May 2026

Index Insights

Mapping Illinois' Quantum Talent Pipeline: A Framework for Defining Quantum-Relevant Degrees and Certificates

Published by the Illinois Science and Technology Coalition in collaboration with the Chicago Quantum Exchange, Illinois EDC Economic Research Center, & Illinois Quantum & Microelectronics Park

The Challenge of Building a Workforce Around an Emerging Technology

Quantum technologies are expected to grow rapidly over the next decade, both globally and domestically. In 2024, the global quantum computing market generated approximately $4 billion in revenue,[1] and an analysis by Boston Consulting Group (BCG) for the Chicago Quantum Exchange (CQE) projected a quantum technology economic impact of up to $80 billion for the Illinois-Wisconsin-Indiana region by 2035.[2] As public and private investment accelerates, regions with strong research institutions, infrastructure, and talent pipelines can position themselves to capture a disproportionate share of this growth by drawing on a wide range of talent to advance quantum discovery, scale emerging technologies, and support the companies and supply chains that will bring them to market.

However, one of the central challenges in quantum workforce development is definitional. Quantum technologies, including computing, are highly interdisciplinary, and the education and training pathways that lead into the field are still evolving. Unlike mature industries with clearly established degree requirements and occupational categories, quantum information science and technology (QIST) does not yet have a settled taxonomy of educational pathways, job roles, or skill requirements. While early stages of quantum discovery relied primarily on a workforce trained at the doctoral level in physics, computer science, and other related STEM fields, a wider variety of roles will become increasingly available as the industry moves towards practical applications. A 2024 CQE analysis found an increasing number of positions requiring a bachelor's degree, expanding opportunities to grow Illinois' quantum workforce.[3]

This challenge is not unique to quantum. Critical and emerging technologies often develop faster than the classification systems leveraged in education and labor market data. Degree programs, certificates, occupational codes, and employer job titles rarely align perfectly with the needs of a new technology sector. As a result, regions seeking to understand their talent strengths must make careful, transparent decisions about which fields of study are relevant and why.

Quantum presents a particularly complex case because the industry includes both hardware and software needs. Quantum software roles may draw from computer science, computer engineering, mathematics, statistics, data science, and related fields. Quantum hardware roles may draw from physics, electrical engineering, materials science, mechanical engineering, chemistry, optics, cryogenics, manufacturing, precision production, and technician programs. As quantum systems scale, the range of relevant roles is expected to broaden further. For that reason, limiting counts to only programs explicitly labeled "quantum" would undercount the available workforce. At the same time, an overly broad definition could risk inflating the talent pool by including fields with limited connection to quantum computing technologies. The goal of this research is to create a disciplined middle ground: a transparent, expert-informed list of education programs that are relevant to quantum hardware and software, while acknowledging that not every graduate from these programs will enter the quantum workforce.

Framing Illinois' Quantum Potential

Illinois' QIST strength is not limited to a single institution, facility, or company. It is the result of a dense, coordinated ecosystem that connects research, education, infrastructure, commercialization, and public investment. That combination gives Illinois a practical advantage in QIST development: the state is not only advancing the science, but building the conditions needed to turn quantum technologies into companies, jobs, and long-term economic growth.

At the research level, Illinois has one of the strongest concentrations of QIST assets in the country. The state is home to major QIST research programs at the University of Chicago, the University of Illinois Urbana-Champaign, Northwestern University, and public and private institutions across the state. It additionally houses two national laboratories, Argonne National Laboratory and Fermilab, and, notably, four of the nation's 10 National Quantum Act research centers, the most of any state.

These institutions support discovery across quantum computing, sensing, communication, materials, devices, and enabling technologies. They also train students at the undergraduate, graduate, and postdoctoral levels who will help shape the next stage of the field. These institutions are also hotbeds for QIST innovation, with initiatives such as Argonne's Chain Reaction Innovations fellowship program, UChicago's Duality Accelerator for quantum-focused startups, and CQE's Founder Platform, serving as a key driver of the move from research to commercialization.

The Chicago Quantum Exchange has played a central role in building and coordinating this ecosystem. By connecting leading universities, national laboratories, industry partners, and public-sector stakeholders, and leading two federal QIST designations for the region, an Economic Development Administration Tech Hub and National Science

Foundation Regional Innovation Engines development award, CQE has helped make Illinois a hub for QIST collaboration, innovation, talent development, and unified regional strategy.[4] Its work has strengthened connections across research, education, and industry, creating a foundation for the broader workforce and commercialization efforts now accelerating across the state.

Illinois has also made a major commitment to commercialization and scale-up. The Illinois Quantum & Microelectronics Park (IQMP), being built on the former U.S. Steel South Works site on the South Side of Chicago, creates a dedicated commercialization campus for QIST and microelectronics companies. IQMP is designed to support the full path from research and prototyping to production, deployment, and supply-chain growth. That kind of dedicated commercialization site matters because QIST development requires additional activity beyond laboratory research. It will require manufacturing capabilities, specialized facilities, and component suppliers, employing not just Ph.D.-level scientists, but software developers, engineers, technicians, machinists, electronics specialists, materials workers, manufacturing professionals, and people trained in applied technical fields.

Illinois' education and workforce system becomes especially important to realize the full potential and impact of its investments in quantum technologies. The state has a large and varied postsecondary system that includes research universities, regional universities, community colleges, technical programs, and certificate pathways.

Illinois is therefore well positioned to ask a more precise workforce question: not simply whether the state has "quantum programs," but which degrees and certificates are producing the skills that can help accelerate and scale the development of quantum computing hardware and software. By mapping programs in detail, Illinois can better understand the scale of its talent base, identify gaps, and align education and training with the needs of a growing quantum industry.

This analysis builds from that advantage. It treats Illinois not only as a case study, but as a proving ground for a more rigorous way to define QIST-relevant education and training. As other states and regions work to understand their own role in the quantum economy, Illinois can establish a framework for measuring the talent pipeline behind an emerging technology.

Defining and Measuring Quantum Talent Supply

To assess the supply of quantum computing talent, this analysis focuses on postsecondary education as a primary pathway into the workforce. While the size and composition of the quantum computing workforce are influenced through multiple channels, this report only includes an analysis of educational pathways that are producing new entrants with quantum-relevant skills.

We define two broad categories of quantum computing roles:

Quantum software roles focus on designing, developing, and optimizing software for both quantum systems and applications, including roles in traditional and quantum software engineering and algorithm theorists and programmers.

Quantum hardware roles focus on tangible, hands-on work to design, develop, refine, and manufacture quantum computing technologies, as well as scaling hardware systems. Hardware roles encompass more categories of roles, including scientists, engineers, specialists, and technicians, some of which include specific expertise in sub fields (e.g., optics and photonics, nanoscale materials, cryogenics).

There are other roles within the quantum computing industry, such as emerging "bridging roles" that require knowledge of both hardware and software to support cross team communication or develop end user applications, that are not captured in this analysis but represent a potential path for further analysis of relevant educational pipelines to the quantum industry.[5] Additionally, roles focused on quantum sensing or communications, end-use applications, or business functions are not included in this analysis; estimates including those roles place Illinois' quantum talent pipeline at roughly 40,000 degrees and certificates annually.

Importantly, this report emphasizes potential talent supply rather than current employment, and therefore includes educational programs that are both tailored to specific knowledge areas very relevant to quantum computing technology, or with skills that are indirectly applicable. For example, Quantum Opus Founder and President Aaron Miller has expressed the need for individuals with educational training in Watchmaking and Jewelrymaking, who hold the skills necessary for the precision work quantum hardware technologies require, but are unlikely to be training with the intention of finding employment in the quantum field.[6] Combining both direct subject matter knowledge and indirect skills for the approach to defining the quantum computing-relevant talent pool reflects the early-stage nature of the industry, where pipelines are still developing and career pathways are not yet established.

Identifying Quantum-Relevant Programs

To operationalize this framework, the CQE and IQMP partnered with the Illinois EDC Economic Research Center (ERC) to conduct a structured review of the 2020 Classification of Instructional Programs (CIP) codes published by the National Center for Education Statistics (NCES). CIP codes provide a standardized categorization of postsecondary fields of study across U.S. institutions.

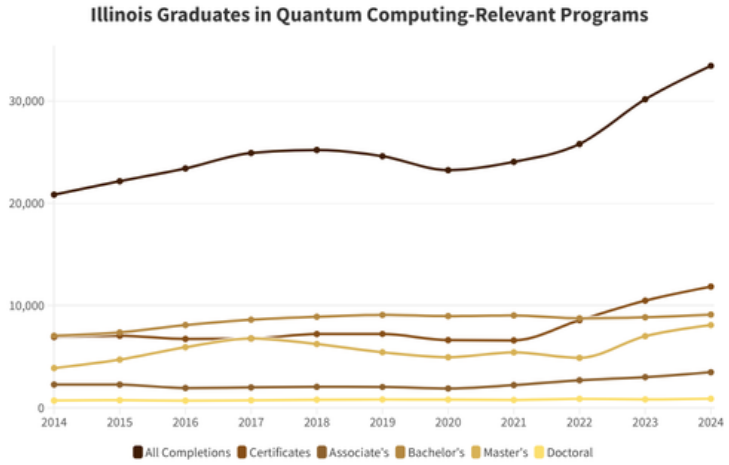
Building off the method employed in the White House's Council on Economic Advisors' (CEA) AI Talent Report,[7] which considered educational programs either directly or indirectly relevant to AI hardware or software, each 6-digit CIP code was evaluated for its relevance to quantum computing technologies based on direct or indirect relevance to quantum hardware or software roles. This was determined through the CIP code definitions and the skills and knowledge the educational programs are described to impart, in consultation with quantum computing industry experts.

Given the interdisciplinary and nascent nature of the industry, adopting a more inclusive collection of degrees and certificates relevant to quantum computing captures a broader range of educational pathways that will contribute to the quantum workforce now and in the near future. This choice of a broader definition of quantum-relevant education programs reflects both the emerging nature of the industry and the absence of dedicated quantum degree programs within the existing CIP codes.

Illinois' Quantum-Relevant Talent Pipeline

Across the 2,325 6-digit CIP codes released in 2020, we identified 171 as quantum-relevant (see Appendix A for full list), with an associated 33,441 quantum-relevant completions in Illinois in 2024. Those completions span certificates, associate's, bachelor's, master's, and doctoral degrees.

Figure 1: Illinois Graduates in Quantum Computing-Relevant Fields



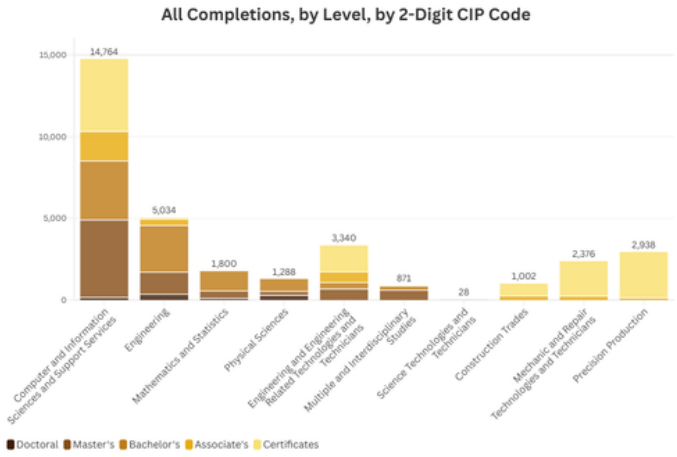
Source: Lightcast 2026
As of April 22, 2026

The 171 quantum-relevant CIP codes span ten 2-digit CIP categories:

- Computer and Information Sciences and Support Services (11)
- Engineering (14)
- Engineering/Engineering-Related Technologies/Technicians (15)
- Mathematics and Statistics (27)
- Mutli-Interdisciplinary Studies (30)
- Physical Sciences (40)
- Science Technologies/Technicians (41)
- Construction Trades (46)
- Mechanic and Repair Technologies/Technicians (47)
- Precision Production (48)

Although Engineering/Engineering-Related Technologies/Technicians contains the largest share of quantum-relevant 6-digit codes (27%), Computer and Information Sciences and Support Services dominate Illinois' completions, accounting for 14,764 in 2024, or over 44% of the state's quantum-relevant total. Engineering ranked second at 15% of 2024 completions.

Figure 2: All Completions, by Level, by 2-Digit CIP Code



Source: Lightcast 2026
As of April 22, 2026

Key Findings

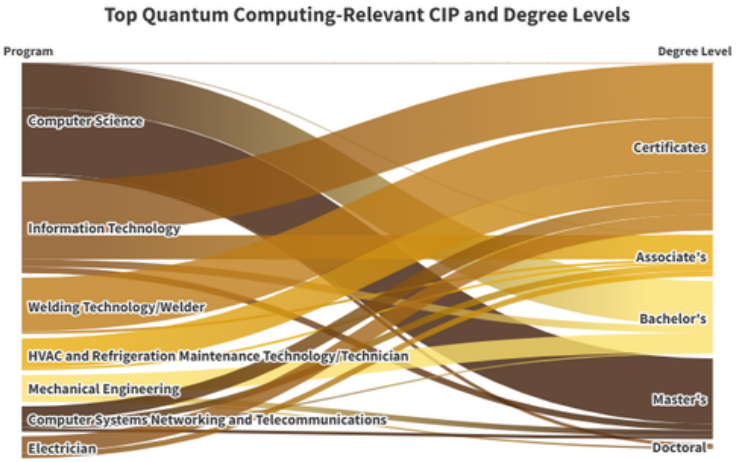
Illinois' quantum computing talent pipeline is growing.
The 33,441 degrees and certificates granted in 2024 represent a 33% increase from 2018, when the National Quantum Initiative Act was signed into law. Additionally, they represent a 60% increase over the decade since 2014. Illinois accounted for more than nearly 5% of all quantum computing-relevant program completions nationally in 2024.

Illinois is software-dominant and hardware-growing across degree levels.
Computer and Information Sciences, at the 2-digit CIP level, accounted for 44% of quantum-relevant completions in 2024, and saw explosive growth over the decade, up over 140% since 2014. This reflects the expansion of software pathways that will enable quantum computing's next stage. Hardware-relevant programs—including Engineering Technicians and Precision Production—grew more modestly, increasing 29% from 2014 to 2024, signaling a rising capacity to support quantum system manufacturing and scale-up.

Illinois' quantum computing talent is anchored by world-class institutions.
The University of Illinois Urbana-Champaign, Northwestern University, the University of Chicago, and University of Illinois Chicago combined account for the majority of Illinois' quantum-relevant completions, with multiple programs ranked nationally in engineering, computer science, physics, materials science, and quantum physics.

Quantum Computing Training by Degree

Figure 3: Top Programs by 2024 Illinois Completions by Level



Certificates

Certificate programs are a rapidly expanding entry point into the quantum computing talent pipeline, for both technician roles critical to scaling hardware systems and software roles. Certificates were the single largest source of quantum computing-relevant completions in Illinois in 2024, with nearly 12,000 awards representing 35% of the statewide total. Information Technology and Welding Technology/Welder were the two dominant programs, each producing roughly 2,500 certificates and together accounting for 42% of all relevant certificates awarded.

Growth in certificate production has been substantial over the past decade. Information Technology certificates increased dramatically from just 18 awards in 2014 to 2,475 in 2024. At the same time, hardware-relevant technician programs expanded meaningfully, with technology and technician-related CIP codes collectively adding more than 1,000 completions over the period, a 37% increase.

Associate's Degrees

Associate's degrees reinforce certificate-level trends, providing an accessible entry point to foundational technical training and a pathway to more advanced engineering or computing roles. Accounting for approximately 10% of quantum computing-relevant completions in 2024, nearly 3,500 associate's degrees were awarded statewide, an increase of 53% since 2014. As with certificates, Information

Technology served as the leading program by a wide margin. In 2024, Information Technology produced 1,105 degrees, representing 32% of all quantum-relevant associate's completions.

Hardware-oriented programs also play a significant role at this level. Electrical, Electronic, and Communications Engineering Technology/Technician (401 degrees) and Engineering, General (379 degrees) were among the largest contributors, reflecting the importance of applied engineering and technical training pathways.

Bachelor's Degrees

Bachelor's degrees were the second-largest contributor to Illinois' quantum computing-relevant talent pipeline in 2024, with more than 9,100 completions, an increase of 29% over the decade. As with certificates and bachelor's degrees, programs within the Computer and Information Sciences and Support Services 2-digit CIP category produced the largest share of completions. However, at the bachelor's level, Computer Science, rather than Information Technology, emerged as the dominant program.

In 2024, Computer Science accounted for nearly 3,000 bachelor's degrees, more than triple the next largest program, Mechanical Engineering. Engineering fields as a whole also represented a substantial share of completions, with more than 2,800 degrees awarded across key disciplines such as Mechanical Engineering (866 degrees), Computer Engineering (539 degrees), and Electrical and Electronics Engineering (460 degrees). Notably, compared to certificates and associate's degrees, bachelor's-level completions are more concentrated in traditional engineering disciplines rather than engineering technology programs.

Master's Degrees

Master's-level education is a major strength for Illinois, particularly in advanced computing fields, positioning the state as a talent pool for highly specialized talent in quantum computing-relevant software skills. Illinois produced just over 8,000 quantum computing-relevant master's degrees in 2024, nearly matching bachelor's-level output. The state is a national leader in advanced computing talent production, awarding nearly 3,000 master's degrees in Computer Science, second only to California, and reflecting a 233% increase since 2014. This single program alone exceeds the combined output of the next eleven largest quantum computing-relevant master's programs, including Industrial Technology/Technician, Computer and Information Sciences, General Engineering, and Electrical and Electronics Engineering.

Emerging fields are also reshaping the master's-level landscape. Data Science and Data Analytics, which were both introduced as distinct CIP codes for the first time in 2020, collectively produced 492 degrees in 2024. Beyond these new programs, the most significant growth over the past decade has been concentrated within the broader Computer and Information Sciences category.

Doctoral Degrees

Doctoral programs provide the specialized research talent that underpins early quantum innovation, with Illinois programs demonstrating strength in Engineering and Physical Sciences, which are essential to advancing foundational technologies. Ph.D.s made up 2.7% of the quantum computing-relevant completions in Illinois in 2024 with 895 degrees. Reflecting their specialized nature, quantum computing-relevant doctoral programs are found under four 2-digit CIP categories: Computer and Information Sciences, Engineering, Mathematics and Statistics, and Physical Sciences.

While Chemistry and Computer Science were the top individual programs by completions, the 2-digit Engineering CIP group collectively produced the largest number of doctoral degrees, with 354 graduates across 12 programs. Leading contributors included Electrical and Electronics Engineering (99 degrees), Mechanical Engineering (84 degrees), and Materials Engineering (70 degrees). Overall, doctoral completions grew by 26% between 2014 and 2024, with particularly strong gains in Materials Engineering, Computer Science, and Mechanical Engineering.

Leading Institutions

The University of Illinois Urbana-Champaign (UIUC) is Illinois' top quantum computing-relevant talent producer, with nearly 12,000 completions across all degree levels in 2024. The University of Illinois Chicago contributed an additional 3,862 completions in 2024. Northwestern University and the University of Chicago were also top quantum computing-relevant talent producers in Illinois in 2024, reflecting the depth of both public and private world-class institutions here in Illinois. In addition to producing large numbers of graduates, these institutions have nationally ranked strengths in fields central to quantum technologies. They are frequently recognized in the top 10 graduate and undergraduate programs for engineering, computer science, physics, chemistry, and materials science.

- UIUC's Grainger College of Engineering is ranked #5 nationally for undergraduate engineering and #6 for graduate engineering, with especially strong quantum computing-relevant rankings in computer engineering (#5 undergraduate and #5 graduate), electrical engineering (#5 undergraduate and #5 graduate), materials science and engineering (#5 undergraduate and #3 graduate), computer science (#7 undergraduate and #5 graduate), physics (#8 graduate), and quantum physics (#12 graduate specialty, last ranked by U.S. News in 2023).[8]

- Northwestern brings nationally recognized private research strength, including a materials science and engineering graduate program ranked #2 nationally, seven faculty ranked in the top one percent of citations in materials science and chemistry, and a #7 overall national university ranking.[9]

- The University of Chicago contributes particular strength in QIST and the physical sciences, including #7 in physics, #6 in mathematics, and #11 in chemistry graduate programs.[10] Additionally, it is the #1 U.S. institution and #6 globally for quantum physics research per the 2025 Nature Index.[11]

Among community colleges, Lincoln College of Technology–Melrose Park, College of DuPage, and Joliet Junior College led quantum-relevant completions in 2024, all in the Chicagoland area. The City Colleges of Chicago, across seven independently accredited colleges, had over 1,000 quantum-relevant completions combined in 2024—and is actively investing in that pipeline. In 2024, City Colleges of Chicago launched the Chicago School of Engineering, expanding its Engineering Access Alliance with the University of Illinois' Grainger College of Engineering. This partnership offers students a direct pathway into one of the nation's premier engineering programs, creating a critical access point for building an equitable and inclusive quantum workforce in Illinois.

Next Steps in Developing the Quantum Workforce

This research is the first of its kind within the quantum industry, illustrating the need for strategies aimed at standardizing quantum-

relevant educational pathways and supporting long-term quantum workforce development.

Firstly, this research methodology should be replicated across QIST applications with a specific focus on quantum sensing- and quantum networking-relevant subject areas. While there is likely strong overlap between these subfields, it is crucial to determine which additional CIP codes may be directly or indirectly relevant. Doing so will further enrich our understanding of the various subject areas that make up the QIST field. This can aid educators and academic institutions nationwide in preparing graduates to enter the broader quantum workforce. The analysis can also be expanded to include a targeted subset of CIP codes tied to construction training pathways that will be essential to building and maintaining Illinois' growing quantum infrastructure.

Findings will also be reviewed with institutions across the state to better understand how they are reporting relevant degrees and certificates. CIP codes provide a useful, but imperfect, measure of training capacity, particularly in fast-evolving technology areas where programs may be coded under broader or more general categories. Institutional input will be essential to developing a more accurate picture of how students are being prepared and where new or expanded programs could strengthen the state's quantum-relevant talent pipeline.

To cement this understanding of quantum subject areas, it is also necessary to review research methodology and findings with quantum ecosystems nationwide. A collaborative approach will allow for the development of a national set of quantum subjects and cohesive quantum talent pool. This framework will support the proliferation of QIST programs across educational levels nationwide.

While this work significantly contributes to our understanding of quantum computing skillsets, it also raises additional key questions: what is considered a QIST role and what must be done to prepare people for them? Together, CQE, IQMP, and Illinois EDC are continuing this research with an analysis of Standard Occupational Classification (SOC) codes, which are defined by the Bureau of Labor Statistics to define occupational categories. The team will use SOC codes to define QIST-relevant occupations, and will work to link CIP and SOC codes to understand how academic pathways align with quantum workforce needs.

As Illinois, and the nation, expands its quantum footprint, this occupational information will offer insight into where we currently have members of the workforce who have quantum-relevant skillsets, where resources can be focused towards QIST reskilling and upskilling, and where additional gaps in the quantum talent pool lie.

Ultimately, this research represents an exciting frontier for Illinois' quantum ecosystem. Due to the evolving nature of the industry, there is a unique opportunity to take a thoughtful, equity-focused approach towards building comprehensive educational pathways and implementing sustainable workforce development strategies. ISTC's upcoming STEM Talent Report will explore the current state of Illinois' STEM talent pool, STEM workforce demand, and how talent is retained within the state. It is undeniable that the QIST industry will play a pivotal role in the broader STEM ecosystem, and research like this will be crucial for our understanding of Illinois' strengths and challenges in maintaining a strong talent supply. As the industry continues to evolve technologically, so must our understanding of the strategies and resources necessary to sustain this growth. This research only marks the beginning.

References

1. Soller, H. (2025, June 23). The Year of Quantum: From concept to reality in 2025. McKinsey & Company. https://www.mckinsey.com/capabilities/tech-and-ai/our-insights/the-year-of-quantum-from-concept-to-reality-in-2025
2. Economic Impact Projections. (2024). Chicagoquantum.org. https://chicagoquantum.org/economicimpactdata
3. Fast-growing quantum tech industry has well-paid jobs — and most don't require a graduate degree. (2024, September 10). Chicagoquantum.org. https://chicagoquantum.org/news/fast-growing-quantum-tech-industry-has-well-paid-jobs-and-most-dont-require-graduate-degree
4. Advancing Together. (2026). Chicagoquantum.org. https://chicagoquantum.org/advancing-together-unified-strategy-scaling-midwest-quantum-talent
5. El-Adawy, S., R, P. A., Zwickl, B. M., & J, L. H. (2026). Profiles of Roles in the Quantum Industry. ArXiv.org. https://arxiv.org/abs/2601.04292
6. Fast-growing quantum tech industry has well-paid jobs — and most don't require a graduate degree. (2024, September 10). Chicagoquantum.org. https://chicagoquantum.org/news/fast-growing-quantum-tech-industry-has-well-paid-jobs-and-most-dont-require-graduate-degree
7. AI Talent Report | CEA | The White House. (2025, January 14). The White House. https://bidenwhitehouse.archives.gov/cea/written-materials/2025/01/14/ai-talent-report/#_ftnref6
8. Grainger. (2024). Facts & Rankings. Illinois.edu. https://grainger.illinois.edu/about/facts-and-rankings
9. Quick Facts | About | Materials Science & Engineering | Northwestern Engineering. (2026). Northwestern.edu. https://www.mccormick.northwestern.edu/materials-science/about/quick-facts.html
10. How Does University of Chicago Rank Among America's Best Graduate Schools? (2025). Usnews.com. https://www.usnews.com/best-graduate-schools/university-of-chicago-144050/overall-rankings
11. The world's top 10 institutions for quantum physics. (2025, July 10). Nature Index. https://www.nature.com/nature-index/news/ten-best-countries-for-quantum-physics-research

Appendices

Appendix A. Table of Quantum-Relevant 6-Digit CIP Codes

2-Digit Code	IPEDS Category	IPEDS Title	CIP Code
11	Computer & Information Sciences & Support Services	Computer and Information Sciences, General	11.0101
11	Computer & Information Sciences & Support Services	Artificial Intelligence	11.0102
11	Computer & Information Sciences & Support Services	Information Technology	11.0103
11	Computer & Information Sciences & Support Services	Informatics	11.0104
11	Computer & Information Sciences & Support Services	Computer and Information Sciences, Other	11.0199
11	Computer & Information Sciences & Support Services	Computer Programming/Programmer, General	11.0201
11	Computer & Information Sciences & Support Services	Computer Programming, Specific Applications	11.0202
11	Computer & Information Sciences & Support Services	Computer Programming, Vendor/Product Certification	11.0203
11	Computer & Information Sciences & Support Services	Computer Programming, Other	11.0299
11	Computer & Information Sciences & Support Services	Data Processing and Data Processing Technology/Technician	11.0301
11	Computer & Information Sciences & Support Services	Computer Systems Analysis/Analyst	11.0501
11	Computer & Information Sciences & Support Services	Computer Science	11.0701
11	Computer & Information Sciences & Support Services	Data Modeling/Warehousing and Database Administration	11.0802
11	Computer & Information Sciences & Support Services	Modeling, Virtual Environments and Simulation	11.0804
11	Computer & Information Sciences & Support Services	Computer Software and Media Applications, Other	11.0899
11	Computer & Information Sciences & Support Services	Computer Systems Networking and Telecommunications	11.0901
11	Computer & Information Sciences & Support Services	Cloud Computing	11.0902
11	Computer & Information Sciences & Support Services	Computer Systems Networking and Telecommunications, Other	11.0999
11	Computer & Information Sciences & Support Services	Network and System Administration/Administrator	11.1001
11	Computer & Information Sciences & Support Services	System, Networking, and LAN/WAN Management/Manager	11.1002
11	Computer & Information Sciences & Support Services	Computer and Information Systems Security/Auditing/Information Assurance	11.1003
11	Computer & Information Sciences & Support Services	Information Technology Project Management	11.1005

11	Computer & Information Sciences & Support Services	Computer Support Specialist	11.1006
11	Computer & Information Sciences & Support Services	Computer/Information Technology Services Administration and Management, Other	11.1099
11	Computer & Information Sciences & Support Services	Computer and Information Sciences and Support Services, Other	11.9999
14	Engineering	Engineering, General	14.0101
14	Engineering	Applied Engineering	14.0103
14	Engineering	Ceramic Sciences and Engineering	14.0601
14	Engineering	Chemical Engineering	14.0701
14	Engineering	Chemical Engineering, Other	14.0799
14	Engineering	Computer Engineering, General	14.0901
14	Engineering	Computer Hardware Engineering	14.0902
14	Engineering	Computer Software Engineering	14.0903
14	Engineering	Computer Engineering, Other	14.0999
14	Engineering	Electrical and Electronics Engineering	14.1001
14	Engineering	Laser and Optical Engineering	14.1003
14	Engineering	Telecommunications Engineering	14.1004
14	Engineering	Electrical, Electronics, and Communications Engineering, Other	14.1099
14	Engineering	Engineering Mechanics	14.1101
14	Engineering	Engineering Physics/Applied Physics	14.1201
14	Engineering	Engineering Science	14.1301
14	Engineering	Materials Engineering	14.1801
14	Engineering	Mechanical Engineering	14.1901
14	Engineering	Metallurgical Engineering	14.2001
14	Engineering	Nuclear Engineering	14.2301
14	Engineering	Systems Engineering	14.2701

14	Engineering	Industrial Engineering	14.3501
14	Engineering	Manufacturing Engineering	14.3601
14	Engineering	Operations Research	14.3701
14	Engineering	Electromechanical Engineering	14.4101
14	Engineering	Mechatronics, Robotics, and Automation Engineering	14.4201
14	Engineering	Engineering Chemistry	14.4401
14	Engineering	Electrical and Computer Engineering	14.4701
14	Engineering	Engineering, Other	14.9999
15	Engineering Technologies/Technicians	Engineering Technologies/Technicians, General	15.0000
15	Engineering Technologies/Technicians	Applied Engineering Technologies/Technicians	15.0001
15	Engineering Technologies/Technicians	Electrical, Electronic, and Communications Engineering Technology/Technician	15.0303
15	Engineering Technologies/Technicians	Laser and Optical Technology/Technician	15.0304
15	Engineering Technologies/Technicians	Telecommunications Technology/Technician	15.0305
15	Engineering Technologies/Technicians	Integrated Circuit Design Technology/Technician	15.0306
15	Engineering Technologies/Technicians	Electrical/Electronic Engineering Technologies/Technicians, Other	15.0399
15	Engineering Technologies/Technicians	Electromechanical/Electromechanical Engineering Technology/Technician	15.0403
15	Engineering Technologies/Technicians	Instrumentation Technology/Technician	15.0404
15	Engineering Technologies/Technicians	Automation Engineer Technology/Technician	15.0406
15	Engineering Technologies/Technicians	Mechatronics, Robotics, and Automation Engineering Technology/Technician	15.0407
15	Engineering Technologies/Technicians	Electromechanical Technologies/Technicians, Other	15.0499
15	Engineering Technologies/Technicians	Heating, Ventilation, Air Conditioning and Refrigeration Engineering Technology/Technician	15.0501
15	Engineering Technologies/Technicians	Metallurgical Technology/Technician	15.0611
15	Engineering Technologies/Technicians	Industrial Technology/Technician	15.0612
15	Engineering Technologies/Technicians	Manufacturing Engineering Technology/Technician	15.0613

15	Engineering Technologies/Technicians	Welding Engineering Technology/Technician	15.0614
15	Engineering Technologies/Technicians	Chemical Engineering Technology/Technician	15.0615
15	Engineering Technologies/Technicians	Semiconductor Manufacturing Technology/Technician	15.0616
15	Engineering Technologies/Technicians	Composite Materials Technology/Technician	15.0617
15	Engineering Technologies/Technicians	Industrial Production Technologies/Technicians, Other	15.0699
15	Engineering Technologies/Technicians	Occupational Safety and Health Technology/Technician	15.0701
15	Engineering Technologies/Technicians	Quality Control Technology/Technician	15.0702
15	Engineering Technologies/Technicians	Industrial Safety Technology/Technician	15.0703
15	Engineering Technologies/Technicians	Process Safety Technology/Technician	15.0705
15	Engineering Technologies/Technicians	Quality Control and Safety Technologies/Technicians, Other	15.0799
15	Engineering Technologies/Technicians	Mechanical/Mechanical Engineering Technology/Technician	15.0805
15	Engineering Technologies/Technicians	Mechanical Engineering Related Technologies/Technicians, Other	15.0899
15	Engineering Technologies/Technicians	Engineering-Related Technologies/Technicians, Other	15.1199
15	Engineering Technologies/Technicians	Computer Engineering Technology/Technician	15.1201
15	Engineering Technologies/Technicians	Computer/Computer Systems Technology/Technician	15.1202
15	Engineering Technologies/Technicians	Computer Hardware Technology/Technician	15.1203
15	Engineering Technologies/Technicians	Computer Software Technology/Technician	15.1204
15	Engineering Technologies/Technicians	Computer Engineering Technologies/Technicians, Other	15.1299
15	Engineering Technologies/Technicians	Drafting and Design Technology/Technician, General	15.1301
15	Engineering Technologies/Technicians	CAD/CADD Drafting and/or Design Technology/Technician	15.1302
15	Engineering Technologies/Technicians	Electrical/Electronics Drafting and Electrical/Electronics CAD/CADD	15.1305
15	Engineering Technologies/Technicians	Mechanical Drafting and Mechanical Drafting CAD/CADD	15.1306
15	Engineering Technologies/Technicians	3-D Modeling and Design Technology/Technician	15.1307
15	Engineering Technologies/Technicians	Drafting/Design Engineering Technologies/Technicians, Other	15.1399

15	Engineering Technologies/Technicians	Nuclear Engineering Technology/Technician	15.1401
15	Engineering Technologies/Technicians	Engineering/Industrial Management	15.1501
15	Engineering Technologies/Technicians	Engineering Design	15.1502
15	Engineering Technologies/Technicians	Packaging Science	15.1503
15	Engineering Technologies/Technicians	Engineering-Related Fields, Other	15.1599
15	Engineering Technologies/Technicians	Nanotechnology	15.1601
15	Engineering Technologies/Technicians	Engineering/Engineering-Related Technologies/Technicians, Other	15.9999
27	Mathematics & Statistics	Mathematics, General	27.0101
27	Mathematics & Statistics	Algebra and Number Theory	27.0102
27	Mathematics & Statistics	Analysis and Functional Analysis	27.0103
27	Mathematics & Statistics	Geometry/Geometric Analysis	27.0104
27	Mathematics & Statistics	Topology and Foundations	27.0105
27	Mathematics & Statistics	Mathematics, Other	27.0199
27	Mathematics & Statistics	Applied Mathematics, General	27.0301
27	Mathematics & Statistics	Computational Mathematics	27.0303
27	Mathematics & Statistics	Computational and Applied Mathematics	27.0304
27	Mathematics & Statistics	Applied Mathematics, Other	27.0399
27	Mathematics & Statistics	Statistics, General	27.0501
27	Mathematics & Statistics	Mathematical Statistics and Probability	27.0502
27	Mathematics & Statistics	Mathematics and Statistics	27.0503
27	Mathematics & Statistics	Statistics, Other	27.0599
27	Mathematics & Statistics	Applied Statistics, General	27.0601
27	Mathematics & Statistics	Mathematics and Statistics, Other	27.9999
30	Multi/Interdisciplinary Studies	Mathematics and Computer Science	30.0801
30	Multi/Interdisciplinary Studies	Computational Science	30.3001

30	Multi/Interdisciplinary Studies	Data Science, General	30.7001
30	Multi/Interdisciplinary Studies	Data Science, Other	30.7099
30	Multi/Interdisciplinary Studies	Data Analytics, General	30.7101
30	Multi/Interdisciplinary Studies	Data Analytics, Other	30.7199
40	Physical Sciences	Physical Sciences, General	40.0101
40	Physical Sciences	Chemistry, General	40.0501
40	Physical Sciences	Analytical Chemistry	40.0502
40	Physical Sciences	Inorganic Chemistry	40.0503
40	Physical Sciences	Physical Chemistry	40.0506
40	Physical Sciences	Chemical Physics	40.0508
40	Physical Sciences	Theoretical Chemistry	40.0511
40	Physical Sciences	Chemistry, Other	40.0599
40	Physical Sciences	Physics, General	40.0801
40	Physical Sciences	Atomic/Molecular Physics	40.0802
40	Physical Sciences	Elementary Particle Physics	40.0804
40	Physical Sciences	Nuclear Physics	40.0806
40	Physical Sciences	Optics/Optical Sciences	40.0807
40	Physical Sciences	Condensed Matter and Materials Physics	40.0808
40	Physical Sciences	Theoretical and Mathematical Physics	40.0810
40	Physical Sciences	Physics, Other	40.0899
40	Physical Sciences	Materials Science	40.1001
40	Physical Sciences	Materials Chemistry	40.1002
40	Physical Sciences	Materials Sciences, Other	40.1099
40	Physical Sciences	Physics and Astronomy	40.1101
40	Physical Sciences	Physical Sciences, Other	40.9999
41	Science Technologies/Technicians	Science Technologies/Technicians, General	41.0000

41	Science Technologies/Technicians	Nuclear/Nuclear Power Technology/Technician	41.0205
41	Science Technologies/Technicians	Chemical Technology/Technician	41.0301
41	Science Technologies/Technicians	Chemical Process Technology	41.0303
41	Science Technologies/Technicians	Physical Science Technologies/Technicians, Other	41.0399
41	Science Technologies/Technicians	Science Technologies/Technicians, Other	41.9999
46	Construction Trades	Electrician	46.0302
47	Mechanic & Repair Technologies/Technicians	Mechanics and Repairers, General	47.0000
47	Mechanic & Repair Technologies/Technicians	Electrical/Electronics Equipment Installation and Repair Technology/Technician, General	47.0101
47	Mechanic & Repair Technologies/Technicians	Computer Installation and Repair Technology/Technician	47.0104
47	Mechanic & Repair Technologies/Technicians	Industrial Electronics Technology/Technician	47.0105
47	Mechanic & Repair Technologies/Technicians	Electrical/Electronics Maintenance and Repair Technologies/Technicians, Other	47.0199
47	Mechanic & Repair Technologies/Technicians	Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician	47.0201
47	Mechanic & Repair Technologies/Technicians	Industrial Mechanics and Maintenance Technology/Technician	47.0303
47	Mechanic & Repair Technologies/Technicians	Watchmaking and Jewelrymaking	47.0408
47	Mechanic & Repair Technologies/Technicians	Precision Systems Maintenance and Repair Technologies/Technicians, Other	47.0499
47	Mechanic & Repair Technologies/Technicians	Mechanic and Repair Technologies/Technicians, Other	47.9999
48	Precision Production	Precision Production Trades, General	48.0000
48	Precision Production	Machine Tool Technology/Machinist	48.0501
48	Precision Production	Machine Shop Technology/Assistant	48.0503
48	Precision Production	Sheet Metal Technology/Sheetworking	48.0506
48	Precision Production	Tool and Die Technology/Technician	48.0507
48	Precision Production	Welding Technology/Welder	48.0508
48	Precision Production	Computer Numerically Controlled (CNC) Machinist Technology/CNC Machinist	48.0510
48	Precision Production	Metal Fabricator	48.0511
48	Precision Production	Precision Metal Working, Other	48.0599
48	Precision Production	Precision Production, Other	48.9999

Appendix B. Table of Quantum Construction-Relevant 6-Digit CIP Codes

2-Digit Code	IPEDS Category	IPEDS Title	CIP Code
14	Engineering	Architectural Engineering	14.0401
14	Engineering	Civil Engineering, General	14.0801
14	Engineering	Structural Engineering	14.0803
14	Engineering	Water Resources Engineering	14.0805
14	Engineering	Civil Engineering, Other	14.0899
14	Engineering	Construction Engineering	14.3301
14	Engineering	Power Plant Engineering	14.4802
15	Engineering Technologies/Technicians	Architectural Engineering Technologies/Technicians	15.0101
15	Engineering Technologies/Technicians	Civil Engineering Technologies/Technicians	15.0201
15	Engineering Technologies/Technicians	Water Quality and Wastewater Treatment Management and Recycling Technology/Technician	15.0506
15	Engineering Technologies/Technicians	Architectural Drafting and Architectural CAD/CADD	15.1303
15	Engineering Technologies/Technicians	Civil Drafting and Civil Engineering CAD/CADD	15.1304
46	Construction Trades	Building/Property Maintenance	46.0401
46	Construction Trades	Insulator	46.0414
46	Construction Trades	Pipefitting/Pipefitter and Sprinkler Fitter	46.0502
46	Construction Trades	Plumbing Technology/Plumber	46.0503
47	Mechanic & Repair Technologies/Technicians	Mechanics and Repairers, General	47.0000
47	Mechanic & Repair Technologies/Technicians	Security System Installation, Repair, and Inspection Technology/Technician	47.011
11	Computer & Information Sciences & Support Services	Network and System Administration/Administrator	11.1001
11	Computer & Information Sciences & Support Services	System, Networking, and LAN/WAN Management/Manager	11.1002
11	Computer & Information Sciences & Support Services	Computer and Information Systems Security/Auditing/Information Assurance	11.1003
11	Computer & Information Sciences & Support Services	Information Technology Project Management	11.1005

PROJECT LEAD

Kaday Kamara

SPECIAL THANKS TO THE FOLLOWING CONTRIBUTORS

Emily Easton
Robin Ficke
Kate Lindgren
Andrew Lytle
Nicholas Kowalski
Amy Wu

THIS INDEX INSIGHT IS PRESENTED IN PARTNERSHIP WITH:

CHICAGO QUANTUM EXCHANGE

ECONOMIC RESEARCH CENTER
ILLINOIS ECONOMIC DEVELOPMENT CORPORATION

IQMP
Illinois Quantum & Microelectronics Park

ILLINOIS SCIENCE & TECHNOLOGY COALITION

@ISTCOALITION

WWW.ISTCOALITION.ORG