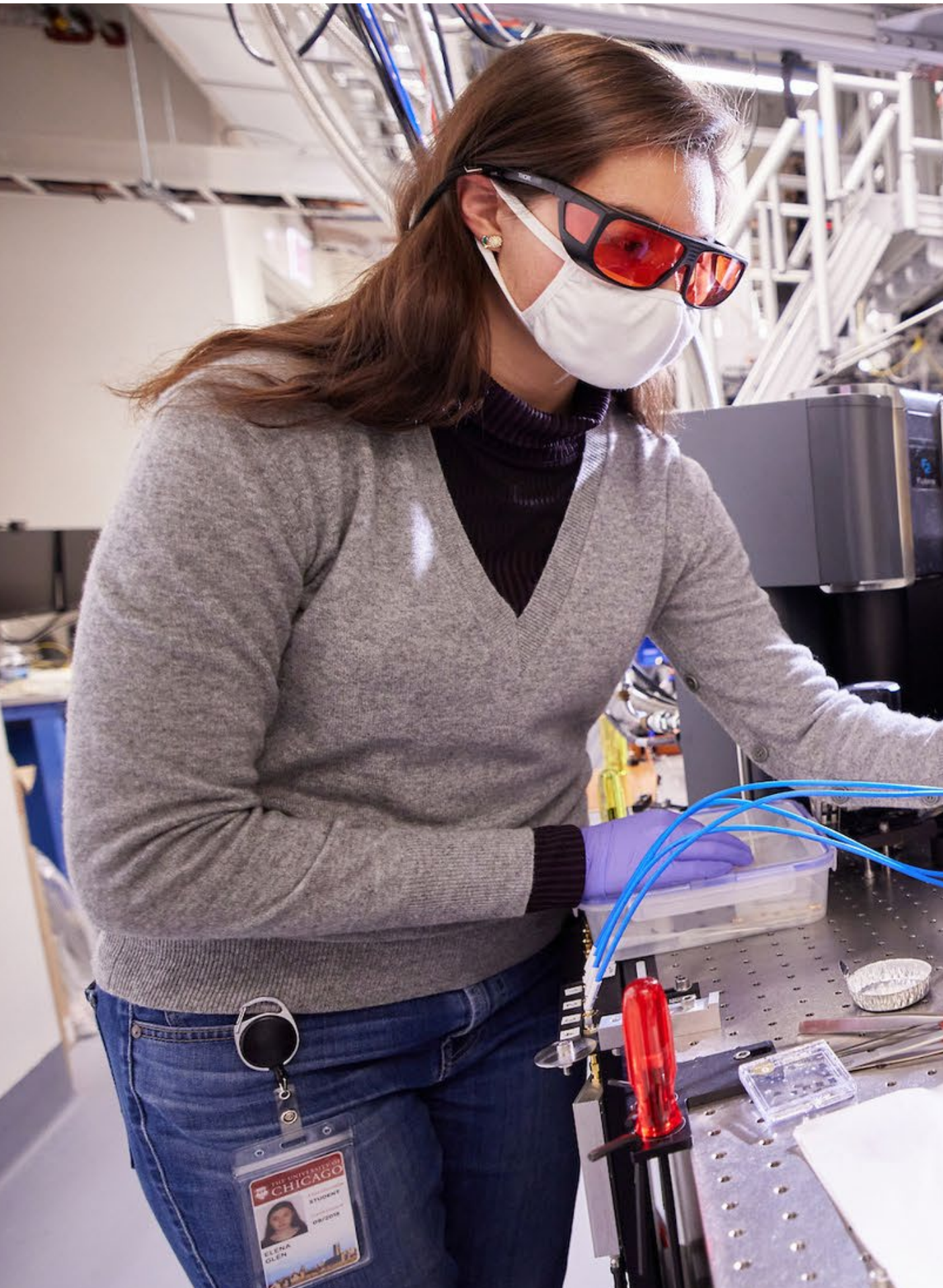
Employer Leadership: Align workforce development with industry

- **QISE-NET (2018-2023)**– 78 PhD student collaborations with industry and national labs across U.S.
- **CQE-IBM Postdocs** in computing and transduction
- **Boeing Quantum Creators**
- **Employer Collaborative lead** and design workforce initiatives to meet specific training needs

Coordination: Establish shared regional structures, data systems, and partnerships to align programs, investments, and workforce outcomes across state lines.

- **Midwest Quantum Workforce Strategy (coming April 2026)**





Working with industry to build pathways to quantum careers

Awareness: early exposure to quantum science and careers through K–12 outreach, teacher professional development, and public engagement

- LabEscape quantum escape room – University of Illinois Urbana – Champaign
- Wonders of Quantum Physics – University of Wisconsin–Madison

Preparation: Increase access to undergraduate coursework, hands-on research experiences, and shared experimental learning infrastructure

Mobility I: Reduce barriers between educational stages and employment, experiential learning opportunities

Professional Courses

- CQE Quantum Science, Networking, and Communications
- Purdue Quantum Information Science & Technology
- Purdue MicroMasters in Quantum Technology: Computing and Sensing

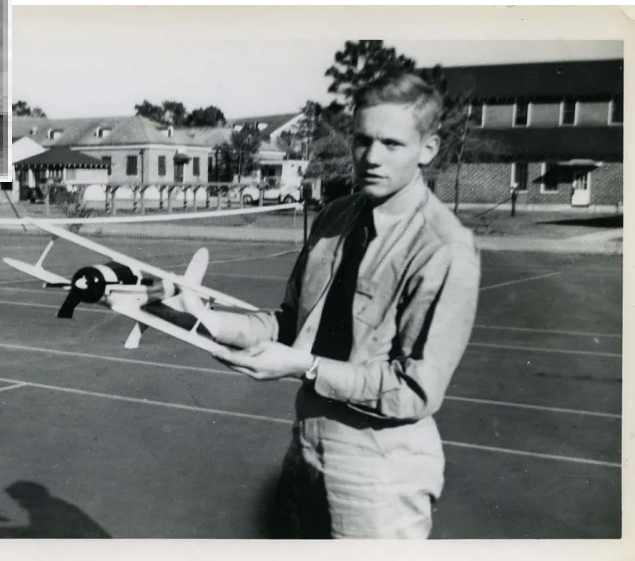
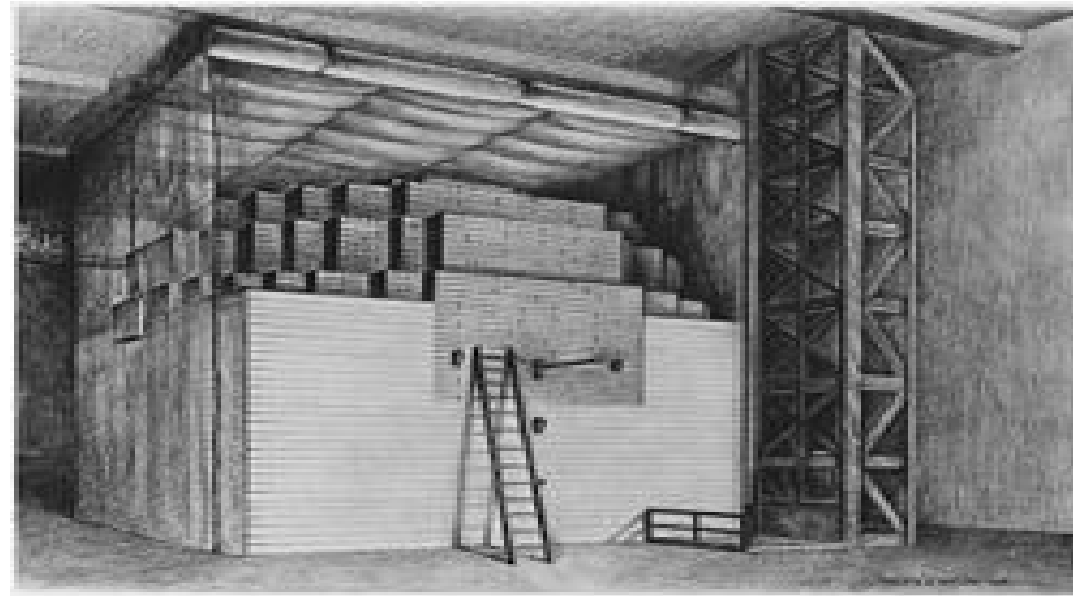
Master's Programs

- University of Wisconsin–Madison — MS Quantum Computing
- University of Chicago — MS in Quantum Engineering
- Northwestern University — MS in Electrical and Computer Engineering, specialization in Quantum Computing, Sensing and Communications

The Quantum Prairie has always had the capacity for success

A Bold History

Essential Ingredients to Grow



Research leadership, facilities, and infrastructure

STEM talent

- 60K STEM graduates annually
- Community college systems among US's largest
- High-access, high-earnings-opp. universities
- Top universities for veterans nationally and in the Midwest

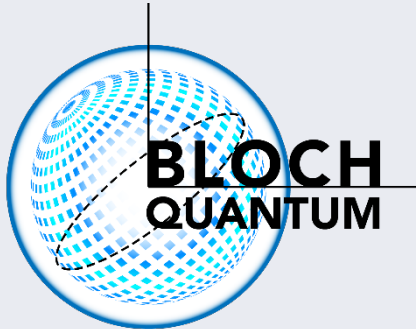
Large and diverse industry base

- Four dozen Fortune 500 companies
- IL, WI, and IN among top-10 manufacturing states

***Your ecosystem probably has these strengths**

Federal programs provide scale to build ecosystems

Leverage our full assets to advance QISE for the nation

DESIGNATION	FUNDED BY	LAUNCHED	OBJECTIVES
 NSF Regional Innovation Engines Development Award		2024	• Advance critical technologies to meet national and societal challenges • Spur regional innovation and talent • Stimulate economic growth and jobs • Advance QISE toward our diverse sectors needs for <i>secure information</i>
 US EDA-designated Tech Hub		2024	• Strengthen U.S. economic and national security • Scale assets to be globally competitive in the technologies and industries of the future • Starting with harnessing our regional strengths to <i>manufacture QISE</i>