



10 Quick Reads From NSF.gov

June 26, 2017

01

NSF Director discusses the fiscal year 2018 budget request for NSF

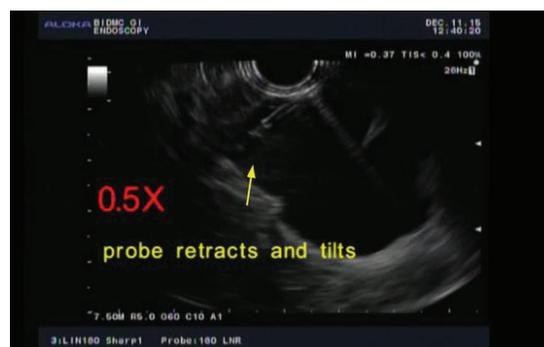
NSF Director France Córdoba presented the President’s fiscal year (FY) 2018 budget request of \$6.65 billion for NSF at a briefing for the public at the agency on May 23, and on June 7, she testified about the proposed budget at a hearing of the House Appropriations Committee’s Commerce, Justice, Science and Related Agencies Subcommittee. To find out more, view the [webcast](#) of the budget briefing at NSF, see the [budget page](#) with links to related budget information, and read the Director’s [testimony](#) before Congress.



02

Light-scattering tool peers into pancreas to find cancer

Early detection of pancreatic cancer is difficult because the pancreas is deep inside the abdomen, making potentially cancerous cells hard to reach and identify without surgery. NSF-funded researchers have developed a new light-based technique that can identify precancerous and cancerous cysts--small, fluid-filled cavities in the body -- by piggybacking on a standard diagnostic procedure. One-fifth of pancreatic cancers come from cysts. While magnetic resonance imaging and other noninvasive imaging techniques in use today can scan for cysts, the tools have limited accuracy in determining which cysts are malignant and which are benign. A team led by Lev Perelman, a professor at Harvard University and director of the Center for Advanced Biomedical Imaging and Photonics at Beth Israel Deaconess Medical Center, developed an approach that Perelman says “can be called a virtual biopsy, as it does not collect any tissue.” In a study published in the journal *Nature Biomedical Engineering*, the team reported they accurately identified 95 percent of cysts in 25 patients. Learn more about the research in this NSF [video](#).



03

NSF announces the 2017 Generation Nano competition winners

High school students from Virginia, Georgia and New Mexico were named winners of the 2017 Generation Nano: Small Science, Superheroes competition on June 6. Presented by NSF and the National Nanotechnology Initiative, the competition challenges high school students to imagine novel superheroes who use the power of nanotechnology--technology on the scale of 1 billionth of a meter--to solve crimes or tackle a societal challenge, and then tell their hero’s story in a comic or a video. Hannah Kim and Daniel Kim from Thomas Jefferson High School for Science and Technology in Virginia were named first-place winners for “Dilatant: Being bulletproof has never taken such a small effort.” Symone Crowder from Northside High School in Georgia was awarded second place for “Mia Kei: Versatility is my specialty.” And Ramona Park from Santa Fe High School in New Mexico was named the People’s Choice winner for “Agent X: ‘X’ marks the spot.” Among those impressed by the winning entries was Stan Lee, former executive vice president and publisher of Marvel Comics, who tweeted, “Congrats, #GenNano winners for your creative #nanotech-powered #superheroes!” The GenNano winning teams were part of the NSF booth at Awesome Con in Washington, D.C., on June 16-18. To see the winning comics and videos, and learn more about the competition, see the [Generation Nano](#) special report.



04

Study reveals America's most flood-vulnerable cities

Flooding is not only the most common natural disaster--it's the natural disaster that kills the greatest number of people. As the threat of floods increases worldwide, scientists have been gathering valuable information on vulnerability to floods in counties throughout the U.S. Trends from 2001 to 2011 show that urban development has declined in coastal flood zones; however, development in flood zones in inland counties has grown. "We found more urban development in inland flood zones than in coastal areas between 2000 and 2011, which is a worrisome trend," said scientist Nina Lam of Louisiana State University. Lam is a co-author of the study, published in the journal *Annals of the American Association of Geographers*. The trend may point to a need for more awareness, education and communication about flood risk in inland counties, the researchers said. They believe that more affordable housing in non-flood zones and strategies to mitigate floods are also needed. Find out more in this NSF [Discovery article](#).



05

Third annual NSF Community College Innovation Challenge rewards top entries

Teams from Del Mar College in Texas and Red Rocks Community College in Colorado were named winners of the third annual Community College Innovation Challenge (CCIC). Sponsored by NSF and the American Association of Community Colleges (AACC), the challenge fosters students' interest in science, technology, engineering and mathematics (STEM) careers and innovation and entrepreneurship by asking them to offer creative solutions to real-world problems. The judges awarded first place to the team from Del Mar College for the team's innovative use of tailor-made viruses that target bacteria that are resistant to conventional antibiotics treatment methods. The Red Rocks Community College team was awarded second place for the team's project demonstrating how students can learn without fear in the safety of student-created cyber labs and develop real-world skills in response to real-world challenges. The winners were selected following a four-day boot camp in Arlington, Virginia, and a reception on Capitol Hill, where students showcased their projects. "Our role as an agency is to fund trailblazers with curiosity-driven ideas," said NSF Chief Operating Officer Joan Ferrini-Mundy at the June 14 Hill reception. "We know that community colleges are rich resources for the skilled technical workforce and provide an environment where bright new ideas can thrive." Find out more about the winning teams in this NSF [news release](#).



06

Researchers gauge impact of "Maker" job opportunities for underserved teens

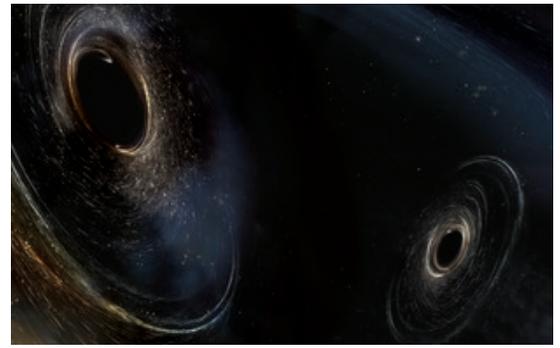
Real world problem solving through "Making" is a popular way to engage youth in STEM education, frequently in after-school programs. With support from NSF, Amy Hurst and her team at the University of Maryland, Baltimore County, partnered with the Digital Harbor Foundation (DHF) to create a living laboratory print shop to study the impact of Maker employment on underserved youth. Teens can come to the DHF Tech Center in their free time to learn the design and programming skills necessary for 3-D printing. In addition, the center is a working print shop that is open for business and taking orders, so the more experienced teens also can get work experience in a STEM-related job. Hurst's team will be tracking the engagement of the teens, measuring how their attitudes about technical employment, STEM fields and Making change during the experience. Find out more in this [Science Nation](#) video.



07

LIGO detects third black hole merger

An international team of researchers recently announced that the Laser Interferometer Gravitational-wave Observatory (LIGO) had observed gravitational waves on January 4, 2017, from a third pair of merging black holes 3 billion light-years away--the farthest distance yet. Last year, the LIGO Scientific Collaboration announced the first detection of gravitational waves resulting from the merger of two black holes. "This is exactly what we hoped for from NSF's investment in LIGO: taking us deeper into time and space in ways we couldn't do before the detection of gravitational waves. In this case, we're exploring approximately 3 billion light-years away!" noted NSF Director France Córdova. "LIGO continues to make remarkable discoveries, transitioning from experiment to gravitational wave observatory. More importantly, each detection has offered much more than just a sighting. Slowly, we are collecting data that unveil the origin and characteristics of these objects, further informing our understanding of the universe." Read more in the Director's [press statement](#).



08

Dawn Tilbury is the new assistant director for Engineering

Dawn Tilbury began her appointment to lead NSF's Directorate for Engineering (ENG) on June 19. She comes to NSF from the University of Michigan (U-M), where she is a professor of mechanical engineering and served as associate dean for research in the College of Engineering. As associate dean, Tilbury led the development of interdisciplinary research teams to advance both large- and small-scale projects. "I welcome the opportunity to work with the engineering and scientific community to address the big challenges that face the nation and world today," Tilbury said. "These challenges require interdisciplinary approaches that rely on engineering, as well as social and computer science, biology, chemistry, physics and the geosciences, and other fields." Find out more about the new assistant director for engineering in this NSF [news release](#).



09

NSF-supported researchers at the University of Maine are putting aquaculture innovation to work

Marine ecologist Brian Beal and a team based at the University of Maine's Machias Marine Science Field Station at the Downeast Institute are putting their aquaculture innovation skills to work. The team's goals are to diversify the U.S. market for shellfish and increase the number of jobs in that market. With support from NSF, the researchers have been focused on two types of shellfish with the potential to bring more jobs and dollars to the area: blue mussels and Arctic surf clams. Find out more in this NSF short [video](#).



10

"Force Feeled" -- The Discovery Files

Engineers at the University of California, San Diego, have developed a miniature device that's sensitive enough to feel the forces generated by swimming bacteria and hear the beating of heart muscle cells. The device is a nano-sized optical fiber that's about 100 times thinner than a human hair. In cultures of beating heart muscle cells from mice, the nanofiber can detect sounds down to 30 decibels--a level that's 1,000 times below the limit of the human ear. The researchers envision applications that range from detecting a single bacterium to sensing changes in a cell's behavior that may indicate cancer or a viral invasion. It might even act as an implantable mini-stethoscope. Hear more in this Discovery Files [podcast](#).

