

CONNECTION



The Official Newsletter of Zhejiang University

Issue 17

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MESSAGE FROM THE EDITOR-IN-CHIEF

As the summer dawns in Hangzhou, the graduation season of Zhejiang University creeps in. Facing the disruptions from the pandemic, we adjust to new work mode and lifestyle. The pandemic may have blocked spatial communication but it does not impede creation. Instead, these difficulties sparked the students' new understanding of the world. Enjoy the online graduation design exhibition "Save As", specially held under this situation.

In this 17th issue of Connection, we are pleased to present you a large number of inspiring breakthroughs made by ZJU scholars in the field of digital protection of cultural relics, intelligent agriculture, treatment of hypoxic cancer, etc.

As always, we sincerely invite you to follow us on social media and share with us your thoughts.

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ZJU NEWS ROOM

INTERNATIONAL

ZJU climbs to 53 in QS World University Rankings 2021

ZJU has climbed one place in the QS World University Rankings 2021 released on June 10th, ranking 53rd among the 1604 institutions considered globally.

Since 2012, the University has risen 117 places and has improved on its performance for 8 consecutive years. The latest results position the University in the top five per cent of institutions considered across 93 locations. Top-performing indicators - International Faculty and Employer Reputation – both achieved the impressive scores of 98.1 and 91.1 respectively.

The continued improvement in these rankings is the recognition of the effort by researchers across ZJU to create global impact and innovation.

ZJU also featured prominently among the world's elite institutions in the recent QS World University Rankings by Subject, placing in the top 100 in 32 of the subjects table. The University's highest-performing subjects were Chemistry followed by Environmental Science, placing 36th and 43rd in the world, respectively.

RESEARCH

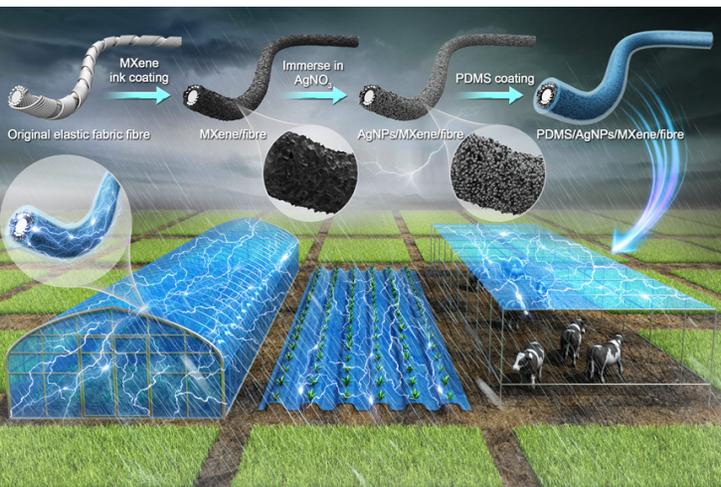
Oxygen from engineered algae to treat hypoxic cancer

Recently, the research team led by ZHOU Min and SUN Yi from the Institute of Translational Medicine and the Second Affiliated Hospital, School of Medicine made groundbreaking discoveries about the role of engineered algae in cancer therapies.

In their study, engineered live microalgae can be delivered to hypoxic tumor regions to increase local oxygen levels and resensitize resistant cancer cells to both radio- and phototherapies. The hypoxic environment in tumors is markedly improved by in situ-generated oxygen through microalgae-mediated photosynthesis, hereby boosting radiotherapeutic effects. Furthermore, the chlorophyll from microalgae produces reactive oxygen species during laser irradiation which can further enhance the photosensitizing effect and promote tumor cell apoptosis.



This naturally living biomaterial-based therapy opens up a novel direction for cancer treatment and offers a new approach to developing tumor therapeutic material, which brings fresh hope to millions of patients.



Triboelectric nanogenerators integrated into greenhouse textiles to build intelligent agriculture

In modern agriculture, the smart sensing technology can collect relevant crop information with great ease. However, it is always a formidable challenge to lay electricity supply lines in farm fields and batteries have finite capacity and pose potential pollution hazards. It is thus essential to develop wireless sensing in intelligent agriculture.

To crack this hard nut, the IBE team led by PING Jian-feng from the College of Biosystems Engineering and Food Science put forward a convenient and effective approach to converting natural resources in the agriculture environment into electricity in an efficient manner.

The research team applied the technology of triboelectric nanogenerators (TENG) to agrotexiles which can harvest raindrop energy and convert it into electricity. This research is published in the journal of *Nano Energy*.



Asian Civilizations Project released

On June 28, Zhejiang University released its ninth convergence research project, and the first of its kind in humanities and social sciences: The Convergence Research Project of Asian Civilizations. With the launch of the Project, the university aims to conduct in-depth studies on the value of Asian civilizations, promote integration of its research forces in humanities, social sciences, and adjacent disciplines, propel new breakthroughs, and provide fresh impetus to better disciplinary development.

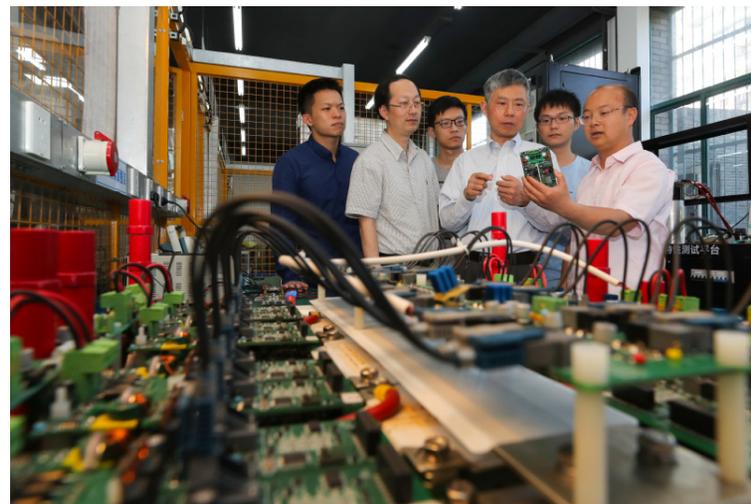
The Project focuses on six research areas: blending and clashing of civilizations, inheritance and innovation of cultures, contacts and variations of languages, circulation and recreation of classical literature, preservation and protection of cultural relics, and the interpretations and dialogue of arts and literature.

'Talkative power' is possible, ZJU electronic engineers show

On May 18, the journal of *Nature Communications* published the findings of the research team led by Prof. HE Xiangning at the Zhejiang University College of Electrical Engineering in a research article titled "Nature of power electronics and integration of power conversion with communication for talkative power".

In this study, researchers reconsider power electronic converters from an interdisciplinary perspective and propose an approach to integrating communication into direct current (dc)-dc converters to achieve what is termed as 'talkative power'. This proposed integration method renders it possible for power to 'talk', or communicate, during the process of conversion.

This research provides insight into the in-depth fusion of power and communication systems and the integrated design of the two systems. It is also expected to open up a new direction for the fusion of power electronics and communication electronics.

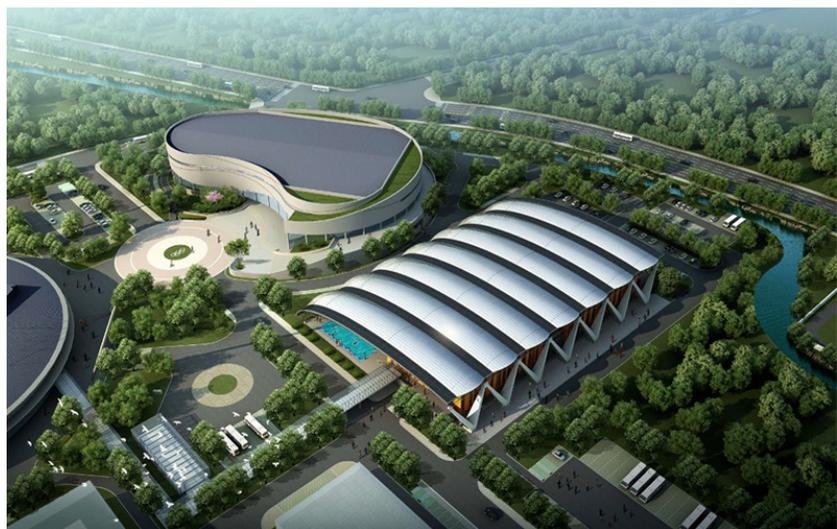


PUBLIC ENGAGEMENT

Construction of auxiliary facility for 2022 Hangzhou Asian Games starts on Zijingang campus

Zijingang Stadium is the basketball venue for the 2022 Hangzhou Asian Games. Construction has recently broken ground on its ancillary facility, the Athlete Training Center, which is scheduled to be completed in March, 2021.

The 19th Asian Games will be held in Hangzhou from September 10 to 25, 2022. It will be the third Asian Games to be hosted in China, after Beijing 1990 and Guangzhou 2010.

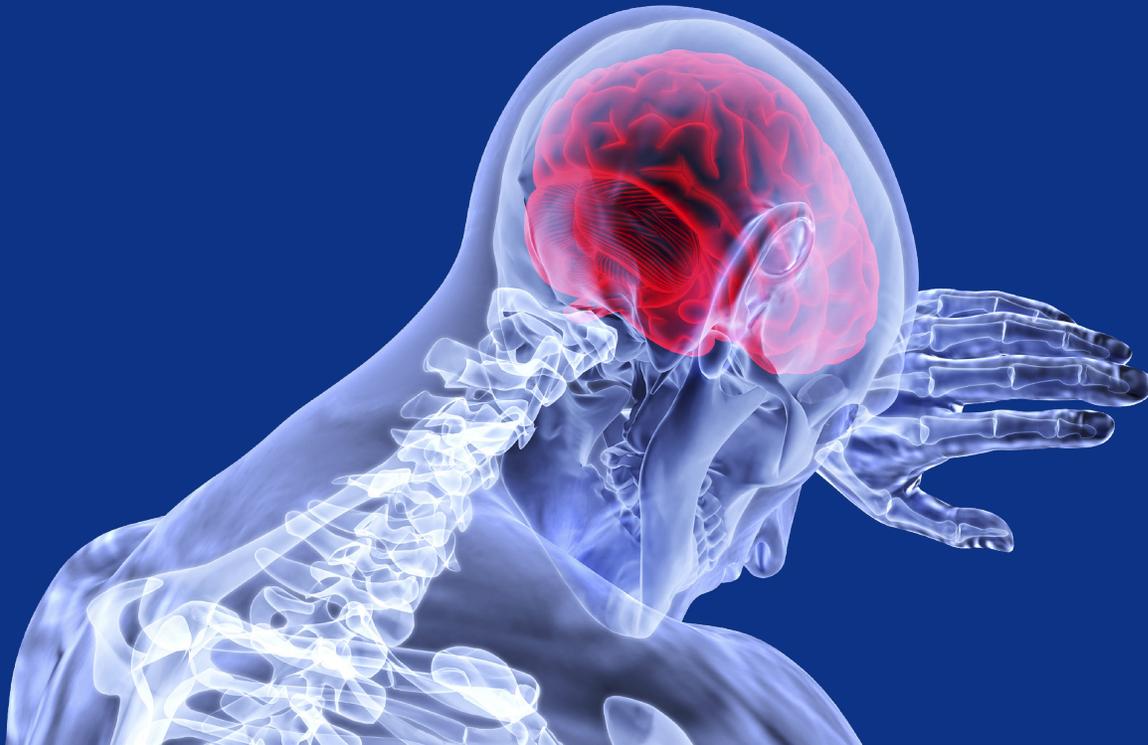


Bird-view of the training center for basketball athletes



The 3D replica of Yungang Grottoes now “moveable” around the world

On June 12 the exhibit “Grace and Grandeur: Memories of Yungang Grottoes through a century” made its debut at Exhibition Halls 2 and 3 of Zhejiang University Museum of Art and Archaeology (ZJUMAA). Featured more than 100 artifacts from the collections of the Yungang Grottoes Research Institute, including stone sculptures, steles, potteries, and architectural components. In this exhibition, the reproduce of the world’s first moveable 3D replica of a cave in the Yungang Grottoes allowed visitors to fully immerse in the art of Yungang.

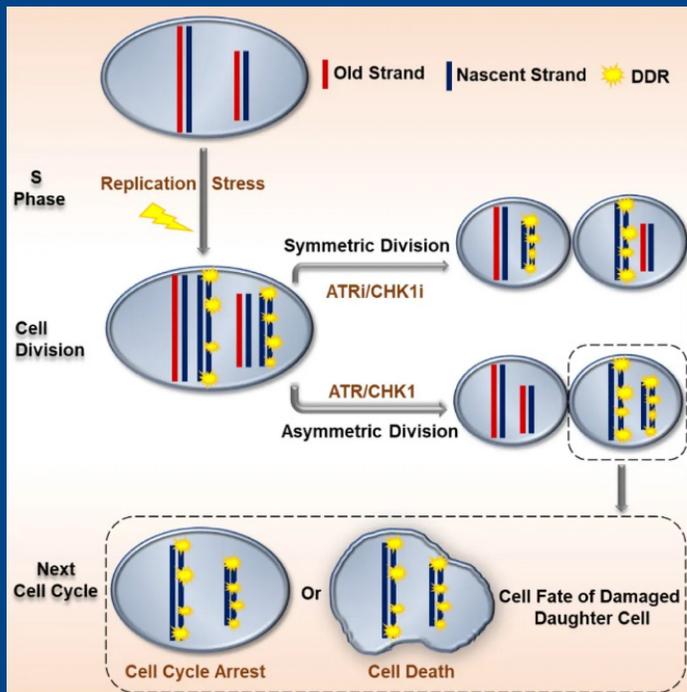


RESEARCH HIGHLIGHTS

ZJU Scientists report a new circuit and molecular mechanisms underlying pain regulation

How is the feeling of pain generated? And what is our body going through when we are in pain? Researchers from Prof. LI Xiaoming's lab, School of Brain Science and Brain Medicine, have been dedicated to studies regarding emotions and behaviors for years with several breakthroughs achieved. The novel research finding from LI's Lab shows that when the body is subjected to pain-like traumatic stimulation,

an alarming signal from the nerve endings reports it to the cerebral cortex via the circuit. Meanwhile, cannabinoids in a specific region of the thalamus blocks the upstream transmission of pain in this circuit, resulting in pain relieving. This research findings are published in *Neuron*, on June 4th.



The enigma behind non-random DNA segregation unveiled

Recently, the research team headed by Prof. YING Songmin and Prof. SHEN Huahao from the School of Medicine observed non-random chromatid segregation during mitosis: the DNA in one sister cell is intact while that in the other sister cell is severely damaged with a salient DNA damage response (DDR). Researchers discovered that the ATR/CHK1 signaling pathway plays an essential role in mediating non-random DNA segregation (NDS), suggesting that the living organism saves its gene in a very smart manner. This biased segregation process contributes to cell-cycle arrest and cell death in damaged daughter cells inheriting newly replicated DNA. Their research findings are published open access in the April 30 issue of the journal of Molecular Cell.

A new model proposed to unify the descriptions of sand transport by wind and water

Sediment transport is a universal phenomenon in aeolian and fluvial environments and is one of the most fundamental natural processes that shape land forms. The core of this issue is how to understand and describe the initiation, transport and deposition of sediments on the Earth's surface.

Recently, Dr. Thomas Pähtz from the Ocean College derived a scaling law in simultaneous agreement measures in water and air streams. Using discrete element method-based sediment transport simulations, Dr. Thomas Pähtz discovered that the linear-to-nonlinear transition in the scaling of Q with τ is caused by a regime shift in the manner in which kinetic fluctuation energy of transported particles is dissipated. The finding was published in the journal of *Physical Review Letters* on April 20.



ZJU scientists discover the mystery of watermelon cracking

Rind hardness or cracking resistance is intimately bound up with pulp quality. Therefore, one of the aims in watermelon breeding is to produce a type of watermelon marked by both the hard, cracking-resistant rind and the crisp and tasty pulp. Prof. ZHANG Mingfang from the College of Agriculture and Biotechnology led his research into a particular gene related to cracking resistance in fresh fruits, which not only provides new insights into the mechanism for cracking resistance, but also helps accelerate the targeted breeding of cracking-resistance varieties. The research findings are published as a cover article in *Plant Biotechnology Journal*.

The results of the study will further enable the molecular manipulation of the desirable trait of fruit cracking resistance in fresh fruits such as watermelon via precise targeting of the causative gene CIERF4, which is relevant to rind hardness.

SPOTLIGHT ON-STUDENTS



- Dual Use UV Air Purifier & Sterilizer -

Save As?

This online graduation design exhibition of Zhejiang University is so cool!

Recently, a graduation design exhibition called "Save As" opened online. The 45 works on display in the exhibition are divided into three categories: "Creation", "Interaction" and "Experience". These works come from graduates of the Industrial Design Department of the School of Computer Science and Technology.

Dual-use UV Air Purifier and Sterilizer by LI Yanzhang is based on the main function of "odor removal and environmental disinfection" and integrates UV disinfection, negative ions, odor synergistic aroma technology and other methods to innovatively design a UV disinfection lamp with "dual use".

Interactive Installation PANGU based on WebGL and AI by CAI Guangxi is a new media interactive installation, which uses

graphic algorithms to generate poetic digital landscapes through the camera's perception of the environment.

YIN is a series of product design based on a traditional handicraft which is Luzhou oil paper umbrella. The crossover process features of oil paper umbrella are refined and recombined, the aesthetic feeling of crossover form is preserved, and different crossover materials and skeleton structures are applied. And finally a series of lamps are designed.

Multi dimension interactive experience design of Museum shop under experience marketing mode by ZHOU Zhiyi rethinks the value of Museum stores different from ordinary retail, aiming at improving users' perception of cultural connotation behind cultural and creative products, and proposes a multi-dimensional interactive strategy.



YIN - Series of Lamps

Design based on a traditional handicraft Luzhou oil paper umbrella

FACULTY



ZJU professors win 2nd National Award for Excellence in Innovation

The 2nd National Award for Excellence in Innovation was held on May 30 which marked the 4th National Science and Technology Workers' Day. Five professors from Zhejiang University won recognition for their dedication to science and technology. They are LI Lanjuan (Director of the Zhejiang University State Key Laboratory for Diagnosis and Treatment of Infectious Diseases), CAI Xiujun (President of Sir Run-Run Shaw Hospital, School of Medicine), YAN Jianhua (Vice President of Zhejiang University, professor of the College of Energy Engineering), HU Hanlan (Professor of the School of Medicine), and WANG Yuefei (Professor of the College of Agriculture and Biotechnology).

This award is set for the scientific and technological workers and research teams who have made outstanding achievements in scientific research, technology development, major equipment, engineering research and social services.



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