Visiting Programs for researchers at Earthquake Research Institute

Joint Invitation Program

At Earthquake Research Institute, the University of Tokyo, we offer unique opportunities for researchers to stay for collaborative research for a few months to one year. One of the programs is the Joint Invitation Program.

Dr. Lin Cheng-Horng of Academia Sinica, Taiwan, was invited as a visiting professor in 2023 jointly by ERI and by Hot Springs Research Institute of Kanagawa Prefecture (HSRI) under this program. In October 2023, Masa Kinoshita, the head of the international office, visited HSRI and talked with Dr. Lin Cheng-Horng and Dr. Kazutaka Mannen of HSRI.

(K) Masa Kinoshita (Professor, Head of International Office, ERI)

- (L) Lin Cheng-Horng (Distinguished Research Fellow, Institute of Earth Sciences, Academia Sinica, Taiwan)
- (M) Kazutaka Mannen (Senior Researcher, Hot Springs Research Institute of Kanagawa Prefecture)



Lin Cheng-Horng Masa Kinoshita Kazutaka Mannen

K: What is your impression about your stay at ERI this time?

L: The Earthquake Research Institute (ERI) is one of the world's leading geoscience research institutions. With many outstanding researchers, ERI covers almost all areas of geoscience, not only seismology but also geology, geophysics and technical engineering. I can easily find any expert from ERI for future collaboration. Besides, Japan has many advanced instruments for collecting reliable data, such as DONET (Dense Oceanfloore Network system for

Earthquakes and Tsunamis) and submarine infrastructure, which is almost unparalleled in the world. In short, ERI offers excellent researchers, instruments and reliable data. If any earth science researcher has the option of going abroad for study, I believe ERI is the best choice.

K: Dr. Lin has been invited by the Joint Invitation Program, one of ERI's unique programs. This program allows joint research to work not only with ERI but also with other research institutes in Japan, and this time it was the Hot Springs Research Institute of Kanagawa Prefecture. Have the results met your expectations?

L: My goal was to understand Taiwan's Tatun volcano*1. The broad expertise of the seismologists at ERI, along with the infrastructure of HSRI and the Hakone volcano*2 field work, were essential. Collaborating with Dr. Mannen, who complements my specialization in seismology, was also crucial. It is because I specialize in seismology, as does Dr. Yukutake of ERI, while Dr. Mannen of HSRI is a geologist. Working with these two researchers provided me with a great deal of inspirations.

K: I believe Dr. Lin has obtained much information from the conversation with both Dr. Mannen of HSRI and Dr. Yukutake of ERI. Did you get any specific increase of your knowledge about Hakone volcano thought comparison with Tatun volcano?

L: The detailed study on Tatun volcano began only 10 years ago. Until then, it was considered a dormant volcano. However, seismic observations have revealed the existence of a magma chamber, sparking interest from both the government and the public regarding the possibility of an eruption. Despite this newfound attention, the history of eruptions and its geochemical aspects of the volcano remain poorly understood.

M: Hakone has a 60-year history of volcanic observation, and research on eruption history based on volcanic ash and other data is in progress. Seismic observation networks have been established, and electromagnetic surveys have recently been conducted, revealing the existence of underground gases (e.g., water vapor) and their changes over time. In addition, development of electromagnetic survey using drones is underway. Hakone is also similar to Tatun in that its last eruption was 3,000 years ago and there had been no recent eruptions until 2015. Two volcanos have a lot of similarities.



K: How effective was this joint research for the HSRI?



M: We met Dr. Lin five years ago at a conference in Japan, and we agreed to do research together. However, we had no idea how to do it at that time. I work with a small institution run by a local government, making it challenge to invite a researcher especially form abroad. In most cases funding is not allocated for such a purpose, we need a lot of paperwork, etc. So, this system at ERI made it very easy to make things happen, In such a situation, the joint invitation program of ERI was extremely useful, so I am very grateful for it.

K: What were the advantages of "in-person" visiting, especially after COVID-19?

L: In 2019 when we first met, we recognized the similarities between Hakone and Tatun volcanos. We both agreed to start joint research immediately, Face-to-face discussions, exchange the views, especially in the volcano field, are of irreplaceable value. This is not possible online. It could have happened earlier if not for COVID-19, but in any case, it was very fortunate that my visit took place this year. To our pleasant surprise, we discovered many similarities between the two volcanoes, which we didn't realize five years ago.

M: Actually, I think it was done in a perfect timing and you know COVID was an unfortunate event but during the COVID crisis however, our study has advanced. This invitation system was very convenient for me, that is a point I would like to emphasize.

L: I would also like to mention that the support provided by the International Office was unparalleled.



K: What are the challenges in the future?

M: The three institutions are involved in this time; the challenge is especially in the inviting parties. In the case of HSRI, there are issues to be considered, such as how to provide the status of the invitees and the actual office and internet environment. As for the future, we have generally agreed to proceed with observation, investigation, and research through mutual visits, and in fact I am planning to visit Taiwan in November later this year. As an initial cooperative effort, it was a great success.

K: That is good to know. That is an advantage for us to know and our system can help other institutions like HSRI in some situations.

(End)

*1. Tatun Volcano group: Although there is no record of volcanic eruptions in the Tatun volcano group throughout human history, the possibility of volcanic impact in the future cannot be entirely ruled out due to the identification of a magma reservoir beneath the volcanoes. Consequently, in 2011, the Taiwan government established the Taiwan Volcano Observatory at Tatun (TVO) to monitor any potential volcanic activity. Since then, many interesting seismic observations have been found in the Tatun volcano group such as seismicity conduit, heartbeat-like seismicity and volcano sound.

*2 Hakone Volcano: Hakone is an active volcano with a much older eruptive history (more than 400,000 years) than its neighbor, the famous Mt. Fuji. Reflecting its long history, its topography is complex, with calderas, central crater hills, lakes, and wetlands, making it one of Japan's most popular tourist destinations. Owakudani, which is an active steaming area attracting 3 million visitors annually, is a potential eruption center, making volcano monitoring extremely important.



Tamagawa Hot Spring, Akita Prefecture



Hot Spring Research Institute (HSRI)

Joint Invitation Program

The Earthquake Research Institute (ERI) invites researchers residing abroad to conduct research jointly with ERI and Japanese institutions. Application is to be submitted by a researcher at a university or research institution in Japan.

Find more about the application (in Japanese):

https://www.eri.u-tokyo.ac.jp/wp-content/uploads/2024/05/kokusaishitukobo2025.pdf



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