HEP COMMUNITY ADVOCACY

Keti Kaadze

Annual Advocacy Effort

- Tremendous effort from HEP community to advocate a support for our science
  - 73 people participated in 2021 advocacy that spanned over March/April
  - This effort is possible thanks to University Research Association

Photo from 2019 trip

Annual DC Trip

- For over 35 years members of the three major HEP users communities have come together for this visit to Congress

Aim of the trip is visit with:

- Confessional offices
- Congressional appropriations and authorization staff
- The Administration (Office of Management and Budget, Office of Science and Technology Policy)
- Funding agencies (DOE and NSF)

Our message:

- Share our excitement about our research
- Thank everyone for their continued support
- Help convey the value added to the society by HEP
- Deliver our Ask

Layout of Trip

- A group of trip attendees are formed
  - UEC, USLUO, SLUA, experienced and new members
- Training sessions are held to prepare attendees about congressional process, meeting etiquette, science communication, and materials

2019 trip

- Trip attendees schedule meetings
  - A special framework is used to assign offices to attendees based on connections
- Attend the meetings
  - In-person: 3-4 days in CD
  - Virtual: 1-2 weeks (based on 2021 experience)

2021 “trip”

Logistics:
Washington-HEP Integrated Planning System

Keti Kaadze

Maintains records of meetings and meeting reports over all years

Keti Kaadze

Your Full Schedule

Yellow = you are the primary.

Search:

Type	Meeting	Time	Location	Primary	Secondary
Legislator	Mann, Tracey R-KS 1 ✓ Packet Phone meeting	2021-03-08 12:00:00	None	Keti Kaadze	Aleena Rafique
Legislator	Rosen, Jacky D-NV ✓ Packet Phone meeting	2021-03-09 10:20:00	None	Keti Kaadze	Micah Buuck
Legislator	Marshall, Roger R-KS ✓ Packet Phone meeting	2021-03-09 11:30:00	None	Keti Kaadze	Mathew Muether
Legislator	LaHood, Darin R-IL 18 ✓ Packet Phone meeting	2021-03-10 14:30:00	None	Keti Kaadze	Kirsty Duffy
Legislator	Feinstein, Dianne D-CA ✓ Packet Phone meeting	2021-03-11 13:00:00	(202) 228 – 0808 and On Zoom	Harvey Newman	Keti Kaadze
Legislator	Sherman, Brad D-CA 30 ✓ Packet	2021-03-11 13:00:00	and on Zoom	Harvey Newman	Keti Kaadze

MEETING #1972 2021-MARCH

Sen Roger Marshall R-KS

Congressional Office Meeting - Senate

Edit meeting details

✓ Packet Delivered! (undo)

ASSIGNED CONTACT SCHEDULE FILE REPORT

Attendees

Primary
Keti Kaadze (UEC)

Secondary
Mathew Muether (UEC)

Coordinates

Time
2021-03-09 11:30:00

Phone Number (if any)
None assigned

Meeting with

Name & email
Bill Birsic <bill_birsic@marshall.senate.gov>

Position
Legislative Aide

SCHEDULING PROGRESS

Scheduled: 298 | Contacted: 435 | Unassigned: 82

Rejected: 29 Scheduled: 298 Contacted: 435 Assigned: 455 Unassigned: 82

PACKET DELIVERY PROGRESS

Packets Delivered: 328

Packets Delivered: 328 / 537

The Advocacy Packet

The Advocacy Packet consists of the following material:

- The Ask
- Particle Physics: Building for Discovery
- Particle Physicists Deliver Discovery Science Through Collaboration
- Particle Physics Makes a Difference in Your Life
- Particle Physics Builds STEP Leaders
- Particle Physicists Advance AI
- Particle Physics and QIS
- Particle Physics is Discovery Science
- Particle Physics in the US Map
- Neutrinos
- DUNE
- Cosmology
- Dark Matter
- Vera C. Rubin Observatory (LSST)
- USLHC
- SLAC
- About Fermilab
- Fermilab Vet Tech Program

The Ask

The U.S. particle physics community asks for your support in advancing P5 priorities by passing FY 2022 appropriations that include:

At least $1180M for High Energy Physics within the Department of Energy's Office of Science including at least $320M for core research

At least $10B for the National Science Foundation

This level of funding will provide support needed to advance world-leading scientific research, develop STEM leaders, and make progress on construction and operations of new facilities and experiments. Specifically, the funding request will support scientific researchers and students at universities and national laboratories to advance experimental and theoretical research and accelerator and detector R&D to take advantage of new and future science facilities and experiments. Core research funding is critically important not just for new discoveries but also developing the next-generation workforce. This funding will also advance P5 priority projects, operations of existing and recently completed large facilities, and completion of small and medium-sized projects. These new capabilities are needed to explore the nature of neutrinos, the Higgs boson, dark matter, dark energy, and the yet-to-be discovered forces that govern the origin and evolution of our universe.

Top three priorities: **Core research, HL-LHC, LBNF/Dune/PIP-II**
Our achievements in physics and advances in project
Looking forward: Theory, Experiment, AI, QIS, P5/Snowmass

Fermilab UEC

Building for Discovery

Strategic Plan for U.S. Particle Physics in the Global Context

usparticlephysics.org

The P5 Report provides the strategy and priorities for U.S. investments in particle physics for the coming decade.

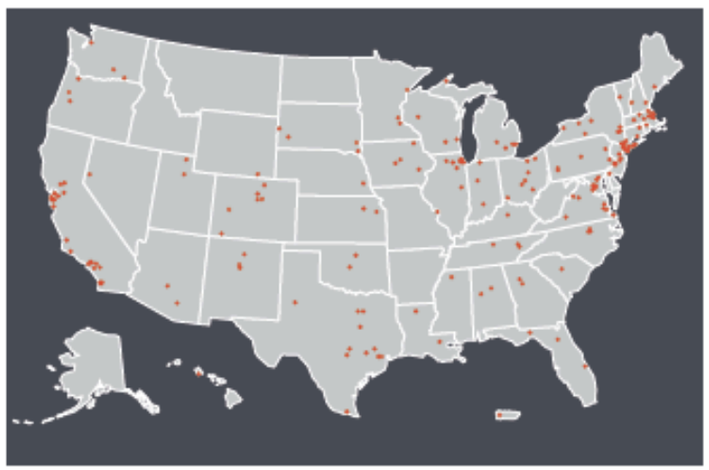
The top three priorities in 2021

Strengthen support for particle physics research at universities and national laboratories, which includes data analysis, R&D, design of new experiments, and a vibrant theory program. As emphasized in the P5 Report, these activities are essential for the success of the field. They are crucial for extracting scientific knowledge from all the great new data, developing new methods and ideas, maintaining U.S. leadership, and training the next generation of scientists and innovators.

Advance the High-Luminosity Large Hadron Collider (HL-LHC) accelerator and ATLAS and CMS detector upgrade projects on schedule, continuing the highly successful LHC program and bilateral partnership with CERN.

Advance the Long-Baseline Neutrino Facility (LBNF), Deep Underground Neutrino Experiment (DUNE), and Proton Improvement Plan-II (PIP-II), working with international partners on the design, prototypes, initial site construction, and long-lead procurements.

These carefully chosen investments will enable a steady stream of exciting new results for many years to come and will maintain U.S. leadership in key areas.



Particle physics is both global and local. Scientists, engineers, and technicians at more than 175 universities, institutes, and laboratories throughout the U.S. are working in partnership with their international colleagues to build high-tech tools and components, conduct scientific research, and train and educate the next generation of innovators. Valuing equity, diversity, and inclusion, the field is committed to increasing participation of underrepresented groups. Particle physics activities in the U.S. attract some of the best scientists from around the world.

The P5 strategy has been very successful. Even with extraordinary challenges due to COVID-19, there was great progress.

Recent results

The LHC experiments reported many important and precise results. The remarkably productive ATLAS and CMS experiments have each produced about 1,000 refereed publications, including the recent evidence of **Higgs boson** decays to muon pairs and other processes that test the foundations of the underlying theory. The LHCb experiment also published many new results, including studies of B-meson processes that are sensitive to **new physics.**

Theoretical physicists have gained insight into how evaporating black holes can radiate their quantum information, suggesting new aspects of **quantum gravity.** They also have proposed new candidates for the **dark matter** and new ways to search for them.

The **High-Altitude Water Cherenkov (HAWC) Observatory** detected the highest energy cosmic gamma ray ever seen. Such observations can be used to test fundamental symmetries and to constrain quantum gravity models.

Program advances in 2020

Building upon the historic 2015 and 2017 bilateral U.S.-CERN agreements, U.S. and CERN scientists successfully continued their cooperative partnership at the LHC and the international neutrino program hosted by Fermilab. ProtoDUNE published results demonstrating that the design meets the requirements needed by the LBNF/DUNE far detector in South Dakota for neutrinos produced at Fermilab.

Important advances toward the next generation of colliders were achieved, including new world records in high-gradient superconducting acceleration technology and in high-field superconducting accelerator steering magnets.

The DESI and Vera C. Rubin/LSST Camera cosmic survey projects have successfully transitioned from construction to commissioning and operations, as has the **LZ dark matter experiment.**

The next-generation cosmic microwave background facility, CMB-S4, moved forward with the selection of LBNL as the host laboratory. CMB measurements uniquely probe physics of the early Universe at energies well beyond those of earth-bound accelerators and can also reveal neutrino properties.

Looking forward

All eyes are on the LHC, as its sensitivity to new physics will continue to improve through vastly greater data volumes and new deep-learning data analysis methods. The experiments will extend their discovery reach and probe the Higgs boson's properties with ever greater precision for many years to come. The HL-LHC upgrade projects are on track.

Eagerly anticipated new data from operating experiments will advance the understanding of the intertwined Science Drivers identified in the P5 Report. In addition, this year the Dark Energy Spectroscopic Instrument (DESI) is starting operations, and the first results of the Muon g-2 experiment are expected to provide the most precise experimental measurement of the muon's magnetic moment.

Particle physicists are expanding efforts to develop and apply artificial intelligence (AI) techniques to the operation of accelerators and experiments, data analysis, and simulations, opening new avenues for scientific discovery.

Theoretical and experimental particle physicists are advancing Quantum Information Science (QIS), providing solutions to problems in computation, data analysis, sensors, and simulations.

The particle physics theory community will continue to play key roles in interpreting results from current experiments, motivating future experiments, and pursuing answers to the deepest questions.

Looking beyond the current P5 horizon, and guided by new results, the US has begun the next Snowmass community process, in which the opportunities in all areas of the field are discussed in depth. To inform choices, the US is also working with partners worldwide on development of concepts for facilities that could be hosted here and abroad. In addition to the well-studied International Linear Collider (ILC) in Japan, there are proposed facilities such as the Future Circular Collider (FCC) at CERN, which is part of the recently completed European Strategy for particle physics.

U.S. researchers are pursuing R&D on advanced technologies to enable future generations of accelerators and detectors with a wide variety of applications in science, medicine, and industry.

Building for Discovery

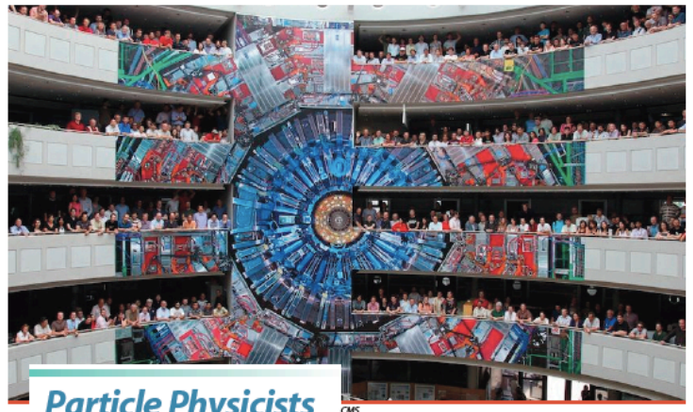
Strategic Plan for U.S. Particle Physics in the Global Context

usparticlephysics.org

How working as **collaborations** and the **interplay between universities and labs** is a key for success of our field

P5 timeline of all our projects

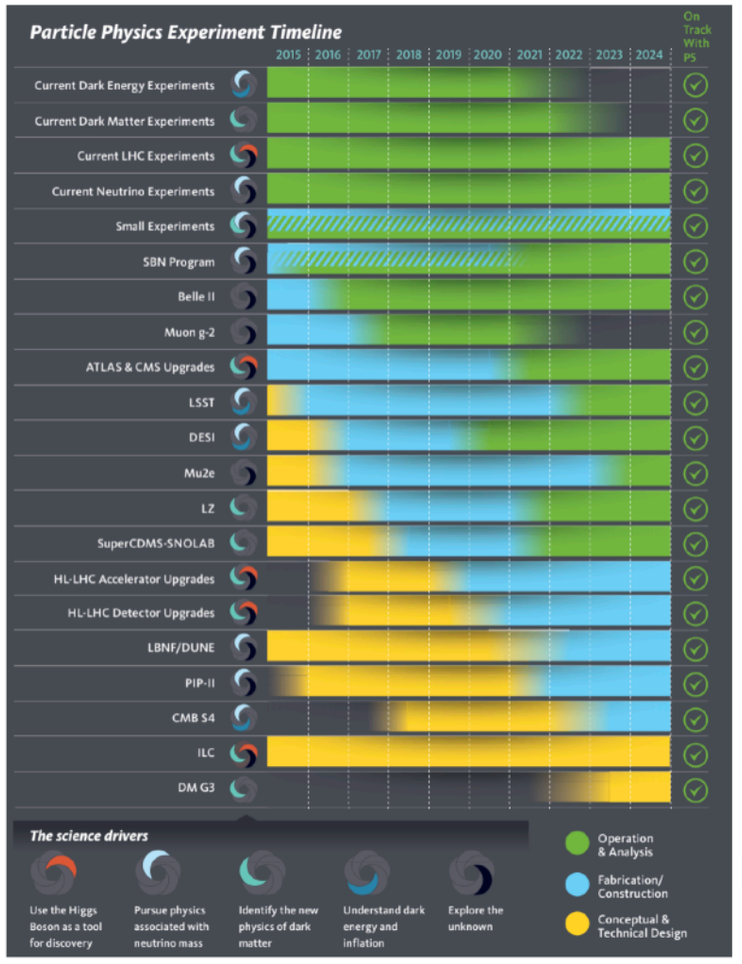
The particle physics community is committed to creating and sustaining a **diverse, equitable, and inclusive** environment and will continue to take concrete steps within our field to increase awareness, reduce bias, and eliminate inequities.


CMS

Particle Physicists Deliver Discovery Science Through Collaboration

Particle physicists seek to discover the fundamental laws of nature by making observations at the largest and smallest distances ever probed by humans. To meet this challenge, particle physicists from the U.S. and around the world join together in groups large and small. These collaborations have been incredibly successful at developing highly


Muon g-2




PIP-II

Delivering Discovery Science

Collaborations bring experiments from concept to reality. Scientists, students, engineers, and technicians work in concert throughout the course of an experiment, from design, through construction, to operations and analysis of data.

Their coordinated efforts allow the U.S. particle physics community to deliver on the long-term strategic plan of the Particle Physics Project Prioritization Panel (P5). The P5 strategy enables a steady stream of exciting new results across five intertwined science drivers.


DES


ADMX


LHCb


LZ


SuperK and T2K


PROSPECT

The particle physics community is committed to creating and sustaining a diverse, equitable, and inclusive environment as the foundation for successful ientific collaborations and takes concrete steps to increase awareness, reduce bias, and eliminate inequities.

uilding a collaboration

rticle physics collaborations bring together many different partners. Each contributes essential ills and resources that enable scientists to answer fundamental questions about the universe.


ustrial partners will excavate an derground site for DUNE.

ndustry

rticle physicists turn to S. businesses small and rge for specialized parts d equipment. Contracts r construction, fabrication, d services generate jobs r thousands of Americans.


vate contributions enabled ry work on LSST.


Inspiring future experiments.


Operating MicroBooNE.

Universities

University researchers inspire, develop, and build experiments that push the frontiers of discovery science and play a vital role in training the next generation of scientists and engineers.


Upgrading ATLAS at the LHC.

National Laboratories

Scientists and engineers at U.S. National Laboratories develop, build, and operate some of the most advanced equipment of modern science including world-class accelerators and ultra-sensitive detectors.


Building SuperCDMS-SNOLAB.


Over a thousand U.S. scientists work on LHC experiments.

International Partners

International partners bring their unique expertise to U.S.-hosted experiments and collaborate with U.S. scientists on world-class experiments hosted elsewhere.


International partners join U.S. scientists on NOvA.

usparticlephysics.org

Prepared by: APS Division of Particles & Fields · Fermilab UEC · SLUO SLAC Users Organization · USLUA

Many applications of expertise in our everyday life

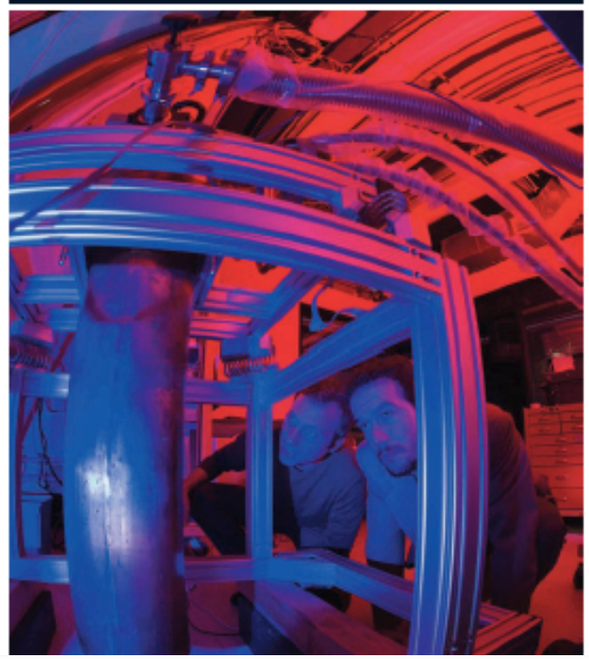
New: PP community is helping in **fight against COVID-19**

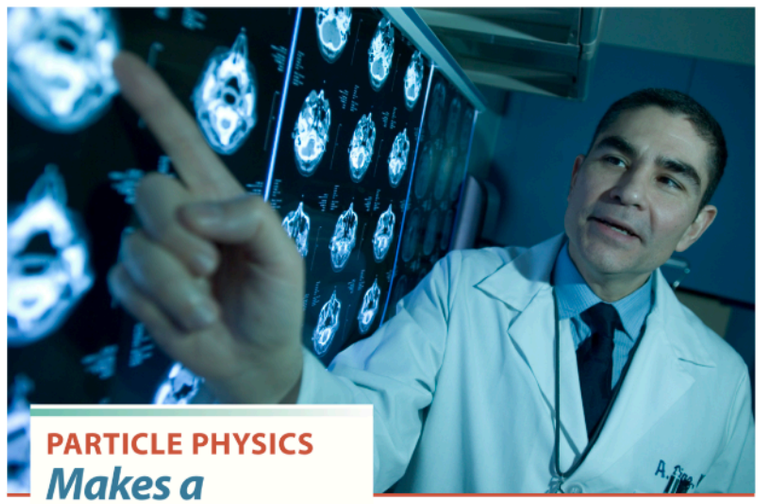
MEDICINE

Mechanical ventilator, image courtesy MVM Collaboration

- Advanced technologies and expertise from the particle physics community are **helping in the fight against COVID-19.** A simplified ventilator design was taken from concept through U.S. FDA approval. Computing resources are helping determine how the virus proteins fold.
- **The pharmaceutical industry** uses X-ray beams created by particle accelerators to develop more

SENSORS





PARTICLE PHYSICS *Makes a Difference in Your Life*

Global science, local impact

Particle physics is a global discovery science central to the modern innovation ecosystem. It drives national, regional, and local progress in science and industry. And it improves your quality of life.

COMPUTING AND SIMULATION

Simulating radiation exposure

- **The World Wide Web** was first developed by particle physicists to share information quickly and effectively around the world. Particle physicists continue to push the frontiers of big data analysis with global grids and cloud computing.
- **Radiation exposure for spacecraft** is simulated using software originally developed to model particle detectors.
- **Atomic and nuclear physics advances** benefit from precise mathematical techniques developed by particle physicists, now used to predict new materials and molecules.
- Particle physics theorists are developing foundational concepts that will **advance quantum information science** and enable quantum simulation experiments that will provide new ways to explore scientific problems.

High performance computing

MANUFACTURING

Manufacturing durable materials

- **Precise, customized medical implants** are manufactured using electron beams from particle accelerators.
- **The food industry** has used particle accelerators for decades to produce the sturdy, heat-shrinkable film that turkeys, fruits, vegetables, and baked goods come wrapped in.
- **Ink curing companies** use particle accelerators as an environmentally friendly way to produce the colorful packaging on many grocery store items, including cereal boxes.

Ink curing for packaging

Screening at cargo ports

NATIONAL SECURITY

- Particle physics detector technology improves homeland security by enabling **advanced cargo screening.**
- The WATCHMAN experiment, a U.S.-UK partnership, will demonstrate the use of neutrino detectors to remotely monitor nuclear reactors, **supporting nonproliferation efforts.**
- U.S. scientists helped create a muon detector system to **safely look inside the nuclear reactors** in Fukushima after the earthquake and tsunami in Japan.

Muon scanning at Fukushima

Images courtesy Fermilab, NASA, TEPCO, Shutterstock

For more examples of particle physics in society: www.symmetrymagazine.org/applied

usparticlephysics.org

Prepared by: APS Division of Particles & Fields, Fermilab UEC, SLUO SLAC Users Organization, US LUA

Sparking interest in STEM

Through diverse activities, we share the thrill of exploring the unknown and making new discoveries. Reaching tens of thousands of people every year, our public engagement programs promote scientific literacy and show how science makes a difference in all of our lives.

The SAGE-S summer camp introduces high school girls to the work and daily life of National Laboratory scientists and engineers. We complement technical activities that foster creativity with insights about professionals growth. SAGE students discover how their passion for STEM can become a career that impacts their community and the world.

—Diana Gamzina and Giulia Lanza, SLAC National Accelerator Laboratory

How do you make science a regular activity in the community? The Big Bang Science Fair caters to ages 3 to 99. It brings together art, science, and music, drawing parallels between them. This event engages thousands of people every year. Families can enjoy learning about science together on a Saturday evening.

—Meenakshi Narain, Brown University

We created VENu as an outreach tool to share the world of particle physics. It lets people explore the MicroBooNE neutrino experiment in 3D to see how it collects data for science. Learning how scientists use data to make discoveries can be as important as the discoveries themselves. In VENu you can see what the real data look like.

—Thomas Wester, Boston University

I am passionate about community education and outreach. I've made it my mission to make science more accessible to minority populations. By sharing my story, I hope to inspire young people and encourage them to reach their full potential.

—Jessica Esquivel, Syracuse University

Supporting aspiring STEM leaders

We offer programs for teachers that enable them to enrich their students' classroom experiences. We bring undergraduate and high school students into our research teams. We make our data and analysis tools available in formats for outreach, classroom exercises, and scientific analysis.

As part of the QuarkNet program, we invite high-school students to do a crash-course in particle physics. We teach them about the ATLAS experiment at the LHC and show them how to identify what the different particles look like in the detector. Then they get to analyze real data on the computer. They're always really excited to learn.

—Joe Haley, Oklahoma State University

We have a responsibility to share our data—scientific knowledge is for everyone. I help make our research more accessible by creating interactive visualizations of collision events and by preparing experimental data for educational programs that inspire the next generation of scientists.

—Tom McCauley, University of Notre Dame

In my third year of college, my physics professor recruited me for a Research Experience for Undergraduates program. The adventure of a real summer job in research inspired me to pursue science as a career. Now, as a scientist at Fermilab, I find it rewarding to work with summer students and try to inspire them in the same way I was.

—Michelle Stancari, Fermilab

I worked with studen
chamber that does n
anyone. We ran "Physi
school teachers wher
physics and the after
use in their classroom

Specific examples of **outreach and education**:

REU, SULI, QuarkNet, Big Bang Science Fair

Stories of people with PhD in physics contributing to **medicine, manufacturing, technology**

Contributing to the innovation economy

We develop our students' analytical and technical skills, enabling them to excel in today's technology-driven economy. Particle physics students pursue many career paths and become leaders in their fields. Their contributions spur innovation in medicine, manufacturing, and technology.

I work a thousand feet underground in a room full of electronics and lasers on experiments that help certify our nuclear weapons stockpile. It directly ties into national security. My analytic, experimental, and leadership training from high-energy physics has allowed me to navigate easily into nuclear stockpile stewardship.

—Andrea Albert, Los Alamos National Laboratory

I work on Waymo's LIDAR team. LIDAR is one of the "senses" that self-driving car systems use to map the 3D world around them. I use my research experience in light detection to build custom sensors that enhance the safety of self-driving cars. I find that people value the data analysis skills and multidisciplinary background I bring to the team as a particle physicist.

—Kanika Sachdev, Waymo

I am the director and co-founder of INQNET, a collaboration between AT&T Foundry and Caltech, to develop intelligent quantum networks and technologies. Bringing together diverse expertise to solve this challenging problem was inspired by my experience working with physicists from around the world in the massive ATLAS collaboration at CERN.

—Rishiraj Pravahan, INQNET

Part of my job is to understand detector physics and how it can be used to create new medical imaging technology. We're able to image anything where there's a lot of blood flow by using radioactive tracers. This technique is based on the physics of the particle detection experiments I worked on at Fermilab. My job is deeply rooted in physics, and I like that my skills are transferable.

—Wesley Gohn, Siemens Medical Solutions, USA

Fermilab provides a great **career opportunity for veterans (VetTech)** to build and enhance their technical and computing career options through paid summer internships.

Visiting Faculty Program (VFP) at Fermilab is great opportunity for faculty and students from community colleges and 4-year teaching universities.

Fermi National Accelerator Laboratory

VetTech Program at Fermilab

Are you a veteran with technical or computing skills? Do you want to pursue a career at the leading edge of technology and innovation? Then we want to hear from you.

VetTech Internships

Every year, Fermilab's VetTech internship program provides training and career opportunities for military veterans seeking to build or enhance their technical and computing career options. The program places veterans in a wide range of jobs, from mechanical to electrical to computing and software development. The program's aim is twofold: identify skilled people to fill open positions at Fermilab, and provide valuable job experience to veterans who plan to pursue a degree in a technical field.

VetTech interns may fabricate, assemble, calibrate, operate, test, repair or modify electronic or mechanical equipment, systems, devices or databases. The interns may also work in information technology, procurement or perform environmental, safety and health duties.

The VetTech internships are paid 10-week, full-time internships that start in June. The application period runs from November to January.

Learn More

Fermilab is located 40 miles west of Chicago in Batavia, Illinois. Our laboratory is home to particle physics research, a herd of buffalo and 1,100 acres of prairie. To find out more about our VetTech program and to apply, visit **diversity.fnal.gov/VetTech**. To browse our current job openings, go to **jobs.fnal.gov**.

Diverse people. Diverse jobs. Great science.

FNAL Procurement and Grant Letters

Keti Kaadze

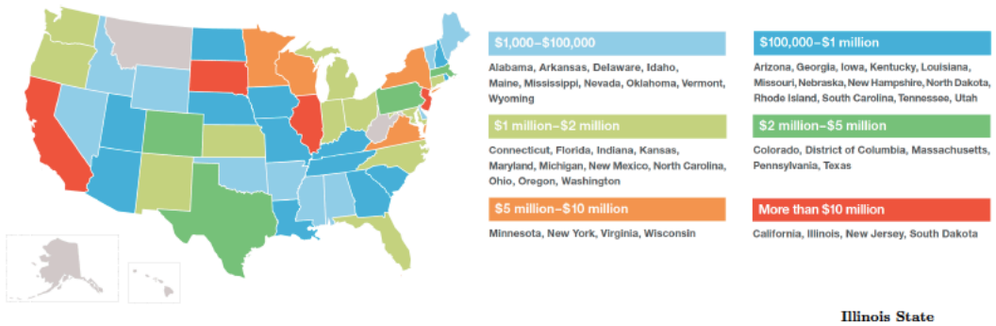
Fermilab Users Executive Committee
Fermi National Accelerator Laboratory
P.O. Box 500 - MS 220
Batavia, IL 60510
Phone: 785 320 9107
E-mail: ketino.kaadze@cern.ch

The Honorable Adam Kinzinger
United States House of Representatives
2245 Rayburn House Office Building
Washington, D.C. 20515

March 17, 2020

Dear Representative Kinzinger:

In fiscal year 2019, Fermilab spent $281 million in the United States to purchase goods and services in 44 states and the District of Columbia. Please find below specific information about goods and services purchased by Fermilab from your State or district during this time.



Illinois's 16^{th} Congressional District

Vendor	ZIP Code	Amount ($)
Whittaker Construction & Excavating Inc	60518	$846,758
Northern Illinois University	60115	$796,821
Mechanical & Industrial Steel Services Inc	60410	$248,105
Burns Machine Company	61350	$207,719
Comet Fabricating & Welding	61109	$141,905
Dial Machine	61125	$93,167
Northern Illinois University	60115	$54,689
Primus Electronics Corporation	60450	$50,717
Advanced Crane Technicians Inc	61024	$9,985
Crystal Precision Drilling Inc	61111	$8,374
Precision Repair Service Inc	61325	$7,328
Tek Matic Inc	61111	$6,219
Nature Conservancy	61031	$6,200
Micro Surface Corp	60450	$3,572
Forest City Gear	61073	$3,314
Elite Tool & Wire	61109	$3,020
Interstate Chemical Co	60410	$2,784
Inman Electric Co	61301	$2,375
Gould Clinics Ltd Dba Ashton Animal Clinic	61006	$2,197
Scope Shoppe Inc	60115	$1,255

Illinois State

Vendor	ZIP Code	Amount ($)
Kiewit Infrastructure Co	60631	$93,508,209
Aecom Technical Services Inc	60601	$8,975,912
Blue Cross Blue Shield of Illinois	60601	$3,229,441
Perkins & Will	60611	$2,618,090
Clorica Management Corporation	60154	$2,159,323
Koi Computers Inc	60148	$1,941,920
Argonne National Laboratory	60439	$1,921,683
Patrick Engineering Inc	60532	$1,801,260
Leyden Electric Inc	60119	$1,351,920
Aon Risk Services Central Inc	60601	$1,269,233
Steiner Security Services Inc	60445	$1,224,495
Moritz Edm	60084	$1,144,236
Applications Software Tech Corp	60563	$1,135,000
Gensler Architecture Design & Planning Pc	60602	$910,081
V3Gate LLC	60675	$908,958
Rachke Piping And Mechanical Inc	60436	$860,969
Whittaker Construction & Excavating Inc	60518	$846,758
Stark & Son Trenching	60140	$829,410
Northern Illinois University	60115	$796,821
Mott Macdonald, LLC	60606	$780,177
R C Wegman Construction Co	60506	$691,332
Prism Mechanical Corp	60543	$686,346
Jacobs Project Management Co	60661	$684,133
Ecs Inc	60523	$659,997
Mcmaster Carr	60680	$615,798
Sterling Staffing Inc	60154	$612,111
Resource Communications Inc.	60532	$600,955
Dsn Group Inc	60047	$579,894
Johnson Controls Inc	60005	$546,674
At&T	60197	$541,000
Northwestern University	60208	$491,871
Partnership Employment	60602	$434,182
Ecs Inc	60522	$423,040
Siemens Industry, Inc	60056	$413,250
Mid American Elevator Company Inc	60622	$405,450
Unified Tool & Die Mfg	60176	$402,665
Softcon Usa Inc	60068	$397,800
Lindblad Construction of Joliet Inc	60432	$396,560
Live Clean Inc	60610	$373,480
University of Chicago	60637	$363,975

Keti Kaadze

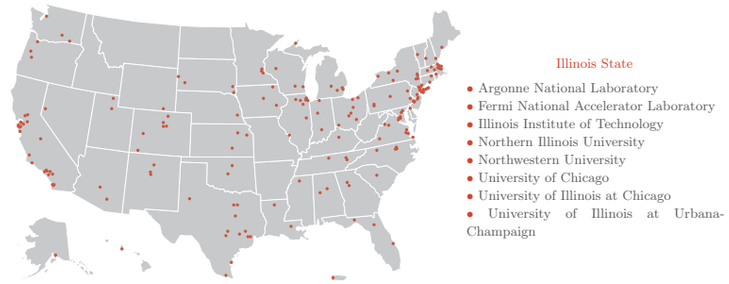
Fermilab Users Executive Committee
Fermi National Accelerator Laboratory
P.O. Box 500 - MS 220
Batavia, IL 60510
Phone: 785 320 9107
E-mail: ketino.kaadze@cern.ch

The Honorable Adam Kinzinger
United States House of Representatives
2245 Rayburn House Office Building
Washington, D.C. 20515

March 17, 2020

Dear Representative Kinzinger:

The DOE Office of Science and NSF Directorate for Mathematical and Physical Sciences (MPS) directly support scientists, engineers, and students in all 50 States, the District of Columbia, and Puerto Rico through research grants to academic institutions and contracts to supporting industries. In fiscal year 2019, the Department of Energy (DOE) Office of Science had a budget of $980 million for High Energy Physics, and the National Science Foundation (NSF) had a budget of $8.075 billion.



Institutions receiving DOE HEP grants during FY19

Please find below specific information about grants and contracts that were awarded by the DOE Office of Science and NSF to institutions and businesses in your district during FY19 and preceding years.

Illinois's 16^{th} Congressional District

In the past 6 years, this district has been awarded:

- DOE Office of Science HEP research grants totaling: **$2,312,000**
  Grants to researchers in your district from the DOE Office of High Energy Physics
- DOE Office of Science contracts totaling: **$NA**
  Contracts with companies in your district, primarily related to the operation of DOE National Laboratories
- NSF MPS research grants totaling: **$5,728,568**
  Grants to researchers in your district from the NSF Directorate for Mathematical and Physical Sciences

DOE Office of Science HEP Research Grants

Grants to researchers in your district from the DOE Office of High Energy Physics

Institution	Amount ($)	Start	End	Principal Investigator
Northern Illinois University	225,000	2019	2020	Erdelyi, Bela
Northern Illinois University	220,000	2019	2020	Erdelyi, Bela
Northern Illinois University	340,000	2018	2020	Piot, Philippe
Northern Illinois University	15,000	2017	2018	Piot, Philippe
Northern Illinois University	272,000	2017	2020	Piot, Philippe
Northern Illinois University	5,000	2017	2018	Zutshi, Vishnu
Northern Illinois University	400,000	2016	Ongoing	Chattopadhyay, Swapan
Northern Illinois University	210,000	2015	2020	Piot, Philippe
Northern Illinois University	0	2015	2016	Zutshi, Vishnu
Northern Illinois University	325,000	2014	2018	Eads, Michael
Northern Illinois University	300,000	2014	Ongoing	Erdelyi, Bela
Northern Illinois University	0	2014	2015	Piot, Philippe

NSF MPS Research Grants

Grants to researchers in your district from the NSF Directorate for Mathematical and Physical Sciences

Year	Institution	Amount ($)
2019	Northern Illinois University	1,029,118
2018	Northern Illinois University	679,528
2017	Northern Illinois University	1,461,293
2017	Pii Redacted	100,000
2016	Northern Illinois University	358,160
2015	Northern Illinois University	767,751
2014	Northern Illinois University	377,757
2013	Northern Illinois University	954,961

SULI & CCI Students

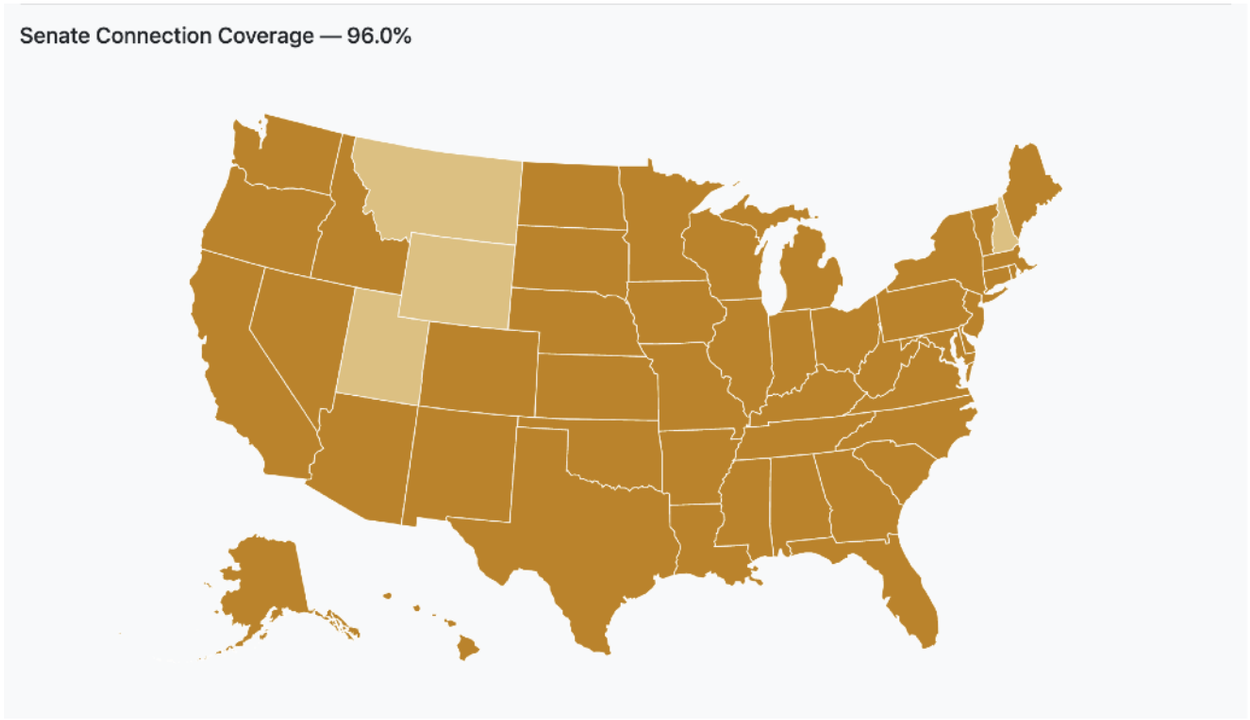
Science Undergraduate Laboratory Internships, Community College Internships

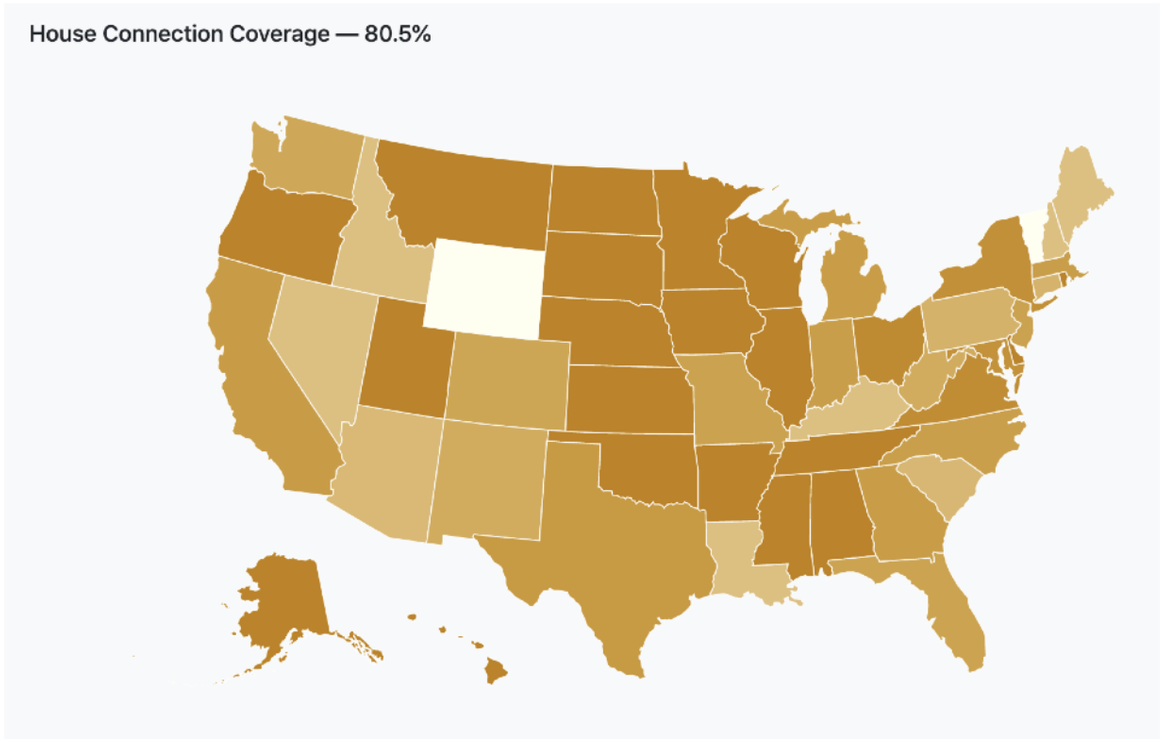
Name	College	Host Lab
Samuel James Carani	Northern Illinois University	Argonne National Laboratory
Amanda Paige Medendorp	Northern Illinois University	Argonne National Laboratory
Austin Pauga	Northern Illinois University	Argonne National Laboratory
Susanna Eschbach	Kishwaukee College	Fermi National Accelerator Laboratory
Samuel James Carani	Northern Illinois University	Argonne National Laboratory
Curt Michael Cheffer	Sauk Valley Community College	Fermi National Accelerator Laboratory
Derek Sexton	Northern Illinois University	Argonne National Laboratory
Mac McKinnon	Northern Illinois University	Argonne National Laboratory

SULI/CCI students from institutes in the State are hosted by national labs across the country

Status of Advocacy

Coverage and Status



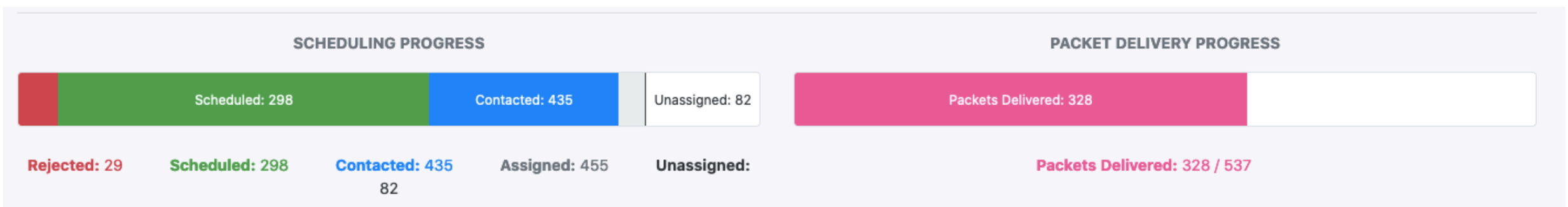


2021 Advocacy effort status:

- 435 contacted → 298 scheduled/met (~69%)
- Packets delivered to 328 out of 537 offices (~61%)

Very similar stats compare to last year

- Meetings over zoom longer and in some cases more engaging



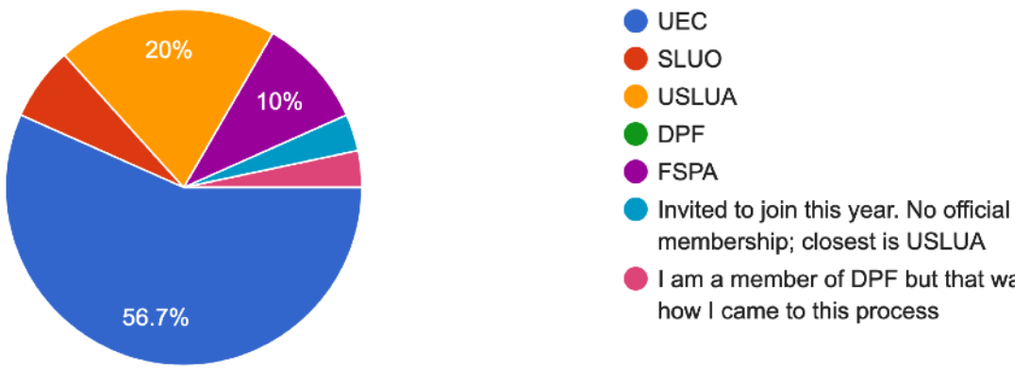
Special Meetings

- Appropriations sub-committees - Thanks to Breese Quinn
  - House/Senate E&W Development
  - House/Senate Commerce, Justice, and Science
  - House/Senate Energy
  - House Research and Technology
  - Senate Science, Oceans, Fisheries, and Weather
- Executive and funding agency meetings - Thanks to Harvey Newman
  - Office of Science and Technology Policy
  - Office of Management and Budget
  - DOE Office of Science HEP and HQ
  - NSF

Participation

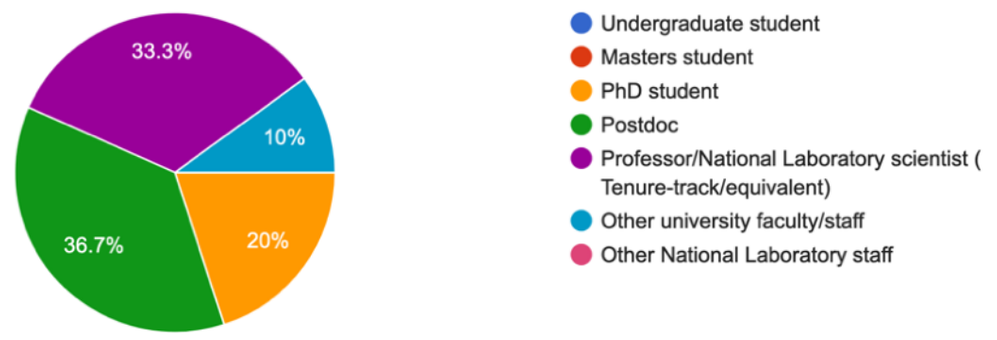
Organization

30 responses



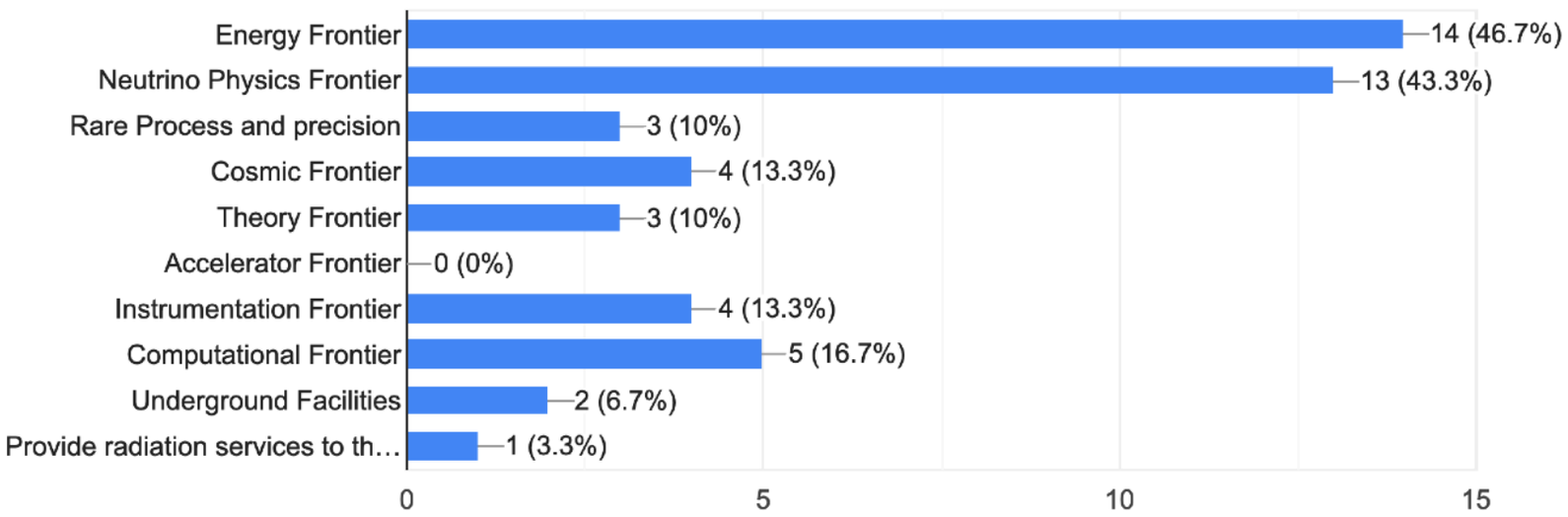
Please select your career level

30 responses



Which research areas are you affiliated with? (Check all that apply; these are borrowed from the Snowmass 2021 categorization)

30 responses



73 Total Participants
34 Female Participants

Main Impressions

- Overall impressions were very positive. Congressional offices show strong support to funding for HEP. They highly appreciate our reaching out to the Congress to update them on progress and priorities of the field. Different offices find different components of our advocacy material very valuable:
  - Raising new generation of STEM leaders and workforce
  - District specific letters on DOE/NSF funding and FNAL procurements
  - Particle Physics makes difference in our everyday life and connections with AI/QIS
  - Fermilab VetTech and Visiting Faculty programs
  - Very highly appreciated world-wide leadership of the U.S. in the field

Thanks to all participants!

GovRel Chair

- Nadja Strobbe is now a chair of the UEC GovRel sub-committee

- Soon there will be an election for the deputy chair
- Continuity is very important in this job as there is quite some to learn at the beginning. Thus, this is a two year commitment
- This is one of the most impactful service to HEP community, but most importantly this is a lot of fun (hopefully also a trip to DC)
- So, please consider volunteering! :)

Main Impressions

- Overall impressions were very positive. Congressional offices show strong support to funding for HEP. They highly appreciate our reaching out to the Congress to update them on progress and priorities of the field. Different offices find different components of our advocacy material very valuable:
  - Raising new generation of STEM leaders and workforce
  - District specific letters on DOE/NSF funding and FNAL procurements
  - Particle Physics makes difference in our everyday life and connections with AI/QIS
  - Fermilab VetTech and Visiting Faculty programs
  - Very highly appreciated world-wide leadership of the U.S. in the field

Thanks to all participants for successful meetings!

Additional Material

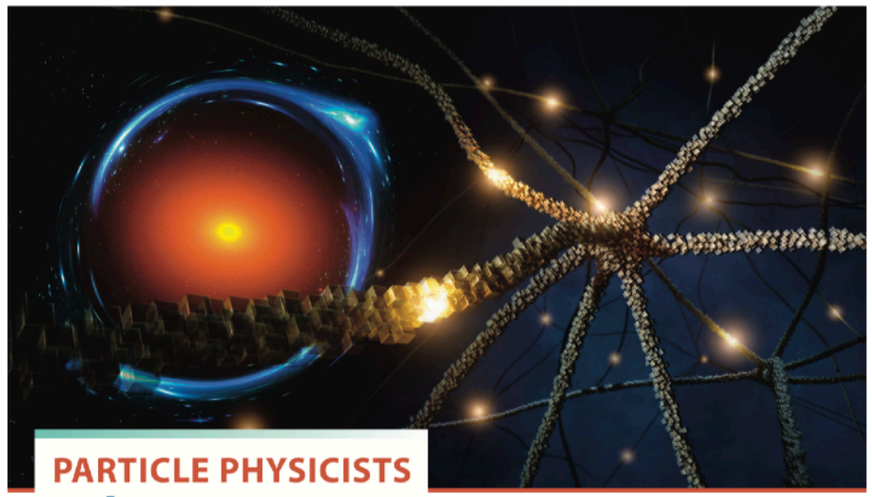
The Packet:

- The Ask
- Particle Physics: Building for Discovery
- Particle Physicists Deliver Discovery Science Through Collaboration
- Particle Physics Makes a Difference in Your Life
- Particle Physics Builds STEP Leaders
- **Particle Physicists Advance AI**
- Particle Physics and QIS

Particle physics faces **specific challenges** (large datasets, high speed data taking, harsh environment) that needs innovative solutions, which further feeds to industry

AI is used for years in HEP to address these challenges: operate complex machines, perform rapid image processing, improve analysis of particle collisions, etc.

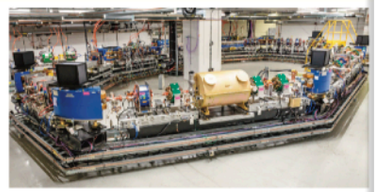
Examples of **collaboration with industry** and providing them workforce experienced in AI



PARTICLE PHYSICISTS

Advance Artificial Intelligence

Particle physicists advance artificial intelligence in their quest to explore the frontiers of science. They face unique challenges in operating complex accelerators and detectors and in analyzing massive streams of data. They meet these challenges with innovative techniques that have applications in other areas of science and in industry.



Particle Physicists

collaborate with industry leaders

Researchers in industry work together with particle physicists to develop new AI technology for these challenging applications.

Xilinx constructs advanced hardware that enhances the rapid data processing needed for the CMS experiment at the Large Hadron Collider (LHC).

Particle physicists are using the advanced AI processors on Microsoft's Azure cloud service to process LHC data in record time.

Particle Physics trains

an AI-ready workforce

Particle physicists who work with AI bring their effective, multidisciplinary skills to other fields and industries.

AI is important because it can help you discover things your brain and other techniques can't. There are many algorithms, but you have to know which one to use and understand where it's applicable. Industry needs this expertise, and I've already worked with Boeing, Lockheed Martin, and companies in the energy sector.

—Sandra Biedron, University of New Mexico and Element Aero

At Tesla, I transformed enormous data sets into detailed road maps for self driving cars and at DeepMind, I am building AI systems that imagine and plan. My experience in particle physics trained me to tackle these complex problems while dealing with the noisy and uncertain data of the real world.

—Alex Mott, DeepMind

usparticlephysics.org

Prepared by: APS Division of Particles & Fields, Fermilab UEC, SLUO SLAC Users Organization, US LUA

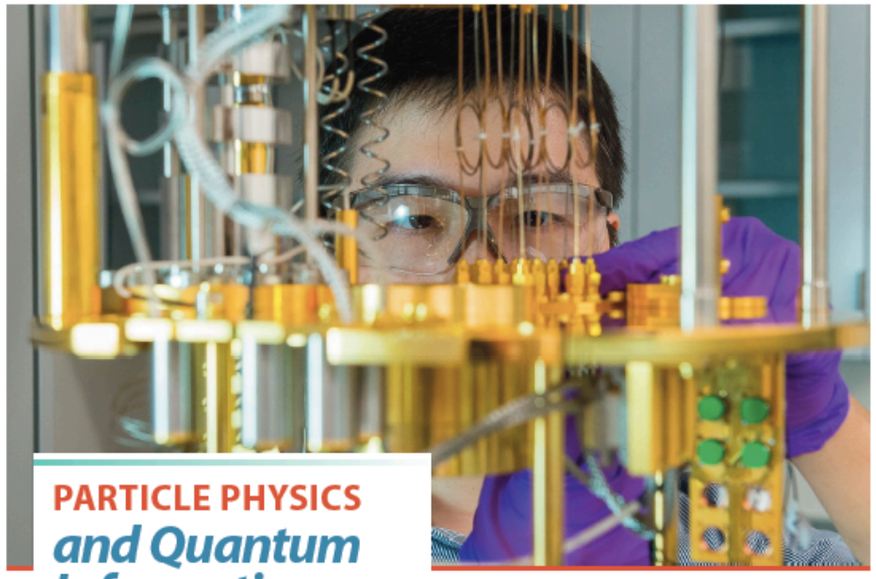
The Packet:

- The Ask
- Particle Physics: Building for Discovery
- Particle Physicists Deliver Discovery Science Through Collaboration
- Particle Physics Makes a Difference in Your Life
- Particle Physics Builds STEP Leaders
- Particle Physicists Advance AI
- **Particle Physics and QIS**
- Particle Physics is Discovery Science

Particle Physics and QIS are tightly connected: Physicists bring ideas, technologies, expertise to construct sophisticated, large-scale instruments. QIS offers solutions to our fundamental problems (interactions of quarks, brith & death of BH, etc).

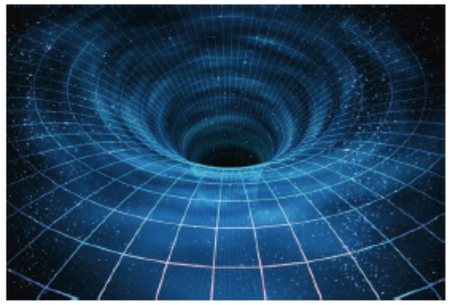
Particle Physicists have constructed **world's largest superconducting systems** or developed **superconducting quantum sensors** to search for DM. Superconducting cavities maintained qubits for world-record times (secs.)

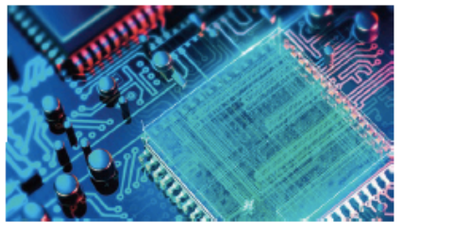
QIS Research centers already benefit from expertise and workforce in our field!

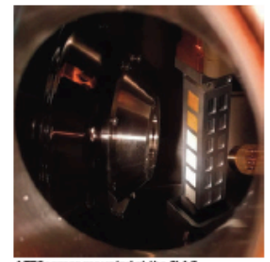


PARTICLE PHYSICS
and Quantum Information Science

ics and Quantum
re tightly connected.
Quantum Initiative
IS to the nation's
c competitiveness.
his effort specific
d the ability to
ge-scale instruments.
ns to fundamental
m the interactions
eath of black holes.



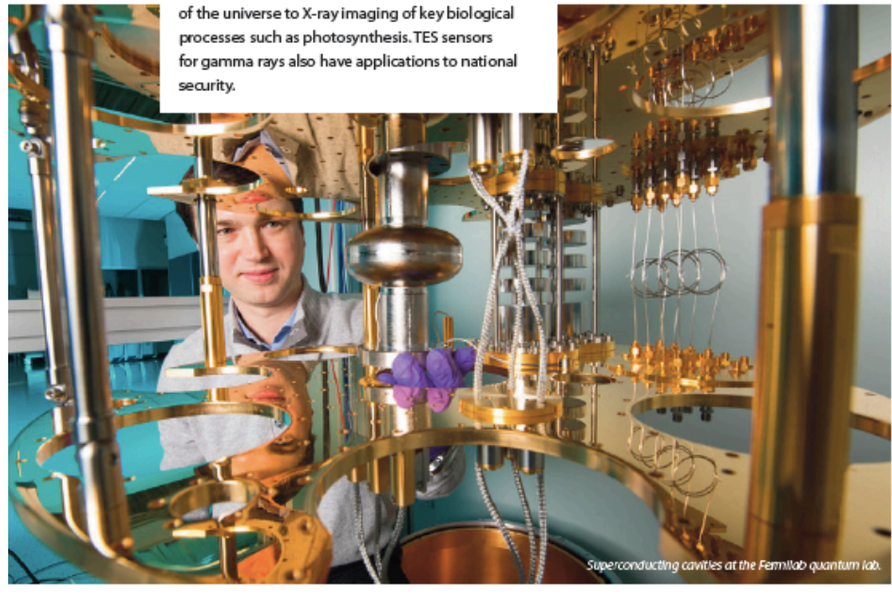




A TES sensor mounted at the SLAC X-ray synchrotron.

Superconducting systems at the Large Hadron Collider.

sensors now have **wide applications as detectors** for measurements ranging from the earliest radiation of the universe to X-ray imaging of key biological processes such as photosynthesis. TES sensors for gamma rays also have applications to national security.



Superconducting cavities at the Fermilab quantum lab.

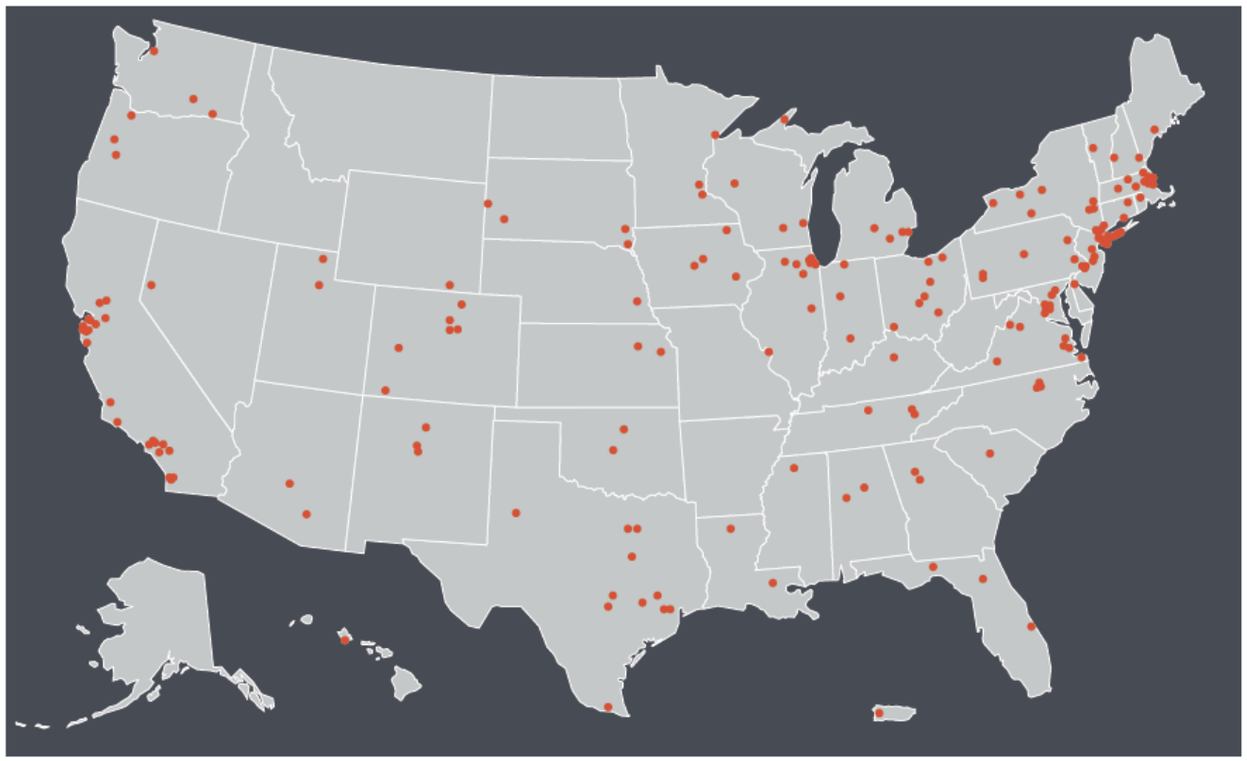
The Packet:

- The Ask
- Particle Physics: Building for Discovery
- Particle Physicists Deliver Discovery
- Science Through Collaboration
- Particle Physics Makes a Difference in Your Life
- Particle Physics Builds STEP Leaders
- Particle Physicists Advance AI
- Particle Physics and QIS
- **Particle Physics is Discovery Science**
- Particle Physics in the US Map
- Neutrinos
- DUNE
- Cosmology
- Dark Matter
- Vera C. Rubin Observatory (LSST)
- USLHC
- SLAC
- About Fermilab
- Fermilab Vet Tech Program

This is an introductory brochure that tells that we have a goal and a clear plan, we work together and are united to achieve our big picture goal, our work has impact in everyday life.
Other brochures are talking about all these aspects in more detail

The Packet:

- The Ask
- Particle Physics: Building for Discovery
- Particle Physicists Deliver Discovery
- Science Through Collaboration
- Particle Physics Makes a Difference in Your Life
- Particle Physics Builds STEP Leaders
- Particle Physicists Advance AI
- Particle Physics and QIS
- Particle Physics is Discovery Science
- **Particle Physics in the US Map**
- Neutrinos
- DUNE
- Cosmology
- Dark Matter
- Vera C. Rubin Observatory (LSST)
- USLHC
- SLAC
- About Fermilab
- Fermilab Vet Tech Program



A list of **more than 175 US Institution** contributing to HEP research

The Packet:

- The Ask
- Particle Physics: Building for Discovery
- Particle Physicists Deliver Discovery Science Through Collaboration
- Particle Physics Makes a Difference in Your Life
- Particle Physics Builds STEP Leaders
- Particle Physicists Advance AI
- Particle Physics and QIS
- Particle Physics is Discovery Science
- Particle Physics in the US Map
- **Neutrinos**
- **DUNE**
- **Cosmology**
- **Dark Matter**
- **Vera C. Rubin Observatory (LSST)**
- **USLHC**
- **SLAC**
- **About Fermilab**
- Fermilab Vet Tech Program