

NSF AT WORK



Data clusters, also called server farms, can contain as many as 90,000 servers. Credit: Zina Deretsky, NSF

### Academic Computing Gets a Big CluE

The Computer and Information Science and Engineering (CISE) directorate at NSF released a solicitation for proposals for the new Cluster Exploratory (CluE) initiative. The CluE program was announced in February as a part of a relationship between Google, IBM and NSF. NSF hopes this initiative will help lead to innovations in the field of data-intensive computing and serve as an example for future collaborations between the private sector and the academic computing research community.

CluE will provide NSF-funded researchers access to software and services running on a Google-IBM cluster to explore innovative research ideas in data-intensive computing. NSF will allocate cluster computing resources for a broad range of proposals which will explore the potential of this technology to contribute to science and

engineering research and produce applications which promise to benefit society as a whole.

For more on CluE, see the [NSF press release](#), which includes video of CISE Assistant Director Jeannette Wing discussing the new initiative.

### Breakthrough Wireless Grids Innovation Promises Seamless Connectivity

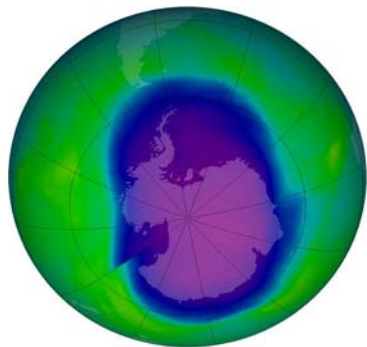
One of the challenges facing modern electronics is achieving a seamless, secure wireless connection between gadgets. Most electronics were not designed with connectivity in mind, so the difficulty lies in getting devices that speak their own languages to talk to each other.

[Wireless Grids Corporation](#), a Syracuse, N.Y.-based start-up company, was founded by CEO and Syracuse University professor Lee McKnight. McKnight received an NSF [Partnerships for Innovation](#) grant to pursue methods for creating “mini-grids” comprised of personal electronics.



Wireless Grids Corp. allows users to link up common consumer electronics, making it easy to share content between devices, and among friends. Credit: Wireless Grids Corporation

A software breakthrough is the key to Wireless Grids' success in linking. Any device that can access the Internet can download Wireless Grids' software, which is compatible with different network types and computer operating systems. Users can share software files as well as computers, speakers, printers, cameras, and screens with other users, who then use Wireless Grids' software to connect to those devices. Wireless Grids is testing the technology in dorms, with plans to bring the innovation to the larger marketplace, with Syracuse University being the first customer. Eventually, Wireless Grids officials hope their software will be embedded in next-generation wireless devices.



Earth's ozone hole, shown in blue, could be exacerbated by some efforts to mitigate climate change. Credit: NASA

## Sulfate Particles Could Damage Fragile Ozone Layer

To combat the effects of global warming, some have suggested injecting sulfate particles into the stratosphere, with the aim of blocking some of the sun's rays before they have a chance to overheat the atmosphere. However, a new study indicates that the sulfate particles would likely have the unintended consequence of harming the earth's protective ozone layer.

Researchers at the National Center for Atmospheric Research in Boulder, Colo., warn that the sulfate approach would delay the recovery of the Antarctic ozone hole by decades and cause significant ozone loss over the Arctic.

"Our research indicates that trying to artificially cool off the planet may be a perilous endeavor," the study's lead scientist Simone Tilmes says. "While climate change is a major threat, this solution could create severe problems for society."

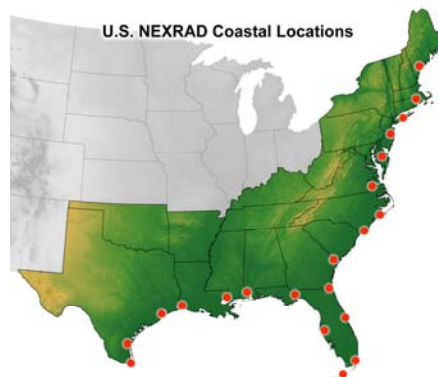
See the [NSF press release](#) for more information on this study.

## Hurricane Hunter: New Technique to Catch Killer Storms

NSF-funded researchers at the [National Center for Atmospheric Research](#) in Boulder, Colo., are part of a team that recently developed a technique to help forecasters monitor landfalling hurricanes. The new system will provide frequent and detailed images of a storm's location and will debut in time for the 2008 hurricane season.

The technique, known as VORTRAC (Vortex Objective Radar Tracking and Circulation), was successfully tested by the hurricane center last year.

The system relies on existing Doppler radars along the U.S. coast. It will provide updates on hurricane winds and central pressure every six minutes, helping scientists better determine a storm's strength as it approaches the shore.



This map shows the locations of NOAA Doppler radars along the East and Gulf coasts. Illustration by Steve Deyo, UCAR

See the [NSF press release](#) on VORTRAC to learn more about this breakthrough technology.

### DID YOU KNOW?

The social, behavioral and economic sciences ([SBE](#)), or the "human sciences," are concerned with human actions at every level, from an individual's brain, to individual behavior, to the actions of social groups and organizations. SBE scientists study team building, risk management, metrics for assessing U.S. competitiveness, brain function, disaster response, radicalization, the dynamics of conflict, decision making, and much more.

Read Dr. Mark Weiss' April 24, 2008, [testimony](#) before the House Subcommittees on Terrorism, Unconventional Threats and Capabilities and Research and Science Education for information on how NSF-supported basic research in the human sciences informs the efforts of the Department of Defense.



Three NSF SBE organizations are: Behavioral and Cognitive Sciences, Social and Economic Sciences, and Science Resources Statistics.



## FACES OF NSF RESEARCH



Vanessa Hull, a doctoral student at Michigan State University. In December 2007, she left for the Wolong Nature Reserve in China, hoping to collar and track up to four wild pandas. Credit: Sue Nichols, Michigan State University

### In the Face of Extinction: Pandas in Peril

When Vanessa Hull traveled to the remote mountains of the Sichuan Province of China earlier this year with the Michigan State University's (MSU) panda habitat research team, she had great hopes to capture, collar and track up to four pandas, using global positioning systems. However, she instead encountered the unpredictable and uncertain nature of science.

"We are accustomed to seeing the results of scientific endeavors when they have already come to fruition, but are often not aware of the setbacks along the way. I think it is important for people to realize that scientific research requires a long term commitment and persistence," said Hull.

A doctoral candidate and NSF Graduate Fellow in the Department of Fisheries and Wildlife in the MSU College of Agriculture and Natural Resources, Hull documented her panda habitat research with a digital video camera and a laptop computer. Her posts are archived on the [MSU Web site](#) about the panda project.



An adult panda in captivity at the China Center for Research and Conservation of the Giant Panda in Wolong. Credit: Sue Nichols, Michigan State University

Though she was unable to capture a panda and obtain much needed data about panda habitats, Hull looks upon this experience as an



opportunity to broaden her dissertation to include other related topics in panda ecology and behavior. "There is so much we don't know about their behavior, and I have gained all the more resolve to continue with this project so that we can find some answers to these questions."

A photo shot by Vanessa Hull as she hiked the trails of Sichuan Province to check panda traps. The mountain range is called Bai Ai. Credit: Vanessa Hull, Michigan State University

Hull, still determined to find the elusive pandas, plans to return to China in November. She will consider an expansion of the current trapping area to include other sites in the Wolong Nature Reserve, with the hope of finally encountering a panda in the wild.

## NSF IN THE NEWS

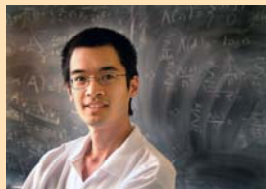
[Bridges to the Future](#) (*Popular Mechanics*, 4/10/2008) -- 10 Expert Solutions for a Smarter, Cleaner U.S. Electric Grid; 10 Expert Solutions for a Better American Water Supply; 10 Expert Solutions for Harder, Better, Faster and Stronger Buildings and Bridges.

[Experts See Impact of Museums in Science Education Efforts](#) (*Forbes*, 4/28/2008) -- Studies show that science museums stimulate interest, awareness, knowledge and understanding for both children and adults.

[A Fast Track to Green Gasoline](#) (*Chemical & Engineering News*, 4/21/2008) -- George W. Huber of the University of Massachusetts, Amherst, is reporting a selective catalytic process that for the first time permits direct conversion of cellulose into compounds that can be used to make gasoline.

THE RIPPLE EFFECT

**Honoring Achievement: Science & Engineering Leaders Receive Awards**



The [2008 Alan T. Waterman Award](#) winner is [Terence Tao](#), a professor of mathematics at the University of California at Los Angeles.

Called a "supreme problem-solver," and named one of "the Brilliant 10" scientists by *Popular Science*, Tao's extraordinary work, much of which has been funded by NSF, has had a tremendous impact across several areas of mathematics.

The [2008 Vannevar Bush Award](#) winner is [Norm Augustine](#), selected for his public service leadership in science and engineering; for his commitment to business ethics and the engineering profession; and for his extraordinary contributions to the welfare of the nation through his advocacy of science, technology and engineering education as national priorities.



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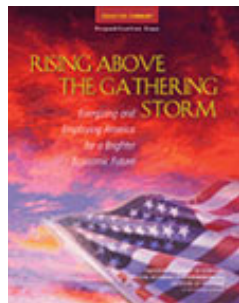


The [2007 Presidential Award for Excellence in Mathematics and Science Teaching](#) (PAEMST) awardees hail from K-12 schools all across the country. The 99 teachers were honored in Washington, DC with an awards ceremony, meetings with Vice President Dick Cheney, and other celebratory activities.



Bayer and SAE International are the [2008 Public Service Award winners](#) for their outstanding contributions to increasing the public's understanding of science and engineering.

**Rising Above the Gathering Storm: Two Years Later**



On Tuesday, April 29, the National Academy of Sciences (NAS), the National Academy of Engineering, and the National Math and Science Initiative hosted a national convocation to take stock of American science and engineering research and education in the wake of the 2005 NAS release of [Rising Above the Gathering Storm](#), a report detailing the steps Congress could take to strengthen American technological competitiveness. Speakers included several members of Congress, three cabinet secretaries, former astronaut Sally Ride, Vannevar Bush Award winner Norm Augustine, and NSF's director, Dr. Ardent L. Bement, Jr. Many of the speakers called upon Congress to fund fully the America COMPETES Act (ACA) of 2007, which includes a doubling of NSF's budget in 10 years. ACA was drafted based on the recommendations of the *Gathering Storm* report. See the [NAS press release](#) for more information.



The National Science Foundation (NSF) is an independent federal agency that supports fundamental research and education across all fields of science with an annual budget of about \$6.06. NSF funding reaches all 50 states through grants to over 1,700 universities and institutions. Each year, NSF receives about 42,000 competitive requests for funding and makes over 10,000 new funding awards. The NSF also awards over \$400 million in professional and service contracts yearly. Contact [NSF's Office of Legislative and Public Affairs](#) for more information, to unsubscribe or for permission to reuse newsletter images.