



U.S. DEPARTMENT OF
ENERGY

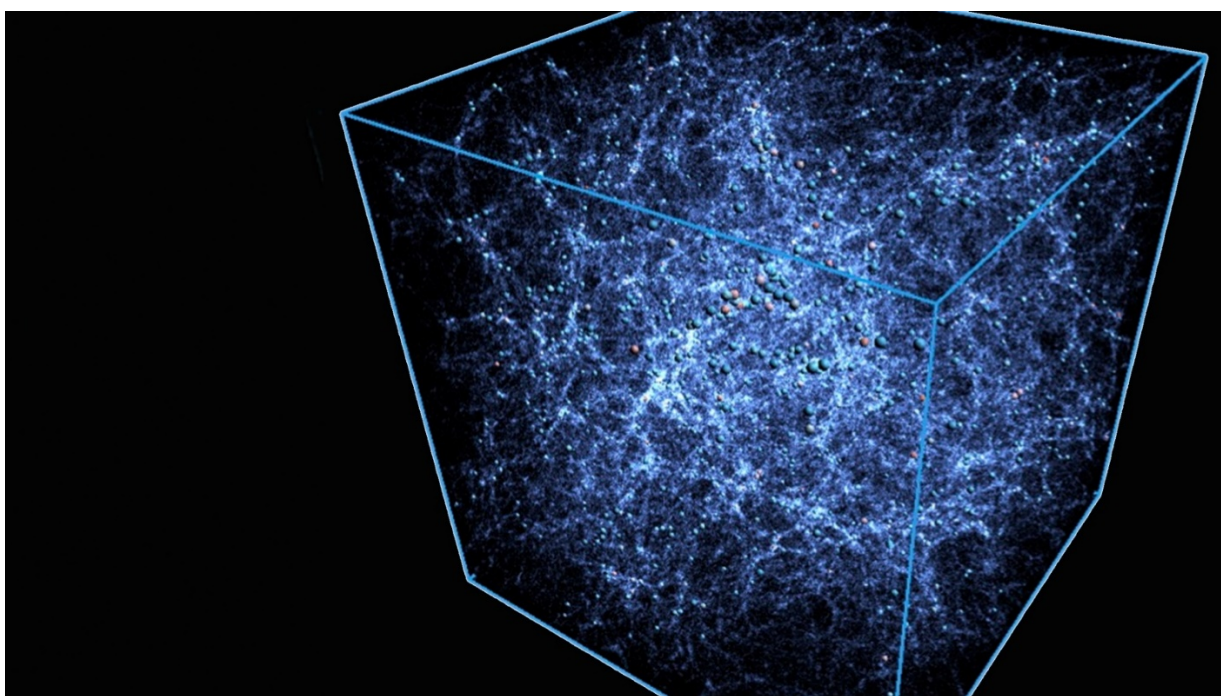
COMMUNIQUE

Office of Science

26 October 2020

Communique 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.*

On Monday, 11/23, *Communique* will begin to be distributed via GovDelivery, an email distribution service. If you would like to continue to receive *Communique*, please subscribe [here](#).



Creating the software that will unlock the power of exascale

Leading research organizations and computer manufacturers in the U.S. are collaborating on the construction of some of the world's fastest supercomputers — exascale systems capable of performing more than a billion billion operations per second. A billion billion (also known as a quintillion or 10^{18}) is about the number of neurons in ten million human brains.

The fastest supercomputers today solve problems at the petascale, meaning they can perform more than one quadrillion operations per second. In the most basic sense, exascale is 1,000 times faster and more powerful. Having these new machines will better enable scientists and engineers to answer difficult questions about the universe, advanced healthcare, national security, and more.

[Click here to read more about how researchers are creating software and finding applications for the world's fastest computers.](#)

NEWS CENTER

The Office of Science posted 49 news pieces between 10/13/2020 and 10/25/2020.

A team of scientists, including researchers from [Lawrence Berkeley National Laboratory](#) has developed a technique to improve the resolution of cryo-electron microscopy, sharpening the focus of the world's most powerful microscopes.

Researchers from [Pacific Northwest national Laboratory](#) modeled interactions among water molecules, finding information about their structure and training machine learning algorithms to predict energy landscapes.

The new FACET-II facility at [SLAC National Accelerator Laboratory](#) is looking to pave the way for a future generation of particle accelerators.

[University of Illinois](#) scientists explored the genomic potential of a renewable bioenergy crop, allowing breeders to make more efficient selections and grow plants better suited to biofuel production.

Researchers at [UC San Diego](#) are using supercomputers to model plasma turbulence, gaining new understanding into an important aspect of fusion energy development.

Scientists from [Cornell](#) are working to develop new environmental models that more accurately reflect the carbon-storage processes in soil.

SCIENCE HIGHLIGHTS

The Office of Science posted two new highlights between 10/13/2020 and 10/25/2020.

Scientists from [Lawrence Berkeley National Laboratory](#) studied microbial communities in a unique permafrost environment, gaining new insight into microorganisms that remain dormant in permafrost and may be affected by thawing.



Scientists from [Oak Ridge National Laboratory](#) investigated tradeoffs in plant defenses against different pathogens, identifying a mechanism used by plants to regulate and selectively target defenses.

IN THE NEWS

Associated Press: Pavement technology could cool cities from the ground up

A team from Arizona State University is working with the hottest big city in America to test “cool pavement.” Ronnen Levinson, who leads the Heat Island Group at Lawrence Berkeley National Laboratory, describes the basic categories and benefits of cool pavement in this article.

Yahoo: Viral 'molecular scissor' is next COVID-19 drug target

This article about a novel COVID-19 drug design mentioned X-ray crystallography performed at Argonne National Laboratory to solve the 3-D structures of SARS-CoV-2-PLpro and two inhibitor molecules.

Forbes: America steps forward to expand nuclear power

This article mentions the nuclear history of Pacific Northwest National Laboratory and the large concentration of nuclear scientists in the Tri-Cities region.

TOP TWEETS

The Office of Science sent out 45 tweets between 10/13/2020 and 10/25/2020.
Here are the two most popular:



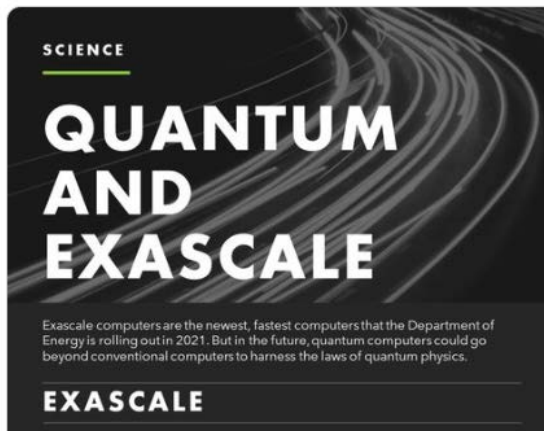
DOE Science
@doescience

Researchers at @Princeton have yielded a new platform to allow chemists to reinterpret the rules of stereochemistry and stereocontrol, a discovery with important implications for the pharmaceutical and agrochemical industries
chemistry.princeton.edu/news/hyster-an...



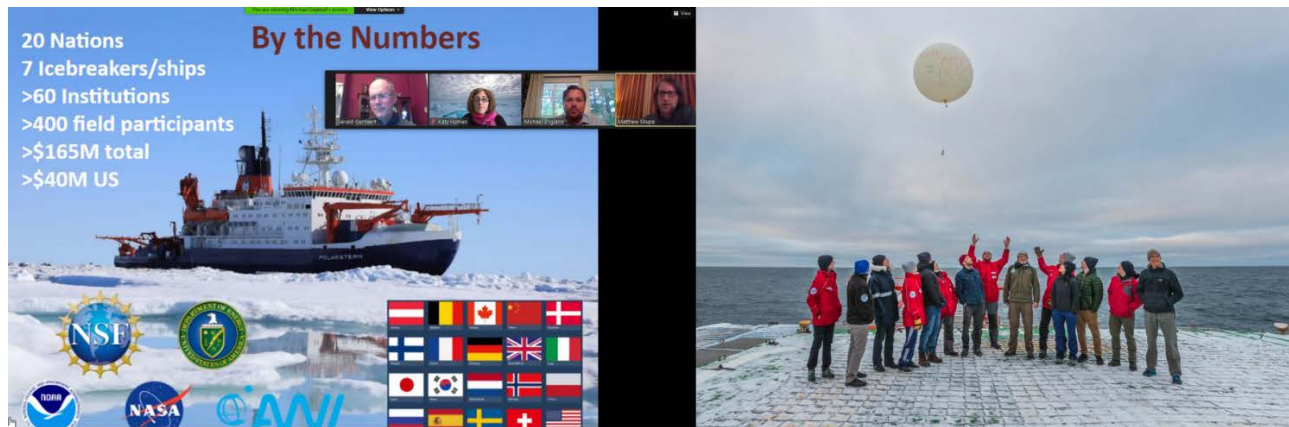
DOE Science
@doescience

How can #quantum and #exascale computers both help @ENERGY's mission?
#ExascaleDay
energy.gov/science/article...



BY THE NUMBERS

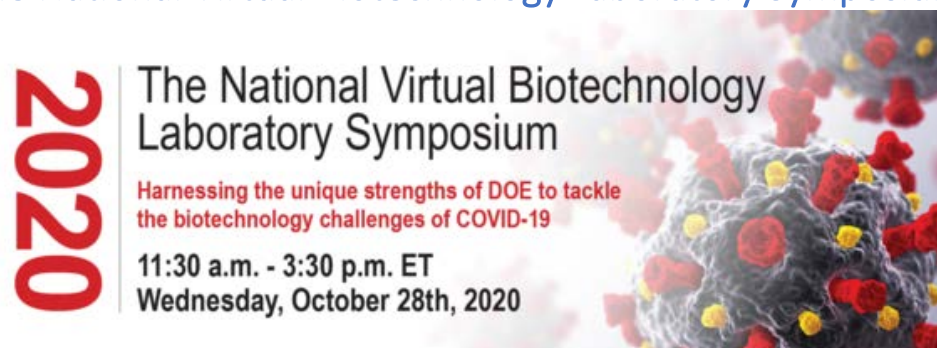
Epic Arctic mission ends



For nearly 12 months, as the German icebreaker *Polarstern* drifted with Arctic sea ice, scientists onboard collected petabytes of data describing the ocean, the ice, and the atmosphere. Supported by more than 60 institutions including the Department of Energy, researchers on the [MOSAIC Expedition](#) built research stations on the ice, dipped nets, deployed buoys, and flew drones. Speaking more than a dozen different languages, they worked toward the same goal: better understanding of how dwindling Arctic sea ice influences the region's climate system—and how those changes ripple around the world.

END NOTES

The National Virtual Biotechnology Laboratory Symposium



The [National Virtual Biotechnology Laboratory](#) (NVBL) is a consortium of Department of Energy national laboratories, each with core capabilities relevant to the threats posed by COVID-19. The NVBL is taking advantage of DOE user facilities, including light and neutron sources, nanoscale science centers, sequencing and bio-characterization facilities, and high-performance computer facilities, to address key challenges in responding to the COVID-19 threat. On October 28th, the [National Virtual Biotechnology Laboratory Symposium](#) will cover the impact the NVBL has had tackling challenges associated with COVID-19 and will discuss areas in which the NVBL can help in the future.

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