

CONNECTION

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*Seeking Truth
Pursuing Innovation*



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MESSAGE FROM THE EDITOR-IN-CHIEF

We are still in a challenging year and experiencing a period of profound change. In spite of those challenges we are facing now, we adapted to the new environment with determination and take further steps in our sustainability action plan. The crisis has driven deeper partnership in response. For example, the 1st Asia-Pacific Carbon Neutrality Symposium was successfully held in April and we held an online meeting to mark the kick-off for the celebration of the 20th anniversary of partnership with UIUC.

The past months have witnessed a new round of accomplishments made by ZJU scientists, who respond in innovative ways to society's most complex challenges in the fields of astrophysics, physical geography, biotechnology, arts, health, environmental chemistry and etc. It is quite remarkable that some members of our community have produced many highlights in research and published articles on top journals. Our students and faculty also make their efforts to preserve the ancient culture as well as the natural resources.

As always, we sincerely invite you to share with us your thoughts. Also, taking this opportunity, we'd like to extend our warmest gratitude for your support and our best wishes for a blissful year.



LI Min, Editor-in-Chief
Director, Office of Global Engagement

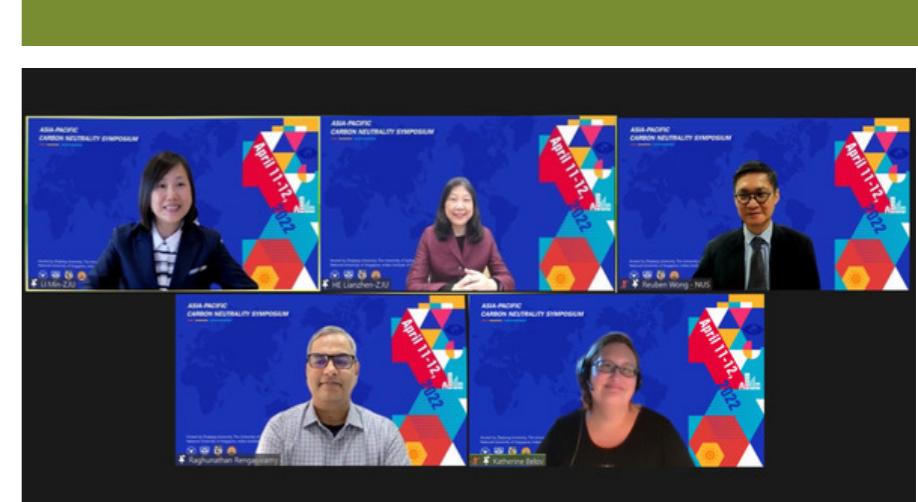


International

1st Asia-Pacific Carbon Neutrality Symposium successfully held

Jointly hosted by Zhejiang University, the University of Sydney (USYD), the National University of Singapore (NUS) and Indian Institute of Technology Madras (IIT Madras), the 1st Asia-Pacific Carbon Neutrality Symposium was successfully held virtually on April 11-12, as part of the 125th anniversary of Zhejiang University and Z4G. More than 400 scholars and students from home and abroad registered for the symposium and over 2,300 people participated in it via live-streaming platforms.

Prof. HE Lianzhen extended her cordial welcome to the participants on behalf of Zhejiang University. She believed that since universities have a unique advantage in responding to social challenges through academic prowess, research, innovation and service, they should play important role in implementing the SDGs. ZJU Vice President, Prof. Katherine Belov, USYD Interim Deputy-Vice-Chancellor (Research), Prof. Reuben Wong, NUS Associate Vice President, and Prof. Ragunathan Rengaswamy, IIT Madras Dean for Global Engagement delivered speeches at the opening session.

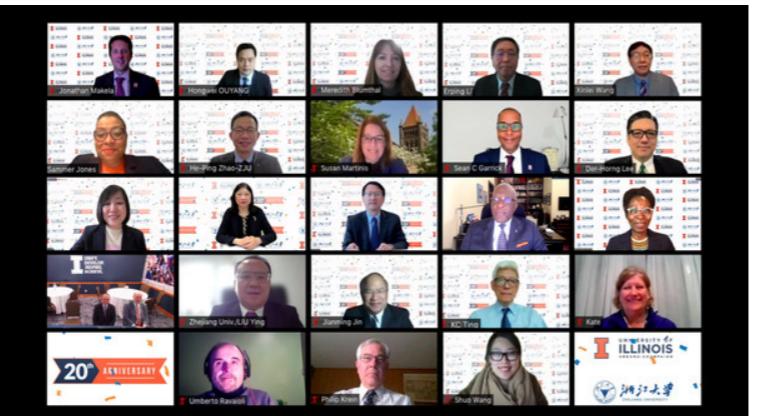


Prof. HE Lianzhen extended her cordial welcome to the participants on behalf of Zhejiang University. The opening ceremony of the 1st Asia-Pacific Carbon Neutrality Symposium was successfully held virtually on April 11-12, 2022.

ZJU and UIUC kick off 20th anniversary of partnership virtually

On April 19, Zhejiang University and the University of Illinois at Urbana-Champaign (UIUC) held an online meeting, marking the kick-off for the celebration of the 20th anniversary of partnership. Present at the meeting were ZJU President WU Zhaohui, ZJU Vice President HE Lianzhen, UIUC Chancellor Robert J. Jones, UIUC Vice Chancellor Susan Martinis, UIUC Vice Chancellor Sean Garrick, and representatives from the two universities.

WU Zhaohui expressed his great pleasure to celebrate two decades of partnership between two institutions with Robert J. Jones and his colleagues at UIUC. He pointed out that in the face of the increasingly prominent global issues and geopolitical complexity, ZJU adheres to openness and cooperation and continues to consolidate and promote cooperation with global partners in teaching and research. After this event, the two universities will host a series of seminars on smart cities, smart agriculture and climate change, and hold student exchange activities.



■ Representatives of the two universities

Vice President HE Lianzhen: higher education community can play a key role in addressing global challenges



On the webinar held by the International Association of Universities (IAU) and Higher Education Teaching & Learning Association (HETL) on March 29, Vice President HE Lianzhen said that the higher education community can play a key role in addressing global challenges and advancing the process of sustainable development.

■ Speech by Vice President HE Lianzhen

HE shared ZJU's sustainability action plan (Z4G) and her insights into the role of higher education leadership in building a more sustainable community. She claims that faculty and students on campus are the key to achieving the shared goal. The University "embeds 'sustainability competence' throughout its curricula and activities" and also "encourages multidisciplinary research" to address grand challenges with innovative solutions. University leadership shall take the responsibility to design and manage the roadmap toward a sustainable campus.

Public Engagement

Transgenic maize 'Ruifeng 125' is remarkably resistant to corn borers



■ SHEN Zhicheng (middle) and his students

Ruifeng 125, an insect-resistant transgenic maize developed by Prof. SHEN Zhicheng's team from ZJU's College of Agriculture & Biotechnology, is one of the two maize varieties on the list. It is the first time that China has issued safety certificates to domestically produced genetically modified (GM) crops in the staple food sector since 2010.

Insect resistance and herbicide tolerance have posed a long-standing challenge in the breeding community. Transgenic technologies utilizing resistance genes from other organisms such as microbe have become one of the most important pathways to improve maize varieties. The team has carried out field experiments for over five years to ensure the safety and quality of transgenic maize varieties before obtaining the certificate. Looking forward, Prof. SHEN seeks integration between biotechnology and conventional breeding for transforming research and development into competitive products.

A "masterpiece" created with craftsmanship in 17 years at ZJU



■ The ZJU team was photographing in the Kurokawa Institute of Ancient Cultures.



■ An exhibition of the Series of Ancient Chinese Paintings was staged at ZJU in 2021.

After 17 years passionate dedication from a cohort of ZJUers, the digital publication of The Series of Ancient Chinese Paintings not only provides clear and authoritative images but also makes immense contributions to the insightful understanding of Chinese paintings all over the world.

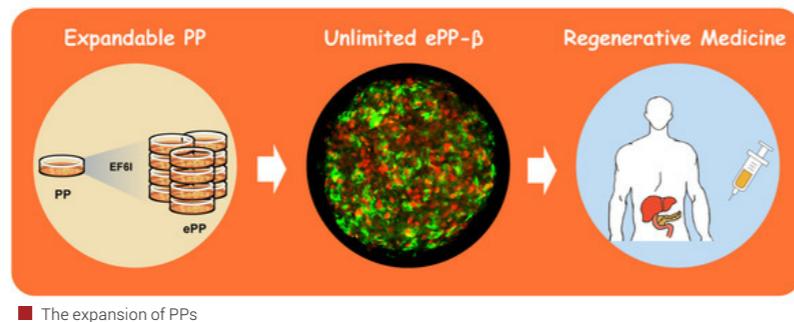
In 2005, the team embarked on their cultural journey. Since then, they have visited more than 260 cultural institutions and museums around the world, with hundreds of kilograms of equipment on their back. With a strong sense of commitment in promoting traditional Chinese culture, the team paid 3 visits to the Kurokawa Institute of Ancient Cultures and completed the basic compilation of A Collection of Song Dynasty Paintings in September 2010, which was definitely inspiring. No single country has ever published a book about the painting art of such magnitude by sorting out its own surviving paintings comprehensively and systematically and photographing them with the state-of-the-art technology.

RESEARCH

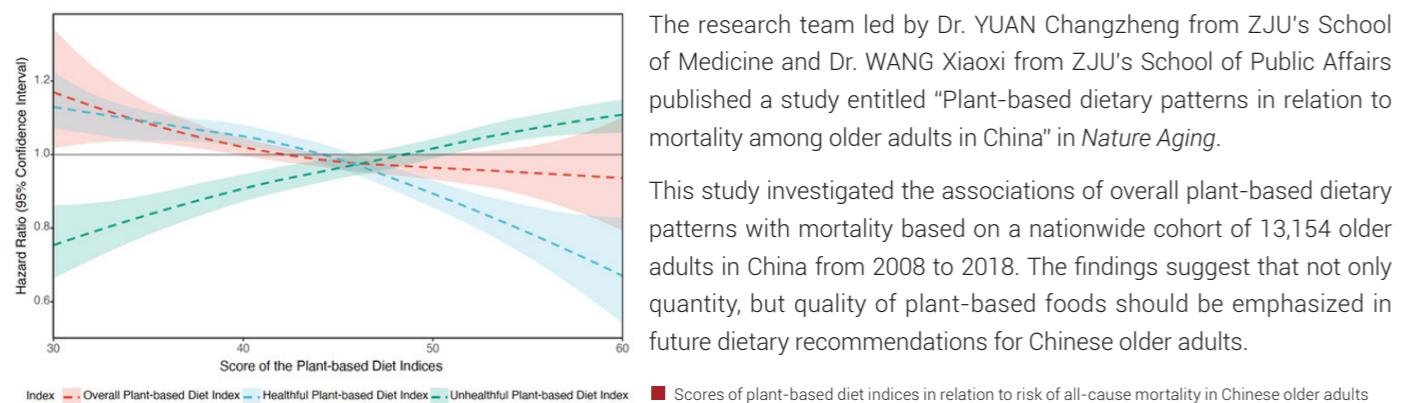
ZJU scientists discover novel approach to robustly producing functional human pancreatic β cells for curing diabetes

Prof. ZHU Saiyong's lab at the ZJU Life Sciences Institute published an article entitled "Human expandable pancreatic progenitor-derived β cells ameliorate diabetes" in the journal *Science Advances*. In this study, ZHU Saiyong et al., for the first time, achieved the long-term goal of robust expansion of pancreatic progenitors (PPs).

In this study, the researchers established an effective approach to producing expendable PPs (ePPs). In this way, ePPs could be stably frozen and recovered, thereby achieving their long-term and stable robust expansion. This study represents a notable step toward providing unlimited functional human pancreatic β cells and islets that are of considerable interest for biomedical research and regenerative medicine.



A plant-based diet with better quality might lower mortality risk in Chinese older adults

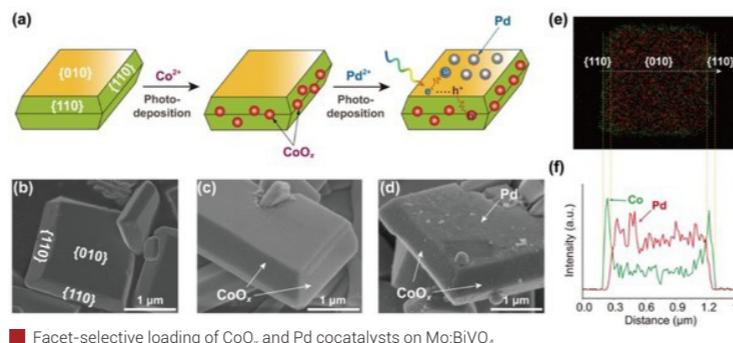


The research team led by Dr. YUAN Changzheng from ZJU's School of Medicine and Dr. WANG Xiaoxi from ZJU's School of Public Affairs published a study entitled "Plant-based dietary patterns in relation to mortality among older adults in China" in *Nature Aging*.

This study investigated the associations of overall plant-based dietary patterns with mortality based on a nationwide cohort of 13,154 older adults in China from 2008 to 2018. The findings suggest that not only quantity, but quality of plant-based foods should be emphasized in future dietary recommendations for Chinese older adults.

Green synthesis of H_2O_2 using water, air, and sunlight

Recently, a new study reports an inorganic Mo-doped $BiVO_4$ ($Mo:BiVO_4$) system that is resistant to radical oxidation and exhibits a high overall H_2O_2 photosynthesis efficiency among inorganic photocatalysts, with an apparent quantum yield of 1.2% and a solar-to-chemical conversion efficiency of 0.29% at full spectrum, as well as an apparent quantum yield of 5.8% at 420 nm.

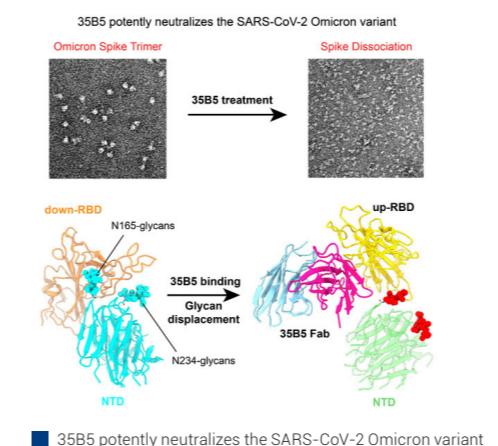


The study, led by the research group of Dr. CHU Chiheng from ZJU's College of Environmental and Resource Sciences, was a collaboration between Zhejiang University, Chuo University, the University of Tokyo, Shinshu University, and Toyota Technological Institute. It was published in the journal *Nature Communications* entitled "Overall photosynthesis of H_2O_2 by an inorganic semiconductor".



RESEARCH HIGHLIGHTS

Scientists reveal how 35B5 antibody neutralizes SARS-CoV-2 Omicron

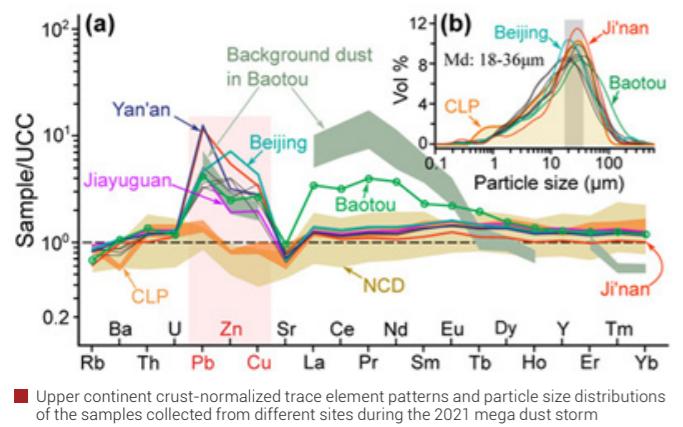


On March 28, 2022, Prof. ZHU Yongqun at the Zhejiang University Life Sciences Institute, in collaboration with Prof. DENG Kai at Sun Yat-sen University, Prof. CHEN Zhiwei at the University of Hong Kong, and Prof. YE Lilin at Third Military Medical University, published a paper entitled "35B5 antibody potently neutralizes SARS-CoV-2 Omicron by disrupting the N-glycan switch via a conserved Spike epitope" in the journal *Cell Host & Microbe*.

ZHU Yongqun et al. discovered that 35B5, a receptor-binding domain (RBD)-targeting monoclonal antibody, exhibited potent nanomolar neutralizing efficacy to Omicron. They found that Omicron spike was featured by tight trimeric packing and high thermostability, as well as significant antigenic shifts and structural changes, within the RBD, N-terminal domain (NTD), and subdomains 1 and 2.

35B5 could potentially neutralize SARS-CoV-2 Omicron and other variants by inducing significant conformational changes within a conserved N-glycan switch that controls the transition of RBD from the "down" state to the "up" state, which allows for the recognition of the host entry receptor ACE2. This study suggested that due to its potent neutralizing efficacy and remarkable antigenic-shift tolerance, 35B5 would be a promising candidate in clinical therapy.

Unravelling the mystery of East Asia's largest dust storm in a decade



Upper continent crust-normalized trace element patterns and particle size distributions of the samples collected from different sites during the 2021 mega dust storm

Last spring, China was plagued by a dust storm, which was considered to be the worst in the past decade. Large-scale dust storms could seriously jeopardize people's life. The research group led by Prof. YANG Xiaoping at the School of Earth Sciences, Zhejiang University has been studying the desert system and its environmental impacts with a special attention to dust storms. They tried to study the dust transport processes in full blow through systematically collecting samples from different sites across northern China. Their findings appeared in the journal *Science Bulletin*. This study proves that dust transport is a complex and exchangeable open system from sources to sinks. The unusual dust storm spread from central Mongolia to northern China spokewise. The "well-established" culprits of every dust storm event—the Kubuqi Desert and the Maowusu Sandy Land—contributed a negligible amount to the dust. A multiple lines of evidence prove that dust emissions from the above two deserts have been effectively suppressed thanks to the endeavor of China's national ecological restoration program. In the past few years, Prof. Yang and his team have established a relatively complete geochemical database of surface sediments from Chinese deserts which provides crucial references for dust source studies.



LIU Beibei (middle) and his students

What was the "childhood" of the Solar System like?

Prof. LIU Beibei from the Zhejiang University School of Physics, in collaboration with the University of Bordeaux and Michigan State University, pointed out that the dispersal of the Sun's gaseous protoplanetary disk probably triggered the instability of the giant planets. This groundbreaking finding was published in *Nature* on April 27. At the beginning of the Solar System, the proto-Sun formed in the hot dense center and the remainder of the cloud formed the solar nebula. This period is also known as the gas disk period. Scientists believe that the four giant planets migrated into a chain of orbital resonances. Today, the orbits of the giant planets, however, appear to be more widely distributed, and these planets have deviated from their original resonances. Liu and his team proposed that disk dispersal can account for the evolution of planetary orbits, a factor not taken into account in the previous models. Their study indicates that dynamical instability following the dispersal of the gas disk occurred about five to ten million years after the formation of the Solar System, earlier than what the Nice model proposes. In the future, they will further explore the impact of the evolution of giant planets' orbits on the formation of the Earth and the origin of water.

SPOTLIGHT ON

Students

Academic cross-pollination ignites sparks

On March 14, WANG Chao, a master's student at the College of Electrical Engineering, and LIN Xin, a PhD candidate at the School of Management, co-authored a research article entitled "Coordinating Thermal Energy Storage Capacity Planning and Multi-Channels Energy Dispatch in Wind-Concentrating Solar Power Energy System", which will come out soon in the *Journal of Cleaner Production*.

In August, 2020, Wang and LIN participated in a 1-month internship in China Southern Power Grid where they met for the first time. With more in-depth communication, LIN provided a string of new ideas and WANG offered background information about their engineering applications. Their discussions eventually gave birth to a brilliant research article in a top journal addressing the demands for cleaner production by applying the operation management theory. WANG and LIN both believe that this sort of interdisciplinary cooperation is a source of inspiration.



■ WANG Chao and LIN Xin



■ Modular basic constructive units: bracket

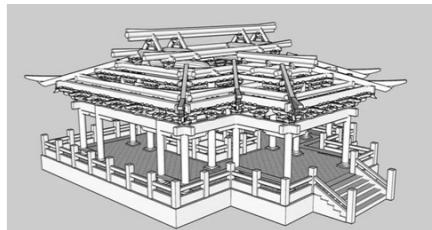
Faculty

A big story in the miniatures of Chinese timber structure

Room 208 in the Crescent Building on Zijingang campus is no less than a museum for miniatures of Chinese timber structure, whose birth-givers are the sophomores of architecture, and the midwife, Prof. ZHANG Yuyu of the College of Civil Engineering and Architecture, Zhejiang University.

Lecturing on the History of Ancient Chinese Architecture since 2005, Prof. ZHANG believes that the traditional architecture in China never fails to impress any westerner. Despite the growing attention drawn to them, these aging wooden buildings are weathered, rotted, and replaced with steel and reinforced concrete that symbolize modernization. So she is determined to retrieve, understand, and preserve these timber structures as a memory, an identity, and an inspiration.

Prof. Zhang insists on adding a practice section to the syllabus, which requires every student to craft his or her own model. While working on their assignments, her students come to understand that timber structures are "alive" and each material and cutting method matters. More importantly, they've learned that concentration, dedication, and strive for perfection are the connotations of craftsmanship and will stick to these ideas in future.



■ The sketch up model of the pavilion