Promising Future for Sci-tech Collaboration

Dialogue

By LONG Yun & WEI Wei

"Receiving the award is not an end in itself, but a logical continuation of the collective efforts of scientists aimed at the fruitful development of joint scientific and technical cooperation," said Russian scientist Alexandrov Igor, a prominent figure in the field of nanomaterials, after receiving the Chinese Government Friendship Award. Igor is researching international sci-tech cooperation and its long-term significance on the global sci-tech community, having already made significant contributions in this field himself. Currently, he works at Changzhou University as a visiting professor. In a recent interview with *Science and Technology Daily*, he shared his views about his research and its implications, as well as the importance of scientific collaboration.

"An invitation to enter a new field of physics"

Igor's journey on the path of material science began several decades ago. His primary research focused on the fabrication, and characterization of microstructures, and the multifunctional properties and applications of nanomaterials created through severe plastic deformation methods.

When asked why he was inspired to pursue nanomaterials research, Igor said, "Research in science always aims for 'further, higher, deeper and better.'" It was during his studies at the Aviation Technical Institute in Russia, that he was presented with the opportunity to apply fundamental physics knowledge to study the superplasticity effect in metals and alloys, which was of much interest at the time.

His early research then led him to "smaller" scales, and he shifted focus from material science to nanomaterials. Additionally, he was greatly influenced by the renowned physicist Richard Feynman. "Feynman's work, particularly the Feynman Lectures on Physics and his assertion that, 'There's plenty of room at the bottom,' stimulated my interest in the field [of nanomaterials]," he said.

Practical applications of nanostructured materials

Igor is passionate about sharing the importance and applications of his current research, highlighting their critical role in everyday life and the academic community. "Objects made of metal materials play an important role in our lives," he said. "They are the basis for creating a wide variety of products, from household items to medical devices and industrial equipment."

The properties of these materials, such as strength and electrical conductivity, depend heavily on their internal structure. Traditional methods of plastic deformation could not achieve the high degrees of deformation required to refine the microstructure significantly. However, the development of special deformation methods has enabled the formation of ultrafine-grained and nanocrystalline structures. "These materials have multifunctional properties significantly higher than their coarse-grained ones," Igor said.

Interest in nanostructured materials has increased significantly over the past few decades, primarily due to their potential applications in various fields, including aviation, space, and medical devices. Igor's research has had a profound impact on the academic community. "Together with my colleagues, we have published hundreds of articles on bulk nanostructured materials," he said. One of their most cited works, Bulk Nanostructured Materials from Severe Plastic Deformation, has been referenced over 6,500 times. This research has also contributed to some practical applications, such as the development of nanostructured titanium dental implants with enhanced fatigue properties and biocompatibility.

Beneficial cooperation

Thirty-three years ago, Igor began to cooperate with Chinese academic institutes and universities. "Joint research has allowed us to make significant strides in understanding and applying nanomaterials," he said, adding that, "Science is truly international and serves to bring together peoples who benefit from scientific research." His collaboration with Changzhou University began in 2017, when he was appointed a visiting professor. He speaks highly of the university's strengths in scientific research and innovation. "The cooperation between industry, university, and research at Changzhou University is distinctive. The campuses are spacious and well-adapted for study, teaching, and research." Igor's long-standing cooperation with Chinese scientists has resulted in numerous collaborative projects, including student exchanges, joint conferences, and scientific internships.

Professor Alexandrov Igor. (COURTESY PHOTO)

"The exchange of undergraduates and postgraduates with Changzhou University and other Chinese institutions has been particularly fruitful," he said.

And his connection with China is not limited to his work. Igor mentioned that his 13-year-old granddaughter is proficient in Chinese, and has even won some prizes in language competitions. In addition, his wife, who has traveled with him to China on several occasions, frequently shares her positive experiences and impressions about life in China on social media.

Igor remains optimistic about the future of nanomaterials research and international collaboration. "Our joint fundamental developments are of interest to the industry," he said. With ongoing projects and the continuous search for new applications, he remains dedicated to fostering scientific innovation and cultural exchange between Russia and China.

WEI Wei is a professor at Changzhou University.

China Impression

Hong Ting Forum: Elaborating New Development Strategy

By Staff Reporters

About 200 diplomatic envoys to China, think tank experts, and journalists from nearly 60 countries exchanged their views on the recently concluded Third Plenary Session of the 20th Central Committee of the Communist Party of China (CPC) at a symposium on Tuesday.

The symposium themed "Hong Ting Forum: Understanding the Third Plenary Session of the 20th Central Committee of the Communist Party of China" was jointly hosted by the Institute of Party History and Literature of the CPC Central Committee and Xinhua News Agency at the Museum of the Communist Party of China in Beijing.

Qu Qingshan, president of the Institute of Party History and Literature of the CPC Central Committee, and Fu Hua, president of Xinhua News Agency, shared their insights on the significance of the plenum.

The forum also discussed topics such as comprehensively deepening reform to advance Chinese modernization and enhancing the capacity for opening up while expanding international cooperation.

At the forum, Spanish expert Francisco Javier Ayllón Piquero, from the Institute of Party History and Literature of the CPC Central Committee, shared his observation and understanding of Chinese modernization.

When he visited Xinjiang Uygur autonomous region in northwest China, Ayllón was struck by numerous common elements between the city of Kashgar and faraway Guangdong province in southern China, despite the considerable distance between the two regions. "I saw many successful commercial and industrial projects from Guangdong," he said.

From what he saw in Xinjiang, Ayllón could also understand the uniquely Chinese concept of "pairing assistance." Since 1997, China has implemented these programs in Xinjiang, directing financial, technical, and human resource support across various sectors from different regions of the country to the region. This initiative has been pivotal in fostering economic development and improving living standards in the area.

"This experience deepened my understanding of the phrase 'Chinese modernization is the modernization of common prosperity for all people,'" Ayllón said.

A think tank report titled "Deepening Reform Comprehensively to Advance Chinese Modernization: Major Achievements and Global Contributions" was released at the event. Jointly produced by think tanks under the Institute of Party History and Literature of the CPC Central Committee and Xinhua New Agency, the report highlighted how China's reform efforts have not only propelled the country's own development but have also benefited the world. China's steady economic and social progress, coupled with improvements in governance, has contributed its experience and strength to the global economy.

The Hong Ting Forum emphasized the importance of China's modernization agenda and its commitment to common prosperity. The experiences and contributions of international experts like Ayllón underscore the global significance of China's development strategy, which aims to ensure that all regions and communities benefit from the country's progress.

The conference site of the Hong Ting Forum. (PHOTO: XINHUA)

Why Does It Feel Hotter When It's Humid?

Science Outreach

By Staff Reporters

If you've lived in northern China before, you will definitely have heard people say, "It's like being in a sauna outside." Beijing, Zhengzhou and some other northern cities are seeing more and more scorching days with uncomfortably high humidity, posing a big challenge for people there who haven't been accustomed to the conditions.

So, why does high humidity make it feel hotter than the actual air temperature?

Cao Yunchang, chief scientist of the China Meteorological Administration, said that the expansion of humid and hot weather to the north is actually an inevitable result of global warming. Data shows that in the past six decades, the annual average temperature in China has increased by about 0.23℃ every 10 years. "Due to the warm and humid air moving from the south to the north, the water vapor content and precipitation in the northern region have increased, so the northern regions see more and more humid summer days," he said.

But why does damp heat make people feel hotter? As we all know, the human body mainly regulates its body temperature by sweating. In a dry and hot environment, heat can be taken away from body by sweating, thus cooling us down and keeping our temperature stable. In contrast, humid and hot weather always seems "oppressive." "With higher dew points in the upper 60s and especially 70s, the air seems to be wrapped in a thick layer of water vapor, which greatly slows down the evaporation rate of sweat, and the body temperature will increase significantly," said Qian Guanyu, director of the Department of Dermatology of the Third People's Hospital Affiliated to Jiangsu University.

Qian also warned that hot and humid weather can cause health problems such as skin diseases and endocrine disorders, aggravating the discomfort of the human body. "When heat exhaustion or heatstroke happens, seek medical help as soon as possible," Qian added.

To deal with the increasing number of humid hot days, Qian suggested that people should keep good ventilation indoors as much as possible, wear breathable clothes when going out to reduce sweat accumulation and bacterial growth, and drink water regularly to maintain body fluid balance.

Foreigners Spoilt for Choice When Paying in China

Service Info

By Staff Reporters

To encourage people to visit China, the Chinese authorities have rolled out a raft of measures to make life easier for them when they do, including waiving visa requirements for citizens of a growing number of countries and ensuring convenient payment services.

Earlier this year, the State Council and the People's Bank of China released the "Guide to Payment Services in China", which details a number of payment options for foreigners.

WeChat Pay/Alipay

By the end of July 2023, both WeChat Pay and Alipay were allowing users to link the app to an international bank card, including Mastercard, Visa, JCB, and Diners Club. Then they can pay for things via online platforms or by scanning the QR code in stores and restaurants.

In June 2024, there were 1.61 million overseas bank card payments amounting to a whopping 2.9 billion RMB. The transaction volume basically doubled compared with February.

e-CNY

China is pushing the use of the digital renminbi or the e-CNY for both locals and foreign visitors in recent years. The long-term goal is to fully replace renminbi notes.

Foreigners can access e-CNY through the e-CNY app. Users can register with a foreign phone number and then link the app to an international card. The wallet can then be topped up and used to make transactions just like WeChat Pay or Alipay.

Bank cards

For visitors who prefer to use their bank cards rather than set up a new mobile payment service, the government encourages merchants to accept international bank cards. They should be accepted anywhere that displays the logo of an international card issuer.

Cash

Cash may not be the preferred payment method anymore, but it remains widely accepted. In fact, the authorities have recently strengthened legislation defining the rejection of RMB cash as unlawful. According to the State Administration of Foreign Exchange, foreigners can exchange RMB at 67,000 bank branches, more than 4,200 foreign exchange facilities and 320,000 ATMs nationwide.

Bridging Cultures Through Oil Painting

By Staff Reporters

Art knows no borders. Oil painting stands as a timeless medium that captures the essence of human experience, bridging the gap between diverse perspectives and fostering global exchange.

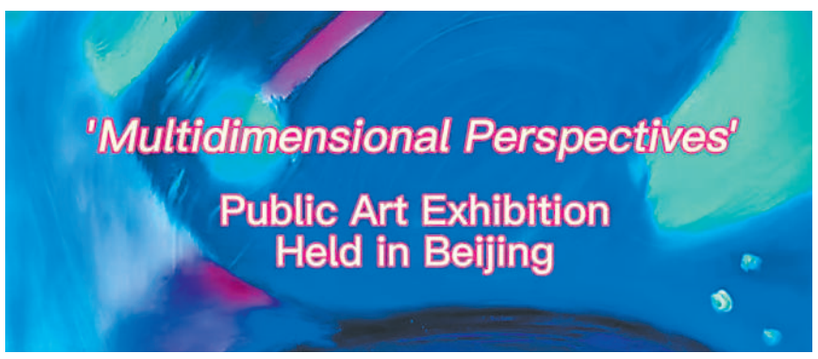
The "Multidimensional Perspectives" public art exhibition was unveiled on August 7 in Beijing, and will last until August 15.

This exhibition is organized with support from the Chinese Oil Painting Academy of the Chinese Art Research Institute, which features 115 diverse oil paintings created by 38 artists of different professions and ages.

The exhibited paintings represent unique viewpoints, experiences, and fresh perspectives on the world.

According to the organizer, art is not an abstract concept confined to theory but a beautiful entity accessible and comprehensible to everyone, which is ready to be appreciated by those who seek it.

Waiting for you in Beijing's 798 International Art Exchange Center for this wonderful exhibition!



Salt Cavern Transformed into Energy Storage Bank

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In two years, the plant has cumulatively generated more than 86 million kWh electricity and completed peak shaving electricity of 250 million kWh.

It epitomizes the significant progress China has made in recent years in salt cavern compressed air energy storage.

In 2022, Sinopec put into use the country's deepest underground natural gas salt cavern storage well, running more than 2,000 meters deep.

Also in 2022, China's first 300 MW compressed air energy storage demonstration project was launched in Yingcheng city, Hubei province, and was successfully connected to the grid this April.

As the technology becomes more mature, the efficiency of salt cavern compressed air energy storage is expected to be further improved, injecting new momentum into its application and the sector's development.