



Internships: Innovative Initiatives for Workforce Inclusion

Sandra Charles, Chief Equity, Diversity, Inclusion & Accessibility Officer

Community Advisory Board

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FermiFusion Uniting Minds for Scientific Advancement: August 5-7



Albany State University (GA) Savannah State University (GA)
Alcorn State University (MS) Tennessee State University (TN)
Bowie State University (MD) University of Alaska Anchorage (AK)
Central State University (OH) University of Alaska Fairbanks (AK)
Dillard University (LA) University of Maryland, Baltimore County (MD)
Grambling State (LA) University of South Dakota (SD)
Hood College (MD) Western Dakota Technical College (SD)
Prairie View A&M University (TX) White Earth Tribal & Community College (MN)

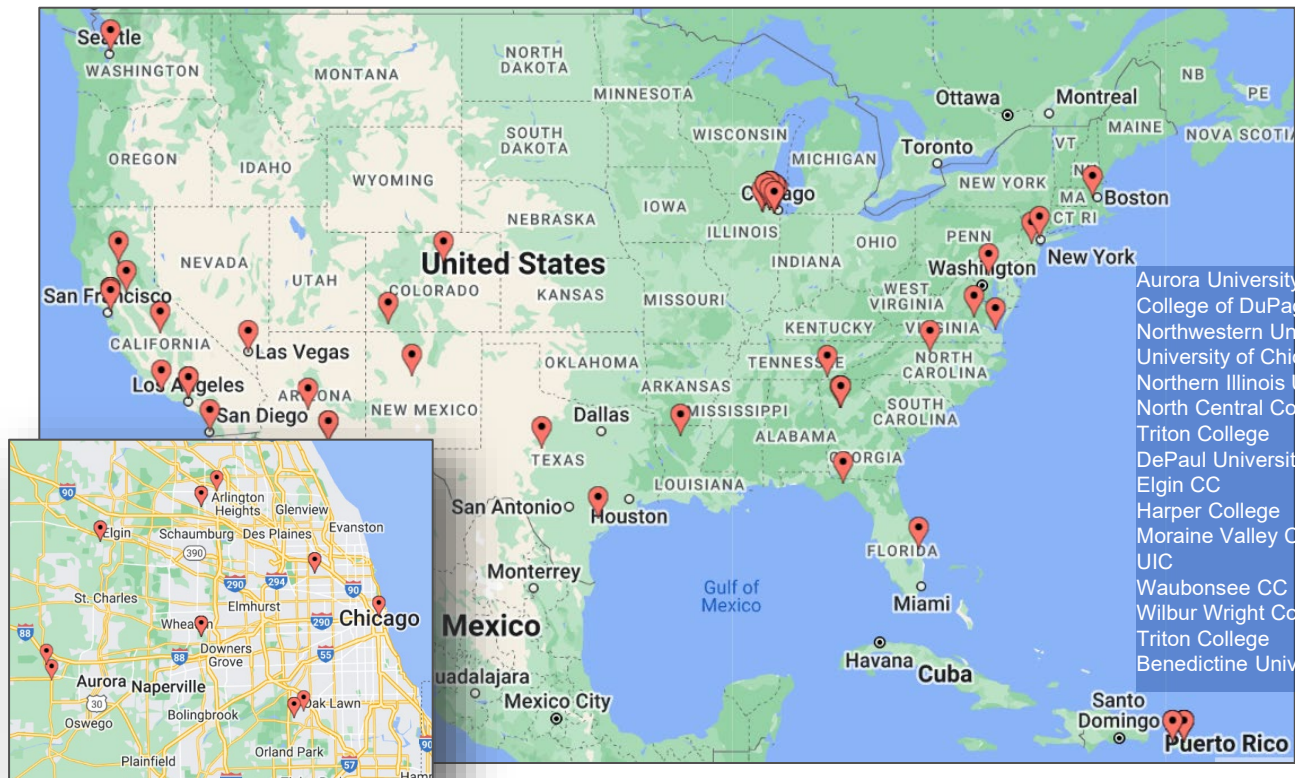
Workshop Focus:

- Foster relationships to build first-hand awareness of Fermilab's cutting-edge research and innovative technologies, workforce opportunities, and workplace culture.
- 30 physics, engineering, mathematics and computer science faculty & students from non-R1 not historically represented in the Office of Science research portfolio.

Agenda Highlights:

- History of Fermilab and campus driving tour
- Talks on AI/ML, Quantum, PIP-II, CMS, Neutrinos, Sustainability, Funding Opportunities and Internship Programs
- Panel Discussions
- Proposal Brainstorming & Collaboration Workshop
- Annual Intern Poster Session

2024 Summer Interns - National Reach



Aurora University
 College of DuPage
 Northwestern University
 University of Chicago
 Northern Illinois University
 North Central College
 Triton College
 DePaul University
 Elgin CC
 Harper College
 Moraine Valley CC
 UIC
 Waubesa CC
 Wilbur Wright College
 Triton College
 Benedictine University

California State University-Chico, CA
 Clovis Community College, CA
 College of DuPage, IL
 College of Mainland, TX
 Florida Agricultural & Mechanical University, FL
 Fort Lewis College, CO
 Georgia State University, GA
 Glendale Community College, CA
 Grambling State University, LA
 Hampton University, VA
 Hudson County Community College, NJ
 Indian River State College, FL
 Laney College, CA
 North Carolina A & T State University, NC
 Paradise Valley Community College, AZ
 Regis University, CO
 Rutgers University-New Brunswick, NJ
 San Diego City College, CA
 Southern Adventist University, TN
 Spelman College, GA
 University of Arizona, AZ
 University of California, CA
 University of California Berkeley, CA
 University Of California Davis, CA
 University of Houston-Victoria, TX
 University of Maryland, Baltimore County, MD
 University of Nevada, Las Vegas, NV
 University of New Mexico, NM
 University of Puerto Rico at Mayaguez, PR
 University of Washington, WA;
 Virginia Commonwealth University, VA
 Wellesley College, MA

■ 27 pipeline programs ■ 110 academic institutions ■ 98 supervisors ■ 227 interns 57% Male 42% Female

2024 Summer Interns - International Reach



University of Bologna
Politecnico di Torino
University of Pisa
Università degli Studi di
Università di Bologna
University of Ferrara
University of Genoa
University of Padova
Università degli Studi di Napoli Federico II
Università degli Studi di Torino
University of Padua





Innovative Workforce Development Opportunities

Funded by DOE Office of Science - RENEW: Reaching a New Energy Sciences Workforce

WDTS: Workforce Development for Teachers & Scientists

Amanda Early, STEM Ambassador, OEDIA

Workforce Development Innovation

Particle Accelerator Capabilities Enhancement and Modernization Apprenticeship Program (PACEMAP)

- **Collaboration:** College of DuPage, Project HireEd and Fermilab
- **Goal:** Create a multi-year program for Electrical Technicians, specifically targeting laboratory workforce needs and skill sets
- **Grant** includes funding to cover student tuition for required courses, stipend while taking courses, wrap around support, equipment at COD, and wages for on-the-job training at Fermilab.
- **Participants:**
6 students participated in pilot.
5 started their on-the-job training



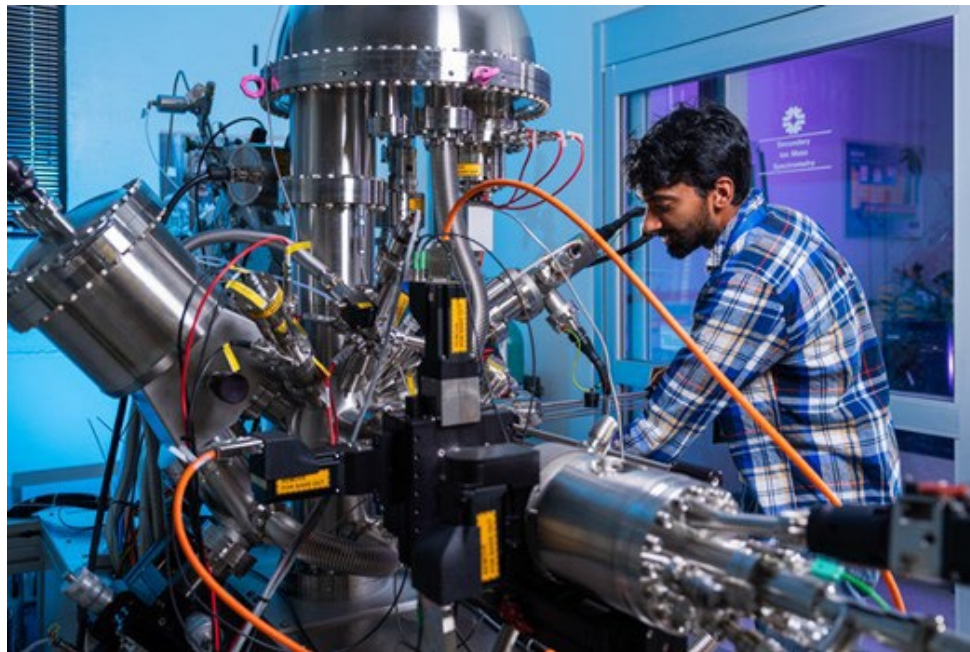
\$400,000 2-yr grant



Workforce Development Innovation

Training through research in quantum information science and engineering at the SQMS Center

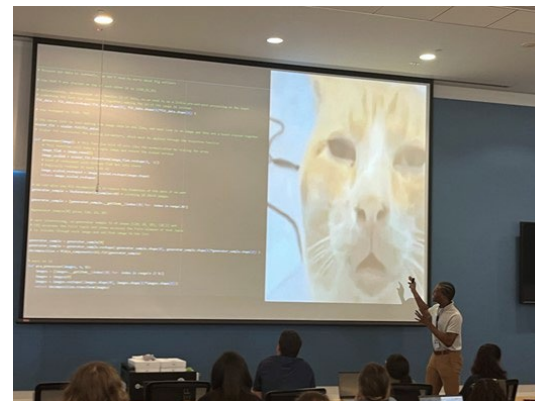
- **Collaboration:** Fermilab, University of Illinois Chicago, Coppin State University, and Spelman College
- **Goal:** Support investigators and students at their institutions through investments in their education and infrastructure
- **Grant** includes funding to purchase equipment at partnering institutions, investigators become part of the SQMS collaboration, and internships are offered at Fermilab to their students
- **Participants:** Build a strong and sustainable career path through hands-on research experiences for undergraduates.



Workforce Development Innovation

Fermilab and Brookhaven Summer School Exchange Program

- **Only** exchange program in national lab complex
- **Participants:** 40 College Freshmen, 20 at each lab
- **Content:**
 - ✓ Particle Physics (Fermilab)
 - ✓ Climate Science (Brookhaven)
 - ✓ Artificial Intelligence/Machine Learning (Both)
 - ✓ Quantum Information Science (Both)
- **Panel discussions** with scientists, engineers, technicians, and interns at all career stages
- **Tours:** Short Baseline Neutrino Detector, MINOS Underground and Nova Detector, Test Beam Facility, Proton Assembly Building, Muon g-2, Silicon Detector Facility, Lederman Science Education Center, Wilson Hall, Quantum Garage, Materials Science Lab, Quantum Computing Labs I and II, NSLS-II, CSI Computer Center, National Nuclear Data Center, QIS Instrumentation Lab, Relativistic Heavy Ion Collider Data Center, Scintillation Lab, Brookhaven Linear Isotope Producer, Center for Functional Nanomaterials, National Weather Service Station



\$298,000 per year to Fermilab
\$596,000 in annual funding

Workforce Development Innovation

Fermilab QIS Institute for K-12 STEM Educators

- **Participants:**
5 STEM Educators:
 - ✓ 2 elementary
 - ✓ 2 mid-level
 - ✓ 1 high school
- **Goal:** Immersed in Quantum Information Science and Engineering through interactive lectures, demonstrations, lab activities, and tours.
Create instructional materials for classroom implementation
- **Grant:** Educators receive a weekly stipend, mileage reimbursement, budget to purchase classroom materials, travel to conferences post-program, post-program stipend for continued participation



Pilot - \$150,000 per year
New RFP - 10 educators and
annual budget ~ \$200-\$300,000



Funding - Awarded FY24 and FY25 Proposals

Partnering Institutions:

Institution	Award	Duration
The College of DuPage	\$300,000	2 years
Spelman College	\$210,000	3 years
Coppin State University	\$105,000	3 years
University of Illinois Chicago	\$180,000	3 years
Brookhaven National Lab	\$894,000	3 years

Fermilab:

Program	Participant	Award	Duration
Fermilab and Brookhaven Summer School Exchange Program	College freshmen	\$894,000	3 years
Fermilab QIS Summer Institute	Educators	\$300,000	2 years
FAME Program	Intern Alumni	\$40,000	Pilot year
Fermilab PRISM	High School seniors & recent graduates	\$819,000	3 years
PACEMAP	College of DuPage	\$100,000	2 years
SQMS Traineeship	Students & Faculty Coppin & Spelman	\$ 90,000	3 years

FY25 Proposals:

Partner Institution	Program Goals	Proposed
Triton College	FORGE: Pre-Engineering Traineeship	\$ 361,000: 2 years
Kennesaw State University University of Chicago	From Service to Science: Military veterans working towards masters and PhDs	\$ 327,000: 2 years
Monmouth College	Physics traineeship	\$ 400,000: 2 years
California State University, Fresno	Online courses and internships: 16 partners including community colleges	\$1,563,000: 3 years
College of DuPage	PACEMAP expansion	\$1,166,000: 3 years
Fermilab QIS Summer Institute	Formalize pilot	\$ 275,000 yearly