Creating Synergy Through Engineering Education

Dialogue

By Staff Reporters

When French Professor Zied Moumni first arrived in Xi'an in 2012 to begin research collaboration at Northwestern Polytechnical University, he had no idea it would be the beginning of a deep and lasting relationship with China. Over the next decade, this initial academic partnership would develop into something far more significant — a personal and professional commitment to Sino-French educational cooperation, rooted in mutual respect, scientific excellence, and cultural understanding.

In 2024, he was appointed French dean of Shanghai Jiao Tong University's Paris Elite Institute of Technology (SPEIT).

From starting out as a mechanics researcher in France to being a key figure in cross-border engineering education, Moumni brings a wealth of experience and a clear vision of how science, teaching, and cultural exchange can come together to build lasting bridges.

Professor Zied Moumni. (PHOTO: SJTU)

Advancing smart materials research

Moumni's academic foundation is rooted in mechanics and materials science. He earned his PhD in Mechanics from école Polytechnique in 1995 and later completed his habilitation in engineering science at Sorbonne University in 2009.

His research focuses on smart materials and intelligent structures. These materials can adapt their properties in response to external stimuli, such as temperature, stress or electric fields — basically the building blocks of future technologies, including shape-memory alloys used in aerospace, biomedical devices, and advanced robotics. His work has contributed significantly to understanding how these materials can be modeled, tested, and integrated into real-world engineering systems.

One of Moumni's most influential collaborations began in 2012 with Northwestern Polytechnical University in Xi'an. Over a three-year period, he helped establish an international research group that brought together scientists from China, France, Turkiye and the UAE. The team's work on intelligent materials gained global recognition, and in 2015 Moumni was honored with the China Government Friendship Award, the highest accolade the Chinese government bestows on foreign experts. He described the award not as a personal achievement, but as recognition of successful international cooperation. "It was a great surprise," he recalled, "but more importantly, it was a sign that our joint efforts were making a real difference."

A decade of cultural and academic exchange

Apart from a previous brief stopover in Hong Kong, Moumni's true introduction to China began in Xi'an in 2012, a city where history and tradition are fully integrated. The cultural contrast was striking, and the experience left a lasting impression on him. "It was a real cultural discovery," he said. "In Xi'an, I began to understand the depth of Chinese values — family, respect for elders, and the importance of community."

He was particularly moved by the way older generations are valued, such as retired professors continuing to live on university campuses. "It shows a deep care for people and their contributions," he observed. Over time, he has developed a genuine appreciation for Chinese culture — from the art of tea drinking, which he compares to the significance of drinking wine in France, to the conviviality of shared meals at a round table.

This cultural sensitivity has also shaped his approach to teaching. While the scientific content he delivers in China is largely the same as in France, he quickly noticed a difference in student behavior: Chinese students were less likely to ask questions in class, not because they didn't understand, but due to cultural norms around respect and uncertainty. To overcome this, he adapted his style by asking students direct questions during lectures to gauge their understanding. "In France, someone will always speak up if they're confused," he explained. "In China, I had to create space for dialogue. Now, I see that both systems have strengths, and the key is to understand and respect those differences."

From his perspective, Moumni's experience teaching mechanics at SPEIT, from foundational courses to advanced topics in nonlinear systems and numerical methods, has given him a comprehensive perspective of engineering education. He believes strongly in the link between research and teaching: "Science advances through research, and teaching should reflect those advances. When we use real examples from industry or ongoing projects, abstract theories become meaningful," he said.

For students interested in research, Moumni encourages them to pursue doctoral studies. "A PhD is not just a degree. It is a mindset of curiosity, perseverance, and contribution. It benefits not only the individual, but society as a whole."

This article was edited and translated based on the Chinese version written by SJTU.

Tech+Culture

Ancient Qin Inscription Found at Roof of the World

By Staff Reporters

A stone inscription discovered on the Qinghai-Xizang Plateau, known as the "Roof of the World," has been identified as China's only known Qin Dynasty (221 B.C.- 207 B.C.) engraved stone still preserved at its original site and the highest-altitude example from that historical period, the National Cultural Heritage Administration (NCHA) announced on Monday.

Located in Maduo county at an altitude of 4,300 meters, the inscribed surface covers approximately 0.16 square meters and contains 37 characters carved in Qin zhuan (seal script). The NCHA confirmed these details after comprehensive field research and expert review.

The inscription was discovered in 2020 by a team led by Hou Guangliang, a professor from Qinghai Normal University. According to Hou, the finding provides early evidence of human activity on the plateau during the Qin Dynasty, offering "vivid historical testimony of China's diverse yet unified civilization."

In June 2025, Tong Tao, a researcher at the Institute of Archaeology of the Chinese Academy of Social Sciences (CASS), suggested in an article that the engraving documented Emperor Qinshihuang's dispatch of alchemists in search of an "elixir of life," who may have stopped at Gyaring Lake near the source of the Yellow River.

While the article drew widespread attention, it also sparked scholarly debate over the inscription's authenticity and dating.

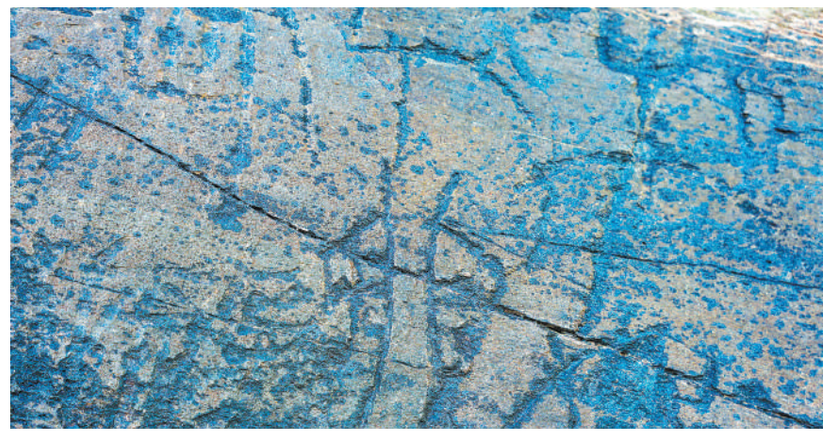
In response, the NCHA organized a multidisciplinary team, including experts from the Chinese Academy of Cultural Heritage (CACH) and the Qinghai Provincial Institute of Cultural Relics and Archaeology, to conduct on-site investigations.

Led by Li Li, vice president of CACH, the researchers employed advanced technology to analyze the inscription. They used high-precision information enhancement technology to collect textual data, macro-photography to examine engraving marks, and portable X-ray fluorescence spectrometers to test the stone's chemical composition.

A key question was preservation: How did the writing survive more than two millennia of exposure?

The research revealed the carving was made on a quartz sandstone formed 250 million years ago. The inscribed panel, facing southeast, was sheltered from the strongest winds and sunlight. Laboratory tests showed the rock has high abrasion resistance and compressive strength, contributing to its longevity.

To rule out forgery, scientists analyzed the tool marks and mineral composition. They found no traces of modern metals such as tungsten or cobalt. Moreover, weathering minerals such as chlorite and illite were present both inside the characters and on the surrounding rock surface, indicating the inscription has undergone ancient, natural erosion.



This photo taken on July 25, 2025 shows the Qin Dynasty engraved stone discovered on the northern shore of Gyaring Lake in Maduo county, Qinghai province. (PHOTO: XINHUA)

Berlin Symposium Advances Oracle Bone Studies

Overseas Echoes

By LI Shan & LONG Yun

The International Symposium on Yinxu Oracle Bone Inscriptions, hosted in Berlin by the Ethnological Museum Berlin in collaboration with scholars from China and around the world, marked a milestone in the international study of ancient Chinese civilization.

The event on September 8 and 9 saw the official release of groundbreaking digital documentation of oracle bones in Berlin's collections and paid tribute to pioneering scholar Professor Hu Houxuan, who has left a legacy in oracle bone inscriptions studies.

The symposium, made possible through the efforts of Dr. Zhi Xiaona, a visiting scholar from the Institute of Ancient Chinese History at the Chinese Academy of Social Sciences (CASS), showcased the fruits of the Sino-German collaborative project. Zhi led a team that documented and analyzed 486 pieces oracle bone fragments in the museum's possession using cutting-edge digital technologies, for a year.

In his opening address, Professor Lars-Christian Koch, director of both the Ethnological Museum and the Museum of Asian Art in Berlin, emphasized the cultural significance of these artifacts and the importance of international cooperation in preserving global heritage.

Henriette Lavaulx-Vrécourt, curator for North and Northeast Asia Department of the Ethnological Museum, outlined the historical context of the collection and the collaborative journey that led to this moment.

Zhi then presented the project's outcomes: high-resolution 2D images, reflectance transformation imaging for dynamic surface visualization, and ultraviolet imaging that revealed previously illegible inscriptions. The team also achieved new fragment reunifications and identified rare character forms.

"This project sets a replicable model for the 'digital repatriation' of scattered cultural relics," Zhi told *Science and Technology Daily*. "We aim to make these materials accessible to researchers worldwide."

The findings will be published in a trilingual corpus (Chinese, English, and German), creating a vital resource for future research.

Professor Song Zhenhao, a member of CASS and a leading figure in oracle bone studies, paid a moving tribute to Professor Hu Houxuan, who was his mentor, saying "Hu's life was dedicated to the collection, collation, and publication of oracle bone materials" and the Berlin project continues that unfinished mission.

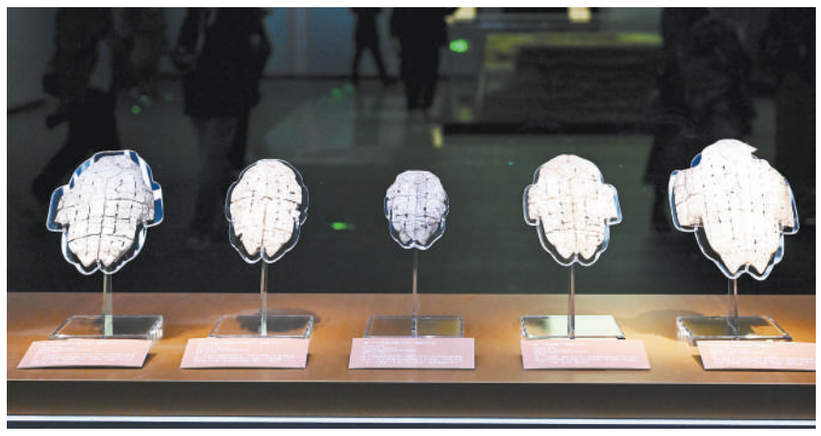
The initiative is a key component of Song's broader Global Oracle Bone Digital Revitalization Project, which aims to digitally reunite and share the information of approximately 160,000 oracle bone fragments scattered across the globe, an ambitious vision for the future of the field.

Professor Wang Zhenzhong, a member of CASS, president of the Chinese Society for Yin-Shang Culture, presented the newly published Collected Works of Hu Houxuan to the museum on behalf of Hu's family, symbolizing the enduring academic bond between generations and nations.

He Wenbo, deputy director of the China Cultural Center in Berlin, praised the symposium as a powerful example of cultural dialogue. "Oracle bones are living fossils of Chinese civilization," he stated. "This event strengthens mutual understanding and cultural exchange between China and Germany."

Over two days, more than 30 scholars from seven countries, including China, Germany, Britain, France, Poland, Spain, and the United States, made 27 presentations on four themes.

Oracle bone inscriptions, excavated from Anyang city in central China, were divinations on tortoise shells and cattle shoulder blades during the Shang Dynasty (ca.1400 BC- 1046 BC). Besides providing insights into ancient history, they are also the earliest writing system in China.



This photo shows oracle bones with inscriptions displayed at the new building of Yinxu Museum in Anyang, Henan province. (PHOTO: XINHUA)

How V-Day Parade Doves Return Home

Science Outreach

By Staff Reporters

When 80,000 doves spread their wings and flew across Beijing's Tian'anmen Square on September 3, it was a poignant moment that conveyed a message of peace to the world.

This spectacular display was made possible by many months of preparation. The doves were all on loan from the Beijing Pigeon Association and had undergone health screening and systematic training before being enlisted. Thanks to their strong homing instinct, all the birds returned safely to their original owners after their epic flyover.

But just how do so many birds find their way back home on a day of such mass celebration?

Homing doves use magnetoreception, or the ability to sense the Earth's magnetic field, for navigation through two primary systems: a light-dependent mechanism involving photoreceptors containing cryptochrome in their eyes, and a magnetite-based system located in the upper beak region. The visual system uses radical pair chemical reactions to act as a compass, while the magnetite-based receptors likely provide information about magnetic intensity to create a navigational "map."

Birds can also use the celestial system comprising the Sun, Moon, planets and other celestial bodies for orientation. Unlike the geomagnetic field, the sun's position varies daily, with latitude and with the seasons. Birds rely on their internal "biological clocks" for solar orientation.

Over time, doves learn to recognize familiar visual cues and landmarks to guide them home. In a similar way to how we find our way, birds memorize prominent geographical features such as rivers, mountains and buildings during flight. These familiar landmarks help homing doves to improve their navigational skills and return home quickly.

Furthermore, birds accumulate experience over time. From the time they are chicks, following their parents on their migrations strengthens their memory of migratory routes.

Redstone Model for Sustainable Development

From page 1

The Redstone project has pioneered a new paradigm for China-Africa cooperation. By integrating advanced technology with localized operations and emphasizing environmental duty and community engagement, it has made energy a key driver of South Africa's social and economic development through job creation and technology transfer.

The project supports energy security, economic recovery, climate action, and regional leadership.

Its success demonstrates a practical and systematic solution for regions with energy shortage, ecological vulnerability, and insufficient employment.

It has proved to be a scalable model for delivering replicable concentrated solar power with energy storage solutions to sun-rich countries worldwide.

Symbolizing a new phase of China-Africa cooperation from infrastructure construction to collaborative innovation in green technology, it has transformed the concept a community with a shared future for humanity into real energy transition action.