LIFE IN CHINA

Science and Technology for Social Good

Dialogue

By LONG Yun, BI Weizi & ZHONG Jianli

Growing up in her hometown of Skopje in Macedonia, Professor Maria Todorovska experienced a devastating earthquake in 1963. Despite the devastation and destruction caused by the earthquake, the traumatizing event also sparked her interest in earthquake science and fueled her motivation to pursue research in this unique field.

Today, the enthusiastic scientist is a full-time professor of Civil Engineering at Tianjin University (TJU), having taken up the post since 2017, and is also the founder of TJU's Strong Motion Observation and Simulation Laboratory.

"Tianjin is [now] my home," she told *Science and Technology Daily* in a recent interview.

Todorovska said she found it is easy and interesting to study maths and physics, and realized that she wanted to contribute to her hometown's resilience against seismic events.

Focusing her research on earthquake engineering, combining her expertise in physics and mathematics, her profound understanding of these disciplines has enabled her to tackle complex problems in her chosen field.

Embracing opportunities

Todorovska's connection with China began with a mix of curiosity and fascination. Many years ago, she met a visiting professor from TJU who was at the University of Southern California in the U.S. Recognizing the potential for collaboration, she embarked on a remote working relationship with the Chinese professor and his students. As time passed, the professor extended an invitation for



Professor Maria Todorovska. (COURTESY PHOTO)

Todorovska to visit TJU—an opportunity she eagerly embraced.

During her visit, Todorovska realized the immense potential for collaboration and research opportunities at TJU. What motivates her to work in TJU are the research funding secured, and the chance to develop her laboratory and seismic observation site from the ground up. The research funds provided a solid foundation for her ambitious plans, enabling her to tackle pressing seismic challenges and further her scientific pursuits. Moreover, the prospect of working with Chinese researchers and students was a significant draw. "The conducive research environment in China enables scientists to thrive and make significant contributions to their respective fields," she said.

A sense of achievement

When Todorovska joined TJU, she brought with her a wealth of knowledge and a passion for strong motion seismology. She established the Strong Motion Observation and Simulation Laboratory, leveraging resources from various funders to acquire sensors for building installations and workstations for motion simulation. Todorovska spared no effort to transform the laboratory into a well-developed and highly regarded facility with a group of diligent people. "I gained a sense of achievement after our hard work," she said.

Her laboratory focuses on the observation and simulation of strong ground motions, playing a vital role in advancing structural health monitoring and soil-structure interaction research. One of the key projects undertaken by her laboratory is a full-scale seismic observation site in the Tongde Plaza Yue Center, an instrumented skyscraper located in Kunming city, Yunnan province. This initiative provides a unique opportunity to develop new approaches for soil-structure interaction and structural

health monitoring studies.

Empowering public safety

According to Todorovska, scientific knowledge empowers the public to have safer living conditions in earth-quake-prone regions. In earthquake-prone areas, disseminating information to the public is crucial for reducing injuries and loss of life during seismic events. Educating residents on proper building practices and practical safety measures can also enhance the population's awareness.

Through science outreach initiatives, individuals can learn how to construct earthquake- resistant houses and protect themselves during tremors, minimizing the impact of disasters.

Fostering friendships

Todorovska believes that, "Science serves as a unifying force, fostering friendships between nations." She actively invites experts from different countries to collaborate with her research team to promote cross-cultural collaborations. Through exchange programs, lectures and virtual platforms like Zoom, Todorovska facilitates knowledge sharing and cultivates scientific friendships beyond geographical boundaries. This approach not only enriches the research conducted at TJU, but also strengthens global scientific networks.

Looking ahead, Todorovska plans to continue her research for the next three years, nurturing the talents of her students and advancing the field of earthquake engineering. She also acknowledges the value of inspiring children to become future scientists, assuring them that with determination, they can make significant contributions to society.

This article is also contributed by TJU.

Traditional Eastern Wisdom

Shoushi Calendar: A Masterpiece of Ancient Calendars

By ZONG Shihan

A calendar serves as a means of measuring time based on astronomical phenomena. The lunar calendar follows the moon's orbit around the earth, while the solar calendar aligns with the sun's seasonal positions. The traditional Chinese calendar belongs to the lunisolar calendar, harmonizing the relationships between the sun, the moon, and the earth, while the globally recognized Gregorian calendar is a solar calendar.

The Xia calendar is the earliest known calendar in China. In the Northern Song Dynasty (960- 1127), Shen Kuo proposed a groundbreaking change in calendar usage with the introduction of the Twelve Qi Calendar, which shares similarities with the current Gregorian calendar.

The Shoushi Calendar, compiled by renowned scientists Guo Shoujing, Wang Xun and others from 1276 to 1281, is a comprehensive collection of the traditional Chinese calendar and holds the distinction of being the longest-lasting calendar in ancient China.

This Calendar's value can be attributed to its remarkable accuracy. Firstly, it defines a tropical year as 365.2425 days, differing by only 25.92 seconds from the Gregorian calendar and predating it by over three centuries. Secondly, advancements include a decreasing length of the tropical year over a century, as discovered by earlier scholars, with a reduction of 0.0001 days. Additionally, the Shoushi Calendar employs innovative calculations, utilizing formulas by Shen Kuo for converting ecliptic longitude, right ascension, declination, and employing cubic interpolation to calculate celestial degrees. This precise calendar fostered productivity and improved living standards during its time.

The influence of the Shoushi Calendar extended beyond China and received recognition by Japan, Korea, and among astronomers worldwide, who conducted extensive research on its principles. While the Gregorian calendar is prevalent in modern society, the Shoushi Calendar continues to impact traditional festivals and agricultural production, leaving a lasting legacy.



The sunset coincides with the Beijing Ancient Observatory. (PHOTO: VCG)

Service Info

Social Insurance Tips for Foreigners Working in China

By Staff Reporters

As an increasing number of foreigners seek employment opportunities in China, questions often arise about their obligations to pay social insurance in the country. Despite some individuals having paid social security in their home countries, the Ministry of Human Resources and Social Security (MOHRSS) unequivocally asserts that social security contributions are mandatory for foreign employees in China. In this article, we will explore the legal basis for this requirement and address concerns related to double payment and the treatment of contributions made by foreigners.

Legal Obligations for Social Insurance

According to the *Social Insurance Law* of China, employees, including foreign employees, are obligated to participate in various social insurance schemes, including pension, medical care, work-related injury, unemployment

and maternity insurance. The responsibility for paying these insurance premiums falls on both the employer and the employee, as specified by law. As such, the payment of social insurance is not subject to negotiation between employers and employees, but is rather a legal obligation that must be adhered to.

Article 97 of the Social Insurance Law explicitly states that foreign employees working in China must participate in the country's social insurance schemes. Moreover, the Interim Measures for Foreigners Employed in China to Participate in Social Insurance, issued by MOHRSS in 2011, clarifies that all employers legally registered in China must provide social insurance coverage to their foreign employees. This includes basic pension insurance, basic medical insurance, work- related injury insurance, unemployment insurance, and maternity insurance. Both the employer and the foreign employee are required to contribute to the social insurance premiums in acment

Concerns may also arise among for-

eign employees about the possibility of double payment, considering that some individuals have already made social insurance contributions in their home countries. Recognizing this, China has taken measures to address this issue through bilateral agreements with certain countries.

According to the response of the MOHRSS to the National People's Congress in 2018, China has established bilateral agreements with countries such as Germany, Japan, South Korea and Canada to waive specific types of social insurance payment obligations for certain personnel, which means that citizens of these countries working in China may be exempt from paying certain social insurance premiums if they meet the conditions specified in the bilateral agreements.

Options for Foreigners Leaving

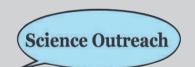
For foreigners who have paid social insurance in China but have left the country without meeting the pension requirements, there are provisions outlined in the "Interim Measures for Foreigners Employed in China to Participate in Social Insurance."

Cumulative Payment Period: Foreigners who have paid into the social insurance system can keep their social insurance accounts. If they return to China for employment in the future, they can continue to accumulate contributions and benefits based on the previous payment period.

previous payment period.

Lump-Sum Payment: Alternatively, foreign employees can apply in writing to terminate their social insurance relationship. In this case, they have the option to receive a lumpsum payout equivalent to the amount stored in their personal social insurance accounts.

Being Aware of Hot Summer Ailments



By Staff Reporters

Heat waves have been ravaging much of China recently with record temperatures across the country. It is therefore important to be aware of the most common illnesses that are normally associated with hot summer days and learn some preventive tips.

Heat Stroke

Heat stroke is the most serious heat-related illness. Heat stroke occurs when the body is unable to control its temperature: body temperature rises rapidly, sweating mechanisms fail, and the body is unable to cool itself. When heat stroke occurs, the body temperature can rise to 41°C or higher within 10 to 15 minutes. Without emergency treatment, it could cause permanent disability or death.

Commonly used cooling methods include evaporative cooling, cold water immersion, ice cooling, and so on. Among them, evaporative cooling is mainly spraying water mist on the skin along with continuous fanning or wiping the whole body with a wet towel, while ice cooling is applying gauze-wrapped ice packs to the neck, groin and armpits.

Risk of Cardiovascular and Cerebrovascular Diseases

Humans, especially the elderly, are generally more susceptible to intravascular volume depletion with exposure to heat, resulting in hypotension, thrombocytosis and hyperlipidemia. During hot summers, the heart pumps harder and faster to maintain an effective circulating blood volume, resulting in increased cardiac workload. In addition, the body loses a lot of water through sweating, which can lead to blood concentration, increased blood viscosity and peripheral vascular resistance, and ultimately increased blood pressure, which is a major risk factor for death from cardiovascular and cerebrovascular disease.

Preventive measures include reducing exposure to high temperatures, timely hydration, regular monitoring to control blood pressure and

Digestive System Infections

Hot weather increases the risk of digestive system infections, because most pathogens grow and multiply faster and survive longer in a warm environment, increasing the chance of contamination of food and water. In addition, dehydration, heat cramps and heat exhaustion caused by high temperatures, vasoconstriction and ischemia of the gastrointestinal tract caused by cold and raw diets will weaken the body's immunity and affect the secretion of the digestive glands, resulting in digestive disorders.

Preventive measures include paying attention to food hygiene, eating less raw and cold food and leftovers, and washing hands before meals. After diarrhea occurs, water and electrolytes should be replenished, and timely access to medical care, especially if there is a drop in blood pressure, dizziness, or coldness at the ends of the limbs.

Photo News

Traditional Hand-woven Product: Tibetan Rugs

The Tibetan rugs are a traditional hand-woven product of Tibetan people in Qinghai, and after more than 3,000 years of inheritance, Gaya Tibetan rugs were included in the list of representative items of national intangible cultural heritage in 2006.

The photo (left) shows Yang Yongliang, an inheritor of Jiaya Tibetan rug weaving skills, arranges the rugs made in Huanzhong county.

Located in Cinghai province, the county is a place where Tibetans. Hui, and other

Located in Qinghai province, the county is a place where Tibetans, Hui, and other Chinese ethnic groups live together, and the intermingling of these groups has given rise to many fine art forms, including Tibetan rugs.

