

Japanese Search for Royal Tombs in Copán with the Help of Cosmic Rays

Scientists from Nagoya University, Japan, have begun searching for pre-Columbian tombs of two rulers from the Copán Acropolis using the same technology they applied in the pyramids of Egypt.



Physicists from Nagoya University, Japan, have installed muon detectors, generated by cosmic rays, in two important Maya temples on the Copán Acropolis to confirm the existence of royal tombs inside these pre-Columbian structures.

The team of physicists, coordinated by scientist Kunihiro Morishima, arrived in Honduras last Saturday, and throughout the week, they worked in excavated pits adjacent to the structures known as Temple 8 and Temple 11, where they installed panels with nuclear emulsion films made by Nagoya University.

In a conference held in this city during the week, attended by researchers, park guides, and employees from the Honduran Institute of Anthropology and History (IHAN), Morishima explained that they are conducting research at the archaeological ruins using muography, a non-destructive technique that employs muons produced by cosmic ray showers.

"We use nuclear emulsion plates as muon detectors. These plates do not depend on electric power, are easy to use, and we install them in small cavities, which will help us detect muons generated by cosmic rays," says Morishima.

This group of scientists, along with colleagues from various countries, has been part of the ScanPyramids mission since 2016, investigating the interior of the Egyptian pyramids. This project, coordinated by the Ministry of Antiquities and led by the Faculty of Engineering at Cairo University, also involves experts from the High-Energy Accelerator Research Organization (Japan),

the French Alternative Energies and Atomic Energy Commission (France), and Laval University (Canada).

In Egypt, these same scientists obtained images of spaces detected inside the Great Pyramid of Giza (Pyramid of Khufu) and the Pyramid of Khafre. According to Morishima, this technology has also been used in underground ruins in Naples, Italy.

In Honduras, the physicists from Nagoya University are conducting research at the Maya Acropolis in partnership with renowned Japanese archaeologist Seiichi Nakamura, Director of the Research Center for Next-Generation Archaeological Studies at Komatsu University, Japan and the IHAH team.

Nakamura emphasizes that epigraphic studies suggest that within Temple 11, there are two royal tombs belonging to the seventh and fifteenth rulers of the Maya dynasty, which were significant during the pre-Columbian era.



"With this technology, muon tomography, physicists and archaeologists hope to precisely identify where the royal tombs are located within Temple 11. The scientists from Nagoya University conducted a preliminary investigation in 2018 and 2019, and now they have returned for the definitive research. Next year, we will have the results." said Nakamura to the media.

Muon tomography or muography is an advanced technology used to explore large physical structures without invading them, such as pyramids, mountains, and volcanoes. It is based on detecting subatomic particles generated when cosmic rays (from outer space) interact with the atmosphere.

Archaeological Research in Honduras

Zoila Madrid Welchez, head of the Copán heritage site, says that "the research conducted by scientists from Nagoya University and Komatsu University, both from Japan, marks an important point in archaeological research in Honduras due to the use of this new, non-invasive, and non-destructive technology."

"For Honduras and for the Honduran Institute of Anthropology and History, it is very important to have the collaboration of these universities because they are changing the way archaeological research is conducted. With this technology, researchers will learn what is inside the temples and then decide whether an excavation should be carried out," she says.

Currently, in addition to the Japanese experts, scientists from Harvard University are conducting research in other areas of the Copán archaeological site, which was declared a UNESCO World Heritage site in 1980.