



U.S. DEPARTMENT OF
ENERGY

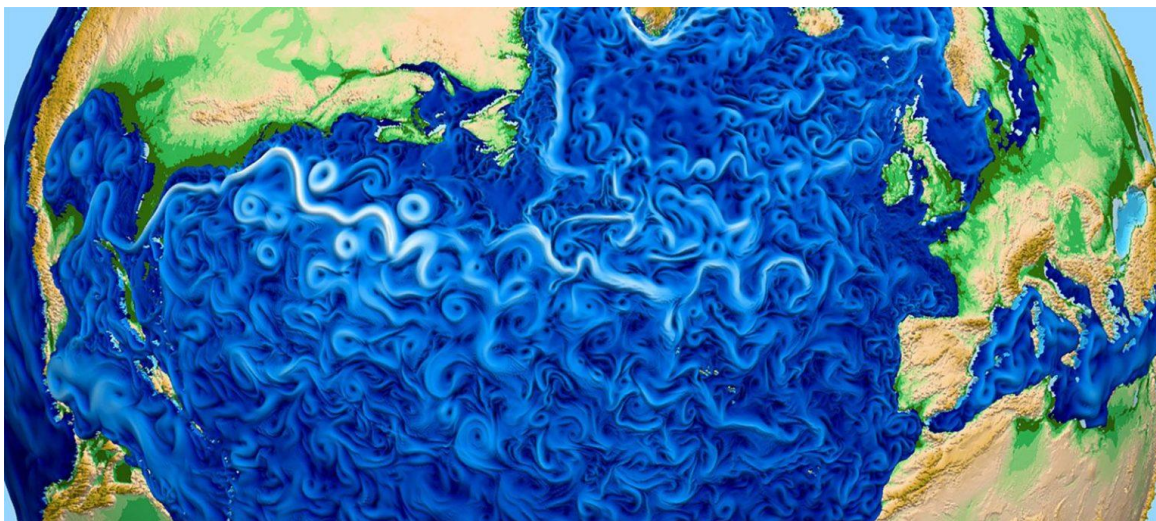
Office of Science

comm**UNIQUE**

February 8, 2021

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.

Climate on a New Scale



How stable will the Antarctic ice sheet be over the next 40 years? And what will models of important water cycle features – such as precipitation, rainfall patterns, and droughts – reveal about river flow and freshwater supplies at the watershed scale? These are two key questions Department of Energy researchers are exploring via simulations on the Energy Exascale Earth System Model.

[Click here to read more about the Office of Science's research to simulate the Earth's systems, particularly around the water cycle.](#)

NEWS CENTER

The Office of Science posted 28 news pieces between 1/26/2021 and 2/8/2021.

A new type of rocket thruster that could take humankind to Mars has been proposed by a physicist at [Princeton Plasma Physics Laboratory](#). The device would apply magnetic fields to cause particles of plasma, electrically charged gas, to shoot out the back of a rocket and propel the craft forward.

Machine learning is helping to accelerate the development of highly tunable materials known as metal-organic frameworks (MOFs). These have important applications in chemical separations, catalysis, and sensing. Researchers at [Georgia Tech](#) are expanding their models to better predict properties of MOFs.

The COHERENT particle physics experiment at [Oak Ridge National Laboratory](#) has firmly established the existence of a new kind of neutrino interaction. The quest to observe this interaction drove advances in detector technology and has added new information to theories aiming to explain mysteries of the cosmos.

Researchers at the [University of Rochester](#) and Cornell University have taken an important step toward developing a communications network that exchanges information across long distances by using photons. Photons are mass-less measures of light and are key elements of quantum computing and quantum communications systems.

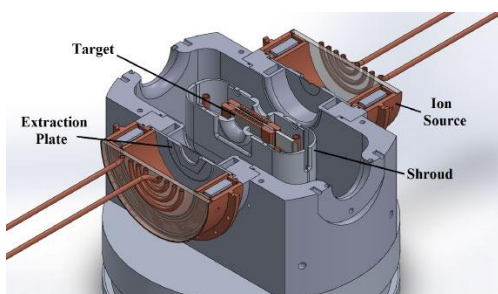
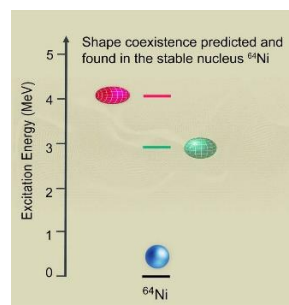
Computational materials science experts at [Ames Laboratory](#) enhanced an algorithm that borrows its approach from the nesting habits of cuckoo birds. This improvement could reduce the search time for new high-tech alloys from weeks to mere seconds.

Collaborators from [Rice University](#), Tulane University, and the Johns Hopkins University School of Medicine created new atom-level models of parts of proteins. The research shows that folding is influenced by the temperature of the solvents the proteins occupy, not only the presence of water.

SCIENCE HIGHLIGHTS

The Office of Science posted six new highlights between 1/26/2021 and 2/8/2021.

Scientists from the [University of North Carolina](#) and [Michigan State University](#) have identified three distinct shapes in stable nickel-64, a stable isotope of nickel. The observations advance our understanding of how the nuclear structure of atoms can change. They will also lead nuclear scientists to look for similar shape changes in the nuclei of other nickel isotopes.



Recent research on a type of reaction called the neutron-proton reaction could help us understand the age of the Earth and build less expensive nuclear power plants. Nuclear scientists from [Lawrence Berkeley National Laboratory](#) used a new neutron source to show that these important neutron-proton reaction rates occur in ways very different from scientists' initial expectations.

One of the challenges in developing practical fusion energy is balancing the temperature at the core and edge of plasma. A tokamak has to keep the core hot enough that fusion can occur while maintaining a temperature at the edge low enough that it doesn't melt the tokamak's walls. This requires dissipating the heat and particles flowing towards the wall without reducing the core's performance. Researchers at [General Atomics](#) recently developed a pathway to improving this issue.



IN THE NEWS

Gizmodo: [Developing algorithms that might one day be used against you](#)

This interview with physicist Brian Nord from Fermilab discusses his work on algorithms for artificial intelligence and the field's ethical issues.

Chicago Tribune: [Is the COVID-19 pandemic growing or shrinking in Illinois?](#)

This article is on a project to help Illinois residents make sense of trends related to the pandemic, which draws from research at Argonne National Laboratory.

Science: [The cloak-and-dagger tale behind this year's most anticipated result in particle physics](#)

This article describes the efforts that Fermilab is making to keep the results of the g-2 experiment as secret as possible before it is time to announce it.

TOP TWEETS

The Office of Science sent out 60 tweets between 1/26/2021 and 2/8/2021. Here are the two most popular:



DOE Science
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What could science gain from developing a comprehensive map of the connections in mammals' brains? Join [@ENERGY](#), [@NIH](#), & [@NINDSnews](#) on February 5 for a free, virtual workshop addressing this question: brainconnectivityseries.com



DOE Science
@doescience

Socks and electricity may not seem related. But Virginia Phiher compares superconducting materials that don't have electrical resistance to smooth sliding on a tile floor. The [@floridastate](#) student is working with [@BerkeleyLab](#) to study superconductivity: news.fsu.edu/news/students-...



BY THE NUMBERS

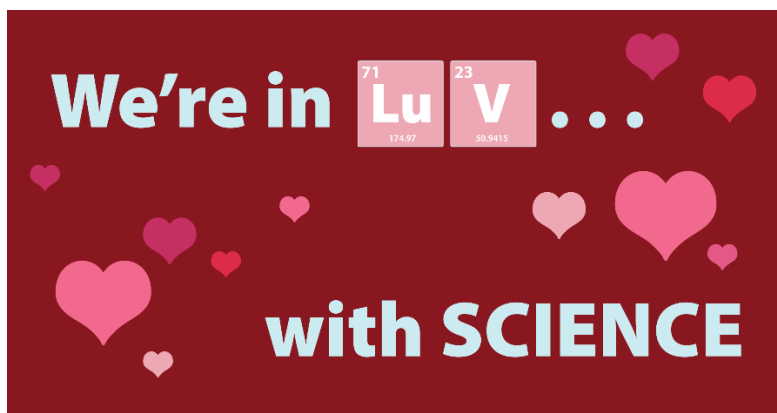
National Science Bowl Kicks Off 2021 Season



This year's set of National Science Bowl (NSB) competitions has officially begun! NSB is a nationwide academic competition supported by the Department of Energy's Office of Science. Since it started in 1991, approximately 315,000 students have participated. Now, NSB draws more than 14,700 middle- and high-school competitors each year. Regional virtual competitions are happening now, with the finalist tournaments happening in May. Find out more and follow the action on the [NSB Homepage](#) and [Twitter](#).

END NOTES

Celebrating Our Love for Science



The DOE Office of Science's Communications and Public Affairs loves science and wants to share it with the world. We've developed a set of eight science Valentines to share with your favorite science lover. Be sure to check out the [printable versions on our website](#) as well as our [campaign this week on Twitter](#).

Please see the [Communique archive](#) on [Energy.gov](#) for past issues.

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