Seeking Truth
Pursuing Innovation

www.zju.edu.cn/english

CONNECTION

The Official Newsletter of Zhejiang University

Issue 27

Mar. 15, 2022

CONTENTS

MESSAGE FROM THE EDITOR-IN-CHIEF

As Hangzhou once again embraces its first snow in the beginning of 2022, I would like to invite you to take a quick look at the global engagement and fruitful academic achievement in fields of earth science, engineering and chemistry, etc.

In the process of preparing to host the Beijing 2022 Winter Olympics, our scholars and students shone brightly with their innovative spirits and groundbreaking technologies, which made contributions to a "green and clean" Winter Olympics. The technological progress will continue to deliver benefits in the post-Winter Olympics period. Moreover, ZJU scientists have been actively engaged in addressing the challenges of the time. A metabolic enzyme which promotes mitosis beyond metabolism, an ultra-fast laser "burin" and a degradable hybrid mineral as a plastic substitute have all demonstrated our commitment to serving the local and global community.

As always, we wish you pleasant reading and hope you follow us in the social media and leave your comments!

Editorial office :
Global Communications
Office of Global Engagement, Zhejiang University
866 Yuhangtang Road, Hangzhou, P.R. China 310058
Phone: +86 571 88981259
Fax: +86 571 87951315
Email: newsletter@zju.edu.cn

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

Edited by :
AI Ni, YE Ying, SHI Yuxi
Designed by :
CHEN Siyuan

ZJU NEWSROOM

International

ZJU International Campus holds 2nd Annual Academic Conference & Academic Forum of World-class Universities

On January 8, the 2nd Annual Academic Conference & Academic Forum of World-class Universities (AAC) was held by the International Campus of Zhejiang University in collaboration with more than 10 world-class universities and institutions. As part of Z4G, Zhejiang University's sustainability action plan, the Conference focused on biology, medicine, engineering and finance to promote integration of multiple disciplines in response to the global challenges in health, energy and environment.

In the welcome remarks, Prof. HE Lianzhen, vice president of Zhejiang University, expressed her cordial welcome to outstanding talents and her sincere hope that all participants could take this event as an opportunity to explore the future direction of academic development, build a platform of academic exchanges for talents both at home and abroad, and translate academic achievements into innovative achievements, thus promoting social transformation and human progress.

ZJU International Campus continues its commitment to sustainability

Responding to China's carbon peak and neutrality goals and under the framework of A Global ZJU for Social Good (Z4G), ZJU's sustainability action plan, Haining International Campus has committed to building itself into a world's leading sustainable campus. On December 27, 2021, the International Campus received the ISO14001:2015 certification, an international standard for the environmental management system, continuing to lead in the operation of a sustainable campus since its construction dating back to 2014.

Adjacent to wetland parks and connected with the city through a water system, the International Campus enjoys a superior natural environment. Over the past years, its leading sustainable operations and management capacity has been recognized by the two-star Green Building Design Label in 2018 and a platinum award in 2020 issued by the British Eco-Campus certification system.

Public Engagement

ZJU develops cool technology for Beijing 2022 Winter Olympics

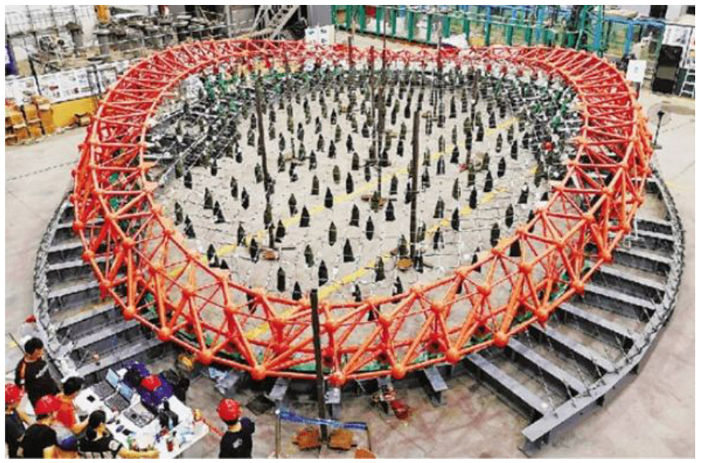
Based on the similarities of surfing and snowboarding in speed, jumping and spinning, the Center for Chinese Water Sports Development at Zhejiang University, in partnership with ZJU's Power Machinery & Vehicular Engineering Institute and Hangzhou Dianzi University, develops the cool technology to help the national snowboarding team brace for the Beijing 2022 Winter Olympics through the motorized surfboards in the summer.

The Center for Chinese Water Sports Development leads research into motorized surfboards. The electric vehicle team led by Dr. ZHU Shaopeng, vice director of the Power Machinery & Vehicular Engineering Institute, integrates the state-of-the-art intelligent networked vehicle technology with traditional motorized surfboard training. In this way, with special sensors, data acquisition cards and remote 4G controllers, they can monitor and analyze the process and effect of using motorized surfboards for snowboarding training in a digital manner. The monitoring system is based on a scientific snowboarding dynamics model. With long-term training, the monitoring system will gradually build a database regarding their key snowboarding maneuvers and can thus be perceived as an interdisciplinary "cool technology" for the Winter Olympics.

The story behind the cool and dazzling "Ice Ribbon"

As the only major new indoor venue of the 2022 Beijing Olympic Winter Games, the National Speed Skating Oval—dubbed the "Ice Ribbon"—has dazzled the world with its impressive "China Solution". Prof. LUO Yaozhi, Prof. DENG Hua and Prof. YUAN Xingfei from ZJU's College of Civil Engineering and Architecture contribute their wisdom to the construction and maintenance of the ultra-large-span cable network structure.

The roofing system of the "Ice Ribbon" adopts a hyperbolic saddle-shaped, single-layer cable network structure with the largest span among stadium buildings all over the world. The tensile cable network roofing system can significantly reduce the amount of steel used in the structure while fulfilling the structural function, which appears to be remarkably environmentally-friendly. During the construction process, Prof. Luo's team installed wireless sensors, developed by Zhejiang University, for real-time monitoring and mechanical analysis. On the strength of massive numerical simulation results and experimental data, the team put forward their systematic proposal in terms of lifting, tension control and pre-tension monitoring, demonstrating their wisdom behind this engineering wizardry.



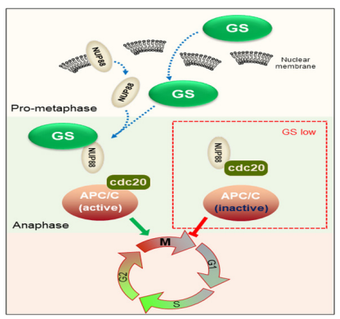
Research

Scientists unravel the enigma of the ancient civilization in the Taklamakan Desert

Recently, the research team led by Prof. YANG Xiaoping at ZJU's School of Earth Sciences found out that the core areas of the Taklamakan were inundated by water multiple times, which was once seen as the driest area of the Asian mid-latitude arid zone. This is the first time that the scientific community could have comprehensively and systematically documented the occurrences of rivers and lakes in the central Taklamakan Desert.

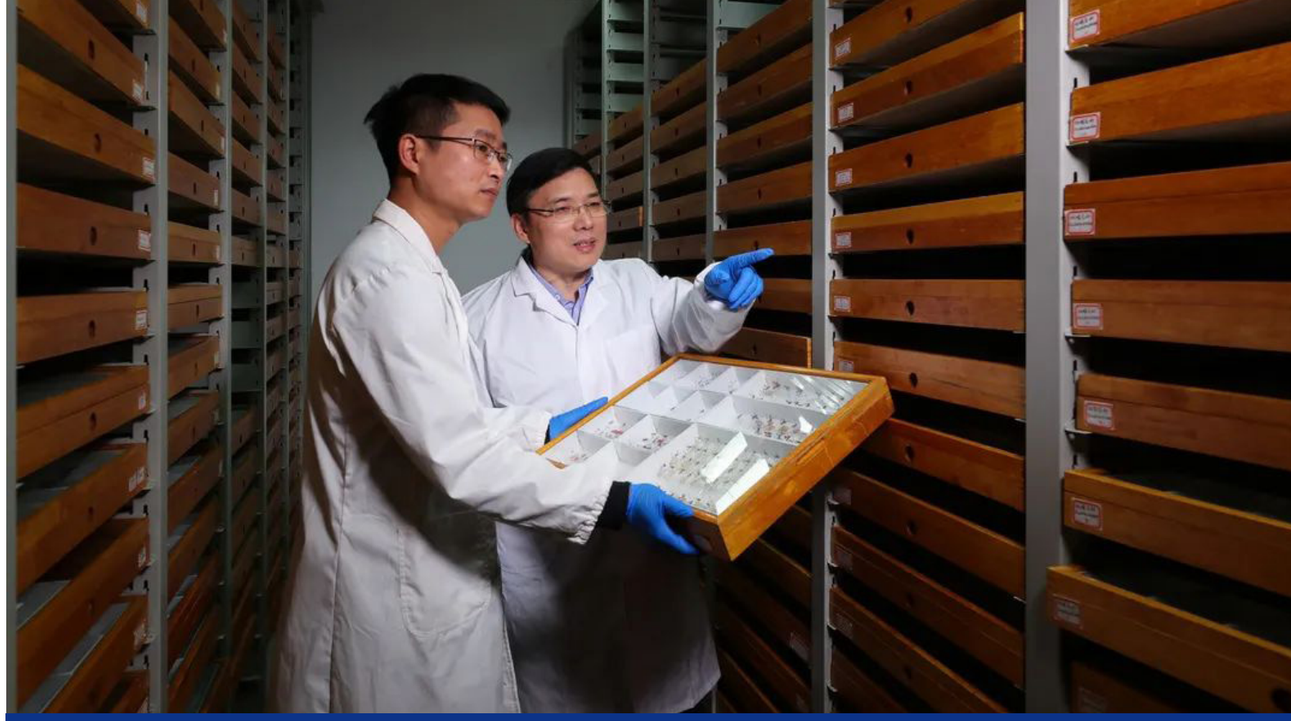
Since 2015, YANG and his team have conducted extensive fieldwork in the central and western parts of the Taklamakan Desert, using multidisciplinary methods related mainly to Quaternary geology and geomorphology. Currently, the newly found slack-water deposits verified the existence of the Niya River since the Han Dynasty, thus creating a large oasis in the inner part of the vast desert and providing water resources for the prosperity of the ancient civilization of Jingjue.

Licensing but not fueling: a metabolic enzyme promotes mitosis beyond metabolism



Recently, Prof. FENG Yuxiong and Prof. LU Zhimin from the Institute of Translational Medicine, ZJU and Prof. LIANG Tingbo from the First Affiliated Hospital of the ZJU's School of Medicine co-published an article entitled "Glutamine synthetase licenses APC/C-mediated mitotic progression to drive cell growth" in the journal *Nature Metabolism*. This study illustrates how glutamine synthetase (GS) promotes cell mitosis in an APC/CCDC20-dependent manner and opens up a new avenue to understanding the crucial role of GS in cancer cells deeply and systematically.

GS is essential for cancer cells to support their avid growth and survival. As the most abundant amino acid in plasma, glutamine is central to the metabolic network and serves as a critical nitrogen and carbon donor for the biosynthesis of essential metabolites. This study reveals the new function of GS in regulating the mitotic progression of tumor cells in a metabolic function-independent manner and provides a potential target for the treatment of tumors.



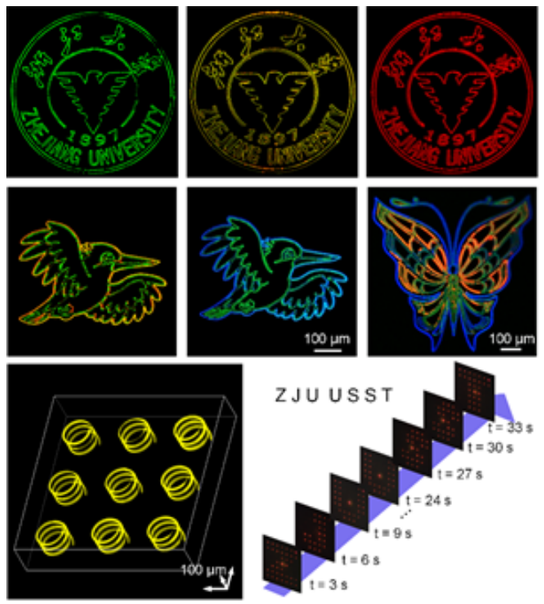
RESEARCH HIGHLIGHTS

30 years' dedication to research into natural enemies for vegetable pest

The use of natural enemies to control pests in agriculture is not only an environmentally-friendly and ecologically-safe biological control technology but also one of the important measures to ensure green vegetable production. Prof. CHEN Xuexin's team has been committed to this field for the past 30 years and achieved a series of theoretical breakthroughs and technological innovations. This achievement earned him the second prize of the 2020 State Scientific and Technological Progress Award.

The team studied two major categories: general predatory insects and parasitic insects. By conducting research on insects as tiny as a sesame seed, the team successfully figured out the mass rearing and production of 12 dominant natural enemies such as Trichogramma chilonis and Diadromus collaris. In terms of pest control, Prof. Chen's team innovatively proposed the key technology of "Natural Enemy Insects +" and devised an integrated green pest control system suitable for different regions and cultivation patterns. After years of applications, the average pest control efficiency reached more than 85% and the use of pesticides was reduced by more than 60%.

Scientists craft a new world with an ultra-fast laser "burin"



Direct lithography of PNC patterns and devices

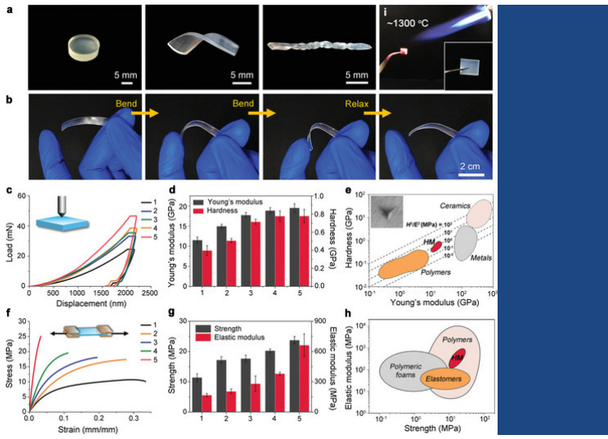
Since its first invention in the early 1960s, laser has been dubbed as "the fastest burin", "the most precise ruler" and "the brightest light". Recently, the team led by Prof. QIU Jianrong at the Zhejiang University College of Optical Science and Engineering discovered laws of ultra-fast laser-induced liquid nanophase separation and subsequent ion exchange. Their findings were published in an article entitled "Three-dimensional direct lithography of stable perovskite nanocrystals in glass" in the journal *Science* on January 21.

In this study, researchers first fabricated homogeneous transparent glass. They successfully prepared uniform precursor glass suitable for laser processing on the strength of rich experience and extensive experiments. Then, QIU Jianrong's team eventually obtained ideal ultra-fast lithography through trial and error, realizing composition-tunable perovskite nanocrystals (PNCs) inside glass. The final step was to carve a three-dimensional pattern with numerous pixel dots in the blink of an eye. Printed three-dimensional structures in glass showed considerable potential in optical storage. It can extend its storage lifespan to several million years, thus holding enormous promise in the future.

Turn brittle mineral into plastic substitute

In recent years, an increasing number of researchers have started to seek new "plastics" as an alternative to traditional petroleum-based plastics. The research findings by Prof. LIU Zhaoming and Prof. TANG Ruikang from the Department of Chemistry, Zhejiang University, appeared in an article entitled "A flexible and degradable hybrid mineral as a plastic substitute" in the journal *Advanced Materials*.

Prof. Liu *et al.* selected polyvinyl alcohol (PVA) and sodium alginate (SA) as ideal biomimetic polymers and added them to CaP ionic oligomers so as to produce a hybrid material. These two polymers are reported to resemble collagen in bones in terms of chemical functional groups. Experiments showed that the tensile strength of this hybrid mineral amounted to about 20 MPa and its elastic modulus reached about 600 MPa. Unlike common plastics which will be ignited and melted in flames, this hybrid mineral remained largely unchanged while burning and turned into a crystalline mineral similar to tricalcium phosphate after burning, thus losing its toughness. With this significant breakthrough, Prof. Liu and his team will conduct follow-up research concerning how to reduce the cost in manufacturing.



Mechanical properties and fire-retardant ability of hybrid minerals

SPOTLIGHT ON : STUDENT

MA Qitao: a kung fu master on campus

MA Qitao (College of Education, '18) is the Grand Prize winner of Zhejiang Province's Student Talent Show and the university's very own martial arts master. At the tender age of eight, Ma started practicing wushu and till now he has got multiple national championships in martial arts (or wushu in the Chinese term) under his belt. His brilliant achievement in the champions even earned him the opportunity to perform with Hollywood movie star Jackie Chan during the China Central Television's Spring Festival Gala – a must-watch TV program for plenty of Chinese families on the Eve of Chinese New Year.

Wushu has also enabled Ma to weather many difficulties of life. Citing the traditional principle of ziqiangbuxi, he emphasizes how wushu has instilled in him perseverance and the desire to achieve excellence in his endeavors. Instead of grumbling over the high work load, Ma is very positive. Despite the high work load during the school semester, Ma believes that academic classes and wushu are complementary to each. For instance, during his classes on Classics and Taoism, Ma got a deeper understanding on the cultural connotations of wushu.

FACULTY

Dialogue@ZJU: With Prof. WEN Wu from the International Campus

Prof. WEN Wu joined the Zhejiang University International Business School (ZIBS) as a full-time professor in 2020. Graduated with a Ph.D. from Oxford University, Prof. WEN has a great research interests in FinTech and security. Before joining ZIBS, he had many entrepreneurial ventures in the fields of information security, digital currency and blockchain. He also served as a senior executive in a number of Fortune 500 companies, and the chairman and director of the international standards organization.

For the past twenty years,Prof. WEN have been working on two very important subjects: Digital Identity and Digital Currency. With his determination to use the next ten years of his time to apply digital currency, blockchain and security technology, Prof. WEN joined the ZIBS as a full-time professor. Prof. WEN have also had many discussions with the leadership of the international campus. They gave him much encouragement as well as practical suggestions to quickly become a constructive member of the international campus.

Looking forward to the future, Prof. WEN will continue to work with his industrial partners on promoting the internationalization of RMB, working with international organizations, especially those in one-belt and one-road countries.