

Cooperation and Sharing Bring Real Benefits

By BI Weizi

Professor Klaus Obermayer, a German scientist, has been engaged in the cross-innovative research of brain science and artificial intelligence for decades. His research results have been published in a large number of high-level academic papers, such as *Nature Neuroscience*, *PLoS Computational Biology* and *Journal of Machine Learning Research*, with a total of more than 12,000 citations.

He is currently a high-ranking professor at the Technical University of Berlin (TUB) and a consultant professor at Northwestern Polytechnical University (NPU) in Xi'an, Shaanxi province.

Obermayer was bestowed with the Chinese Government Friendship Award in 2020 for his major contributions to China's modernization drive, specifically in the fields of machine learning and computational neuroscience.

He told *Science and Technology Daily*, "It is a great pleasure and honor to receive this award. And I'm extremely happy that our collaboration with my colleagues at NPU was not only valued by our peers, but also by the government stakeholders."

He is now leading the Neural Information Processing Group at TUB and managing this discipline at NPU.

"My links to China actually date back many years. As early as 2002, I started to cooperate with Professor Xie Songyun at NPU in the fields of neuroinformatics and image processing, and over the years we have always maintained close cooperation in discipline construction, scientific research, teaching, and the training of personnel, in-



Professor Klaus Obermayer. (COURTESY PHOTO)

cluding the supervision of PhD students. The first time I visited the old campus of NPU, I was struck by its beauty and by its collaborative research environment. I was strongly motivated to continue and deepen our collaboration," said Obermayer.

In 2004, Obermayer assisted Xie in launching the discipline of neural information processing at NPU and the Laboratory of Neuroinformatics was established in a collaborative effort. In the early stages of the lab construction, only very limited funds were available. Obermayer selflessly provided data and technical guidance, which was critical to the successful launch of the laboratory. He then visited NPU many times and helped students promote the development of this newly-born discipline.

Remarkable achievements have been made in the 19 years of cooperation between NPU and TUB. In this time Obermayer has helped to get nearly ten national and provincial projects off the ground, among them projects funded by the National Natural Science Foundation of China, provincial key science and technology projects, and international cooperation projects. Under his guidance and assistance, the strength of neuroinformatics at NPU was rapidly enhanced and the laboratory was exponentially developed.

"In 2017, led by TUB and NPU, we jointly established the 'Shaanxi Joint International Research Center on Integrated Techniques of Brain-Computer Interfaces for Unmanned System' with principal investigators from six internationally

renowned universities, including the University of Kent in the UK, and the Charite Medical School and the Technische Universität Berlin in Germany, laying a solid foundation for research at the interface of brain science and artificial intelligence," said Obermayer.

One of his collaborative achievements with NPU is the technology of brain computer interfaces for controlling robotics. An application of this technology to the control of formations of quadcopters was recently presented at the exhibit of China - Germany Science and Technology Innovation Cooperation Conference held in Berlin, Germany on October 14, 2019.

"This brain-machine interface for intelligent control has overcome several of the problems of long response times, low recognition rates, and inter-individual differences between human operators," said Obermayer. He further explained that this portable system innovatively combines brain-machine interfaces and artificial intelligence to realize robust control in noisy conditions. Since it can be applied in outdoor environments, this technology has significant application prospects for robotics control in many different areas.

Cooperation and sharing for mutual benefit have always been Obermayer's philosophy. "In terms of global challenges, it's important to bring the best people together to solve the problems. But not all of the best people are in the same country, international cooperation is a key," he said.

For the past decades, he has indeed been practicing his own philosophy and promoting international collaboration with committed dedication.

Letter to the Editor

Collaboration Leads to a Way to Greatness

By Syafrizal Maludin

An overview of the development of science and technology in China, shows the great impact the country has had on civilization. The long history of this nation cannot be separated from the development in science and technology that blends with a culture of hard work.

Surprises in China

In April 2013, I received an offer to participate in China's science and technology indicator training program. Imagine arriving in a city like that represents the size of an economy, with high human mobility and sophisticated transportation modes. Being curious of my new surroundings I decided to explore the city and some of its facilities.

Worship facilities are one of the things I did not imagine I would find, so believing there was no mosque I brought my own religious prayer items to pray in the hotel. I was therefore surprised to find mosques I was under the impression that there were few Muslims here.

Not only could I enjoy worshipping while in China, but also the availability of halal food. I found out that the halal food in China is not imported but in fact produced locally.

Strengthening Science and Technology Collaboration with China

The contours and constellations of the world are influenced by politics and defense policies, as well as bioeconomic trends, in which there are those related to global warming and COVID-19 and the development of science and technology.

Unlike the first two, the development of science and technology is a virtue. For example, the political and defense conflict between America and Iran does not reduce joint research activities between researchers from the two countries. Likewise, judging by the network of keywords on Google Scholar or patent searches, it can be seen that the involvement of cross-country researchers is melting in the strengthening of science and technology.

Research collaboration between researchers in Indonesia and China has existed for a long time. The collaboration is not limited to specific institutions or universities. Agencies and institutions also carry out cooperation in the form of technical assistance and expertise under the technical ministries.

My thinking on technological innovation

Economics and Engineering in scientific documentation are rarely sourced from Asia, so in the application of the theory and concept, adjustments need to be made, except for the exact sciences.

We could also find the terminology and standard formulas in the exact sciences. The perspective of the entrepreneur

neural economy and the innovation system/ecosystem has also begun to be studied a lot and some of its concepts apply to developing countries. However, the concept cannot be fully developed in other areas. The literature on political and economic developments in several developed countries does not mean that it can be perfectly applied in Indonesia.

In the study of innovation, many bombastic English terms are used to improve developing countries' economies, such as "Innovate or Die" and so on. When learning about technological innovation, there are two divisions of courses: Economic Innovation and Technology Innovation Management. The two study groups are equally fascinating. However, it is not appropriate, for example, to use the slogan "Innovate or Die" in government institutions. Research activities at government institutions are not directed at making a profit as the primary goal.

Economic development in one country cannot be fully implemented in other countries. As a result, we need to realize that enriching knowledge is essential in developing and applying knowledge in different areas.

The industrial transformation carried out in China is shaped by its culture as root. It has not been achieved smoothly as it should align human resources, funds, and S&T management systems. On the other side, welfare problems faced by developing countries are the main obstacle in transforming the culture. Corruption and violations of financial management and imbalances in accessing production sources must be faced.

With great power comes great responsibility

A metaphor of two countries based on GDP, America is often depicted as the eldest child who often intervenes in the lives of his younger siblings. He checked his school bag, arranged who was allowed to have contact with whom and could even punish his younger brother who was considered naughty. China is considered a hardworking member who can provide almost all needs. So each member of the family was so dependent on China.

So great was his influence that would affect other brothers in the family. Cooperation in Science and Technology is an important part of achieving a balance in its greatness. The magnitude of its influence and capability naturally creates conflict. So, strengthening the collaboration of research and innovation is one reliable aspect.

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Traditional Eastern Wisdom

Shen Kuo : A Great Ideologist in Ancient China

By Staff Reporters



Shen Kuo. (PHOTO: VCG)

As Joseph Needham notes in his *Science and Civilization in China*, ancient China was well ahead of the West in the development of several fields of knowledge about the physical world.

A notable polymath in ancient China was Shen Kuo (1031-1095), who made contributions in fields as diverse as mathematics, geography, economics, engineering, medicine and other fields.

Shen is primarily known for the explanations of natural phenomena found in his famous 11th-century book, *Dream Pool Essays*, which is regarded as a milestone in the history of Chinese science. The book details the outstanding contributions of working people in science and technology, as well as his own research accomplishments. At the same time, it reflects ancient China's

brilliant achievements in natural science, particularly during the Northern Song Dynasty.

In these pages, he presents his theories on a variety of topics, including the working mechanism of the compass. When the point of a needle is rubbed with the lodestone, then the sharp end always points south, but some needles point to the north.

In another section, Shen argues against the theory that tides are caused by the rising and setting of the sun raised by Lu Zhao and demonstrates that they correlate instead with the cycles of the moon.

Aside from the topics mentioned, Shen was way ahead of his time in many fields. Apart from inventing the concept of true north, he hypothesized that land

was formed by mountain erosion and silt deposition after discovering fossils in a mountain range in northwest China.

In addition, he developed techniques that laid the foundations for spherical trigonometry. He introduced the arithmetic progression of a higher order and explained the rainbow as a phenomenon of atmospheric refraction. He was also one of the first people to record the phenomenon of unidentified flying objects.

Shen wrote this encyclopedic work after retiring from government service, naming it after his private estate near modern Zhenjiang, Jiangsu province. With its global influence, the masterpiece has been translated from Chinese into English, German, French, and Japanese.

Daily life Myth Buster

By Staff Reporters

Rumor: Eating strawberries can cause hemorrhagic fever?

Truth: The main transmission route of hemorrhagic fever is rodent-to-human

Recently, a rumor began circulating that eating strawberries can cause hemorrhagic fever, which has caused some panic. So, are strawberries innocent or the culprit of this disease?

"There is no direct relationship between eating strawberries and having hemorrhagic fever," Wang Yimin, chief physician of the Department of Critical Care Medicine at Tianjin TEDA Hospital, said in an interview with *Science and Technology Daily* that hemorrhagic fever, also known as epidemic hemorrhagic fever, is a natural epidemic disease caused by the Hantaan virus.

China has a high incidence of hemorrhagic fever, with rodents being the main source of infection. Wang said that the blood, saliva, urine and feces of infected rodents contain this contagious virus. "When people are bitten by rodents infected with Hantaan virus or come into contact with objects contaminated with virus-infected rodent excrement, they may become infected. But the virus does not spread from person to person," he said. "In fact, not just strawberries, any food contaminated with virus-bearing rodent excrement can cause a person to develop hemorrhagic fever," said Wang. Finally, Wang said that hemorrhagic fever is a preventable and treatable disease, Hantaan virus is sensitive to ether and chloroform. So in daily life, we can effectively prevent hemorrhagic fever as long as we do a good job of rodent prevention and extermination, and effective cleaning of food.

Rumor: A UFO appeared in Henan province

Truth: Space rock broke into the Earth's atmosphere

Recently, a mysterious white light appeared at night in Henan province. As a result, the rumor that a UFO had appeared in Henan province went viral and dominated the Internet. "I have seen the recorded images and think this is a fire meteor event," Yan Weiguo, executive vice president of the Tianjin Astronomical Society, told *Science and Technology Daily*, adding that fire meteors are common astronomical phenomena. They are large space rock fragments traveling at high speed into the Earth's atmosphere, which are characterized by a relatively strong light and sometimes explosive sound. The rock fragments burn up as they rub against the atmosphere, with smaller fragments burning up and larger ones falling to the ground as meteorites.

Photo News



Foreign experts gather to celebrate Spring Festival and Winter Olympics. (PHOTO: S&T DAILY)