Technology Used in Egyptian Pyramids Will Reveal Secrets in Copán

Physicists from Nagoya University, Japan, will use muon particles, as in the ScanPyramids mission, to explore the interior of two monuments in the acropolis of Copán.

Scientists from Nagoya University in Japan will install muon detectors at Temple 11 of Copán with the aim of confirming whether two royal tombs are located inside this ancient structure.

Archaeologists and physicists from Nagoya University, Japan, will begin to unravel the secrets held by some Maya temples in the acropolis of Copán using the same technology they employed in the Egyptian pyramids.

Next week, in collaboration with the Honduran Institute of Anthropology and History (IHAH), these experts will install muon scanners or detectors in the ancient Temple 8 and Temple 11. Their goal is to reveal underground structures and gather new information about the founding of Copán, dated around 426 and 427 AD.

Muon particles continuously reach the Earth at nearly the speed of light, with a flow of about 10,000 per square meter per minute. They originate from interactions between cosmic rays created in the universe and atoms in the upper atmosphere. Similar to X-rays, they can penetrate objects and enable the creation of images.

Japanese archaeologist Seiichi Nakamura, one of the most renowned researchers of Copán and a leading figure in the Maya world, stated in an exclusive interview with La Prensa that physicists from Nagoya University conducted a preliminary experiment between 2018 and 2019 and are now returning to carry out a definitive investigation.

"In Maya archaeology, including the archaeology of Copán, structures are built one on top of another (...). Previously, the only way to investigate the acropolis of Copán was through tunnels. From the 1970s to the 1980s and into the 1990s, many tunnels were created."

"Nobody knows the exact length of the tunnels, but they say it's between 4 to 5 kilometers. Making tunnels is very useful; through them, great discoveries were made, such as royal tombs and excellent structures like Rosalila, Margarita, and others. However, in terms of conservation, it brings significant challenges and tasks, and it also costs a lot of money to fill the tunnels back in," he says.

Nakamura, who is also the director of the Research Center for Next Generation Archaeological Studies at Komatsu University, Japan, states that "now, thirty years later, archaeologists must consider a more sustainable and non-destructive research methodology. One such methodology is muon tomography."

"Muon is a particle that is generated when cosmic rays collide with the Earth's atmosphere. They are small particles that we cannot see. They fall everywhere on Earth. This particle has a penetrating power not only in hard materials, but even in volcanoes, it penetrates volcanoes, pyramids (...)," he explains.

The archaeologist emphasizes that, "in 2017, at the Giza pyramid in Egypt, physicists conducted an experiment using these particles for tomography and discovered an unknown space, which generated a lot of interest among archaeologists around the world, and they began to apply it as a possible sustainable methodology."

In this structure, known as Temple 8, scientists from Nagoya University will use the same technology employed in the pyramids of Egypt during the ScanPyramids mission, of which they were a part along with other international entities.

With this technology, physicists and archaeologists hope to confirm or find two royal tombs inside Temple 11, belonging to the seventh and fifteenth rulers of Copán, which historical and archaeological evidence suggests are located inside. They do not rule out the discovery of stelae, altars, and hieroglyphic steps.

Temple 11, recognized for the Bacab Head found at its base, is a pyramid located in the heart of the Acropolis, southwest of the Ball Court and the Hieroglyphic Stairway, which are recognized by Hondurans as they are printed on the reverse side of the one-Lempira banknote. Meanwhile, Temple 8 is just a few meters away, to the west of Temple 11.

Nakamura explains that the physicists "will bring special films, plates, assemble them, and install the muon detectors. Two months later, they will return to Copán to retrieve the films of tunnels or wells and take them to Japan to analyze with equipment they invented, in order to read the direction of those muons that fall."

They will place the particle scanners.

Following their own methodology, scientists from Nagoya University will place the particle scanners at strategic points (technically called wells) of the temples to be studied. Later, with data on the detected muons, they will create three-dimensional images that will reveal the internal characteristics of the structures.

According to Nakamura, if possible, between 2025 and 2026, other scientists from different universities may conduct similar research in Copán using the same technology but with a different methodology, as has happened at other archaeological sites around the world, such as in Mexico.

In 2017, the ScanPyramids project used muon tomography to discover a large hidden cavity, known as the "Great Void," in the Great Pyramid of Giza (Pyramid of Khufu) in Egypt. In recent years, scientists from the United States have used the same technology in Mexico to explore the interior of the Temple of Kukulkan at Chichen Itza.

On October 25, 2015, the Egyptian Ministry of Antiquities launched the ScanPyramids mission, led by the Faculty of Engineering at Cairo University and the HIP Institute, with the participation of other institutions, including Nagoya University, the High Energy Accelerator Research Organization (Japan), the French Alternative Energies and Atomic Energy Commission, and Laval University (Canada).

(Translated from the original Spanish article by Adán Guerra)