

INCLUSIVE INNOVATION IN THE SCIENCES

A BLUEPRINT FOR
INVESTMENT + IMPACT

JUNE 2022

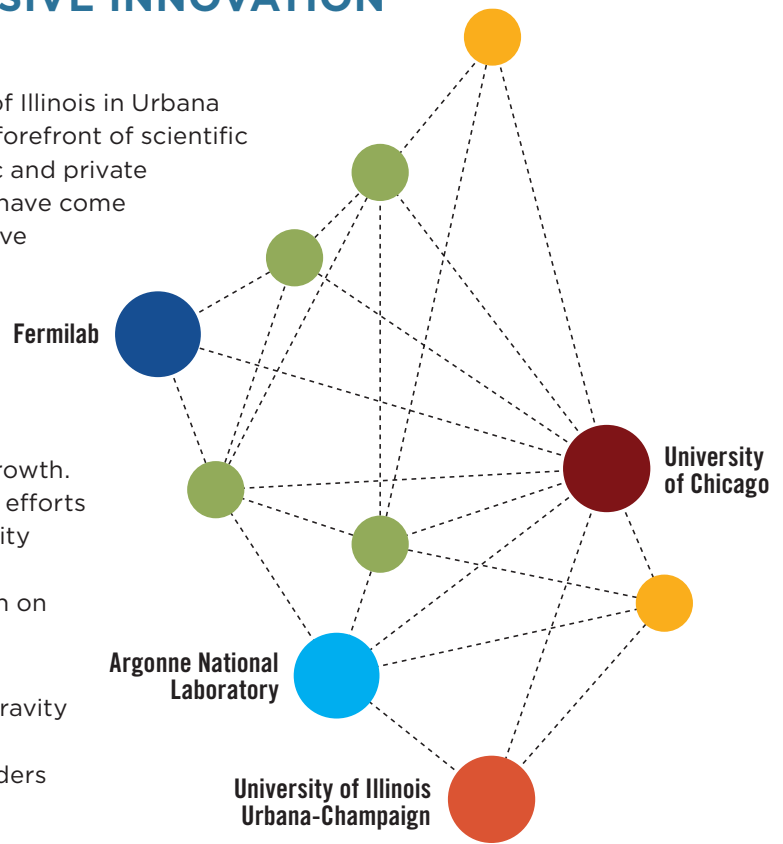


THE PARTNERSHIP FOR INCLUSIVE INNOVATION

The University of Chicago (UChicago), the University of Illinois in Urbana Champaign (UIUC), Argonne, and Fermilab are at the forefront of scientific research and engineering. Representing leading public and private academic institutions and national labs, these entities have come together to advance a shared vision to catalyze inclusive innovation through increased investment on Chicago's South Side.

The Partnership for Inclusive Innovation will leverage research, education, and commercialization assets coupled with a shared commitment to diversity and inclusion to catalyze and anchor inclusive economic growth. This new partnership builds upon a foundation of joint efforts in the sciences, engineering, technology, and community engagements to support business diversity, youth entrepreneurship, STEM education, and urban research on Chicago's South Side.

Together the Partnership represents a new center of gravity for building the talented, diverse pipeline of scientists, technologists, educators, early adopters, and civic leaders needed to enable a sustainable innovation economy.



In 5 years, the South Side of Chicago will be an Inclusive Innovation hub, a diverse talent pipeline, and a working model for equitable economic growth catalyzed by science and engineering.



WHAT IS INCLUSIVE INNOVATION?

Inclusive innovation can be defined as the full participation of underrepresented and under-resourced communities in the creation, development, and implementation of a new product, process, or service. For research universities, inclusive innovation supports equitable economic growth by aligning place-based investments in science and engineering with institutional commitments to diversity, equity, and inclusion.

Inclusive innovation provides an opportunity to respond to educational and economic disparities in new ways. A generation focused on STEM education alone has not significantly increased Black and Hispanic workers' representation in science and technology fields.¹ Similarly, traditional models for economic development have often resulted in limited wealth creation for the residents and businesses in under-resourced communities.²

Both research and practice inform the following guiding principles of the Partnership:

- Robust and sustained community engagement is paramount to building trust and actionable partnerships.
- Community knowledge and interests inform research and its applications.
- Existing STEM education, employment, and economic development strategies are reviewed for inclusive program design and ability to produce inclusive outcomes.
- Efforts are documented and evaluated to measure for inclusive impact.
- Institutional commitments to diversity, equity and inclusion are aligned, strengthened, and sustained in conjunction with commitments to scientific research and education.

Diversity refers to the representation of people who are members of racial, ethnic and gender groups or persons with disabilities that historically have been underrepresented in innovation fields including STEM.

Inclusion refers to the fostering of a culture where uniqueness of beliefs, backgrounds, talents, capabilities, and ways of living is valued to enable full participation and leveraged to support learning and informed decision making.

Research underscores that diversity and inclusion provide intellectual diversity of thought and innovative ability, and broaden the composition of talent from underrepresented communities to further strengthen the enterprise.

The Partnership will leverage the education and research mission of participating institutions, as well as UChicago's anchor role on the city's South Side, to demonstrate inclusive innovation as an actionable and achievable goal. The *Blueprint for Inclusive Innovation in the Sciences* lays out a collaborative approach to building a robust ecosystem able to generate a diverse talent pipeline and serve as a working model for equitable economic growth on Chicago's South Side.

As institutions committed to diversity and inclusion, rigorous inquiry, and educational excellence, this *Blueprint for Inclusive Innovation in the Sciences* reflects a new vision for innovation in educational equity and economic development on Chicago's South Side that can serve as a model for other regions and globally.

1 [STEM Jobs See Uneven Progress in Increasing Gender, Racial and Ethnic Diversity](#). For the purposes of this Blueprint, Census terminology will be utilized for race and ethnic communities.

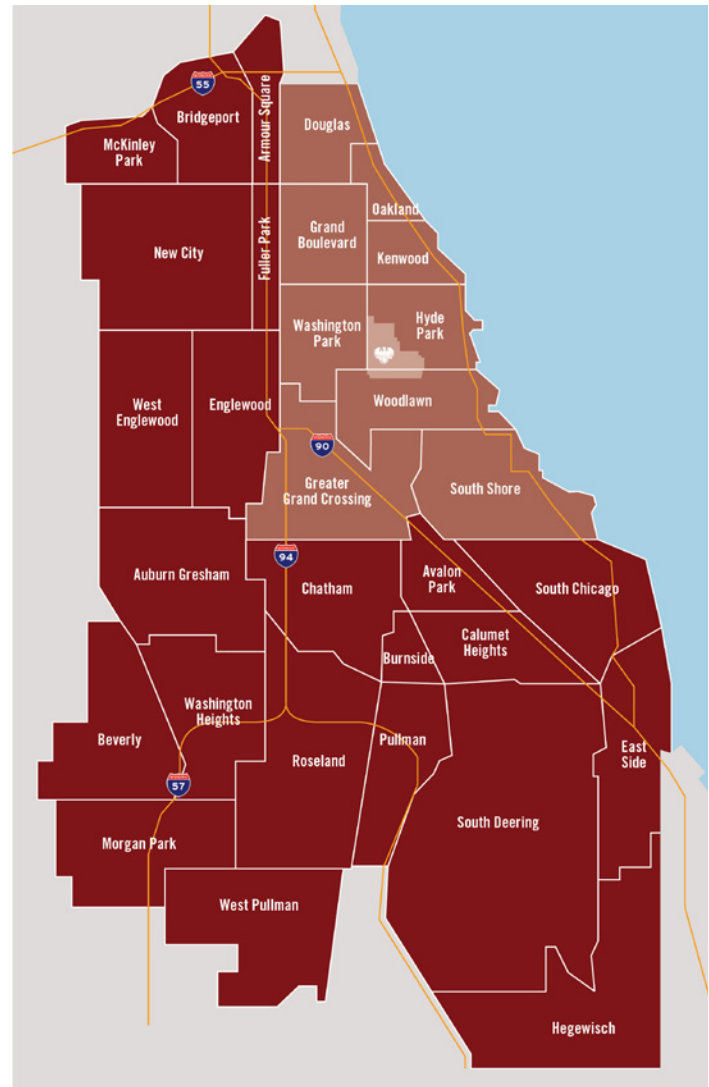
2 [Towards a New System of Community Wealth](#)

THE SOUTH SIDE ECOSYSTEM

Inclusive innovation begins with strengthening the local ecosystem to attract investment, align actions, and increase the diversity of participation in new areas of economic growth.³ For the Partnership, the commitment to create a new model for inclusive innovation begins with the communities proximate to UChicago's Hyde Park campus on the city's South Side.⁴

The South Side has a rich history and a growing economic future. According to 2019 data, the South Side is almost 80% Black, with a growing Hispanic population. The area has a sizable youth population, strong entrepreneurial supports, and active civic networks.

Alongside these strengths are persistent challenges. Unemployment stands at 21% (more than twice the statewide average). The economic disparities on the South Side are the results of persistent inequities in education, employment, and wealth creation opportunities. The city of Chicago poverty rate is 19%. All nine communities, inclusive of Hyde Park, most proximate to UChicago's campus have higher poverty rates, ranging from 22% in Kenwood to more than double the city's rate in Washington Park (44%).⁵ The impacts of racial and economic inequality are complex and interconnected, and have a deep connection to geography. As a result, anchor institutions have a distinct relationship and set of assets to contribute to increasing inclusive economic growth.



3 See [Assessing Chicago's Small Business Ecosystem: Pathways to Improved Coordination, Inclusive Growth, and Shared Prosperity and Prototyping Equity: Local Strategies for a More Inclusive Innovation Economy](#)

4 See map and defined South Side region attached in appendix of document.

5 University of Chicago Medicine Community Health Needs Assessment 2019

A SHARED FRAMEWORK FOR ACTION

The work of the Partnership will be guided by one bold vision and four strategies that can be adapted by members of the Partnership to inform planning for institutional priorities in the sciences. place-based planning in areas of institutional priorities in the sciences. These four strategies reflect the fundamentals—building strong partnerships, improving education, and providing jobs and business opportunities. The framework integrates these fundamentals to better contribute to more inclusive economic growth on the South Side.

- **STEM Education:** Increase education initiatives that strengthen the STEM ecosystem and connect to career pathways.
- **Employment:** Create internships, fellowships, and apprenticeships to support career pathways in science, technology, engineering, and community economic development.
- **Economic Development:** Leverage new developments in science and engineering to achieve inclusive economic investment opportunities, MBE/WBE⁶ business growth, and community wealth creation.
- **Civic Infrastructure:** Build multi-sector collaborations that enable full participation in scientific discovery and investment on the South Side.

These four strategic areas will help guide institutional and stakeholder engagement, long-range planning, resource alignment, and early implementation. The Partnership will apply this framework across four shared vectors of engagement in the sciences. These include:



**Quantum Information Sciences
& Engineering (QISE)**
Activated in 2020



Data Science/AI
Activated in 2021



Climate/Clean Energy
In Progress - 2022

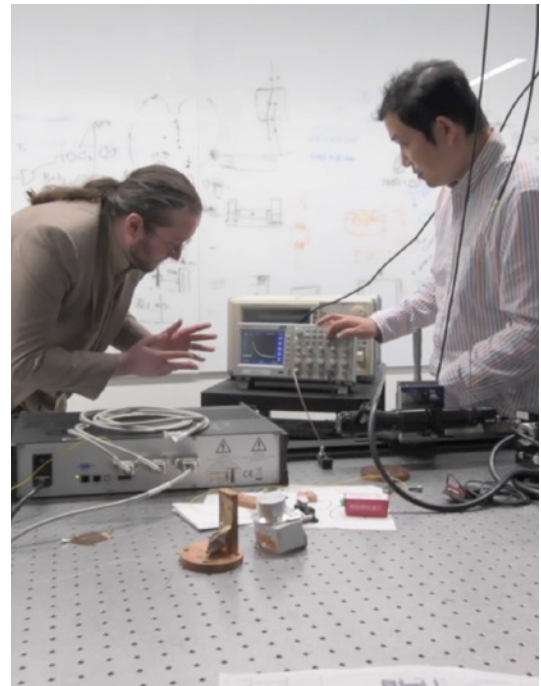


Biotech/Bio Engineering
Future Opportunities

6 Minority Business Enterprise/Woman Business Enterprise

A shared framework for inclusive innovation, applied across different scientific domains, enables other actors in the ecosystem to connect and coordinate programs designed with and for South Side communities. The Partnership also aims to forge multi-sector collaborations and leverage new investments that anchor the South Side in other regional economic growth efforts. These four scientific areas represent a significant amount of investment and potential for job creation and innovation in the future. The Partnership has an opportunity to land these opportunities in our region, in our city, and specifically on the South Side. As a coalition of partners, we have an opportunity to create significant education and workforce pipelines into these fields and Partnership institutions have already accelerated substantive research and development across some of these domains, including QISE and Data Science and Artificial Intelligence.

Moving forward, the Partnership will begin these collaborations by advancing a Quantum Information Science and Engineering (QISE) implementation plan⁷ specifically, to be followed by additional implementation plans for the other strategic areas, as necessary.



With Illinois established as a national quantum leader, an implementation plan for QISE is imperative and immediate. Illinois has a unique and expansive portfolio of research, academic, and industry assets:

- The University of Chicago (UChicago) and the University of Illinois Urbana-Champaign (UIUC) boast some of the highest ranked science and engineering programs in the country.
- Two of the five U.S. Department of Energy (DOE), Office of Science National Quantum Information Science Research Centers, located at Fermi National Accelerator Laboratory and Argonne National Laboratory, are in Illinois.
- UIUC and UChicago host two of the three National Science Foundation (NSF) Quantum Leap Challenge Institutes.
- The Chicago Quantum Exchange (CQE) brings together 6 members and 35+ corporate partners with a common goal of advancing academic and industrial efforts in the science and engineering of quantum information across CQE members, partners, and our region.

Additionally, the new science and engineering facility planned for the University of Chicago's Hyde Park campus will further strengthen Illinois' distinct position as a center for QISE research, education, and innovation. This opportunity also represents a visible investment in the inclusive innovation ecosystem on the South Side.

The Partnership will leverage public and private investment to spur technological advancement, attract, retain, and promote diverse talent, and build new QISE ventures in the state of Illinois, by activating this inclusive innovation framework.

⁷ QISE Implementation Plan attached as separate document.

FOUNDING MEMBERS

UNIVERSITY OF CHICAGO

For more than 125 years, the University of Chicago has forged its own path that has led to new schools of thought and a transformative education for students, and laid the groundwork for breakthroughs across the sciences, medicine, economics, law, business, history, culture, the arts, and humanistic inquiry. Throughout its history, UChicago research has led to breakthroughs that have benefited humankind and transformed thinking in a wide range of domains, ranging from medicine, to economics, to anthropology. UChicago demonstrated the first controlled, self-sustained nuclear chain reaction, which formed the basis for the development of the first form of clean energy—nuclear energy—and led to the foundation of Argonne National Laboratory. Seventy-five years later, the University of Chicago through the UChicago Argonne, LLC continues to manage and operate Argonne National Laboratory and the Fermi Research Alliance, LLC manages the Fermi National Accelerator Laboratory on behalf of the Department of Energy.

UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN

The University of Illinois at Urbana-Champaign (UIUC) is charged by the State of Illinois to enhance the lives of citizens in Illinois, across the nation and around the world through our leadership in learning, discovery, engagement, and economic development. Since its founding in 1867, the University of Illinois at Urbana-Champaign has earned a reputation as a world-class leader in research, teaching, and public engagement. UIUC's Grainger College of Engineering is one of the top engineering programs in the world, enabling individuals to improve their quality of life through education, research, innovation, entrepreneurship, and societal engagement.

ARGONNE NATIONAL LABORATORY

Argonne is a multidisciplinary science and engineering research center, where talented scientists and engineers work together to answer the biggest questions facing humanity, from how to obtain affordable clean energy to protecting ourselves and our environment. Ever since Argonne was born out of the University of Chicago's work on the Manhattan Project in the 1940s, the goal has been to make an impact—from the atomic to the human to the global scale. The laboratory works in concert with universities, industry, and other national laboratories on questions and experiments too large for any one institution to do by itself. Through collaborations here and around the world, Argonne strives to discover new ways to develop energy innovations through science, create novel materials molecule-by-molecule, and gain a deeper understanding of our planet, our climate, and the cosmos. Surrounded by the highest concentration of top-tier research organizations in the world, Argonne leverages its Chicago-area location to extend the benefits from ANL's capabilities and resources to disadvantaged communities; advance science and technology through expanded collaborations; accelerate the transfer and adoption of technology by industry for U.S. economic prosperity; and build the workforce of the future to maintain U.S. competitiveness.

FERMILAB

At the world's leading particle physics and accelerator laboratory, Fermi National Accelerator Laboratory scientists work with international partners to solve the mysteries of matter, energy, space, and time. UChicago has served as co-contractor with the Universities Research Association for Fermilab since 2007. Fermilab works on the world's most advanced particle accelerators and digs down to the smallest building blocks of matter. Fermilab probes the farthest reaches of the universe, seeking out the nature of dark matter and dark energy. Fermilab's 1,750 employees include scientists and engineers from all around the world. Fermilab collaborates with more than 50 countries on physics experiments based in the United States and elsewhere. Fermilab's 6,800-acre site is located in Batavia, Illinois, and is managed by the Fermi Research Alliance (FRA) LLC for the U.S. Department of Energy Office of Science. FRA is a partnership of the University of Chicago and Universities Research Association Inc., a consortium of 89 research universities.

THE PARTNERSHIP FOR INCLUSIVE INNOVATION

QUANTUM INFORMATION SCIENCE & ENGINEERING IMPLEMENTATION PLAN

JUNE 2022



CONTEXT

Quantum Information Science and Engineering (QISE) is one of four inclusive innovation strategic vectors of engagement in the sciences. As a national quantum leader, Illinois has a unique and expansive portfolio of research, academic, and industry assets:

- The University of Chicago (UChicago) and the University of Illinois Urbana-Champaign (UIUC) boast some of the highest ranked science and engineering programs in the country.
- Two of the five U.S. Department of Energy (DOE), National Quantum Information Science Research Centers, located at Fermi National Accelerator Laboratory and Argonne National Laboratory, are in Illinois.
- UIUC and UChicago host two of the nation's five National Science Foundation (NSF) Quantum Leap Challenge Institutes.
- The Chicago Quantum Exchange (CQE) brings together 6 members and 35+ corporate partners together with a common goal of advancing academic and industrial efforts in the science and engineering of quantum information across CQE members, partners, and our region.

These assets establish Illinois as a unique region for advancing a successful inclusion framework that enables each of the Partner organizations to advance their own respective commitments. By participating in the inclusive innovation ecosystem, for example, the National Laboratories advance the mission of their respective DOE Quantum Information Science Research Centers, through commitments to workforce development, thereby contributing to the Illinois regional ecosystem and by mutually reinforcing the priorities of their centers.

Most immediately, the new science and engineering facility planned for the University of Chicago's Hyde Park campus will further strengthen Illinois' distinct position and will represent a visible investment in the inclusive innovation ecosystem on the South Side.

The Partnership will leverage public and private investment to spur technological advancement, attract, retain, and promote diverse talent, and build new QISE ventures in the state of Illinois, by activating **the inclusive innovation framework which includes four strategies:**

- **STEM Education:** Increase education initiatives that strengthen the STEM ecosystem and connect to career pathways.
- **Employment:** Create internships, fellowships, and apprenticeships to support career pathways in STEM and community economic development.
- **Economic Development:** Leverage new developments for science and engineering to achieve inclusive economic investment opportunities, MBE/WBE business growth, and community wealth creation.
- **Civic Infrastructure:** Build multi-sector collaborations that enable full participation in scientific discovery and investment on the South Side.

WHY QUANTUM SCIENCE?

The emerging field of Quantum Information Science and Engineering is focused on developing new ways of understanding and applying the laws of quantum mechanics. QISE opens new ways to collect and process information and challenges the current limitations of traditional computing, sensing, and communication. The development of quantum technologies over the past two decades has relied on contributions from physics, computer science, mathematics, materials science, chemistry, and engineering. Currently, experts in QISE from industry, government, and academia are working to develop powerful new types of computers, ultra-sensitive detectors, “hack-proof” communication, and the supply chain to support this future market. More broadly, QISE may provide a set of foundational technologies that will integrate with current computing and information infrastructure, leading to new science and innovation.

It is estimated that the market for quantum computing alone will grow to \$65 billion by 2030. A recent Boston Consulting Group report estimated quantum computing will make an \$850 billion impact in the next decade. QISE provides once-in-a-generation opportunities for Illinois to leverage its distinct advantages in this growing field to catalyze economic growth. It also challenges academic institutions to respond in new ways to the national ‘grand challenge’ to increase diversity in science and technology fields.

A catalyst for research activity across its member and partner institutions, the Chicago Quantum Exchange (CQE) is based at the University of Chicago and is anchored by the U.S. Department of Energy’s Argonne National Laboratory and Fermi National Accelerator Laboratory, the University of Illinois Urbana-Champaign, the University of Wisconsin-Madison, and Northwestern University. The CQE convenes leading academic researchers, top scientific facilities, and the most innovative industry partners in the world to advance the science and engineering of quantum information, train the next generation of quantum scientists and engineers, and drive the quantum economy. The CQE facilitates interactions between member institutions and partners and provides an avenue for collaborations, joint projects, and information exchange.

IMPLEMENTATION STRATEGIES & INITIATIVES

Through a series of planning meetings and information sessions across partner institutions and with South Side stakeholders, the Partnership generated a core set of initiatives to advance inclusive innovation in QISE. These initiatives share the following criteria:

- Designed to engage and positively impact South Side communities and residents.
- Evidence-based and/or innovative program design with capacity to track participants and be evaluated over time.
- Inclusion of science education standards for STEM education programs.
- Prioritization of businesses located on the South Side and owned by minority, women, or residents of the South Side for entrepreneurship services.
- Resources committed, or planned, to sustain programs for Phase 1.

This implementation plan does not reflect all STEM education, employment, or economic development activities of the Partnership members, but serves as a model for how research institutions can activate their innovation capabilities towards a common and urgent need for diversification in STEM fields.

STRATEGY 1: INCREASE STEM AND QISE EDUCATION INITIATIVES THAT STRENGTHEN THE STEM ECOSYSTEM AND CONNECT TO CAREER PATHWAYS.

The Partnership will strategically increase STEM and QISE education initiatives that support in-school and out-of-school learning that is experiential and sequential. We will further focus on building year-round partnerships at the school and neighborhood-level and help connect students to aligned internship and career pathway opportunities building on the UIUC CISTEME 365 model.¹ We will incorporate quantum information science and engineering awareness into STEM programs, which is critical for inspiring young students and engaging teachers, parents, and communities.

STEM EDUCATION INITIATIVES

<p>Provide 30 South Side CPS educators professional development to strengthen STEM and introduce QISE into the curriculum through initiatives like Quantum Leap Challenge Institute for HQAN (Hybrid Quantum Architectures and Networks).</p> <ul style="list-style-type: none"> • Lead units: Program Leads across Partnership Institutions • Status: In Progress - scaled • Initiative Type: Program • Contingent on Funding (Y/N): Yes • Funding Need: [TBD] • Kickoff Year: Year 1
<p>Provide 2100 South Side CPS students participation in STEM education and QISE in-school and out-of-school education and career exploration programs.</p> <ul style="list-style-type: none"> • Lead units: [new infrastructure, coordination by UChicago OCE + EVP/Science Strategy] + academic/outreach staff across partner units • Status: In Progress- scaled • Initiative Type: Program • Contingent on Funding (Y/N): Yes • Funding Need: [TBD] • Kickoff Year: Ongoing
<p>Expand UIUC’s IQUIST and Catalyzing Inclusive STEM Experience All Year Round (CISTEME365) cohort model for enriched student STEM education and connectivity to career counseling in STEM fields to 10 schools.</p> <ul style="list-style-type: none"> • Lead units: UIUC • Status: In Progress - scaled • Initiative Type: Program • Contingent on Funding (Y/N): Yes • Funding Need: [TBD] • Kickoff Year: Year 1
<p>Provide 400 CPS educators with Quantum-adjacent STEM enrichment opportunities.</p> <ul style="list-style-type: none"> • Lead units: Program Leads across Partnership Institutions • Status: In Progress - scaled • Initiative Type: Program • Contingent on Funding (Y/N): Yes • Funding Need: [TBD] • Kickoff Year: Year 1

¹ [CISTEME 365: Catalyzing Inclusive STEM Experiences All Year Round](#)

STEM EDUCATION INITIATIVES

Expand UIUC's IDEA Institute and other inclusive pedagogy programming, network, and training opportunities to provide training, program, and evaluation support to Partnership faculty and staff.

- **Lead units:** UIUC - Grainger School of Engineering
- **Status:** Existing - scaled
- **Initiative Type:** Program
- **Contingent on Funding (Y/N):** Yes
- **Funding Need:** [TBD]
- **Kickoff Year:** Year 1

STRATEGY 2: CREATE INTERNSHIPS, FELLOWSHIPS, AND APPRENTICESHIPS THAT CONNECT TO NEAR-TERM AND LONG-TERM CAREERS IN QISE.

Preparing a quantum workforce requires education and training partnerships that provide sequential STEM curriculum, as well as retooling and retraining workers that are both low and high-skilled to build an inclusive workforce for this growing field. The Partnership will increase coordination to enable more aligned talent acquisition and career pathways within its member institutions and connected to industry partners in QISE and quantum-adjacent fields like Computer Science/Data Science, and Biological/Health Sciences.

EMPLOYMENT INITIATIVES

Increase South Side applications to and matriculation from QISE certification programs and replicate the certificate model to develop a potentially new QISE technician program for workers with Associate or Bachelor's Degrees.

- **Lead units:** UChicago CQE + OCE
- **Status:** Existing - scaled
- **Initiative Type:** Program
- **Contingent on Funding (Y/N):** Yes
- **Funding Need:** [TBD - needed for student stipends/scholarships]
- **Kickoff Year:** Year 0

Hire 50 graduates (from underrepresented/minoritized population) from QISE and aligned STEM (i.e., Data Science/AI, Computer Science) education to career programs for employment within Partnership institutions.

- **Lead units:** Partnership Institutions
- **Status:** NEW
- **Initiative Type:** Partnership
- **Contingent on Funding (Y/N):** Yes
- **Funding Need:** N/A
- **Kickoff Year:** Year 1

Provide 100 QISE and aligned STEM internships for high school and young adults 16 - 20 years of age within Partnership institutions.

- **Lead units:** UChicago OCE
- **Details:** Building on the Youth Internship Program (at UChicago) and increasing opportunities for high school+ internship opportunities
- **Status:** Ongoing
- **Initiative Type:** Program
- **Contingent on Funding (Y/N):** Yes
- **Funding Need:** Current funding \$250k for FY22 for small number of STEM placements; additional funding and strategic realignment needed to bridge goal
- **Kickoff Year:** Year 0

EMPLOYMENT INITIATIVES

Convene relevant industry partners, workforce agencies, and academic units, to develop QISE training programs and workforce initiatives, aimed at increasing participation, recruitment, and retention of South Side community members.

- **Lead units:** UChicago CQE + Partner Institutions + Industry Partners
- **Status:** NEW
- **Initiative Type:** Program
- **Contingent on Funding (Y/N):** Yes
- **Funding Need:** [TBD]
- **Kickoff Year:** Year 2

In partnership with UChicago's Pritzker School for Molecular Engineering, develop concept for a South Side, skills-based workforce training facility for hands-on learning, teaching, and design, aimed at developing foundational skills necessary for career transition into engineering and applied sciences.

- **Lead units:** UChicago PME, CREO, OCE
- **Status:** NEW
- **Initiative Type:** Construction, Program
- **Contingent on Funding (Y/N):** Yes
- **Funding Need:** [TBD]
- **Kickoff Year:** Concept Stage

STRATEGY 3: LEVERAGE NEW DEVELOPMENT TO ACHIEVE INCLUSIVE ECONOMIC OPPORTUNITIES, MBE/WBE BUSINESS GROWTH, AND COMMUNITY WEALTH CREATION.

UChicago has fostered the beginnings of a new inclusive innovation ecosystem on the South Side through its development along the 53rd Street corridor in Hyde Park, building strong assets such as the startup focused Polsky Center and a vibrant commercial corridor. UIUC, bringing its renowned faculty and community programming presence to 53rd Street, will join CQE, Argonne, and Fermilab to accelerate collaboration and attraction of private businesses. The addition of a new science and engineering facility and additional new construction of lab and office space along 53rd Street will create new jobs and business growth opportunities. The Partnership will leverage this new investment to build new economic opportunities on the South Side to grow local businesses and support new community wealth building initiatives.

ECONOMIC DEVELOPMENT

Complete New Science and Engineering Facility - construction diversity goals of 35% MBE, 6% WBE, and 1% VBE.

- **Lead units:** UChicago FS; UIUC
- **Status:** On Hold
- **Initiative Type:** Construction
- **Contingent on Funding (Y/N):** Yes
- **Funding Need:** [TBD]
- **Kickoff Year:** On Hold

Complete new lab and commercial office space - 300,000 square feet (9 floors of lab-enabled space) on 53rd Street Corridor -construction diversity goals of 35% MBE and 6% WBE.

- **Lead units:** UChicago CREO, Polsky
- **Status:** In Progress
- **Initiative Type:** Construction
- **Contingent on Funding (Y/N):** Yes
- **Funding Need:** [TBD]
- **Kickoff Year:** Construction - August 2022; starting year for space 2024/2025

ECONOMIC DEVELOPMENT

In partnership with the Duality Quantum Accelerator, recruit 3 large and mid-sized QISE companies to commit to a physical presence on the South Side.

- **Lead units:** UChicago CREO, Polsky
- **Status:** NEW
- **Initiative Type:** Partnership, Engagement
- **Contingent on Funding (Y/N):** Yes
- **Funding Need:** [TBD]
- **Kickoff Year:** Year 0

Expand MBE/WBE /South Side business growth opportunities connected to QISE by integrating 'Business Diversity Services' into QISE and quantum-adjacent Polsky small business incubator and accelerator, including Duality Quantum Accelerator, resulting in at least **10 contracts** for local businesses with these companies.

Invest in community wealth building on the South Side through development of a new fund to provide low-cost capital and grant support for local business growth, in accordance with community wealth building principles; and attracting outside QISE MBE/WBE start-ups to the South Side to grow the local inclusive innovation ecosystem. Support at least **3 development projects** or start-ups through the fund.

- **Lead units:** UChicago OCE, CREO, Polsky, Business Diversity, CQE
- **Status:** NEW
- **Initiative Type:** Engagement, Program, Partnership
- **Contingent on Funding (Y/N):** Yes
- **Funding Need:** [TBD]
- **Kickoff Year:** Year 1

Expand Partnership collaboration for NSF-funded I-Corps program to accelerate translation of ideas from the laboratory to the marketplace, in partnership with entities such as the NSF Great Lakes Region Hub.

- **Lead units:** UIUC
- **Status:** Existing - scaled
- **Initiative Type:** Program, Partnership
- **Contingent on Funding (Y/N):** Yes
- **Funding Need:** [TBD]
- **Kickoff Year:** Ongoing

STRATEGY 4: BUILD MULTI-SECTOR COLLABORATIONS THAT ENABLE FULL PARTICIPATION IN SCIENTIFIC DISCOVERY AND INVESTMENT ON THE SOUTH SIDE.

Inclusive Innovation begins by building the **civic infrastructure** that can attract investment and increase participation in new areas of economic growth catalyzed by QISE on the South Side.² Partnership institutions contribute research, education, and direct programs to existing STEM education, employment, and entrepreneurship ecosystems. However, these ecosystems have few incentives to coordinate and collaborate. This plan's primary objective is to build multi-sector collaborations and increase the flow of information and investment in South Side nonprofits and civic institutions that enable community engagement and participation.

A commitment to civic engagement and community participation is a core component of building the local inclusive innovation ecosystem.³ The Partnership will assess the STEM education and workforce ecosystem and

² [Building an Intentional and Inclusive Civic Infrastructure](#)

³ [Full Participation: Building the Architecture for Diversity and Community Engagement in Higher Education.](#)

identify community ‘hubs’ to support a stronger network among the Partnership members, South Side, and citywide entities. The Partnership will integrate multi-sector and community participation into the Initiative through the organization of an Inclusive Innovation Engagement Coalition that will provide ongoing networking, resource sharing, and idea generation to advance this blueprint beyond the start-up phase.

To generate collaborative programming across the inclusive innovation ecosystem, the Partnership will designate \$2 million to a new “Grand Challenges” fund that will provide seed grants to test, scale, or strengthen the initiatives identified in this blueprint. The Partnership will design and execute this new fund in consultation with Inclusive Innovation Engagement Coalition members⁴. Finally, Partnership institutions will develop new Memorandums of Understanding/Collaboration Agreements with other civic and education institutions to advance this blueprint’s key commitments.

Initiative Key

Timeline	Initiative Type	Status
Year 0 - FY22	Partnership	Existing
Year 1 - FY23	Engagement	In Progress - Scaled
Year 2- FY24	Program	New
Year 3 - FY25	Construction	On Hold
Ongoing		

CIVIC INFRASTRUCTURE INITIATIVES

<p>Engage 100 stakeholders on the Inclusive Innovation framework and the Partnership.</p> <ul style="list-style-type: none"> • Lead unit(s): UChicago Office of Civic Engagement (OCE) • Status: Existing • Initiative type: Engagement • Contingent on New Funding (Y/N): No. Assumption: OCE existing % FTE portfolio (in-kind) • Funding Need: N/A • Kickoff Year: Year 0
<p>Design and launch an ‘awareness campaign’ to increase South Side (and broader) awareness of and participation in QISE and raise visibility of the Inclusive Innovation ecosystem to reach 100,000 households⁵.</p> <ul style="list-style-type: none"> • Lead unit(s): UChicago Chicago Quantum Exchange (CQE) + OCE • Status: In Progress - scaled • Initiative Type: Engagement • Contingent on New Funding (Y/N): Yes, with CQE augmentation • Funding Need: [TBD] • Kickoff Year: Year 1
<p>Execute and renew 20 Collaboration Agreements with Nonprofit organizations (e.g., Community Colleges, Cultural Institutions, Community-based Organizations) to build multi-sector programs and investment.</p> <ul style="list-style-type: none"> • Lead units: UChicago agreements facilitated by OCE, in partnership with internal lead academic units; UIUC agreements facilitated by UIUC; National Labs advancing institutional partnerships as necessary and in accordance with their review processes and commitments. • Status: In Progress – scaled; (City Colleges of Chicago MOU executed July 2021; Museum of Science and Industry, Chicago Public Schools, Chicago State University – In Progress) • Initiative Type: Partnership • Contingent on New Funding (Y/N): No • Kickoff Year: Year 0 • Funding Need: N/A for agreement execution/renewal; [TBD] for program execution

4 Inclusive Innovation Engagement Coalition is envisioned as new entity comprised of civic and community members, representing organizations in partnership with University of Chicago, UIUC, Argonne National Laboratory, Fermilab.

5 Based on % of total households across Chicago’s South Side footprint, as regional impact area established for this effort.

CIVIC INFRASTRUCTURE INITIATIVES

Launch the Inclusive Innovation Collaboration Coalition comprised of collaboration leadership.

- **Lead units:** [new infrastructure, coordination by UChicago OCE + EVP/Science Strategy]
- **Status:** NEW
- **Initiative Type:** Engagement
- **Contingent on New Funding (Y/N):** Yes (staffing)
- **Funding Need:** N/A
- **Kickoff Year:** Year 1

Launch \$2 million Grand Challenges fund to provide seed grants to launch and scale programs.

- **Lead units:** [new infrastructure, coordination by UChicago OCE + EVP/Science Strategy]
- **Status:** NEW
- **Initiative Type:** Programs
- **Contingent on New Funding (Y/N):** Yes
- **Funding Need:** \$1 million
- **Kickoff Year:** Year 1

Coordinate and develop 3 bi-directional partnership programs, modeled after UChicago's Data Science Institute + City Colleges of Chicago collaboration, by creating opportunities for increased access, education, and research in areas of aligned STEM degree programs.

- **Lead units:** UChicago academic units + civic partner
- **Status:** In Progress - scaled
- **Initiative Type:** Teaching, Program
- **Contingent on Funding (Y/N):** Yes
- **Funding Need:** [TBD]
- **Kickoff Year:** Year 0

ROLES + RESPONSIBILITIES

The Partnership for Inclusive Innovation will continue to provide strategic oversight to the activities led in this plan by the respective institution and will receive quarterly updates from the partnership management team advancing the QISE plan.

The Partnership roles and responsibilities assume coordinated staffing and resources to launch Inclusive Innovation in the Sciences, with direct QISE program leadership and execution by the Chicago Quantum Exchange (CQE)

UCHICAGO - UIUC JOINT STEERING COMMITTEE

- UChicago: Juan de Pablo, EVP; Derek R. B. Douglas, VP; Ivan Samstein, former VP; Matthew Tirrell, Dean, PME; Angela Olinto, Dean, PSD
- UIUC: Andreas Cangellaris, Provost; Wanda Ward, EVC; Susan Martinis, Vice Chancellor Research/Innovation; Rashid Bashir, Dean Engineering
- National Labs: Paul Kearns, ANL; Anna Grassellino, Fermilab

QISE PARTNERSHIP MANAGEMENT

- UChicago: Juan de Pablo EVP; Derek R. B. Douglas VP OCE; Matthew Tirrell Dean PME
- UIUC: Andreas Cangellaris, Provost; Wanda Ward, EVC
- CQE: David Awschalom, Faculty, PME; Kate Timmerman, ED CQE
- UChicago Executive Director Inclusive Innovation: joint report to UChicago VP/EVP

Additional staffing will be identified and added to the Inclusive Innovation team as needed to support early-stage implementation to advance the plan.

EVALUATION

This Implementation Plan will continue to be shaped by stakeholder engagement and in response to the dynamic field of QISE. However, the Partnerships will develop an evaluation design for this initiative that will include formative and summative evaluations, for the inclusive innovation in the sciences framework as well as strategic programs within the QISE Plan.

Through the translation of evaluation research, in public-facing reports and other methods for sharing findings, the partners also aim to inform policy and practice. Below are a set of draft progress and impact metrics that will be revised as part of the evaluation design process for the Initiative.

IMPACT METRICS

The strategies, objectives, and projects proposed in this plan have the potential in the near term to increase awareness of and access to new curriculum, training, credentials leading to the emerging QISE economy. The following are a summary of the Phase 1 (Year 1 to Year 3) impact metrics for this plan. unless otherwise noted.

STEM EDUCATION

- **30** South Side CPS educators provided with professional development in QISE and STEM
- **400⁶** CPS educators provided with Quantum-adjacent STEM enrichment opportunities
- **50** South Side K-12 schools⁷ activated with Quantum-adjacent STEM supports and programming⁸
- **150+** University students engaged in new STEM-related activities
- **10+** CPS school-based family engagement nights
- **2,100** South Side CPS students participating in STEM education and QISE in-school and out-of-school education and career exploration programs
- **10** Illinois schools participating in UIUC's IQUIST and CISTEME 365 program

EMPLOYMENT

- **50** graduates (from underrepresented/minoritized population) hired by Partnership institutions in QISE and aligned STEM (i.e., Data Science/AI, Computer Science) programs
- **100** internship and intensive exposure programs opportunities for high school students and young adults, including QISE and aligned STEM internships within Partnership institutions
- **50+** individuals certified with Quantum-related technician training and ready for job-placement
- **70+** City Colleges of Chicago students trained and hired in apprenticeship programs and given access to employment pathways by UCM and UChicago
- **50+** jobs within the new NESB facility secured by local residents who participated in pipeline and pathway programs

6 Including Scratch Encore, TeachQuantum, Elementary Math Teacher Cohort, NSP Science Corps, Summer Teacher University

7 Includes Bronzeville South Lakefront CPS Region and schools in South Shore (together reaching all nine neighborhoods in UChicago's focus area)

8 Additional teacher professional development opportunities, in-school support from UChicago STEM programs, out-of-school opportunities for youth, youth career exploration activities, and family engagement activities

ECONOMIC DEVELOPMENT

New Engineering Science Facility⁹

- **\$636 million** in net new economic output in Illinois
- **35% MBE, 6% WBE, 1% VBE** diversity goals for construction-related contracts
- **2,000+** peak year net new construction jobs in Illinois
- **750** net new permanent direct jobs to be supported (peak year)
- **30%** goal for share of total permanent direct jobs to be secured by South Side residents
- **10** contracts executed by QISE and quantum adjacent-companies with local entrepreneurs/small businesses

Harper Court Expansion⁹

- **9** floors of lab-enabled space and advanced infrastructure to support life sciences ecosystem
- **\$339 million** in net new economic output in Illinois
- **378** peak year net new direct jobs in Illinois
- **446** net new indirect jobs in Illinois
- **903** peak year net new construction jobs in Illinois
- **35% MBE, 6% WBE** diversity goals for construction-related contracts

CIVIC INFRASTRUCTURE

- **100** stakeholders engaged on the Inclusive Innovation in the Sciences framework and Partnership.
- **100,000** households reached through Inclusive Innovation and QISE awareness campaign.
- **20** Collaboration Agreements renewed and/or executed, towards building multi-sector programs and investments.
- **\$2 million** Grand Challenges fund launched, providing seed grants to launch and scale programs.
- **3** bi-directional partnership programs developed towards increased access, education, and research in areas of QISE aligned STEM degree programs.

⁹ Estimated employment and economic output during the five year period beginning with groundbreaking (Anderson Economic Group, March 2021)

INCLUSIVE INNOVATION IN THE QUANTUM SCIENCES – PARTNERSHIP FACULTY AND STAFF PARTICIPANTS

NOT COMPLETE

UNIVERSITY OF ILLINOIS-URBANA CHAMPAIGN (UIUC)

Robert Jones, Chancellor
Andreas Cangelaris, Provost

Susan Martinis, VCRI
Wanda Ward, EAC, PE
Rashid Bashir, Dean, ENG

Executive Associate Chancellor for Public
Engagement, OC
Associate Director for Public Engagement, OC

Lisa Diaz, UIUC/Extension
Emily Edwards, UIUC/ IQUIST
Lynford Goddard, UIUC/IDEA
Lara Hebert, UIUC/WYSE
Raya Hegeman-Davis, UIUC/CS
Stafford Hood, UIUC/CREA
Barbara Hug, UIUC/Impact on Science Education
Eric Kuo, UIUC/IPASS
Ruby Mendenhall, UIUC/STEM IL
Breant Roberts, UIUC/PSYC
Andy Singer, UIUC/ECE
Jed Taylor, UIUC/ENTRP TECH
Kandace Turner, AD, PE

UCHICAGO LEADERSHIP

Paul Alivisatos, President
Ka Yee Lee, Provost

Juan de Pablo, EVP
Derek R. B. Douglas, VP
Ivan Samstein, former VP
Matthew Tirrell, Dean, PME
Angela Olinto, Dean, PSD
David Awschalom, Faculty, PME

Susana Vasquez, AVP, OCE
Nika Levando, Sr. Dir., OCE

STEM EDUCATION SUB-COMMITTEE

Rovana Popoff, PME
Todd D Barnett, SSA
Meridith Bruozas, ANL
Duane Davis, President's Office
Veronica Hauad, Admissions*
Randall H. Landsberg, PSD
Denise Porter, PSD
Shaz Rasul, OCE
Laura Rico-Beck, PME
Rebecca Thompson, FNL
Meishan Zhao, PSD
Tian Zhong, PME

Lisa Diaz, UIUC/Extension
Emily Edwards, UIUC/ IQUIST
Lynford Goddard, UIUC/IDEA
Lara Hebert, UIUC/WYSE
Raya Hegeman-Davis, UIUC/CS
Stafford Hood, UIUC/CREA
Barbara Hug, UIUC/Impact on Science Education
Eric Kuo, UIUC/IPASS
Ruby Mendenhall, UIUC/STEM IL

ECONOMIC DEVELOPMENT SUB-COMMITTEE

Josh Anderson, CREO
Bryan Dickinson, PSD
David Gross, Booth
Angie Marks, CREO
Joel Poelhuis, F&A
Rob Rush, OLC

Jed Taylor, UIUC/ENTRP TECH
Andy Singer, UIUC /ECE
Robert Brunner, UIUC/Gies
TBD, UIUC Corporate Relations & Economic
Development

EMPLOYMENT & WORKFORCE DEVELOPMENT

SUB-COMMITTEE

Alyssa Berman-Cutler, OCE
Hannes Bernien, PME
Jim Bluemond, ANL
Meredith Daw, Admissions
Peter J. Duda III, PME
Neli Fanning, former PSD
Benjamin Gibson, UCM
Supratik Guha, PME
Alexander High, PME
Julie Nuter, ANL
Bill Payne, Booth
Betsy Rahill, UCM
Marni Simmons, F&A
Triste Smith, former UCM
Kate Waimey Timmerman, PME

Brent Roberts, UIUC/PSYC
Kandace Turner, Associate Director for Public
Engagement, OC
Dan Bodony, UIUC/GCOE
Alan Renear, iSchool, Provost Office
Tiffany Williams, CS/GCOE
Jen Bernhard, ARI
TBD, UIUC Corporate Relations & Economic
Development
TBD, UIUC ACES & Extension

OCE COORDINATION TEAM

Jessica Velazquez, Assistant Dir., OCE
Mary Ellen Angelucci, Executive Assistant, OCE

IMPLEMENTATION ADVISORS

John Boller, PSD
Russel Ceballos, CQE
Heather Crews, Office of Research & National Labs
Bob Hanley, UCM
Patrick McQuillan, CQE
Mindi Mysliwicz, PSD
Spencer Pasero, FNL
David Uminsky, PSD
Silvia Zorzetti, FNL