

CAB meeting, July 27, 2023

News

[How new atomic clocks could help in search for dark matter — and beyond](#)

Researchers look to develop ultra-sensitive, ultra-precise tools that can operate in space on a joint Fermilab and MIT's Lincoln Laboratory project.

[Fermilab-led microelectronics codesign team works to develop a cutting-edge particle detector](#)

Using superconducting nanowires and cryogenic electronics, experts from different fields combine their know-how to develop a completely new type of particle detector. The goal: detect particles in ultracold environments, even in the presence of strong magnetic fields where other technologies fail.

[DESI early data release holds nearly two million objects](#)

Press release led by Berkley as the lead for DESI

The first batch of data from the Dark Energy Spectroscopic Instrument is now available for researchers to mine. Taken during the experiment's "survey validation" phase, the data include distant galaxies and quasars as well as stars in our own Milky Way.

[SAGE Journey program ignites interest in STEM](#)

Three SAGE alumni talk about their experiences with a program meant to broaden gender diversity in STEM.

DUNE update

[Contract awarded for acquisition of large cryogenic system for DUNE detectors in South Dakota](#)

A newly awarded multi-year contract for the acquisition of a large cryogenic plant to cool tens of thousands of tons of liquid argon brings the [Deep Underground Neutrino Experiment](#) one step closer to realization.

[LBNF/DUNE gears up for next stage of construction in South Dakota](#)

More than 70% of the excavation of the South Dakota portion of the Long-Baseline Neutrino Facility for the Deep Underground Neutrino Experiment is complete. Preparations for turning the huge caverns into usable laboratory space are underway.

[Live: Particle pursuit, a journey of the Deep Underground Neutrino Experiment](#)

On June 6, we hosted a collaborative quiz-show style livestream simultaneously from Fermilab, CERN and SURF.

June 6, 2023: Join CERN, Fermilab and Sanford Underground Research Facility on June 15 at 11 a.m. CDT for its first gameshow-style livestream to learn about all things neutrinos. Click to learn more about this exciting virtual event/

<https://www.youtube.com/watch?v=LaMjEINVhEg>

Neutrino Day – July 8, 2023

[Weird science!](#)

From the Black Hills Pioneer, July 7, 2023: Over 2,000 people in Lead, South Dakota celebrated Neutrino Day on July 8, organized by the Sanford Underground Research Facility with LBNF and DUNE members participating. The event featured a science comedian, interactive science booths, virtual underground tours as well as speakers on renewable energy and the Long Baseline Neutrino Facility for DUNE.

Muon g-2

[Peter Winter chosen as new Muon g-2 spokesperson](#)

A proponent of mentorship and inclusion, Argonne National Laboratory physicist Peter Winter brings his experience with managing and collaborating among the researchers of the Muon g-2 experiment to the position of spokesperson.

[What does the Standard Model predict for the magnetic moment of the muon?](#)

A large number of scientists are working on improving the Standard Model prediction of the value of muon g-2 using new data and new lattice calculations. By measuring and calculating this number to ultra-high precision, scientists can test whether the Standard Model is complete.

New results from the Muon g-2 experiment at Fermilab will be unveiled in a scientific seminar on August 10, 2023 at 10:00 am US Central Time

The seminar will be livestreamed on the [Fermilab YouTube](#) channel. Further information and a link to the webinar can be found [here](#).

Awards

[Patrick Green wins 2023 URA Doctoral Thesis Award](#)

[Fermilab accelerator scientist wins 2023 URA Early Career Award](#)

[The 2023 URA award recipients](#)

[Donato Passarelli wins inaugural URA Engineering Award](#)

[Fermilab researcher receives 2023 URA Tollestrup Award](#)

Symmetry

[SAGE Journey program ignites interest in STEM](#) – Three SAGE alumni talk about their experiences with a program meant to broaden gender diversity in STEM.

[Will AI make MC the MVP of particle physics?](#)

Particle physicists are building innovative machine-learning algorithms to enhance Monte Carlo simulations with the power of AI.

[The magnet detectives](#)

During a routine test, two HL-LHC magnets unexpectedly flatlined. Was it just a coincidence, or did they have a common foe?

[A call to cite Black women and gender minorities](#)

Theoretical astrophysicist Chanda Prescod-Weinstein recently unveiled the Cite Black Women+ in Physics and Astronomy Bibliography.

[India's gem at CERN: Archana Sharma](#)

The first Indian scientist to join CERN was recently recognized with the highest honor of India for overseas citizens.

[Physics on tour](#)

A group called the Big Bang Collective sets up physics discovery stations at rather unexpected venues: music festivals.

[A cosmological headache](#)

For over a century, scientists have wondered what is counteracting the force of gravity in the universe.

[A different way of thinking](#)

Neurodivergent physicists face barriers in STEM, but there are also benefits to being who they are.

[From inventor to entrepreneur](#)

Creating a startup to commercialize technology developed during research is a risky road for physicists and engineers, but the help of experts can improve their chances.

Videos

Don Lincoln

[Cosmic rays and the mummy's curse](#)

Archaeology and particle physics would seem to have nothing in common, yet researchers are using subatomic particles called muons to effectively x-ray such huge and ancient structures as both Egyptian and Mexican pyramids. In this video, Fermilab's Dr. Don Lincoln tells us how it is done.

Don Lincoln

[Do photons experience time?](#)

In relativity theory, fast moving clocks tick more slowly than slow moving ones. The effect increases as one approaches the speed of light. But what happens at the speed of light? Do photons experience time? In this video, Fermilab's Dr. Don Lincoln lays out what we know about this interesting question.

Don Lincoln

[Is the weak nuclear force really a force?](#)

Fermilab In the News

[The muon g-2 experiment: insights into the unknown](#)

From the Innovation News Network, May 31, 2023: Editor Georgie Purcell interviews Sean Foster, Research Scientist at Boston University, and Elia Bottalico, Postdoctoral Researcher at the University of Liverpool, who are both heavily involved on the Muon g-2 experiment. The g-2 collaboration scientists are in the final stages of data analysis for Runs 2 and 3 and are preparing to announce the results later this year.

[Fermi Research Alliance donates \\$20K to Lead park project](#)

From the Black Hills Pioneer, June 10, 2023: The city of Lead announced Fermi Research Alliance contributed a majority of the costs to the improvements of Manuel Brothers Park in Lead, South Dakota. FRA's contribution will help pay for the concrete pathway that has been built around the perimeter of the park that is used as a gathering place for many events and activities for the residents throughout the year.

[Preparing for the next era of neutrino research](#)

From CERN, June 13, 2023: Teams at CERN's Neutrino Platform are currently upgrading and assembling multiple detectors to help large experiments like the Deep Underground Neutrino Experiment to uncover the mysteries of neutrinos. But before the full-size detectors are built, CERN has created the large cryostat modules of the ProtoDUNE experiment. The Neutrino Platform is also an assembly station for the Tokai to Kamioka (T2K) experiment in Japan.

[A joint statement from the United States and India](#)

From the White House, June 22, 2023: Prime Minister Narendra Modi of India and President Joe Biden met last Thursday to deepen bilateral cooperation between the two countries on cutting-edge scientific infrastructure. As part of the agreement, India will supply components worth \$140 million to the U.S. Department of Energy's plans to upgrade the Fermilab accelerator complex to create the most intense high-energy neutrino beams which would help unravel understanding of the evolution of the universe. This contribution is described in number 10 of the White House statement.

[What is it like to be a photon traveling at light speed?](#)

From Big Think, June 22, 2023: Fermilab's Don Lincoln discusses how the Universe is timeless and dimensionless from a photon's viewpoint.

[Physicist by day, YouTuber by night](#)

From the CERN Courier, July 5, 2023: As the popular face of Fermilab on YouTube and outreach events, Don Lincoln discusses the importance of science communications and outreach in an interview with the Courier.

[New tool helps improve quantum computing circuit component](#)

From Phys.org, July 5, 2023: Researchers from Ames Laboratory announced important research results done with Fermilab's SQMS Center that will improve the quantum circuit quality of a vital qubit component. The research was an important step in quantum computing

development and proves that collaborative research groups like SQMS with Ames can lead to solving very complex technological and scientific problems.

[A novel type of neural network comes to the aid of big physics](#)

From Wired, July 16, 2023: The use of a machine learning tool known as sparse convolutional neural network is now being used by researchers to accelerate real-time data analysis. SCNNs have been used in simulations of the data expected from DUNE and analyzed the simulated data faster than ordinary methods while requiring significantly less computational power.

[Lia Meringa – First woman to serve as director of Fermi National Accelerator Laboratory in Batavia](#)

From West Suburban Living, July 10, 2023: West Suburban Living magazine interviews Lia Meringa on how she developed an interest in science, who inspired her and her journey from early education to being Fermilab's first female director.