

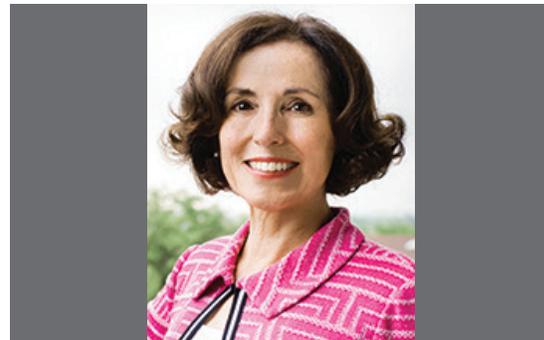


10 Quick Reads From NSF.gov

March 14, 2017

01 NSF Director testifies before a House subcommittee about NSF's unique mission and its impact on the U.S. economy and security

On March 9, 2017, NSF Director France Córdoba testified before the House Committee on Science, Space and Technology's Subcommittee on Research and Technology at the first of two hearings on NSF. The focus of the first hearing was overview and oversight. NSF Inspector General Allison Lerner also testified. The Director said NSF's merit review process was critical to the agency's ability to support high-quality research, "including high-risk, high-reward or potentially transformative ideas," and pointed to NSF's unique role in supporting all fields of fundamental science and engineering and STEM education. She talked about NSF's 10 Big Ideas, and described how the agency's STEM education efforts fit with the American Innovation and Competitiveness Act (AICA) of 2017. "AICA provides a useful blueprint for NSF's continued critical contributions to the development of a skilled and diverse STEM workforce," she noted. Córdoba also talked about efforts to improve transparency, accountability and the management of large facilities. Read the Director's [testimony](#) on the NSF website.



02 Hot off the (digital) press: "Transforming the World Through Science"

What is NSF and why are its investments important to the country? These are just two of the questions answered in the newly released book, "Transforming the World Through Science." It provides numerous examples of how outcomes from NSF-supported basic research across all disciplines of science and engineering are transforming entire industries. In the chapter, The Arc of Science: Research to Results, the authors write: "NSF has supported discoveries and innovations that have transformed the way we live, sparked and expanded the limits of our curiosity, opened the world to entirely new occupations and industries and enriched our quality of life." There are highlights and examples listed by the directorates and offices that supported the research. The book also offers information about key programs and processes including broadening participation; merit review; major facilities and global infrastructure; U.S. centers, sites, labs and infrastructure; and other information about the agency. The [book](#) is available from the NSF Toolkit listing on the website.



03 Engineering a spinal cord repair kit

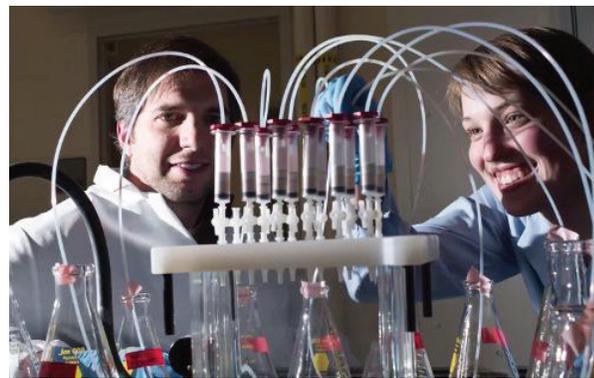
Materials scientist Polina Anikeeva and her team at the Massachusetts Institute of Technology (MIT) are engineering a nerve repair "tool kit," with an eye toward repairing damaged nerves and even growing new ones. They're designing multifunctional polymer strands--thinner than a human hair--that would be implanted right alongside damaged neurons. The strands can have hollow channels to deliver drugs, embedded electrodes to send electrical signals, or optical guides to transmit light for optogenetics, a method for switching nerve signals on and off. Find out about the research in this [episode](#) of "Science Nation" that originally aired on Feb. 29, 2016.



04 NSF Science Now episode highlights the use of AI in cancer research, and more

The new episode of the NSF video series “NSF Science Now” looks at how a team of researchers used artificial intelligence (AI) to uncover new insights into the biophysics of cancer. The Tufts University machine learning platform analyzed research data and identified a trio of chemicals that was able to generate cancer-like properties in tadpoles that had never been seen before. The work raises broad implications for the use of AI in biomedicine. Other topics in this week’s show: how Chilean recluse spiders spin their silk in a special way and the resulting loops achieve toughness; how engineers are trying a new analytical method to test water samples for a wide range of pollutants; and the release to the public of a new dataset of stars that citizen scientists can use in the hunt for exoplanets. Find out more in this [episode](#).

.....



05 NSF announces new LTER sites off the coasts of Alaska and New England

The number of Long-Term Ecological Research (LTER) sites supported by NSF has increased by two. The new sites, each awarded \$5.6 million over five years, are the Northeast U.S. Shelf and the Northern Gulf of Alaska LTER sites, and they will enable scientists to conduct research in regions known for productive fisheries and abundant marine sources. Woods Hole Oceanographic Institution (WHOI), along with the University of Massachusetts, Wellesley College and the University of Rhode Island, will lead the Northeast U.S. Shelf LTER site. The University of Alaska Fairbanks, in collaboration with Western Washington University, Oregon State University and the University of California, Santa Cruz, will manage the Northern Gulf of Alaska LTER site. Read more about the new sites and the research they make possible in this NSF [press release](#).

.....



06 Water and agriculture: Developing technology to monitor salinity levels and help farmers make better watering decisions

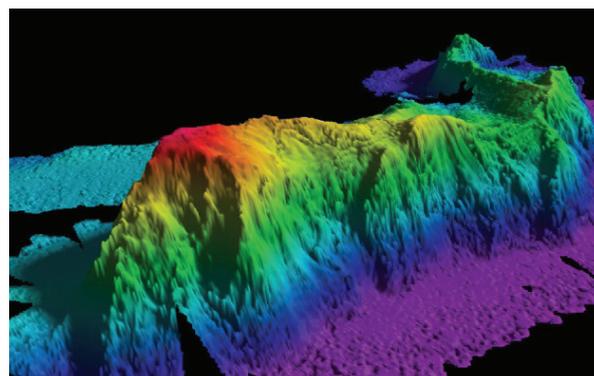
In this episode of “Human-Water Cycle,” a video series produced by NSF and NBC Learn, we learn about water and agriculture. Meagan Mauter, a professor of civil and environmental engineering at Carnegie Mellon University, focuses on the connection between water and food in order to ensure water sustainability. With support from NSF, she and her team are developing small robotic boats equipped with sensors to continuously measure water quality in real time. The data will help farmers make decisions about whether they need to modify growing seasons or receive water from a different source. See the [video](#) to learn more.

.....



07 Underwater mountains help ocean water rise from the depths

Scientists at Massachusetts Institute of Technology, Woods Hole Oceanographic Institution and the University of Southampton in the United Kingdom have identified a mechanism by which waters may rise from the ocean’s depths to its uppermost layers. Ocean waters are thought to flow between the surface and the deep in a never ending loop. But what was unclear was how and where deep waters rise to the surface. Through numerical modeling and observations in the Southern Ocean, the research team, partly supported by NSF, found that topographic features on the seafloor such as seamounts and ridges play an important role. Read about it in this News From the Field [brief](#) that links to the university press release.

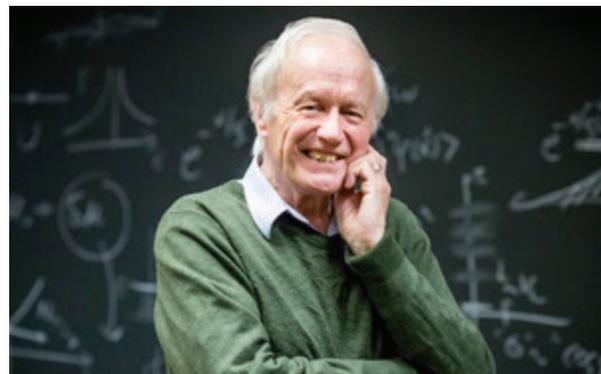


08 Paleontologists find fossil relative of Ginkgo biloba plant
A discovery of well-preserved fossil plants by paleontologists from the U.S., China, Japan, Russia and Mongolia has allowed researchers to identify a distant relative of the living plant Ginkgo biloba. The find helps scientists better understand the evolution and diversity of ancient seed plants. The fossils, from the species *Umaltolepis mongoliensis*, date back to the early Cretaceous Period (some 100-125 million years ago). Scientists discovered the fossils in ancient peat deposits at the Tevshiin Govi mine in the steppes of central Mongolia. Read about the discovery in this NSF [press release](#).



09 Noted University of Illinois physicist Anthony Leggett gives talk on quantum liquids

University of Illinois physicist Anthony Leggett is known for his contributions to understanding helium-3, including why at low temperatures it becomes a superfluid (a liquid that flows without apparent friction and conducts electricity without resistance). Leggett received the 2003 Nobel Prize in physics “for pioneering contributions to the theory of superconductors and superfluids,” sharing the award with Alexei Abrikosov and Vitaly Ginzburg. Leggett recently spoke at NSF, as part of the agency’s Distinguished Lectures Series in Mathematical and Physical Science, in remarks titled, “What can we do with a quantum liquid?” View the [lecture](#) in the NSF Multimedia Gallery.



10 NSF award aims to accelerate advanced wireless research and take the U.S. beyond 5G

The use of wireless, internet-connected devices has nearly doubled in the U.S. over the last decade. The surge in smartphones, connected tablets, wearable technology and other devices places an unprecedented burden on conventional 4G LTE (4G refers to fourth generation and LTE stands for Long Term Evolution) and public Wi-Fi networks. How can the country keep pace with the growing demand? NSF has announced a \$6.1 million, five-year award to accelerate fundamental research on wireless communication and networking technologies through a project called Platforms for Advanced Wireless Research (PAWR). The aim is to foster use-inspired, fundamental research and development that will move beyond current capabilities and enable future advanced wireless networks. U.S. Ignite, a public-private partnership, and Northeastern University will lead a consortium of industry partners to establish and oversee multiple city-scale testing platforms across the U.S. “The planned research platforms will provide an unprecedented opportunity to enable research in faster, smarter, more responsive, and more robust wireless communication, and move experimental research beyond the lab -- with profound implications for science and society,” said Jim Kurose, NSF assistant director for Computer and Information Science and Engineering.” Read more about PAWR in this NSF [press release](#).

