EUROPA, AN ICY MOON OF JUPITER, AS VIEWED FROM NASA’S GALILEO SPACECRAFT. THIS IMAGE SHOWS PLANES OF BIRDS AND ICE, CIRCLING FROM RHON TO RHON. COLOR AND CONTRAST ENHANCED TO BRING OUT ICE Details CONTAINING BOTH ICE AND DIRT.
UTIG scientists are dedicated to understanding how the world works. When a deadly earthquake devastated Haiti, UTIG scientists arrived within weeks, assessing the damage, identifying future hazards, and advising rebuilding efforts. When Hurricane Ike hit Galveston, UTIG took to the seas, conducting a Rapid Response survey that showed dramatic changes to the seafloor, information vital to the recovery process. And when the Galileo spacecraft sent back images from Jupiter’s moon Europa, UTIG used its knowledge of Earth’s ice sheets to find a potential habitat for life hidden under Europa’s icy shell.

UTIG is home to 35 doctorate-level scientists—research entrepreneurs—providing a broadband of expertise that can do everything from conducting scientific ocean drilling to leading airborne radar studies of ice sheets. UTIG scientists supplement their fieldwork with computer analysis, modeling, and laboratory work.

UTIG seeks state, national, and international opportunities to leverage its proven geophysical expertise to address leading issues in resource development and environmental management. When society faces critical environmental problems that cause controversy among citizens and confusion among government policymakers, UTIG scientists engage the parties, plan an appropriate and effective response, and collect data that leads to responsible solutions. For such issues, UTIG scientists don’t take sides; they find answers.

The UT Institute for Geophysics (UTIG) is a world leader in expeditionary-scale geophysical research, conducting investigations over land, at sea, and in the air. Whether collecting seismic data, responding to natural disasters, or searching for signs of life, UTIG is there.
UTIG Milestones

 UTIG’s budget comes from external funding – grants from the National Science Foundation, NASA, international partners, foundations, and private industry — that pioneering geophysics work will continue for generations.

Lean and Agile
From the ends of the earth to the bottom of the sea to other planets, UTIG is there, making cutting-edge scientific discoveries that change the way we live and work in the world.
Scientists from the U.S., U.K., and Australia have used ice-penetrating radar to create the first high-resolution topographic map of one of the last uncharted regions of Earth, the Aurora Subglacial Basin, an ice-buried lowland in East Antarctica larger than Texas. The map reveals some of the largest fjords or ice-cut channels on Earth, providing important insights into the history of ice in Antarctica.

The data will help computer modelers improve their simulations of the past and future Antarctic ice sheet and its potential impact on global sea level.

In a significant finding in the search for life beyond Earth, scientists from UTIG have helped discover a body of liquid water locked inside the icy shell of Jupiter’s moon Europa. The water, the volume of the North American Great Lakes, could represent a potential habitat for life, and many more such lakes might exist throughout the shallow regions of Europa’s shell.

Knowledge gained over 20 years’ study of Earth’s ice sheets and floating ice shelves made the discovery possible.
Within weeks of the 2010 Haiti earthquake, UTIG scientists helped lead multiple expeditions to the island nation to help assess the damage, identify future earthquake hazards, and make recommendations about how and where to rebuild. They surveyed Haiti from the air, land, and sea.

UTIG scientists and colleagues combined data from their Rapid Response expeditions, seismological observations, and measurements from space to show that the earthquake wasn’t caused entirely, or even largely, by the Enriquillo-Platanar Garden Fault. Rather, most of the motion was on previously unknown shallow faults. The report notes that much more strain is still waiting to be released on the Enriquillo-Platanar Garden Fault, possibly as another large earthquake.

Following the 2010 Haiti earthquake, UTIG scientists assessed the extent of Hurricane Ike’s underwater damage. Conducting a Rapid Response research mission after Hurricane Ike, UTIG scientists surveyed the inlet between Galveston Bay and the Gulf of Mexico, and discovered that the hurricane significantly reshaped the seafloor and carried an enormous amount of sand and sediment into the gulf. The ongoing research revealed the role storms play in building and eroding barrier islands such as Galveston and could help coastal communities gauge the effectiveness of their sometimes controversial efforts to replenish eroding sand along shorelines.

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Credit: NASA/GSFC/METI/Japan SEASAT-1 Astroid Science Team.
WHAT MAKES THE EARTH SHAKE?

JAPAN 2011

The March 2011 earthquake and tsunami off the coast of Japan killed more than 15,000 people. With an eye toward better understanding of the fault and identifying potential hazards at other large faults around the world, UTIG researchers are studying the ocean trench and fault where the magnitude-9.0 Tohoku quake occurred. It is one of the largest quakes in recorded history.

UTIG scientists have a long history of creating partnerships with industry and government through geophysical investigations around the globe. The Gulf Basin Depositional Synthesis Project (GBDS) is one such longstanding UTIG project with industry partners that seeks to understand the depositional history of the economically important Gulf of Mexico. Another recent example of UTIG-industry partnerships involves the seismic investigation of the deep structure and earliest geologic history of the Gulf of Mexico. Research conducted by UTIG scientists continues to help industry scientists to more efficiently identify and develop energy resources in the deep gulf. Lessons learned from the studies in the Gulf of Mexico are used in other resource-rich deep basins around the globe.

WHAT MAKES THE EARTH SHAKE?

EAST TEXAS 2012

A UTIG scientist is investigating East Texas' largest earthquake ever — a 4.8 magnitude temblor near Timpson in May, 2012. Because the quake epicenter was just a few miles from some injection disposal wells, drilled to store waste fluids from hydraulic fracturing, the two could be linked. Studies are ongoing — stay tuned.

BUILDING BRIDGES: ACADEMIA, INDUSTRY AND GOVERNMENT
The Jackson School offers GeoFORCE program

The Jackson School of Geosciences' GeoFORCE program and its staff are housed at UTIG. GeoFORCE is an experiential outreach program that prepares Texas high school students to become part of the geosciences workforce. UTIG scientists regularly participate in the summer field excursions associated with this nationally recognized program that engages more than 640 high school students each summer, 85 percent of whom are minorities.

The Texas Earth and Space Science Revolution (TXESS Revolution) is a professional development program for eighth-grade and high school teachers preparing to teach the senior capstone course in Earth and Space Science. The project has served 172 teachers over four years. These teachers have directly affected more than 21,000 students; 69 percent of whom are underrepresented minorities.

A middle school science teacher from Watauga, Texas, was also aboard the New Zealand expedition. She learned alongside the expedition's science party and shared her experiences with students and the public through a blog and live video conferences. She connected directly with students in Texas, Nebraska, California, and France.

Geoforce

Teachers at Sea

A teacher at sea and a student at sea drilling for sediments on汇报 about the expedition.