



*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 work promoting the research done at universities, national labs, and user facilities throughout the country.

*Please note that some links may expire after time.*



## Who owns the world's fastest computer?

On November 19<sup>th</sup>, in conjunction with the [TOP500 announcement](#) and the SC18 supercomputing conference in Dallas, Under Secretary for Science Paul Dabbar published an op-ed on the DOE's supercomputing mission in the *Dallas Morning News*.

When people hear "the Department of Energy," they think, well, energy.

That's understandable, especially given our leadership by former Texas governor Rick Perry.

But we do supercomputing, too. In fact, we are, and have been for almost every year since the 1950's, the world's leader in supercomputing. And that's why we were proud to be part of SC18, the world's premiere supercomputing conference, in Dallas. The department is not simply involved with supercomputing; it is the

nation's leader in the development of such high-performance machines. In fact, the world's top two fastest supercomputers, and a total of five in the top ten, are at Department of Energy's 17 National Laboratories.

These efforts are a reflection of the high priority Secretary Perry places on science and innovation, and on applying the power of supercomputing to some of the greatest challenges we face as a nation in science and energy and national security. And with nations like China announcing their own supercomputing ambitions, we're determined to do even more, and to push even further. We're committed to staying ahead, not simply in terms of pure computing power, but related areas such as quantum computing, artificial intelligence and machine learning.

We're committed to keeping America first, as a pro-science, a pro-innovation and a pro-supercomputing administration.

[Click here to read more of Under Secretary Dabbar's statement on the Department of Energy's dedication to supercomputing.](#)

## NEWS CENTER

---

The Office of Science posted 48 news pieces between 11/12/2018 and 11/26/2018, including 25 university articles and 19 pieces from the labs and user facilities.

**The DOE's Office of Science announced 62 projects for 2019 aimed at accelerating discovery and innovation to address some of the world's most challenging science problems through its INCITE program.** Deploying on supercomputers that rank among the country's most powerful, the projects originate in national laboratories, academia, and industry, and encompass a remarkable range of scientific inquiry. The awards allocate the resources of the DOE Leadership Computing Facilities at DOE's Argonne and Oak Ridge National Laboratories, allowing investigators to partner with computational and domain scientists at the facilities.

**This year, Fermilab has expanded its VetTech internship program, seeking out veterans for technical and computing positions across the laboratory.** The result: More than 50 veterans applied for the program this year, 12 of whom were brought aboard as interns. That's more than the past two years combined, according to the program's administrators. The VetTech internship is open to military veterans of all stripes and places

**Researchers at the Georgia Institute of Technology have led the development of a new fuel cell that runs on methane at room temperature.** Methane fuel cells usually require temperatures of 750 to 1,000 degrees Celsius to run. This new one needs only about 500, which is even cooler than automobile combustion engines. That lower temperature could trigger cascading cost savings in the ancillary technology needed to operate a fuel cell, making the new cell commercially viable.

**A natural "battery" of briny liquids and volcanic minerals may have produced Mars' organic carbon, according to new analysis of three Martian meteorites by a team including researchers at Rensselaer Polytechnic Institute.** The group's analysis shows that they contain an inventory of organic carbon remarkably consistent with the compounds detected by the Mars Science Laboratory's rover missions.

those veterans in a wide range of technician jobs, from mechanical to electrical to computing and software development. The hope, say the program's administrators, is that they will find the right people to fill these jobs permanently, and so far, that has been happening.

This analysis gives an example of how organic compounds could have been synthesized prior to life starting, in natural water/rock systems that were common on early Earth and early Mars. That may give researchers an idea of where to look for the organic chemistry that eventually gave rise to life, and where they might look for evidence of life beyond Earth.

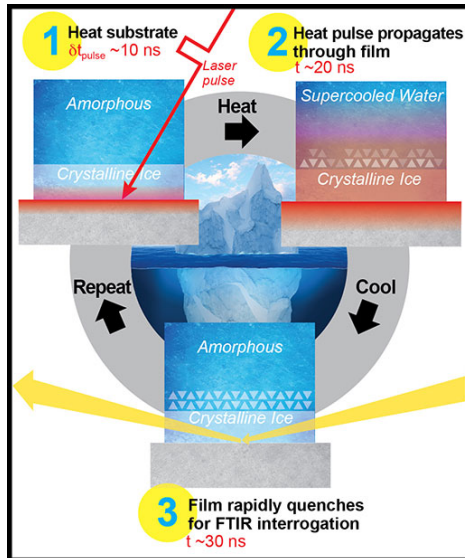
**By changing the structure of graphene, scientists from the Center for Functional Nanomaterials—a DOE Office of Science user facility at Brookhaven National Laboratory—have dramatically improved its response to light.** The unexpected improvement could pave the way for the development of graphene-based detectors that can quickly sense light at very low levels, such as those found in medical imaging, radiation detection, and surveillance applications.

**Researchers at the MSU-DOE Plant Research Laboratory have genetically tuned a plant to become highly resistant to insect attacks. But becoming such a fortress compromises its growth and procreative capabilities.** The findings seem to support a long-held paradigm called the growth-defense trade-off. It goes something like this: plants work with a fixed energy budget. So, they prioritize resource usage depending on need. If they spend more energy on growth, their defenses are compromised. On the other hand, having more defense capabilities penalizes growth.

## SCIENCE HIGHLIGHTS

---

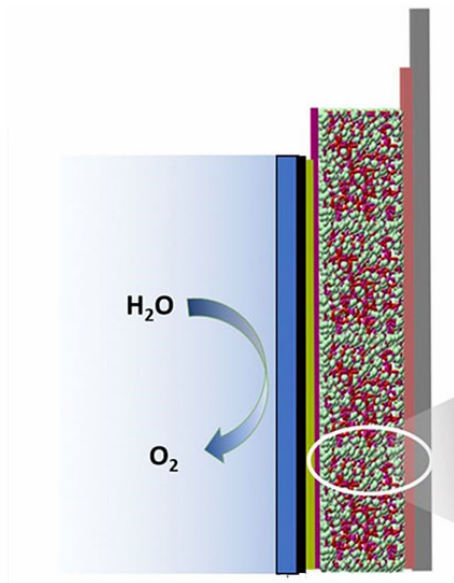
The Office of Science posted 8 highlights between 11/1/2018 and 11/26/2018 spotlighting science from 2 programs: BES and BER.



Supercooled liquid water is rather unusual. It remains fluid at ultracold temperatures, but it can freeze. Researchers wanted to know how it solidified, but rapid, uncontrolled crystallization made it impossible. Taking snapshots of supercold liquid water as it froze, a team of scientists from Pacific Northwest National Laboratory measured the physical properties of water at previously unexplored temperatures, gaining new data with which to revise our fundamental understanding of water.

A large-scale soil project uncovered genetic information from bacteria with the capacity to make specialized molecules that could lead to new pharmaceuticals. As part of a study on carbon cycling in soils, researchers from UC Berkeley sequenced 60 soil metagenomes across a single grassland meadow at the Angelo Coast Range Reserve in northern California. The team then computationally searched the genomes for similar DNA sequences of the genes required for the biosynthesis of antibiotics, siderophores, and other bioactive molecules. Unexpectedly, the team identified novel members of bacterial groups that scientists rarely study, possessing a majority of the biosynthetic genes in this soil environment.





Researchers at Pennsylvania State University have designed a more stable, more efficient dye-sensitized photoelectrochemical cell. Dye-sensitized photoelectrochemical cells use the energy contained in sunlight to split water into hydrogen and oxygen. The hydrogen itself can then be used as a fuel, or it can be used to make other types of fuels. This new cell allows the use of dyes that absorb more light and lets scientists optimize the pH to more efficiently split water, an important step forward in solar-driven water splitting.

## TOP TWEETS

---

The Office of Science sent out 62 tweets between 11/12/2018 and 11/26/2018 and gained 117 new followers.



DOE Science  
@doescience

Congrats to @ORNL and @Livermore\_Lab on having the top supercomputers in the world!  
#SC18 @top500supercomp @ENERGY

Top 5 Supercomputers, November 2018					
		SITE	COUNTRY	RMAX PFLOPS/S	POWER MW
01	Summit	DOE /SC/ORNL	USA	143.5	11.1
02	Sierra	DOE/NNSA/LLNL	USA	94.6	7.44
03	Sunway TaihuLight	NSCC in Wuxi	China	93.0	15.4
04	Tianhe-2A (Milkyway-2A)	NSCC Guangzhou	China	61.4	18.5
05	Piz Daint	CSCS	Switzerland	21.2	2.38



DOE Science  
@doescience

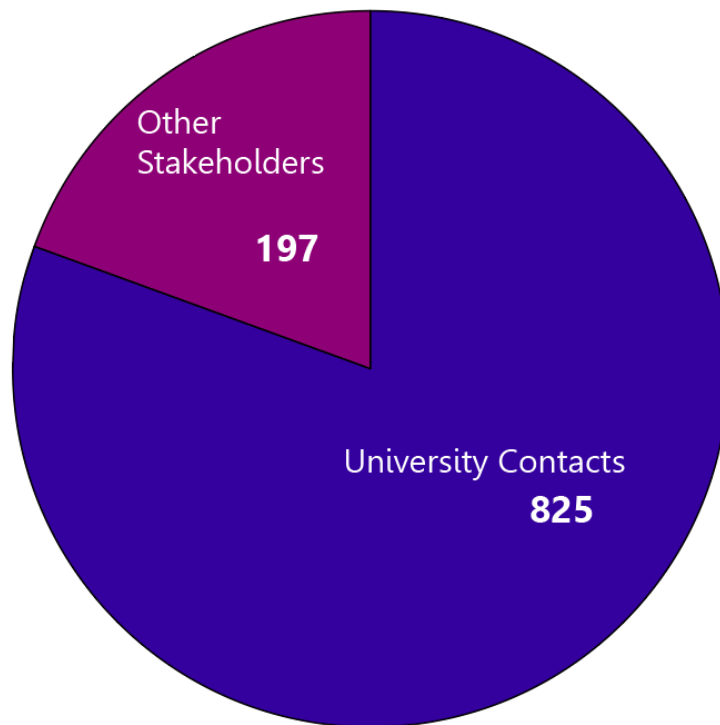
.@UCBerkeley showed how to get genetic data on soil-dwelling microbes that won't grow in the lab & opened up a new frontier in #antibiotics @nature  
[science.energy.gov/ber/highlights ...](https://science.energy.gov/ber/highlights...)



## STATISTICS

The Office of Science by the numbers.

OCPA University Contacts in 2018



The Office of Communications and Public Affairs (OCPA) has in recent years made it a priority to improve relationships between the Office of Science and universities and other research partners. Outreach efforts have included OCPA’s University Grants Initiative, through which the office works to provide timely grants awards information to university news and public affairs staff, and efforts to amplify university research news on social media and the Office of Science homepage.

Between January and October of 2018, OCPA reached out to 825 university contacts and 197 other stakeholders from scientific, professional, and educational associations—including the American Association for the Advancement of Science, the American Council on Education, and others—to provide them with this information, some of them multiple times.

## END NOTES

---

Veterans Month: Served and Still Serving



November 2018 is National Veterans Month and the DOE is acknowledging the history, contributions, and continued service of its veterans. To that end, the Department will be honoring its veterans through the Served and Still Serving campaign, which will highlight the essential contributions that our veterans make in their continued service at DOE. [Profiles of members of the DOE's veteran community can be found on the Energy website throughout the month of November.](#)

*This format is not compatible with forwarding. If you would like to forward this message, please use the attached PDF copy.*

No. 4: 27 November 2018