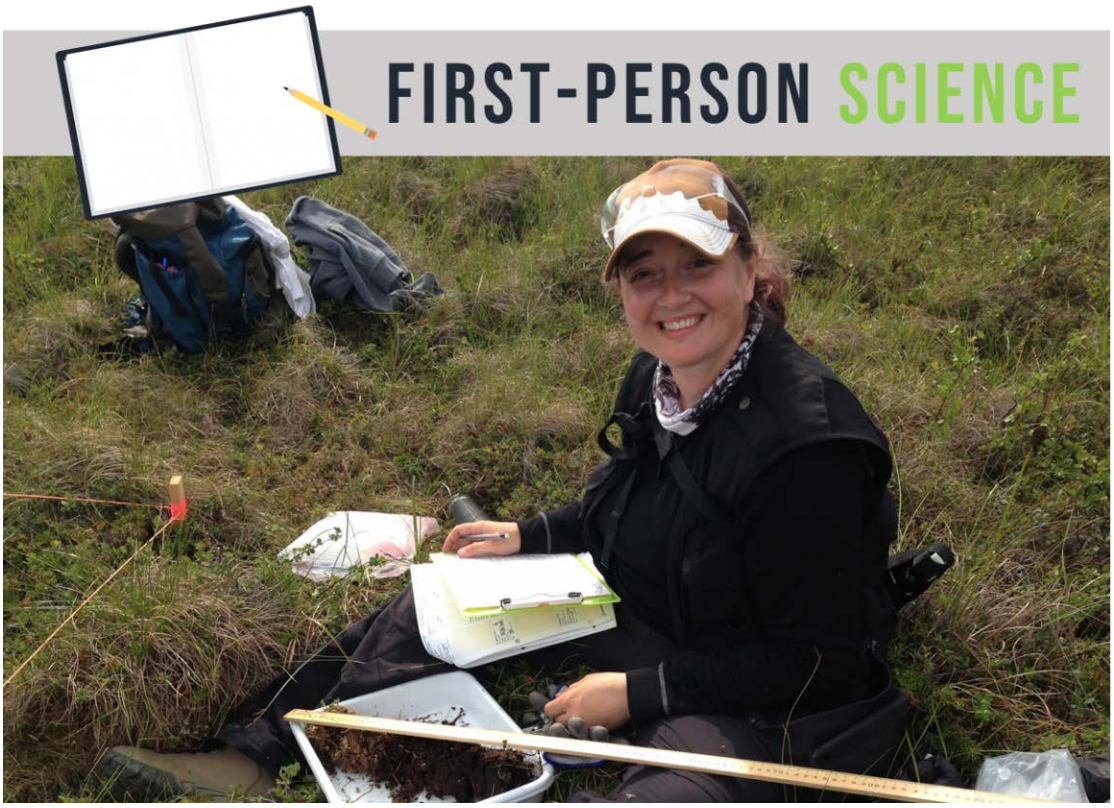
U.S. DEPARTMENT OF ENERGY

Office of Science

COMMUNIQUE

13 July 2020

*Comm*unique provides a biweekly review of recent Office of Science Communications and Public Affairs work, including feature stories, science highlights, social media posts, and more. This is only a sample of our recent work promoting research done at universities, national labs, and user facilities throughout the country. *Please note that some links may expire after time.*



First-Person Science: Colleen Iversen on Belowground Ecology

In the First-Person Science series, scientists describe how they made significant discoveries over years of research. Colleen Iversen is a senior staff scientist at the Department of Energy's Oak Ridge National Laboratory:

I get to see things that nobody else sees and I get to understand them in a way other people haven't thought about. Using special tubes and cameras that can see underground, I can see beautiful white fungal strands growing on a root and know that they're working together to keep the plant alive.

So I think of myself as a cheerleader for the belowground world.

Click here to read more about researching roots and how belowground systems contribute to models of ecosystems.

NEWS CENTER

The Office of Science posted 59 news pieces between 6/29/2020 and 7/12/2020, including 28 university articles and 26 pieces from the labs and user facilities.

A team from Arizona State University used the Advanced Photon Source at Argonne National Laboratory to simulate conditions on water-rich exoplanets, gaining insights into their composition that could change the way these planets are modelled.

In 1998, researchers built a target to study the internal structure of a neutron at Jefferson Lab. More than 20 years later, physicists are still using it to investigate the mysteries of neutrons and their smaller constituent particles, quarks.

Researchers at Princeton Plasma Physics Laboratory demonstrated a computer code that could help design more efficient stellarators to replicate fusion reactions.

A new paper from Virginia Tech seeks to explain two recent anomalies in Antarctica, instances in which high-energy neutrinos appeared to come up out of the Earth and move toward the sky of their own accord.

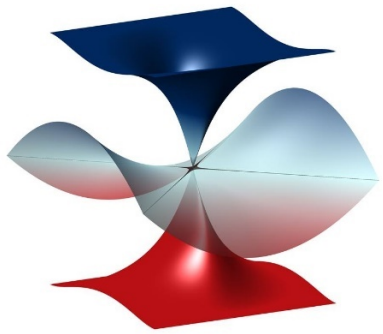
Using climate change projections simulations, researchers from Stony Brook University have predicted that, in the North Atlantic, the frequency of hurricanes will decrease, but storm intensity will increase.

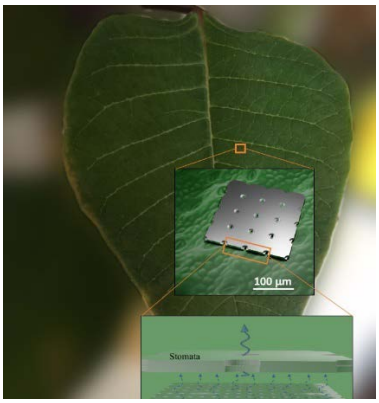
Scientists from Northwestern University have developed a new system to accelerate the design of biological systems, exponentially reducing the time it takes to produce biomanufacturing products.

SCIENCE HIGHLIGHTS

The Office of Science posted four new highlights spotlighting BES between 6/29/2020 and 7/12/2020.

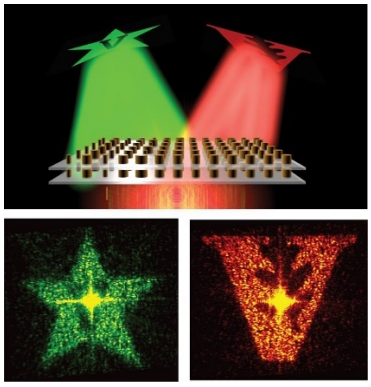
Scientists from Argonne National Laboratory have demonstrated the existence of an “exceptional surface” for the first time. These materials could have applications in information processing and sensing, improving quantum sensors and helping scientists explore quantum physics.





Scientists from Oak Ridge National Laboratory and Virginia Tech are developing "synthetic trees" that function like their natural counterparts. These trees have potential uses in a wide range of energy and water applications, like pumping water or cooling buildings without machinery.

Researchers from Vanderbilt University and Oak Ridge National Laboratory have demonstrateed novel ways to design and build materials for controlling light. These materials could improve the versatility and complexity of electronics that work with light, like those key to medical imaging.



IN THE NEWS

Washington Post: The Inventor of N95 Masks Had Retired. But He Now Works 20 Hours a Day, Mostly for Free, to Fight COVID-19

Peter Tsai, the inventor of the N95 mask, is working to determine methods for cleaning and reusing the masks without compromising their integrity. He has worked with Oak Ridge National Laboratory to use the lab's Carbon Fiber Technology Facility to produce mask material.

New Scientist: The Detector with a Billion Sensors that May Finally Snare Dark Matter

This article about dark matter and large arrays of quantum sensors quotes Fermilab scientist Gordan Krnjaic.

Nature: Countdown to Mars: Three Daring Missions Take Aim at the Red Planet

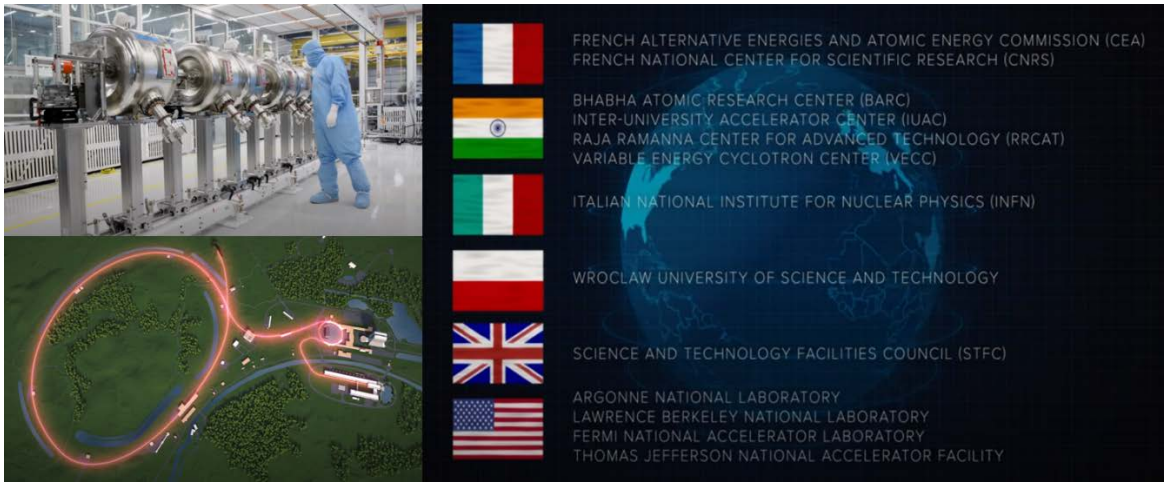
The Mars rover Perseverance represents the best chance yet for scientists to learn whether life ever arose on Mars. Sherry Cady, an astrobiologist at Pacific Northwest National Laboratory, is featured in this article.

TOP TWEETS

The Office of Science sent out 62 tweets between 6/29/2020 and 7/12/2020. Here are our two most popular from the past two weeks:

BY THE NUMBERS

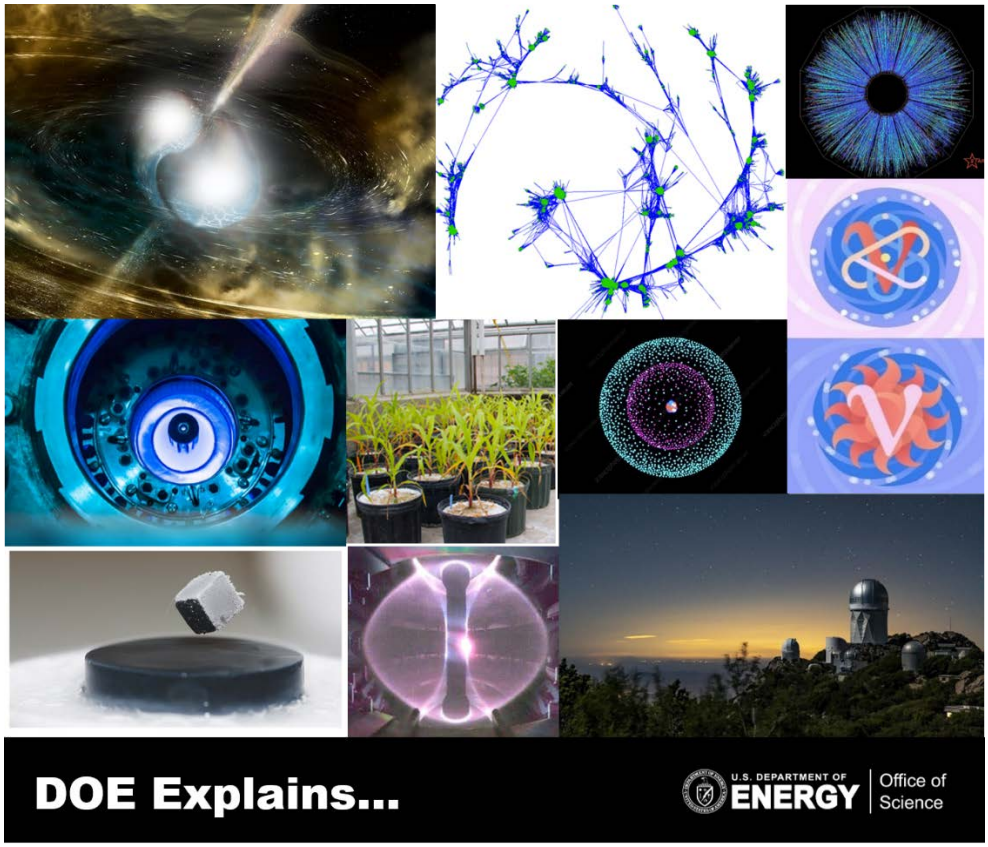
Video: How Will Fermilab's New Accelerator Propel Particles Close to the Speed of Light?



The Proton Improvement Plan-II, an essential upgrade to the Fermilab Accelerator Complex, is the first U.S. particle accelerator project with significant contributions from international partners. 13 institutions from five countries are building major components of the new machine, which includes the construction of a 215-meter-long particle accelerator that will accelerate particles to 84% of the speed of light. This new accelerator will enable Fermilab to generate an unprecedented stream of neutrinos, powering the scientific program for the international, Fermilab-hosted Deep Underground Neutrino Experiment and Long-Baseline Neutrino Facility.

END NOTES

DOE Explains…



Sometimes, scientific terms can be confusing. The Office of Science's new series, DOE Explains…, offers straightforward explanations of key words and concepts in fundamental science. Defining everything from Atmospheric Radiation to Ultrafast Science, DOE Explains… describes how scientific concepts apply to the work of the Department of Energy's Office of Science as it helps the United States excel in research across the scientific spectrum.

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