

NSF AT WORK



An artist's depiction of the giant frog *Beelzebufo*, or "devil frog," believed to be the largest frog ever to live on earth. Credit: SUNY-Stony Brook

### "Giant Fossil Frog from Hell" Discovered in Madagascar

A team of researchers, led by Stony Brook University paleontologist David Krause, has discovered the remains in Madagascar of what may be the largest frog ever to exist. The 16-inch, 10-pound ancient frog, named *Beelzebufo*, or "devil frog," links a group of frogs that lived 65 to 70 million years ago with frogs living today in South America.

The discovery of the voracious, predatory fossil frog is significant because *Beelzebufo* may provide direct evidence of a one-time land connection between Madagascar, the largest island off Africa's southeast coast, and South America. To identify *Beelzebufo* and

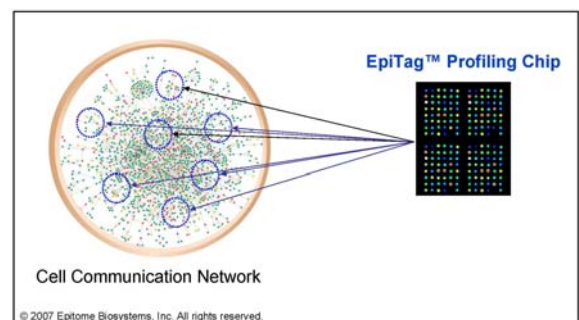
determine its relationship to other frogs, Krause collaborated with fossil frog experts Susan Evans and Marc Jones of the University College London.

"*Beelzebufo* appears to be a very close relative of a group of South American frogs known as 'ceratophyrines,' or 'Pac-Man' frogs, because of their immense mouths," said Krause, whose research was funded by NSF.

See the [NSF News Release](#) for more on *Beelzebufo*.

### From Discovery to Innovation: Epitome Breakthrough Could Enable Real-Time Patient Drug Evaluation

Many failures in clinical drug trials are attributed to unforeseen interactions between the drug and the "cell-signaling network" -- the complex chemical communication pathways governing the activities of living cells. [Epitome Biosystems, Inc.](#) of Waltham, Mass., recipient of three NSF Small Business Innovation Research grants, has developed an innovative "assay" method for simultaneously testing a drug's interaction with more than a hundred proteins within the signaling network.



Epitome's technology can generate a "fingerprint" of changes in the cell-signaling network, allowing scientists to evaluate both the expected and unexpected effects of potential new drugs. Epitome's technology may be useful in the development of new therapies, including anti-cancer drugs.

Epitome's protein assay approach could make it easy for scientists to quickly evaluate a drug's potential interactions with living cells. Credit: Epitome Biosystems, Inc.

In addition, Epitome's methods may one day be able to predict suitability of drug treatment for specific patients and to allow doctors to monitor a drug's effectiveness while the patient is receiving treatment.



Study shows officials should consider public health impacts of indirect exposure to extreme stress. Credit: Morguefile

## 9/11 Stress Attacks American Hearts

A new study by researchers at the University of California, Irvine says stress and fear in the aftermath of the Sept. 11, 2001, terrorist attacks on the World Trade Center and the Pentagon may have prolonged health effects for Americans.

For the first time, researchers have evidence that high levels of mental and emotional stress from traumatic events may be linked to an increase in cardiovascular problems among those with no personal, direct exposure to the conditions that caused the stress. Three years after the 9/11 attacks, researchers found a 53 percent increase in heart-related problems among those who reported high acute stress responses, as compared to those who reported low acute stress symptoms.

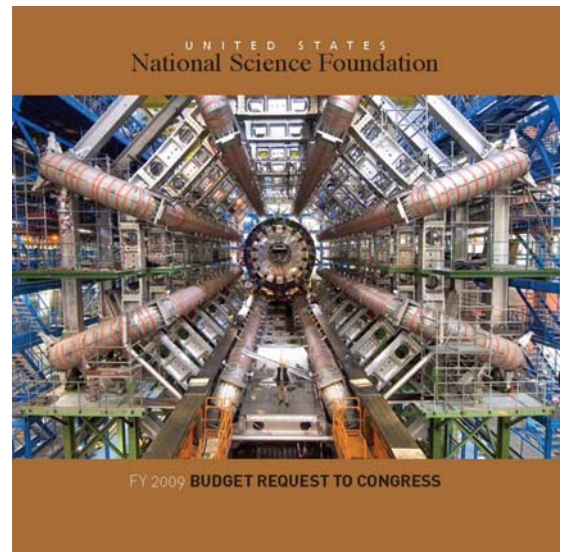
For more on this study, see the [NSF press release](#).

## NSF Submits Fiscal Year 2009 Budget Request to Congress

NSF Director Arden L. Bement, Jr., has presented the agency's proposed \$6.85 billion budget for fiscal year (FY) 2009, a 13 percent increase over NSF's actual FY 2008 budget. The additional \$789 million would increase funding for agency programs that advance the frontiers of research and education in science and engineering.

Bement said the increase reflected a growing consensus that the United States needs to invest more resources in basic scientific research if it is to remain a global leader in science and technology. "More than a dozen major studies have now concluded that a substantial increase in federal funding for basic scientific research is critical to ensure the preeminence of America's scientific and technological enterprise," Bement said.

See [NSF's full budget request](#), including funding levels for existing programs and proposed new interdisciplinary efforts.

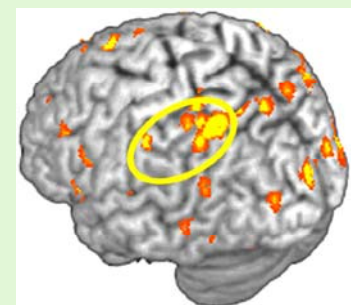


The cover of NSF's Budget Request to Congress features the ATLAS Barrel Toroid Magnet, so enormous that a human is dwarfed at its center. Credit: CERN

### DID YOU KNOW?

Scientists can now identify what words you're thinking of by scanning your brain. Late last year, neuroscientist Marcel Just and computer scientist Tom Mitchell of Carnegie Mellon University presented the results of experiments that had people look at drawings of ten common items such as a hammer or a house while an MRI scanner imaged their brains. Using sophisticated algorithms and computers, the researchers were then able to analyze brain images from other people and correctly identify which drawings people were looking at based on their brain activity.

More information on this work in computational neuroscience is available from [Carnegie Mellon's Web site](#).



Computer-generated image of brain activity in regions associated with object classification. Credit: Carnegie Mellon University

## FACES OF NSF RESEARCH

### Faces of the Future: Women Sweep Siemens Competition in Math, Science and Technology



Isha Jain won the individual category of the Siemens Competition for her project aimed at combating bone disorders. Credit: Siemens Foundation

When Isha Jain, a senior at Freedom High School in Bethlehem, Pa., entered the prestigious Siemens Competition in Math, Science and Technology, she doubted that she would even place. "I came here thinking that I had no chance at all," said Jain. So it came as a surprise to her when she won first place in the individual category for her project on bone growth.

Not only did Jain win the top individual spot, but for the first time in the history of the Siemens Competition, women swept all of the top spots.

Janelle Schlossberger and Amanda Marinoff, seniors at Plainview-Old Bethpage John F. Kennedy High School on Long Island, placed first in the team category. Their project involved creating a molecule that helps block the reproduction of drug-resistant tuberculosis bacteria.

The results of the Siemens Competition are likely a sign of the times. The numbers of women excelling in science, math and engineering are steadily increasing, and educators have not failed to respond to the changing face of their classroom.



Janelle Schlossberger and Amanda Marinoff won first place for their project on a tuberculosis therapy. Credit: Siemens Foundation

According to Margaret Hunter, an associate engineering professor at Hofstra University, "Many women in science and math say the subjects should be taught in ways that excite girls about them."

Hunter is the recipient of an NSF grant to make college science courses more gender-neutral. She is coordinating Project ESTEEM (short for Equitable Science Technology Engineering Education and Mathematics), a collaboration of faculty from several universities. ESTEEM is developing strategies to attract more women to careers in science, technology, engineering and mathematics.



Professor Margaret Hunter's Project ESTEEM is helping to attract more women into the science and engineering workforce. Credit: Hofstra University

"The gender and racial gap in science, technology, engineering and mathematics education programs limit the pool of potential workers and threatens the nation's intellectual and economic competitiveness," Hunter said. "The lack of women in these professions also diminishes the social consciousness that competent female leaders would bring to technical endeavors."

## NSF IN THE NEWS

[Predicting a Pandemic](#) (*U.S. News and World Report 2/21/2008*) -- Using global databases and sophisticated computer models, NSF-funded scientists say they can predict for the first time where the next major pandemic disease like HIV/AIDS or SARS could occur.

[NSF Director Interviewed by Charlie Rose](#) (*Charlie Rose, PBS 2/18/2008*) -- NSF Director Arden L. Bement, Jr., said, "I think every nation in the world now recognizes that in a knowledge-based economy, economic growth is driven by investment in R&D, investment in education and investment in information infrastructure."

[Engineering's Greatest Challenge: Our Survival](#) (*MSNBC 2/15/2008*) -- The National Academy of Engineering, at the request of NSF, assembled an all-star team of technologists to lay out their list of the 21st century's top engineering challenges.

THE RIPPLE EFFECT

**Research.gov: Powering Knowledge and Innovation**



NSF recently launched [Research.gov](#), an exciting new initiative that modernizes FastLane and enables institutions and grantees to access streamlined research grants management services and other resources for multiple federal research agencies, beginning with NASA and the Department of Defense.

During NSF's FY 2009 budget presentation, NSF Director Dr. Arden L. Bement, Jr., remarked, "Research.gov is a modernization of FastLane, tailored to the needs of the research community. This new system provides the latest award information and exciting research content."

Research.gov offers the following publicly-available services, which are just the beginning. The site will continue to evolve as NSF adds more features, making it a one-stop shop for federal grants services.

- [Research Spending and Results Search](#): Find out where federal research grant dollars are going. Search awards by a number of elements including awardee and congressional district.
- [Research Headlines](#): View research news and articles from NSF and its partner agencies.
- [Policy Library](#): Find agency policies, guides, terms and conditions, and instructions that applicants and agencies need to conduct grants business.

**NSF's Open House a Big Hit With Kids**

On February 4, NSF held its budget rollout and annual open house, with exhibits and demonstrations ranging from 3-dimensional computer modeling to how to reduce household carbon dioxide emissions.



An elementary school student playing with the humanoid robot DARwIn. Credit: Steven Lonker, NSF



Arun Ross (right), of West Virginia University, demonstrates face recognition to Josh Chamot of NSF. Credit: Gwen Morgan, NSF



Elementary school students view a computer model of the rapid prey capture movement of the chameleon. Credit: Gwen Morgan, NSF

**Upcoming NSF Hearings on Capitol Hill**



**March 11:**  
Review of NSF's 2009 Budget Request: Senate Commerce, Science & Transportation

**March 13:**  
Review of NSF's 2009 Budget Request: Senate Appropriations

**April 2:**  
Science Diplomacy: Science & Education Subcommittee

**\*\*\*Capital Science 2008\*\*\***

The Washington Academy of Sciences and its affiliates present [Capital Science 2008](#) from March 29-30 at NSF Headquarters. Register today!



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.