

Right: A multinational team of researchers has detected low-energy solar neutrinos—subatomic particles produced in the core of the sun—and measured in real-time the rate the particles hit our planet. The researchers also obtained fresh evidence that neutrinos oscillate (transform from one state to another) before arriving at Earth, adding weight to present theories about the nature of neutrinos and the inner workings of the sun and other stars. These are the first results from the Borexino detector, shown here, an international collaboration comprised of more than 100 researchers, including NSF-supported investigators at Princeton University and Virginia Polytechnic Institute and State University. These scientists have operated the Borexino experiment in one of the deepest laboratories in the world, the Gran Sasso Laboratory of the Italian National Institute of Nuclear Physics (INFN). The 18-meter (59-foot) diameter Borexino detector lies more than a kilometer (almost a mile) underground. The depth blocks out cosmic rays and other radiation sources that could create additional background signals.

For more information:

www.nsf.gov/news/news_summ.jsp?cntn_id=109893&org=NSF&from=news



Page 1

Sierra Negra, an active volcano in the Galápagos Archipelago, displays remarkable behavior that discloses how magma fills up and is stored in shallow reservoirs in Earth's crust. A team of NSF-funded researchers used a network of Global Positioning System (GPS) monitors to measure the deflection of Earth's surface when magma becomes pressurized as it rises from great depths. Between 2002 and 2005, the top of the volcano—one of five volcanoes on Isabela Island—bulged almost a meter. When the volcano erupted in 2005, the GPS readings revealed that pressure beneath the surface began to build up again within 20 seconds of an eruption. The GPS measurements provide scientists with a greater understanding of volcanic activity and can help researchers better predict new eruptions, which, in turn, will lead to improved early warning systems. This project also demonstrates how international and national scientific partnerships add to the understanding of fundamental natural processes, while promoting the broader education of students in the United States and around the world.

Credit: Dennis Geist, University of Idaho

For more information:

www.webpages.uidaho.edu/~dgeist/

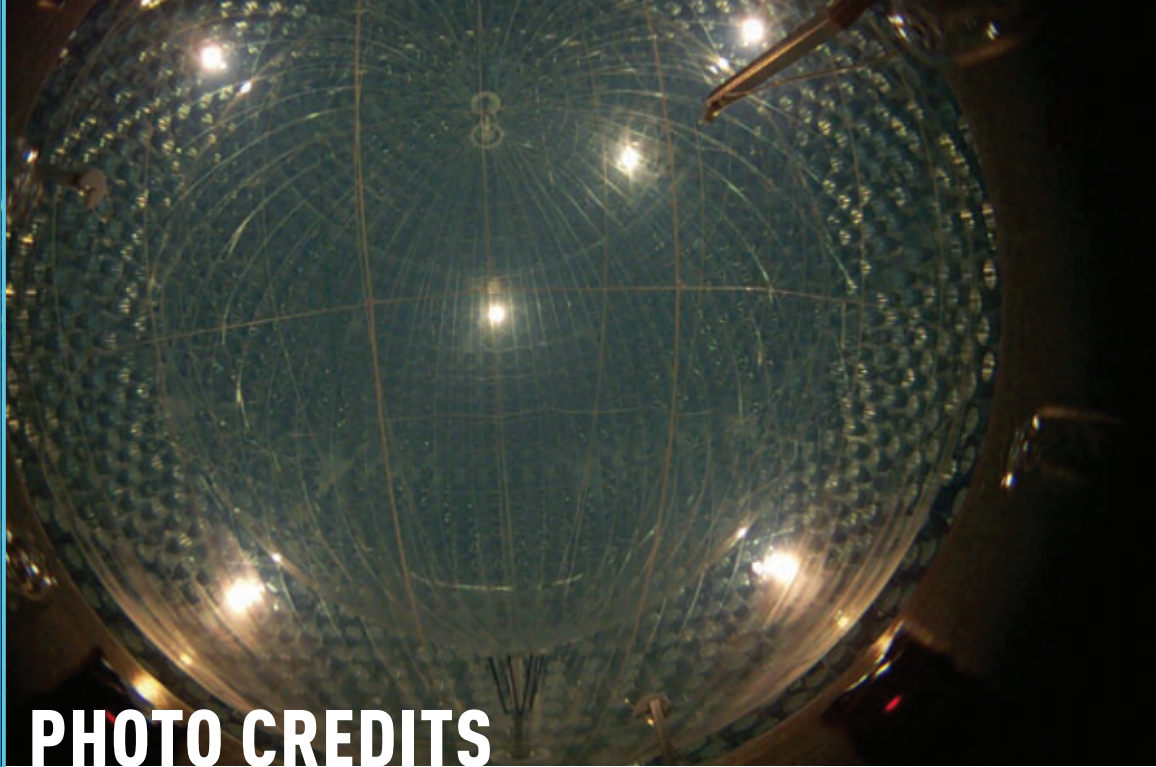


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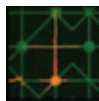
Page 2

Credit: Cathy Morrison, Missouri Department of Transportation



Page 4

Credit: Cedar Creek Long-term Ecological Research Site



Page 6

Credit: Ginger Withers, Whitman College



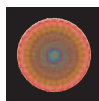
Page 6

Credit: Victor Pushparaj, Rensselaer Polytechnic Institute



Page 8

Credit: Andrew Hanson, Indiana University



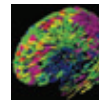
Page 10

Credit: John Stembridge, University of Michigan



Page 12

Credit: ARC COE for Coral Reef Studies



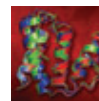
Page 14

Credit: Dr. Paul Thompson, University of California, Los Angeles, National Institute of Biomedical Imaging and Bioengineering



Page 16

Credit: X-ray: NASA/CXC/SSC/J. Keohane et al.; Infrared: Caltech/SSC/J. Rho and T. Jarrett



Page 18

Credit: R.C. Walker, San Diego Supercomputer Center, University of California, San Diego, and S. Raman, University of Washington



Page 18

Credit: Richard F. Voss and Heinz-Otto Peitgen



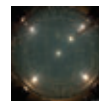
Page 20

Credit: NSF, Steven Profaizer



Page 22

Credit: Joseph McClain, College of William and Mary



Page 24

Credit: Italian National Institute of Nuclear Physics (INFN)