



January 5, 2017

01

Congress funds federal agencies through April 2017; COMPETES re-authorization awaits President's signature

Before departing for the year, Congress approved a continuing resolution that funds federal government operations through April 28, 2017. The measure maintained the \$1.07 trillion budget cap and extended current funding levels for most agencies. The new Congress that convenes in January 2017 will have to pass legislation funding the government for the remainder of the 2017 fiscal year. In other late-breaking action, Congress approved the American Innovation and Competitiveness Act and, on Dec. 28, sent the bill to White House for the President's signature. Senators John Thune (R-South Dakota) and Bill Nelson (D-Florida) and Representatives Lamar Smith (R-Texas) and Eddie Bernice Johnson (D-Texas) led the effort to work out compromise legislation, bringing to a successful close a four-year effort to reauthorize the America COMPETES Act. Read more in this NSF and Congress [update](#).



02

Technology helps create bio-engineered organs for human transplant

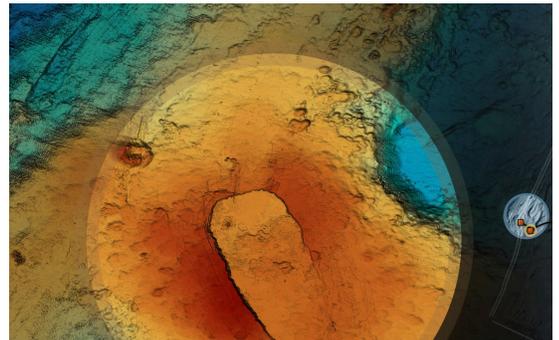
Miomatrix Medical, a small business supported through NSF's Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) program, is developing a technology to create bio-engineered organs for human transplant. The technology removes all cells from existing human or animal organs while preserving the material's architecture, mechanical properties and blood vessel network -- giving the appearance of a "ghost organ" -- and creating a decellularized matrix ready to receive new cells from the organ's future recipient. The approach minimizes potential organ rejection. Learn more about how the new technique improves upon existing technologies in this [video](#) from NSF's Multimedia Gallery.



03

Underwater volcano's fiery eruption captured in detail by seafloor observatory

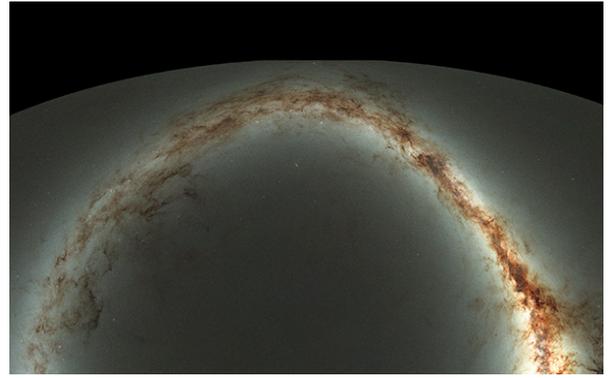
A sensor array off the Pacific Northwest coast has captured the cracking, bulging and shaking from the eruption of Axial Seamount, a nearly mile-high undersea volcano, in more detail than ever before. In a series of papers published recently in the journals *Science* and *Geophysical Research Letters* and at a press conference at the American Geophysical Union fall meeting, researchers showed how the volcano behaved during its most recent known eruption, revealing new clues about volcanoes that form where two tectonic plates are moving apart. The research studies are based on data collected by the Ocean Observatories Initiative (OOI) Cabled Array, a NSF-funded project that brings electrical power and Internet connections to instruments on the seafloor. Watch a [video](#) of the Axial Seamount in the Pacific Ocean via the OOI and learn more in this NSF [press release](#).



04

Pan-STARRS releases largest digital sky survey to the world

Attention students and citizen scientists. The first Panoramic Survey Telescope & Rapid Response System (Pan-STARRS) observatory has released to the public the world's largest digital sky survey. Four years of data comprise 3 billion separate sources, including stars, galaxies and various other objects, allowing scientists, students and others to make new discoveries about the universe. Find out more in this [News From the Field brief](#). It links to the University of Hawaii's Institute for Astronomy press release that provides a link to access the data.



05

State government R&D expenditures top \$2.2 billion in FY 2015

State government agencies spent more than \$2.2 billion on research and development (R&D) in Fiscal Year (FY) 2015, a 16.9 percent increase over the previous year, according to a new report from the National Center for Science and Engineering Statistics (NCSES). Of the \$2.2 billion states spent on R&D, 78 percent came from state governments and other nonfederal sources. The rest came from federal funding. Find out more in the NSF [press release](#).



06

NSF Director on "Ten Big Ideas" for discovery, creativity and innovation

In remarks delivered before the Science Museum in London, NSF Director France A. Córdova gave a brief overview of NSF's history, mission, and current activities before turning to "a number of bold ideas for the future," she said. "We have identified 10 big ideas -- 6 of them research ideas, and 4 of them process ideas -- that would invite transformative discoveries. I have time to only touch briefly on these ideas today, but you will be hearing more about them in the weeks and months ahead," she promised. Learn more about the 10 big ideas in her [speech](#).



07

Scientists create ice storms to study nature's chilly response

Anyone who has ever driven in freezing rain knows all too well the potential hazards of an ice storm. These powerful winter weather events are also capable of catastrophic ecological and socio-economic impacts on forest ecosystems, affecting forest species and productivity, and even increasing the risk of fire. Syracuse University bio-geochemist Charley Driscoll and U.S. Department of Agriculture (USDA) Forest Service ecologist Lindsey Rustad are part of a team supported by NSF to monitor more precisely how a forest ecosystem responds to and recovers from ice storms. And, the researchers are not waiting on Mother Nature to provide the right weather. They're creating their own ice storms in New Hampshire's Hubbard Brook Experimental Forest. Find out more in this episode of the NSF video series [Science Nation](#).



08

How does NSF INCLUDES work to broaden participation?

NSF INCLUDES is a comprehensive initiative to enhance U.S. leadership in science and engineering discovery and innovation by proactively seeking and effectively developing science, technology, engineering and mathematics (STEM) talent from all sectors and groups in society. By facilitating partnerships, communication and cooperation, NSF aims to build on and scale up what works in broadening participation programs to reach underserved populations nationwide. In this [video](#), NSF Director France A. Córdoba talks about how people and organizations who work to broaden participation in STEM can benefit from the NSF INCLUDES program.



09

“Math Path”

This week’s episode of “The Discovery Files” podcast reports on a Vanderbilt University study that looked at whether children’s math skills at ages four and five predicted math achievement at age 11. The study results say yes, but not all types of math knowledge were equally important. The researchers tested 517 kids from low-income families on six different math skills, in pre-school and at the end of first grade. When the children finished *fifth* grade, the researchers then tested the kids’ knowledge about numbers, algebra and geometry. Check out the [podcast](#) to learn what the researchers found.



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