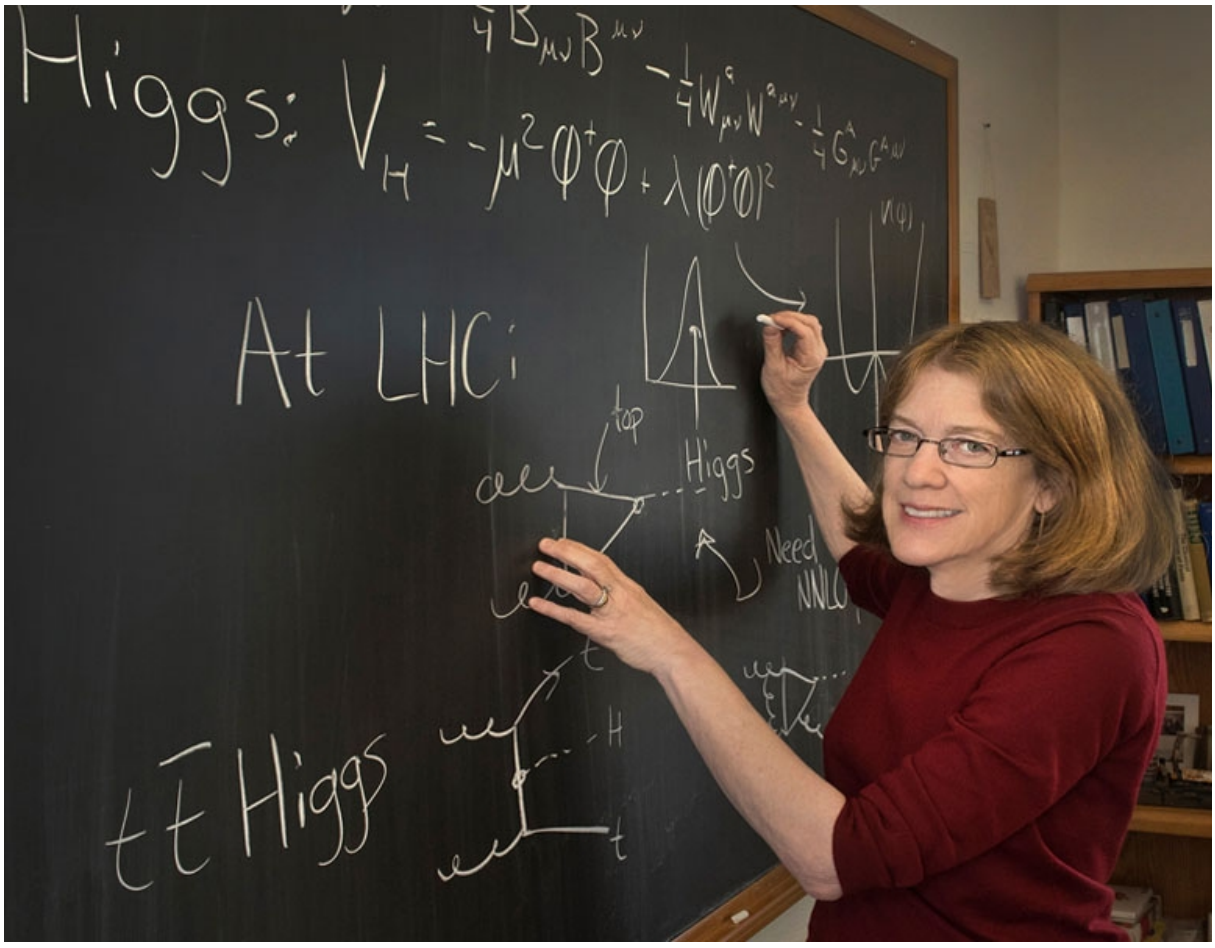
U.S. DEPARTMENT OF ENERGY

Office of Science

communique

December 12, 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.*



The Big Questions: Sally Dawson on the Higgs Boson

The Big Questions series features perspectives from the five recipients of the Department of Energy Office of Science's 2019 Distinguished Scientists Fellows Award describing their research and what they plan to do with the award. This article was the most popular feature post on our site in 2020.

What particle causes the universe's fundamental particles to have mass? That question drove the effort to discover the Higgs Boson, the focus of my work for the past 30 years.

Click here to read more about Dawson's work on the Higgs Boson.

NEWS CENTER

The Office of Science posted 1280 news pieces in 2020, including 685 university pieces and 595 from the labs and user facilities. These were the most-read articles this year.

To help particle physics researchers sort through overwhelming amounts of data, researchers at Lawrence Berkeley National Laboratory are looking to see if quantum computing systems may be able to recognize patterns in the tracks particles leave.

Scientists at the Center for Advanced Bioenergy and Bioproducts Innovation (CABBI) at the University of Illinois at Urbana-Champaign have developed a new high-resolution mapping framework to help make more accurate forecasts of crop water use.

One scientist at SLAC National Accelerator Laboratory describes how working on new technologies for accelerators is helping scientific research leap forward.

A team led by researchers from Princeton University has uncovered a new class of magnet that exhibits novel quantum effects that still occur at room temperature.

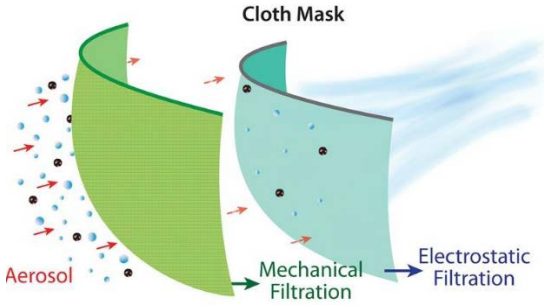
Brookhaven National Laboratory researchers have discovered the critical role a specific compound plays in the process of converting carbon dioxide into a chemical useful to industry.

A discovery by researchers led by scientists from UMass Lowell found that the symmetry that exists within the core of atoms is not as fundamental as scientists have believed.

SCIENCE HIGHLIGHTS

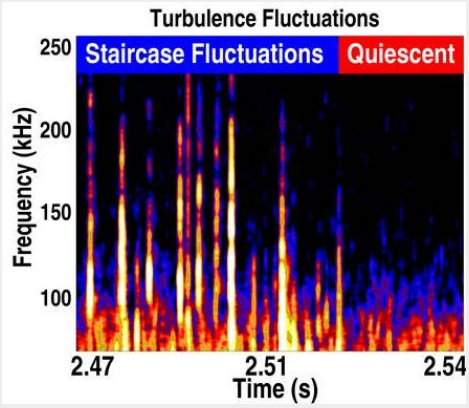
The Office of Science posted 90 new highlights in 2020.

In a study of the effectiveness of face masks made of different materials using the Center for Nanoscale Materials, scientists from Argonne National Laboratory found the best-performing masks used hybrid designs that include high thread-count cotton and electrostatic layers such as silk or polyester chiffon.



Scientists from the University of California, Santa Barbara may have discovered a quantum phase where magnetic moments of electrons (the strength and orientation of a magnet) inherently change over time and never become ordered even at absolute zero temperature. This exotic state of matter is called a quantum spin liquid.

Most of fusion science assumes that tokamaks (machines used to study fusion) need to suppress turbulence at the edge of fusion plasmas. It seemed like this control was necessary to keep fusion reactors hot enough. However, recent experiments in the DIII-D tokamak by researchers at Princeton Plasma Physics Laboratory show the opposite. They demonstrate that more turbulence at the edge of the plasma can result in it being hotter.



IN THE NEWS

New York Times: **Cloud Computing Is Not the Energy Hog That Had Been Feared**

In this article about cloud computing's energy usage, scientists from Berkeley Lab provide insights that may counter prevailing assumptions on data centers and energy use.

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.

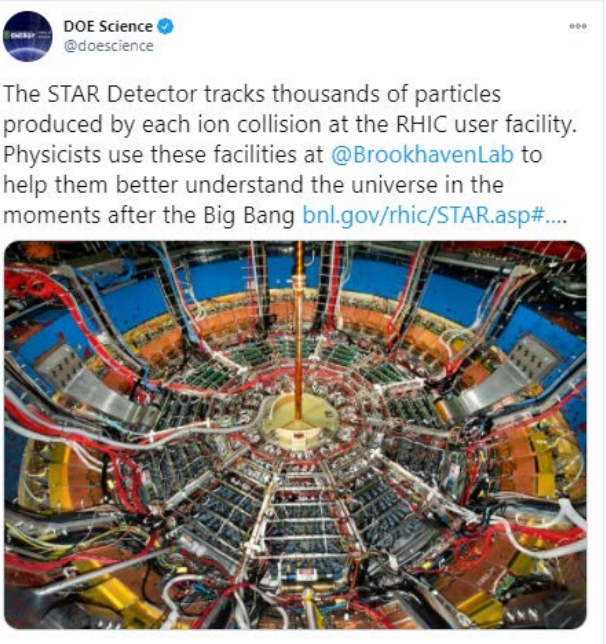
The Guardian: Terrawatch: dust is speeding up the melting of Himalayan snow

Researchers from Pacific Northwest National Laboratory used remote sensing observations and computer simulations to assess the impact of dust blowing in from Africa and Asia on Himalayan snow and ice.

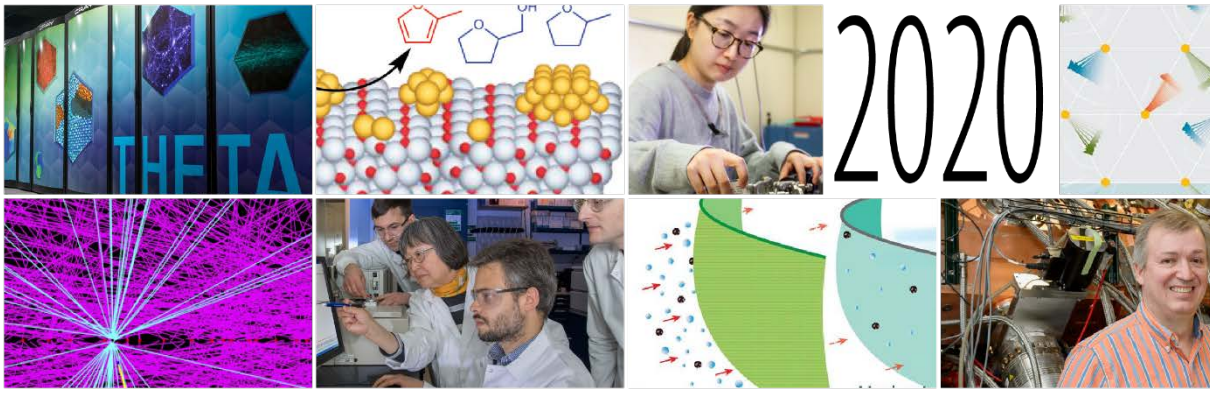
TOP TWEETS

The Office of Science sent out 1,413 tweets in 2020.

Here are the two most popular:

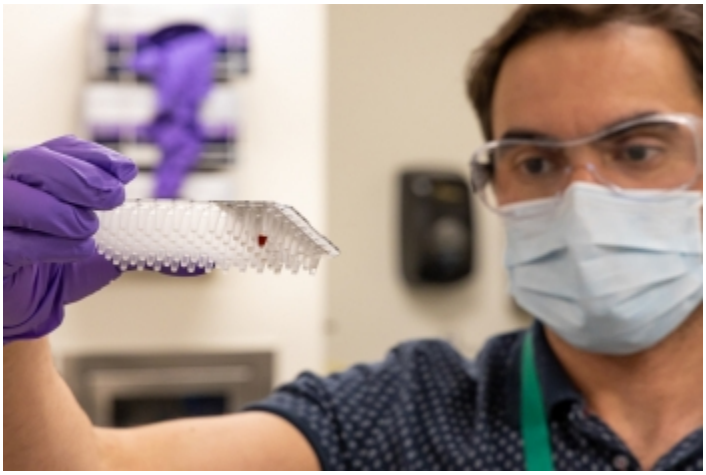


BY THE NUMBERS



In 2020, the Office of Science covered science ranging from high-performance computing to COVID-19 research to polymers. Content from the Office of Science and its national laboratories was viewed more than four million times on Energy.gov, Newswise, and EurekAlert!

END NOTES



2020 was a year like no other. Despite the challenges offered by the COVID-19 pandemic, the Department of Energy Office of Science continued its good work.

In response to the pandemic, SC mobilized the national laboratories to establish the National Virtual Biotechnology Laboratory. Among the most notable results of our national laboratories' research laboratories was the determination of the atomic-level structures of the proteins of the SARS-CoV-2 virus and their complexes, yielding crucial functional information about the virus.

The camera core for the future Vera C. Rubin Observatory has snapped its first test photos, setting a new world record for the largest single shot by a giant digital camera. The photos were taken at SLAC National Laboratory and the research team includes scientists from several national laboratories.

Recognizing her long-standing accomplishment, the Nobel Prize committee awarded Jennifer Doudna, UC Berkeley professor and faculty scientist at DOE's Lawrence Berkeley National Laboratory, with the 2020 Nobel Prize in Chemistry, along with co-laureate Emmanuelle Charpentier, for "for the development of a method for genome editing."

Please see the Communique archive on Energy.gov for past issues.

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