U.S. DEPARTMENT OF ENERGY
Office of Science

COMMUNIQUE

March 8, 2021

*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.*

Aaron Chou: Then and Now
2011 Early Career Award Winner

The Then and Now series allows scientists to speak in their own words about how the Office of Science's Early Career Research Award enabled their research.

The Early Career Award allowed me to begin my first investigations into the fundamental nature of information, entropy, and noise (unwanted fluctuations on measured signals) in space-time. The support from the award paved the way to my present work both in detailed quantum noise studies for ultrasensitive dark matter detection and developing devices for quantum information science.

Read more about Aaron Chou's work in quantum noise and dark matter research.

NEWS CENTER

The Office of Science posted 54 news pieces between 2/23/2021 and 3/8/2021.

Until recently, astrophysicists couldn't make detailed simulations of supernova explosions. Thanks to advances in computing, researchers using the NERSC DOE user facility are now able to run multiple 3D simulations of these complex processes a year.

A soft robot developed by researchers from Northwestern University can walk at the same speed as a human, pick up and move cargo, and function without electricity. These types of robots could be used to help catalyze different chemical reactions or remove particles in environments.

Quantum chromodynamics theory explains how quarks interact with the strong force that binds them. It predicts that protons could be squeezed so hard that they no longer stick to other particles. But a recent experiment at Jefferson Lab didn't find evidence for this prediction.

Understanding how the "spike" in the SARS-CoV-2 virus protein (that causes COVID-19) attaches to human cells could help scientists investigate how vaccinations persist. Penn State researchers analyzed how the SARS-CoV-2 virus binds and compared it to the virus that causes SARS.

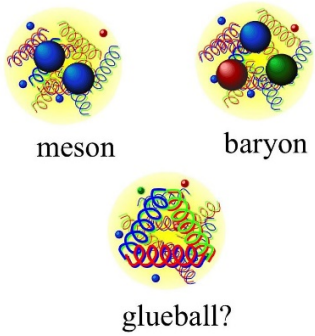
Researchers at SLAC National Accelerator Laboratory have used ultrabright X-rays to observe the role tiny pores play when copper is hit by an extreme shock. Understanding how materials deform and fail when they're hit by a powerful shock is crucial in astrophysics, materials science, and aerospace engineering.

Finding a way to reduce the amount of platinum in the catalyst used in hydrogen fuel cells could lower their cost and increase their longevity. Researchers at Washington University in St. Louis demonstrated a platinum-free catalyst that was four times more stable than previous platinum-free ones.

SCIENCE HIGHLIGHTS

The Office of Science posted two new highlights between 2/23/2021 and 3/8/2021.

Quarks and antiquarks are bound together by gluons, the carriers of the nuclear strong force. In principle, the universe should contain objects composed only of gluons. But scientists' experiments have never confirmed these hypothetical objects. Physicists from Brookhaven National Laboratory and AGH University of Science and Technology used DOE's Relativistic Heavy Ion Collider (RHIC) to search for signs of these hypothetical objects.



The strong force binds protons and neutrons within the nucleus of the atom, creating one of the densest environments in nature. Nuclear physicists from George Washington University studied the strong force with a novel method of accessing the space between protons and neutrons within a nucleus. This research confirms that current theoretical models of the strong force describe the behavior of protons and neutrons quite well.

IN THE NEWS

Quanta Magazine: **Decades-long quest reveals details of the proton's inner antimatter**
This feature on the SeaQuest experiment to measure the proton's inner antimatter in detail quotes Donald Geesaman from Argonne National Laboratory and Chuck Brown from Fermilab.

C&E News: **Thomas H. Epps III and LaShanda Korley have teamed up to envision a more sustainable plastics industry**
This profile focuses on the director (LaShanda Korley) and deputy director (Thomas H. Epps, III) of the Center for Plastics Innovation, an Energy Frontier Research Center supported by the Office of Science.

PBS: **Tennessee life – Mission to Mars**
This video highlights the contributions that DOE's Oak Ridge National Laboratory made to the latest space mission to Mars.

TOP TWEETS

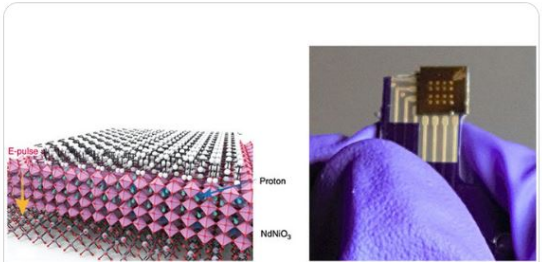
The Office of Science sent out 90 tweets between 2/23/2021 and 3/8/2021. Here are the two most popular:

DOE Science
@doescience

Science #WordOfTheWeek: Burning plasma fuels our sun's ability to provide us with heat and light. It's also what fusion researchers are aiming to create and control so they can produce self-sustaining fusion power. Learn more: energy.gov/science/doe-ex...

DOE Science
@doescience

The human brain still sorts certain types of information far more effectively than any computer. Scientists @LifeAtPurdue used tools @argonne & @BrookhavenLab to explore using quantum materials to create hardware for AI that acts like a human brain: anl.gov/article/argonn...



BY THE NUMBERS

DOE Explains...

Scientific terms can be confusing. DOE Explains offers straightforward explanations of key words and concepts in fundamental science. It also describes how these concepts apply to the work that the Department of Energy's Office of Science conducts as it helps the United States excel in research across the scientific spectrum. So far, more than 35 different terms help break down some of the most challenging ideas in basic research, from quantum networks to atmospheric radiation.

END NOTES

Welcome to the New Secretary of Energy

Jennifer M. Granholm was sworn in as the 16th Secretary of Energy on February 25, 2021, becoming just the second woman to lead the U.S. Department of Energy (DOE). Previously, she was the Governor of Michigan, Attorney General of Michigan, and a distinguished professor of practice in the Goldman School of Public Policy in the University of California, Berkeley. In her Secretary's Message to America, she talks about how DOE has solutions to tackle climate change and create healthy, safe, and thriving communities.

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

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