THE UNIVERSITY OF TOKYO

Earthquake Research Institute

The University of Tokyo

Our ultimate mission is
to study earthquake phenomenon scientifically,
and to find out the ways to prevent
or mitigate the disasters caused
directly/indirectly by earthquakes.

Observation in Deep Mines

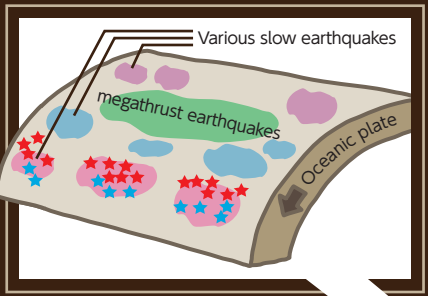
In order to have better understanding of earthquake mechanisms, observing seismicity as close to the earthquake source as possible would be ideal. Our research team conducted such observations in a South African gold mine. Using network of sensitive high-frequency acoustic emission sensors, a magnitude 2 earthquake was observed at depth of 3545m. The distance between sensor and fracture surface was only 6m.

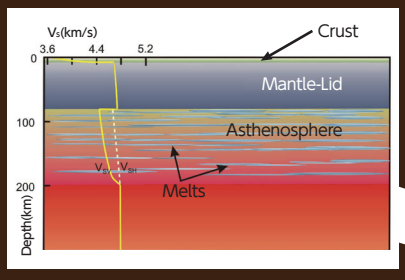
Kumamoto Earthquake

The 2016 Kumamoto, southwestern Japan, earthquake of Mw 7.0 was preceded by foreshocks, including a Mw 6.2 event, and followed by numerous aftershocks. Approximately 34-km-long right-lateral surface ruptures appeared along the eastern part of the Futagawa fault zone and the northernmost part of the Hinagu fault zone. Rupture process from the foreshock to mainshock in complex fault system was revealed, by the use of data from dense seismic observations.

Slow Earthquakes

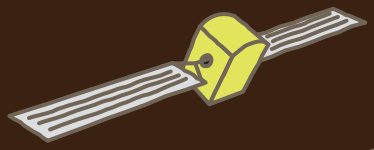
Slow earthquakes are low-speed fault slip phenomena compared to normal earthquakes. They were discovered at the end of 20th century in Japan. We expect some connection between slow and megathrust earthquakes because slow earthquakes are surrounding the megathrust earthquake seismogenic zone.





Millefeuille Asthenosphere

Asthenosphere is also known as a layer of low seismic wave speed and anisotropy. This model is proposed to explain the low seismic wave speed and low viscosity of the asthenosphere due to the lubrication caused by a presence of thin melt layers stretched in the direction of plate motion which itself introduces seismic anisotropy.



Tectonic plate

Upper mantle

Lower mantle

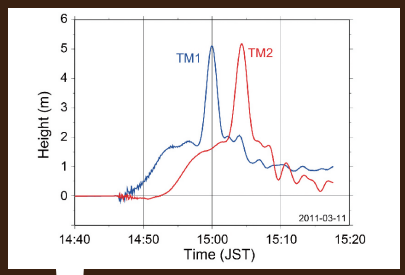
Core

Tsunami

High performance and accurate computer simulations of tsunami wave propagation are conducted targeting applications in tsunami warning systems. Tsunami sources and propagation are studied based on the offshore and on-coast observations. Further, we study ancient earthquakes and tsunamis based on deposit brought by past tsunamis and left in coastal geology.

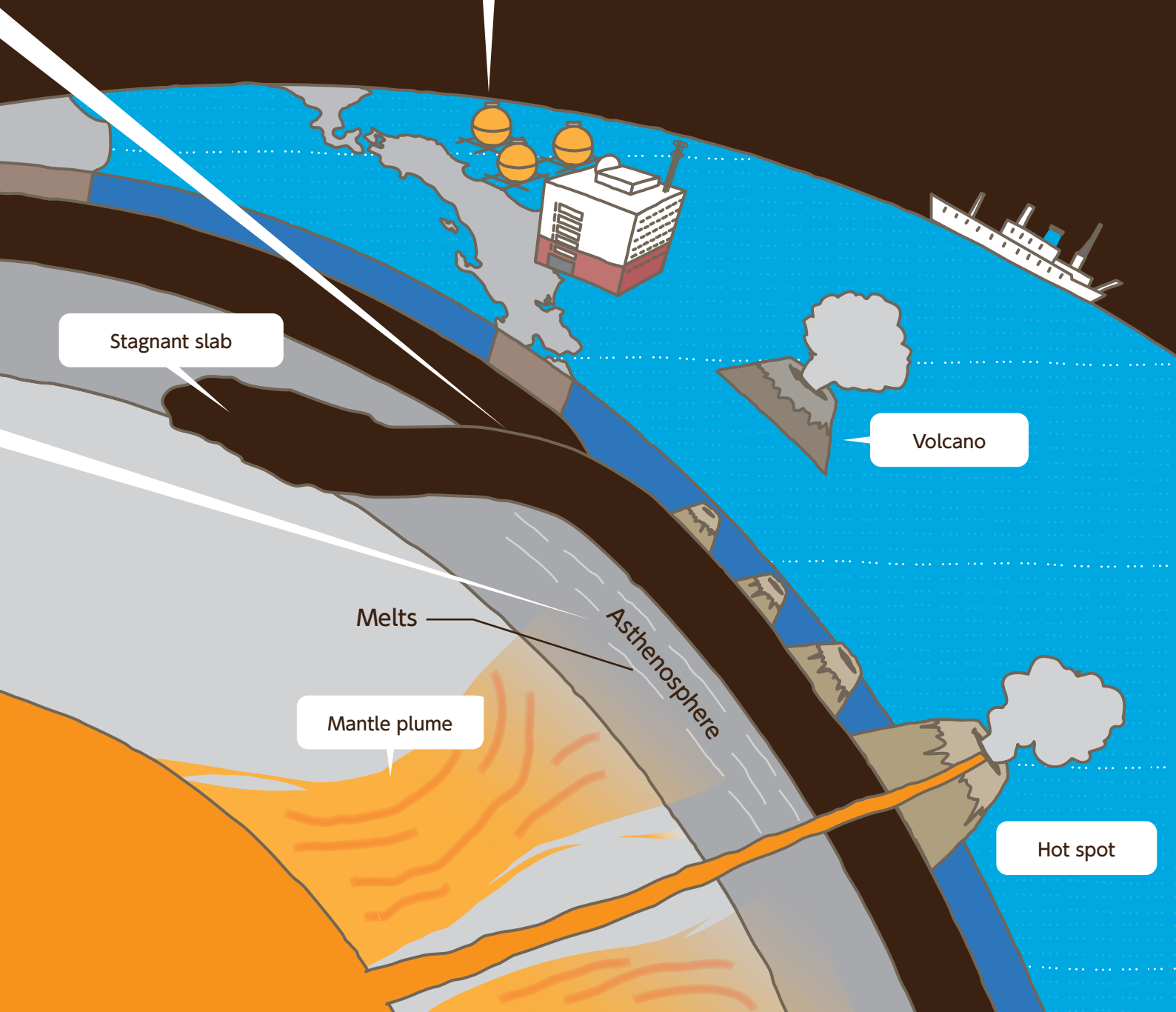
Ocean-bottom Observation

Ocean-bottom Cabled Seismic and Tsunami observation system installed in 1996 off Sanriku, Japan, has three seismic stations and two tsunami-gauges. The system observed the tsunami by the 2011 Tohoku earthquake and the data contributed to precisely estimate the tsunami source region.



Computational Science

A large-scale comprehensive urban earthquake simulator is enhanced with sophisticated techniques from computational science and computer science. Such earthquake simulation is expected to change the quality of earthquake disaster estimation.



ERI

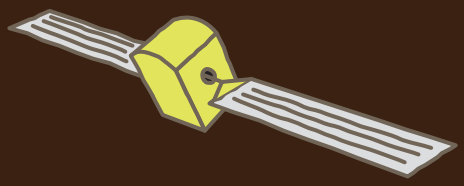
» Earthquake Research Institute

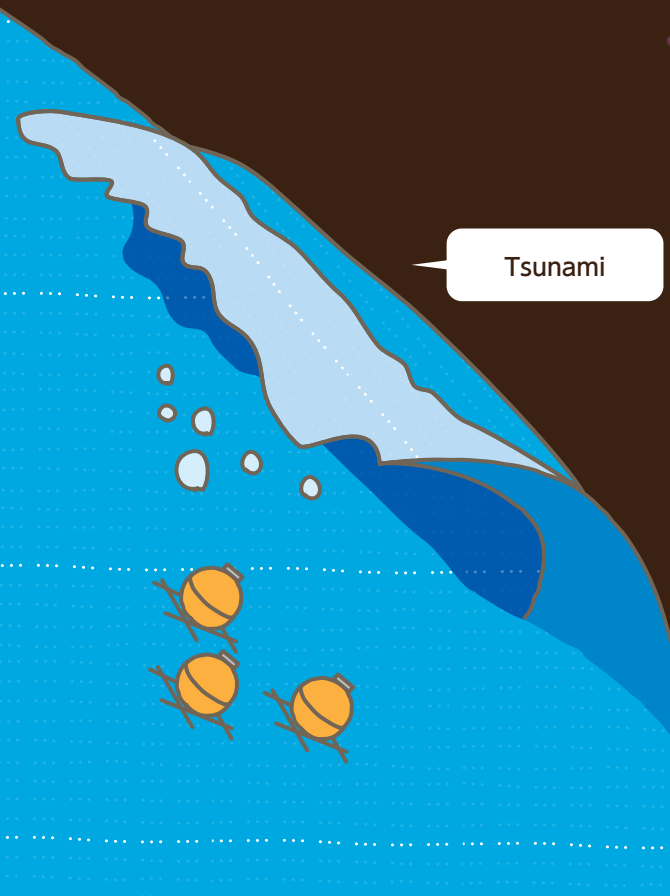
Muography

Muography is a scientific technique using high energy particles in cosmic rays. It can be used to visualize the internal structure of volcanoes and detect phenomenon within these structures such as ascent and descent of magma.

The New Island

Prior to the ongoing Nishinoshima Island's eruption started in April 2017, there had been previous eruption which lasted from 2013 to November 2015. In between these two eruptions, ERI conducted an on-land investigation from 16th to 25th October, 2016, setting seismometers, low-frequency microphone and collecting volcanic product.





About ERI

Earthquake Research Institute (ERI) was established in 1925, two years after the 1923 Kanto earthquake. The mission of ERI is to promote research on earthquakes and volcanic eruptions and to develop methods for mitigating related disasters. It also requires a comprehensive understanding of the dynamics of the Earth's interior which derive these phenomena. ERI employs about 80 top-notch academics (professors, associate professors and assistant professors) drawn from diverse fields, ranging from seismology to volcanology, geophysics, geochemistry, geology, geodesy, applied mathematics, information science, civil engineering and earthquake engineering.

Graduate students enjoy advanced field/ laboratory work with their supervisors.

Education

ERI (Earthquake Research Institute, The University of Tokyo) accepts graduate students and researchers from following disciplines: Earth and Planetary science, Civil Engineering, Architecture, Information Science and Technology, etc. Also, professors who belong to ERI are involved in graduate programs of each major, giving lectures and research guidance.

For detail, contact: gradstudy@eri.u-tokyo.ac.jp

International Networking

International research collaborations and contribution in the field of seismology and volcanology are one of our main responsibilities. We promote exchange of researchers/post-docs/students, establishing research & education agreements, holding international research meetings, etc.

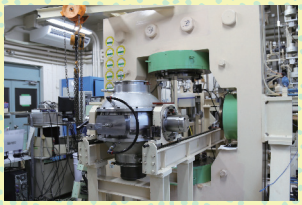
For more information, visit: http://www.eri.u-tokyo.ac.jp/kokusai/english/index.html

Joint Usage/Research Center

ERI has been designated as a nationwide Joint Usage/Research Center for Earthquake and Volcano Sciences by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) since the academic year 2010.

The goal of this center is to promote solid-earth sciences related to earthquakes and volcanoes, science and engineering to mitigate disasters caused by earthquakes and volcanic eruptions, and observational research both in Japan and abroad for the prediction of earthquakes and volcanic eruptions. In order to achieve this goal, ERI conducts joint researches, and accepts visiting researchers from all over the world.

http://www.eri.u-tokyo.ac.jp/en/joint-usage-top/



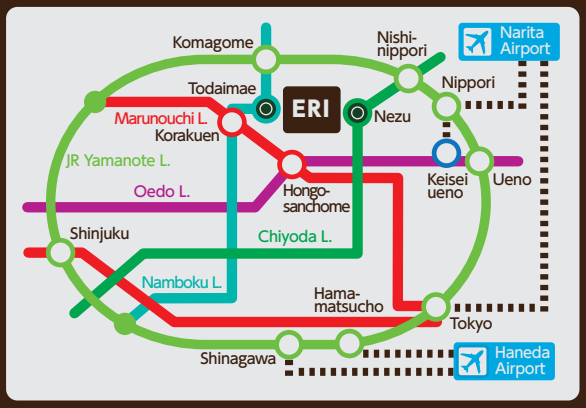
Coordinating Committee of Earthquake and Volcanic Eruption Prediction Researches (CCEVPR)

The Earthquake and Volcano Hazards Observation and Research Program was formed by the Subdivision on Geodesy, Council for Science and Technology, Japan, for forecasting earthquakes and volcanic eruptions and mitigating earthquake and volcanic disasters. For promoting the research program based on collaboration among universities and other institutions in all parts of Japan, ERI has put in place the CCEVPR. CCEVPR holds a symposium every year to exchange information about research outcomes, and makes a urgent research plan immediately after earthquake or during volcanic eruption.

Collaborative Research Organization for Historical Materials on Earthquakes and Volcanoes

This collaborative research organization was established to analyze and compile historical source materials concerning earthquakes and volcanic activity and build a database of historical earthquakes and volcanic eruptions in cooperation with Historiographical Institute, the University of Tokyo. Historical data on earthquakes and volcanic activity in the period before modern observation with seismometers are expected to be useful for long-term forecasts of earthquakes and volcanic eruptions.

The people of Edo, the former name of Tokyo, were punisghing the catfish that was thought to have caused the earthquake (1855).



From Nezu Station, Chiyoda Line: 10 min. walk from Exit1
From Todai-mae Station, Namboku Line: 5 minutes from Exit1

Earthquake Research Institute, The University of Tokyo

1-1-1 Yayoi, Bunkyo-ku, Tokyo 113-0032, JAPAN
E-mail orhp@eri.u-tokyo.ac.jp
Tel 03-5841-5666
http://www.eri.u-tokyo.ac.jp/en/

Published July 2017