

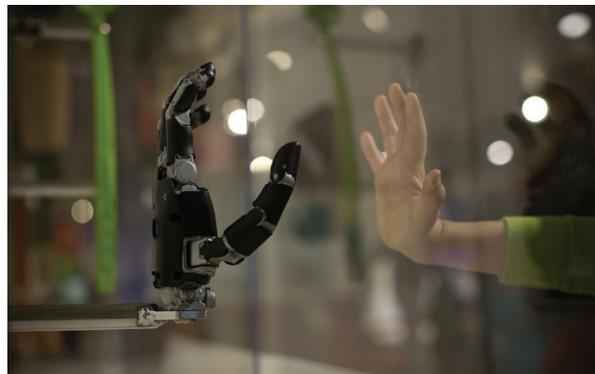


October 31, 2019

01

NSF leads federal partners in accelerating the development of transformational, AI-powered innovation

NSF announced the creation of a new program that will significantly advance research in artificial intelligence (AI) and accelerate the development of transformational, AI-powered innovation by allowing researchers to focus on larger-scale, longer-term research. The National Artificial Intelligence Research Institutes program anticipates approximately \$120 million in grants next year to fund planning grants and up to six research institutes in order to advance AI research and create national nexus points for universities, federal agencies, industries and nonprofits. Find out more in this NSF [News Release](#).



02

NSF statement: New development in quantum computing

In a recent published paper, “Quantum supremacy using a programmable superconducting processor,” a team of researchers led by Google presented evidence that their quantum computer has accomplished a task that existing computers built from silicon chips cannot. When verified, the result will add credence to the broader promise of quantum computing. In addition to funding a broad portfolio of quantum research, including for other quantum computing systems and approaches, NSF has provided research support to five of the paper’s co-authors. Read more in this NSF [Press Statement](#).



03

The Nobel Prizes: The NSF connection

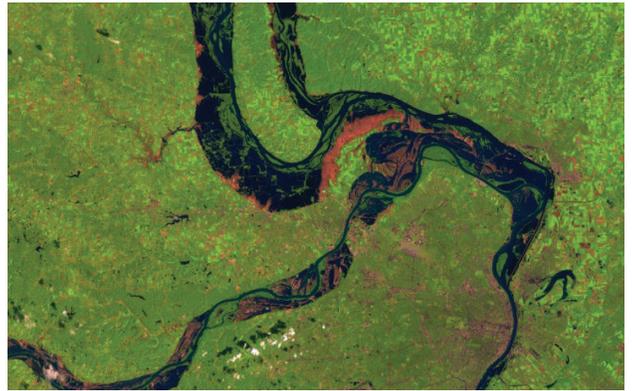
Public support of science is an investment in the future. The long list of NSF-funded Nobel laureates proves the wisdom of a public that dares to invest in curiosity, and in a better future. As stewards of the public trust, NSF and other federal agencies help secure that future by supporting tomorrow’s Nobel laureates today. Find out more about past heroes of science and their achievements in this NSF [Special Report](#).



04

Plant physiology will be major contributor to future river flooding

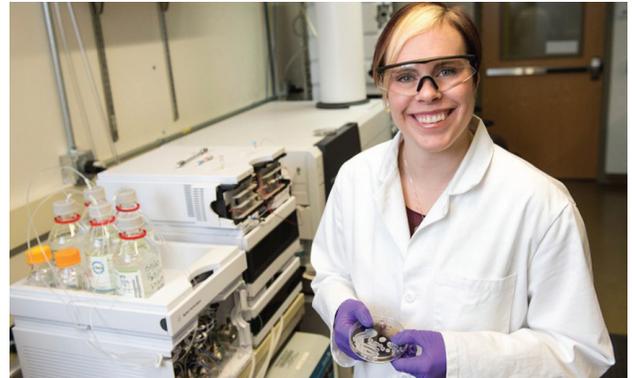
The next time a river overflows its banks, don't just blame the rain clouds. Earth system scientists from the University of California, Irvine, have identified another culprit: leafy plants. In a newly published study, the researchers describe the emerging role of interrelationships of organisms and their environment in understanding flooding. Adapting to an overabundance of carbon dioxide (CO₂) in the atmosphere, trees, plants and grasses constrict their pores to regulate the amount of CO₂ they consume, a mechanism that limits the release of water from leaves through evaporation. Find out more in the NSF [Research News](#).



05

Nanoparticles may have bigger impact on the environment than previously thought

Over the last two decades, nanotechnology has improved many everyday products, from microelectronics to sunscreens. Nanoparticles (particles just a few hundred atoms in size) are ending up in the environment by the ton, but scientists are still unclear about the long-term effects of these super-small particles. In a first-of-its-kind study, researchers have shown that nanoparticles may have a bigger impact on the environment than previously thought. Learn more in this NSF [Research News](#).



06

New approach for modern power grids increases efficiency, reduces costs

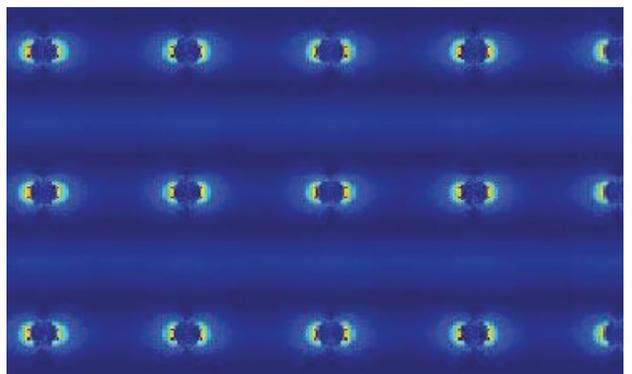
Modern power grids are rapidly developing because of the increasing availability of renewable energy sources such as solar photovoltaic and wind power. The trend is expected to continue. Renewable energy generation technologies, however, are highly variable and not fully dispatchable, researchers say, resulting in new challenges to the operational paradigm of the existing power system. One of the major challenges in today's power grids is designing a dispatch policy that minimizes generation costs, while ensuring that all generation and transmission constraints are met for renewable power and variable demand. Find out more in this NSF [Research News](#).



07

Tiny, biocompatible laser could function inside living tissues

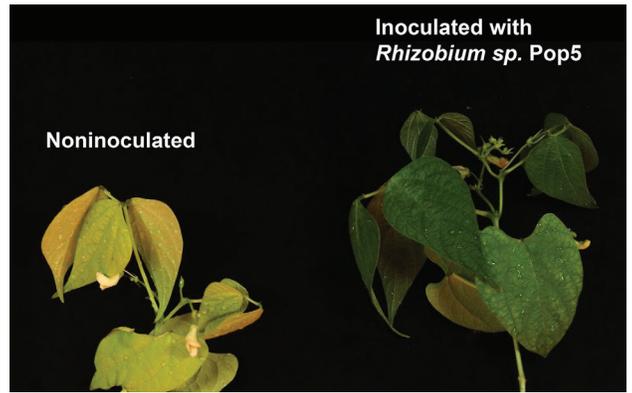
Researchers have developed a tiny nanolaser that can function inside living tissues without harming them. Just 50 to 150 nanometers thick, the laser is about 1/1,000th the thickness of a single human hair. At this size, the laser can fit and function inside living tissues, with the potential to sense disease biomarkers or perhaps treat deep-brain neurological disorders, such as epilepsy. Developed by NSF-funded researchers at Northwestern and Columbia Universities, the nanolaser shows promise for imaging in living tissues. Not only is the laser made mostly of glass, which is intrinsically biocompatible, but it can also be excited with longer wavelengths of light and emit at shorter wavelengths. Read more in this NSF [Research News](#).



08

Scientists discover new antibiotic in tropical forest

Scientists have discovered an antibiotic produced by a soil bacterium in a Mexican tropical forest that may help lead to a “plant probiotic.” Probiotics, which provide health benefits to humans, can also keep plants robust. The new antibiotic, known as phazolicin, prevents harmful bacteria from entering root systems of bean plants, according to a recently published study. Find out more in this NSF [Research News](#).



09

Sunlight degrades polystyrene faster than expected

New research published by scientists at the Woods Hole Oceanographic Institution shows that polystyrene, one of the world’s most ubiquitous plastics, may degrade in decades or centuries when exposed to sunlight, rather than thousands of years as previously thought. Learn more in this NSF [Research News](#).



10

Researchers repurpose failed cancer drug into printable semiconductor

Many potential pharmaceuticals end up failing during clinical trials, but thanks to new, NSF-funded research from the University of Illinois, biological molecules once considered for cancer treatment are now being repurposed as organic semiconductors for use in chemical sensors and transistors. Find out more in this NSF [Research News](#).

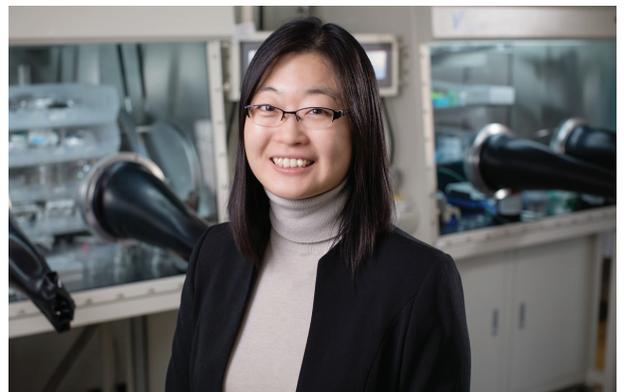


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