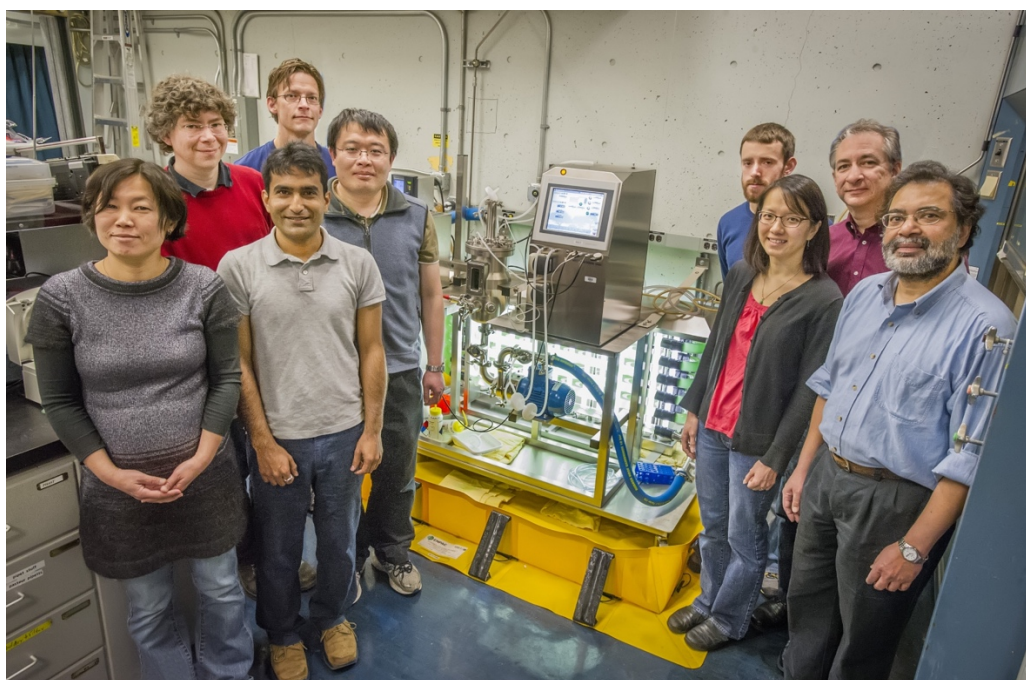




Communique provides a biweekly review of recent Office of Science Communications and Public Affairs work, including feature stories, science highlights, social media posts, and more. This is only a sample of our recent work promoting research done at universities, national labs, and user facilities throughout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



The Technological Heavyweight You've Probably Never Heard Of: ESnet

One lone computer, sitting at Lawrence Livermore National Laboratory, didn't seem all that significant at the time. While in 1974 computers weren't as ubiquitous as they are today, they were widely used in the research community. In fact, the fusion researchers using the computer had borrowed it from other scientists at the lab. The system's single stand-out feature was that it had four dial-up lines that could send items to other computers at the astounding speed of 10 characters a second.

But those four lines were the first piece of a network that's now the technological superhighway for the Office of Science's data. Of course, that original computer has long since been retired. But its legacy lives on in the user facility Energy Sciences Network, or ESnet for short.

[Click here to read more about ESnet, the big player in the internet you 've probably never heard of.](#)

NEWS CENTER

The Office of Science posted 115 news pieces between 9/1/2019 and 9/29/2019, including 61 university articles and 48 pieces from the labs and user facilities.

Scientists at [Ames Lab](#) are now able to see greater details of DNA origami nanostructures, which will lead to a greater understanding and control of their assembly for future applications. Because these nanostructures can be made identically and in relatively large quantities, they are very attractive to nanotechnology researchers and are potentially useful in a number of applications.

A team at [Oak Ridge National Lab](#) has taken the Department of Veterans Affairs' medication possession ratio algorithm and sped it up, engineering an expanded version of it to run 300 times faster. The model helps clinicians pinpoint veterans with inconsistent medication usage patterns—these veterans are known to have a higher risk of attempting suicide in the next month.

A study by scientists at [Berkeley Lab](#) uses a numerical model of the Cosumnes River watershed in California to shed light on how wildfires can affect large-scale hydrological processes, such as stream flow, groundwater levels, and snowpack and snowmelt. The team found that post-wildfire conditions resulted in greater winter snowpack and subsequently greater summer runoff and increased groundwater storage.

This year, researchers from [the University of Colorado Boulder](#) will play a leading role in the Multidisciplinary Drifting Observatory for the Study of Arctic Climate, an expedition that will send a German icebreaker into Arctic waters, where it will freeze itself into the winter pack ice to drift for an entire year, allowing around 500 scientists from 17 countries to take detailed measurements of the ice, ocean, and air.

A [University of Wisconsin-Madison](#) professor has shown that the recipe for making shells, spines, and coral skeletons is not only the same across many modern animal lineages, but is ancient – dating back 550 million years – and evolved independently more than once. These findings help stitch together the evolutionary narrative of biomineralization, details that may one day be harnessed by humans to produce harder, lighter, and more durable materials.

Cars rely on catalytic converters to remove carbon monoxide, hydrocarbons, and other harmful chemicals from exhaust emissions. To do so, they rely on costly metals that have special chemical properties that diminish in effectiveness over time. Researchers from [Stanford University](#) have proposed a new way to reduce the cost and expand the lifespan of these materials.

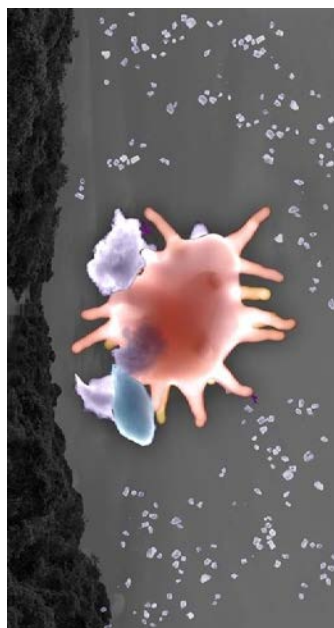
SCIENCE HIGHLIGHTS

The Office of Science posted 11 highlights spotlighting BER and BES between 9/1/2019 and 9/29/2019.



New research shows that the number of copies of genes in a poplar tree affects its traits. Scientists from [UC Davis](#) developed a group of poplar trees in which different plants have DNA segments that are repeated or deleted. They found that the number of copies of certain regions of the genome influences traits important to agriculture, the bioenergy industry, and the tree's ecological role.

Tiny particles of sodium salt float in the air over the pristine Amazon basin. An international team of scientists at [Purdue University](#) used chemical imaging and atmospheric models to discover that, during the wet season, fungal spores contribute as much as 69 percent of the airborne sodium salt particles in the central Amazon basin. By understanding where and when sodium salt particles will be present and in what quantities, scientists can better predict cloud formation.

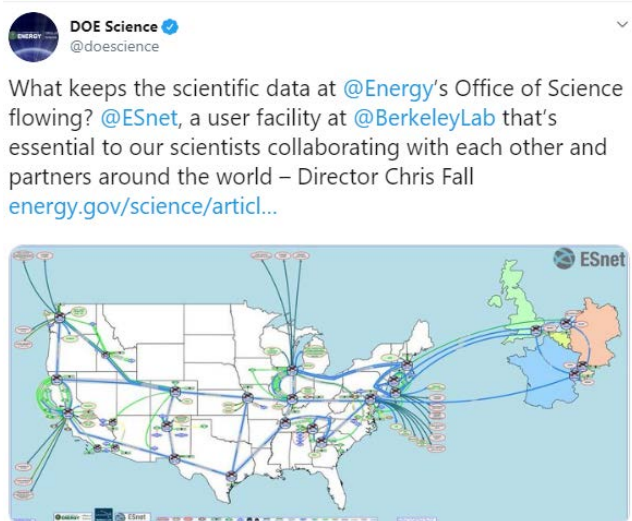




Scientists from the [University of Massachusetts, Amherst](#) have developed a novel and efficient approach to surface cleaning, materials transport, and repair. This work suggests a new, simple, and noninvasive strategy to achieve self-directed materials healing.

TOP TWEETS

The Office of Science sent out 71 tweets between 9/1/2019 and 9/29/2019. Here are our two most popular from the past two weeks:



BY THE NUMBERS

OSTI.GOV



The Office of Scientific and Technical Information ([OSTI](#)), a unit of the Office of Science, fulfills agency-wide responsibilities to collect, preserve, and disseminate both unclassified and classified scientific and technical information from DOE-funded research and development activities. OSTI houses a total of 3,071,016 records, including 135,427 patents for innovations, ranging from a UV laser-based acoustic sensor to methods for the recovery of precious metals from oil shale; 1,626,462 journal articles from 177 publishers; 3,701 video and audio products on a range of subjects from ITER to the secrets of brain signals; and 666,958 technical reports from 941 research organizations.

END NOTES

DOE's Nobel Laureates



The 2019 Nobel Prizes will be announced the week of [October 7th](#), revealing the scientists, writers, and peace workers who have conferred the greatest benefit to mankind. There have been [115 Nobel laureates](#) affiliated with the Department of Energy, beginning in 1925 with James Franck, a physicist who participated in the Manhattan Project. In the last decade, there have been 10 Nobel laureates in chemistry and physics affiliated with DOE. The most recent of these laureates, who all were awarded in 2018, are Gerard Mourou and Donna Strickland, who won the prize in physics for work undertaken at the Laboratory for Laser Energetics, and Frances H. Arnold, who collected data from the Advanced Photon Source and won the prize for chemistry.

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No. 20: 30 September 2019