



# ZHEJIANG UNIVERSITY

## SUSTAINABLE DEVELOPMENT GOALS REPORT *2023*





*Image: Zijingang Campus, the main campus of Zhejiang University, sits adjacent to the Xixi Wetland Park and spans an impressive 2,173 hectares. Its construction adheres to eco-friendly principles of preservation and moderate transformation, protecting the existing wetlands and rich vegetation to maintain a verdant landscape.*

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# ABOUT THE REPORT

In 2015, the United Nations and its member states signed the 2030 Agenda for Sustainable Development - a call to action to meet some of the most pressing challenges facing our world. The specific challenges and objectives are defined in the 17 Sustainable Development Goals (SDGs), which offer states and non-state actors a plan for promoting and achieving sustainability in areas such as the environment, access to food, gender equality, and healthy and safe communities.

Zhejiang University is committed to sustainability in all its forms and prepared to play a leading role in areas of research, education, innovation, and collaboration with the broader community. This SDG report, in its first edition, aims to showcase the practices and initiatives undertaken by Zhejiang University in the field of sustainability. It will address and outline the University's approach to some of the weightiest problems facing the world. ZJU welcomes your inquiries and feedback on this report.





# MESSAGE FROM THE PRESIDENT

**M**ore and more frequent extreme weather events and destructive forest fires in recent years are warning us that the globe has been warming at an unprecedented rate over millennia. Particularly, higher education institutions (HEIs) as the bank of talent and hub of scientific research, play an essential role in addressing the pressing challenges brought by climate change.

As a globally-minded and socially-responsible HEI, Zhejiang University has actively answered the call of the 2030 Agenda for Sustainable Development. Zhejiang University has worked and will continue working with its global partners to address the pressing challenges facing the world.

In capturing the essence of the University's dynamic endeavors throughout the preceding year, this report highlights significant actions related to SDGs. It offers a glimpse into our institution's commitment to addressing sustainability challenges through education, research and efficient campus operations-impacting not only our immediate surroundings but also resonating on a global scale. Rooted in dedication, our University remains steadfast in its pursuit of a sustainable future for the collective well-being of all.

JIANGFENG DU  
PRESIDENT



# SDG 01



# NO POVERTY

End poverty in all its forms everywhere

**45**

RELATED  
RESEARCHERS IN ZJU

**497**

NUMBER OF  
PUBLICATIONS

**3.80%**

PERCENTAGE OF ALL  
CHINESE PUBLICATIONS

**3**

RANKING AMONG  
CHINESE UNIVERSITIES

**33.80%**

PERCENTAGE OF  
INTERNATIONAL CO-AUTHORED

**1.44**

CITATION IMPACT

**9**

NUMBER OF PUBLICATIONS  
IN TOP 1%

**40**

COURSES COVERING  
THIS GOAL

## Advanced seminar on anti-poverty issues in developing countries

The 21-day seminar in June 2023, sponsored by China's Ministry of Commerce and hosted by ZJU's China Academy for Rural Development Institute, saw participation from 35 director-level officials from 13 countries, including Nepal, Kiribati, Ghana, and others. Launched in 2004 and held annually, the Seminar covers topics such as China's national development, inclusive agriculture, digital economy and sustainable agricultural development, rural reforms, and the transformation of the food system under the United Nations Sustainable Development Goals and its impact. Additionally, the seminar includes field visits to understand China's innovative practices in various sectors like entrepreneurship, investment, and agriculture.

A participant in the "Advanced Seminar on Anti-Poverty Issues in Developing Countries", Nichita Turcan from Moldova, said: "We intend to integrate China's poverty reduction experience into our own countries' practices, aiming to contribute to the elimination of poverty in developing countries."

## Enhancing rice yields sustainably with TOR signaling

In a study published in *Molecular Plant* on December 5, 2023, the research team led by Prof. DU Hao from the College of Agriculture and Biotechnology revealed a promising strategy to enhance rice production while conserving water and reducing fertilizer usage. Addressing a significant agriculture challenge, this study focuses on the effects of water-saving treatments (WST) in rice cultivation, which, while environmentally friendly, have led to a substantial reduction in yields and nitrogen use efficiency (NUE). The team discovered that the target of rapamycin (TOR) signaling pathway in rice is compromised under WST. Their research shows that increasing TOR activity could mitigate the yield reduction caused by WST.

This discovery opens the door to developing new rice varieties that can thrive under water-saving conditions without significant yield loss. The study holds great promise for promoting sustainable and efficient rice production, contributing to the development of global low-carbon agriculture.



## Green weed managing technologies boost high-quality agricultural development

ZHU Jinwen, an associate research fellow at the College of Agriculture and Biotechnology, is leading the charge towards green development and ecological civilization in agriculture. With over 1,400 types of harmful weeds causing significant crop losses and hosting pests, resulting in over 3 million tons of annual food loss in China, and the rise of herbicide-resistant weeds, his team focuses on eco-friendly weed management. Over the last decade, they have developed innovative methods, including using agricultural waste for weed control, new crop cultivation techniques, and ecological regulation. These efforts have led to a 95% weed control, improved crop quality and yield, and the recycling of agricultural resources.

Currently, ZHU's team is working on commercializing these scientific achievements to address herbicide-resistant weeds and promote green, organic agriculture. This aligns with the World Food and Agriculture Organization's conservation agriculture concept and aims to realize the vision of healthy rice and beautiful countryside through sustainable, low-carbon production methods.

## Innovative poverty alleviation: ZJU's recognized efforts in Southwest China

From applying new technologies to local industries and expanding sales channels for agricultural products to providing volunteer teaching, training and medical assistance, ZJU spares no effort to help local people in Jingdong Yi autonomous county, an underdeveloped area in Southwest China's Yunnan province, overcome poverty and live a happier and more fulfilling life.

Our long-term endeavor was recognized as one of the global best poverty reduction practices at the 2022 International Seminar on Global Poverty Reduction Partnerships. The seminar was jointly organized by the International Poverty Reduction Center in China (IPRCC), International Fund for Agricultural Development (IFAD), Food and Agriculture Organization of the United Nations (FAO), World Food Program (WFP), and China Internet Information Center (CIIC).



# SDG 02



## ZERO HUNGER

End hunger, achieve food security and improved nutrition and promote sustainable agriculture

**171**

RELATED  
RESEARCHERS IN ZJU

**3351**

NUMBER OF  
PUBLICATIONS

**3.51%**

PERCENTAGE OF ALL  
CHINESE PUBLICATIONS

**6**

RANKING AMONG  
CHINESE UNIVERSITIES

**40.26%**

PERCENTAGE OF  
INTERNATIONAL CO-AUTHORED

**1.57**

CITATION IMPACT

**88**

NUMBER OF PUBLICATIONS  
IN TOP 1%

**164**

COURSES COVERING  
THIS GOAL



## Agricultural breeding by design

Zhejiang University announced a batch of convergence research projects under its *Innovation 2030*, a university-wide strategic framework, to catalyze greater collaboration among discipline clusters, impel significant breakthroughs and find innovative solutions for big questions of tomorrow. One of the projects centers on agricultural breeding by design. The strategic importance of breeding in the global competition within the agricultural sector has been well recognized worldwide. Against the backdrop of growing world population, global climate change, natural resource constraints and socio-economic development, additional demands are placed on biological breeding to ensure food security and ecological safety, and satisfy the need for health and nutrition. Working collaboratively with leading breeding enterprises, we aim to harness strengths of related disciplines across the university in a smarter way. Huge amount of agricultural biological data will be managed and analyzed, and then exploited by big data analytics platform for targeted breeding. A number of new varieties with high quality and biotic or abiotic resistances will be developed and widely used in agricultural production.

## Student association dedicated to agricultural and rural development

ZJU's Peasant, Rural and Agriculture Association (PRAA) was founded in April 2003. It is the first advanced university student association in Zhejiang Province with the theme of agriculture, and rural issues. The Association actively guides college students to understand the rural area, pay attention to agriculture, and care for farmers. It encourages students to widely carry out social practice, social research and theoretical research related to these issues. Through various activities, PRAA shows the development of rural China today to college students and society. It helps college students to make use of their academic advantages and social influence to explore the three rural issues, and strive to apply the knowledge they have gained. As a comprehensive association, it is composed of outstanding students from all faculties. At present, the association has more than 100 core staff and more than 3,000 members.

## Impact of ageing on agricultural sustainability in China: ZJU scientists offer solutions

Approximately one in every five people in China is over 60 years old. This demographic shift towards an ageing population is posing great challenges on agriculture sector. A new study has quantified the impact of ageing through a set of data science research, providing the first explanation of how ageing affects agriculture production and solutions to address the issue. The results were published in *Nature* on February 22, 2023. A research team at ZJU used data from a survey of about 15,000 households with crops but no livestock across China, and explored the relationship between rural population ageing and agricultural sustainability based on a multiple regression model (MRM). The results showed that in 2019, about 4 million hectares of cropland in China were abandoned due to rural ageing, which reduced the average farm size by about 4% and posed a great threat to cropland protection and food security. When comparing traditional smallholder farming with new farming models such as family farms, cooperative farms, and industrial farms, the researchers found that these new farming models were less affected by population ageing. With more young people and higher levels of education and larger farm size, the new farming models had higher total farming inputs, including fertilizer and machinery, which substantially improve agricultural outputs and labour productivity.

## ZJU students won national championship in anti-food waste contest

On December 10, 2023, the College Student Competition of Anti-Food Waste and Food Safety was successfully held in Beijing. The ZJU team, consisting of three undergraduate students, won the championship in the provincial sub-competition. They made it into the finals and competed with 18 teams from other provinces. After several intense rounds, the ZJU team finally won the national championship. This year's competition focused on anti-food waste. Topics included were food storage, label recognition, and food safety in daily scenarios. A total of 1 million students from 888 colleges and universities in 30 provinces participated in the contest.



# SDG 03



# GOOD HEALTH AND WELLBEING

Ensure healthy lives and promote well-being for all at all ages

**991**

RELATED  
RESEARCHERS IN ZJU

**41403**

NUMBER OF  
PUBLICATIONS

**3.58%**

PERCENTAGE OF ALL  
CHINESE PUBLICATIONS

**2**

RANKING AMONG  
CHINESE UNIVERSITIES

**24.67%**

PERCENTAGE OF  
INTERNATIONAL CO-AUTHORED

**1.28**

CITATION IMPACT

**951**

NUMBER OF PUBLICATIONS  
IN TOP 1%

**730**

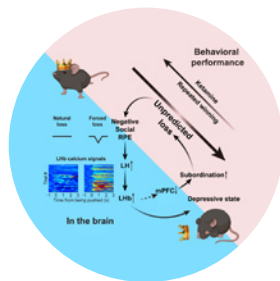
COURSES COVERING  
THIS GOAL



Scan to enjoy an active lifestyle at ZJU.

## Are people with high social status more prone to depression?

In both humans and animals, social status has a significant impact on their physical and mental health. To measure social hierarchy in mice, Prof. HU Hailan's team from the School of Medicine developed the tube test by which the social rank of each mouse could be determined by the number of wins it gained when competing against other mice. By forcing mice to lose against their subordinates in a non-violent social contest, and recording their neural activity in the brain, researchers have established a mouse model of depression to explore the fundamental neural mechanism behind this process. They find that the depressive-like behaviors are triggered only in those higher-ranking mice which have a rapid decline in social status, and these behaviors can be reversed by regaining social status. This discovery provides insights into interventive therapy for depression. Their findings were published in an article titled "Neural Mechanism Underlying Depressive-Like State Associated With Social Status Loss" in *Cell* in January 2023.



## How gut microbes manipulate immune system to trigger fat absorption

A new study on mice has shown that gut microbes work in tandem with the immune system to determine fat absorption.

For their study, published in *Science*, the team led by WANG Yuhao, a biochemist at Zhejiang University, first analysed all the lncRNAs produced by cells lining the intestines from mice that were devoid of gut microbes, and compared them to those of normal mice. The gut microbe-free mice contained many more copies of one lncRNA called *Snhg9*, suggesting that microbes may suppress levels of *Snhg9*. The researchers found that this lncRNA bound tightly to CCAR2 in the intestinal cells, a protein which inhibits an enzyme that decreases fat absorption from food. They hypothesized that when *Snhg9* blocked the action of CCAR2 in this way, it unleashes the fat-regulating enzyme, resulting in less fat being absorbed by the intestine. To test their idea, the researchers edited the genes of mice so that they produced more *Snhg9* and then fed them a high-fat diet. Compared to the unaltered mice, also on a high-fat diet, the edited mice had less fat in their intestines and excreted more fat.

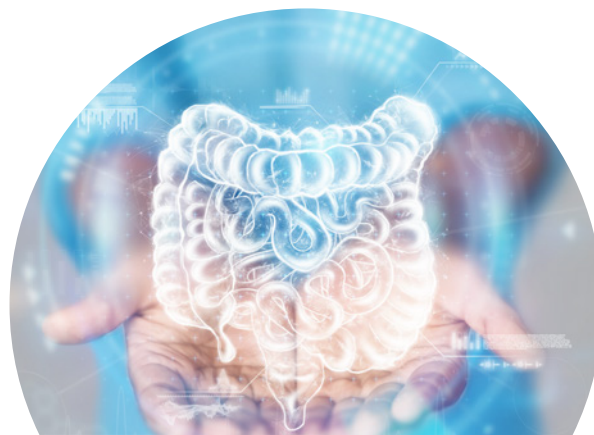
These findings reveal intriguing therapeutic targets and raise the prospect of novel therapies for metabolic diseases, such as obesity and type 2 diabetes.



## ZJU scientists decipher the biased signaling mechanisms toward cannabinoid receptor 1

Cannabis activates the cannabinoid receptor 1 (CB1), which elicits analgesic and emotion regulation benefits, along with adverse effects, via Gi and  $\beta$ -arrestin signaling pathways. This joint research by Prof. LI Xiaoming and Prof. ZHANG Yan from the School of Medicine presented the high-resolution cryo-electron microscopy structure of CB1- $\beta$ arr1 complex bound to the synthetic cannabinoid MDMB-Fubina (FUB), revealing notable differences in the transducer pocket and ligand-binding site compared with the Gi protein complex.  $\beta$ arr1 occupies a wider transducer pocket promoting substantial outward movement of the TM6 and distinctive twin toggle switch rearrangements, whereas FUB adopts a different pose, inserting more deeply than the Gi-coupled state, suggesting the allosteric correlation between the orthosteric binding pocket and the partner protein site. The findings were published in *Cell* under the title "Snapshot of the Cannabinoid Receptor 1-Arrestin Complex Unravels the Biased Signaling Mechanism" on December 14, 2023.

This research not only proposes a comprehensive model for the molecular mechanism of signaling bias, but also builds a solid foundation for the development of safer synthetic cannabinoids and the clinical application for the CB1 compounds in treating neurological and psychiatric disorders.



# SDG 04



# QUALITY EDUCATION

Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

**69**

RELATED  
RESEARCHERS IN ZJU

**670**

NUMBER OF  
PUBLICATIONS

**2.90%**

PERCENTAGE OF ALL  
CHINESE PUBLICATIONS

**4**

RANKING AMONG  
CHINESE UNIVERSITIES

**31.00%**

PERCENTAGE OF  
INTERNATIONAL CO-AUTHORED

**1.44**

CITATION IMPACT

**19**

NUMBER OF PUBLICATIONS  
IN TOP 1%

**365**

COURSES COVERING  
THIS GOAL



Scan to watch what ZJU SDG Global Summer School offers.



## ZJU Summer School empowers global youth for a sustainable future

Themed "SDG for a Shared Future", the 2nd SDG Global Summer School was unveiled in July 2023. It offered five academic modules aligned with seven SDGs, namely Carbon Neutrality, Inclusive Development, Smart City, Data Visualization and Networked Autonomous Systems. The 14-Day Tasks were also arranged as a complement to help students gain insights into China and better understand ZJU. This two-week summer school has gathered over a thousand young students from 82 countries and regions around the world to take credit-bearing courses under the mentorship of world-class professors. ZJU worked with top universities worldwide to provide high-quality courses and immersive cultural experiences, enabling students to have a better understanding of the meaning and paths of SDGs in globalization, mobilizing global participation in sustainable development governance, and contributing wisdom and strength to a sustainable world through academic and cultural exchanges.

## ZJU opens Mental Health Education and Counseling Center

Zhejiang University has always regarded mental health as an important dimension of education. In 1987, ZJU established the Mental Health Education and Counseling Center, among the first of its kind established at Chinese universities. The Center covers an area of 3,000 square meters and aims to be a comprehensive platform providing teaching, research and consulting. It organizes various forms of psychological quality training activities targeting diverse needs of students' self-development and psychological growth. In May 2023, the Center held the Mental Health Forum of Zhejiang University with the theme of "Improving Psychological Quality and Empowering Students' Growth".

## Strengthening educational bonds: ZJU's landmark visit to Brunei

In a landmark visit in November 2023, Prof. REN Shaobo, chairman of the Zhejiang University Council, led a delegation to Brunei to enhance educational cooperation under the Belt and Road Initiative. Professor REN co-signed the third phase of the Memorandum of Understanding (MoU) with Universiti Brunei Darussalam's Vice-Chancellor Hazri bin Haji Kifle. Pursuant to the MoU, ZJU, UBD, and Hengyi Industries will continue to work on training the UBD students on the Chemical and Process Engineering Program, at ZJU and UBD, for an additional five years. This phase marks a continuing commitment by ZJU to develop skilled international petrochemical professionals, thereby bolstering Brunei's petrochemical sector and aiding Chinese enterprises abroad. Over the past decade, ZJU has collaborated with Universiti Brunei Darussalam and Hengyi Group to cultivate over 160 petrochemical professionals, with more than 100 graduates enhancing the workforce of Hengyi Industries. This successful collaboration has established a robust trilateral model, synergizing education with practical industry application. The future of this collaboration looks promising, with both universities acknowledging the milestone significance of the third phase MoU. The focus remains on producing more tangible outcomes and strengthening the exchange of innovative and entrepreneurial talent cultivation practices.

## ZJU postgraduates volunteer teaching in southwestern China

Since 2013, more than 50 Zhejiang University's postgraduate students have traveled to volunteer in high schools in Jingdong Yi autonomous county, southwest China's Yunnan province, 2,600 kilometers away from Hangzhou, the city where the University is located. Since its inception, the group has taught the equivalent of 20,000 class hours for over 4,000 students. This has enabled the Jingdong Vocational High School to rank first among all the vocational high schools in Yunnan province for nine consecutive years in terms of college entrance examination admission rate. The Project of Targeted Support to Jingdong by the ZJU's Postgraduate Volunteer Teaching Team was selected by China's Ministry of Education among the 11 model projects in 2021 and is one of the many projects launched by the team. In total, they have raised 12 million CNY in subsidies and 15.36 million CNY worth of materials. More than 8.6 million CNY has been invested to complete more than 30 infrastructure construction projects.

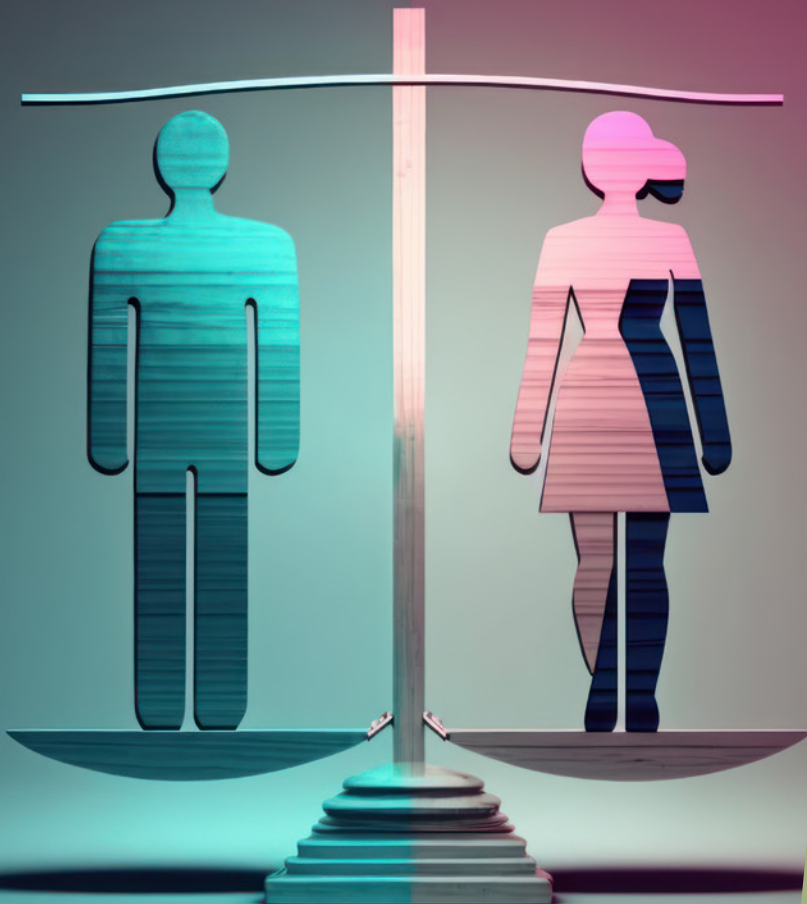


# SDG 05



# GENDER EQUALITY

Achieve gender equality and empower all women and girls



**106**

RELATED RESEARCHERS IN ZJU

**1477**

NUMBER OF PUBLICATIONS

**4.10%**

PERCENTAGE OF ALL CHINESE PUBLICATIONS

**6**

RANKING AMONG CHINESE UNIVERSITIES

**18.35%**

PERCENTAGE OF INTERNATIONAL CO-AUTHORED

**1.19**

CITATION IMPACT

**24**

NUMBER OF PUBLICATIONS IN TOP 1%

**15**

COURSES COVERING THIS GOAL



## ZJU wins “grand slam” at 18th Chinese Young Women in Science Awards

The 18th Chinese Young Women in Science Awards honored several outstanding contributors in science. Prof. XU Wenyuan from the College of Electrical Engineering received the individual award for her work in IoT security, including the development of the first IoT sensor vulnerability detection toolkit. Prof. HU Xinyang's team from the Second Affiliated Hospital of Zhejiang University School of Medicine won the Team Award for their significant contributions in cardiac function reconstruction, recognized with national and provincial awards. Dr. CHANG Dan, a postdoctoral fellow at the Department of Polymer Science and Engineering, was selected for the 2021 Future Women Scientist Program, notable for her research in reversible assembly and application of nano-carbon materials.

The awards, established in 2004 by various Chinese and international organizations, including L'Oréal China, aim to recognize and inspire young female scientists. In this edition, 20 young female scientists and five teams were awarded, and 10 PhD students or postdoctoral fellows were chosen for the Future Women Scientist Program, highlighting their groundbreaking scientific achievements and contributions.



## Breaking barriers: professor advocates for female leadership in science

"The biggest thing holding women back is thinking that they're not good enough," said Prof. Sue Welburn, executive dean of the Zhejiang University-University of Edinburgh Institute, at the ZJU Female Professors Association event. In the dialogue with LI Min, director of the Office of Global Engagement, she delved into her experiences and insights on women in science and leadership, encouraging female scholars to surpass self-limitations and aim for excellence.

Professor Welburn's own journey from the Tsetse Research Laboratories to establishing the Global Health Academy at the University of Edinburgh and her significant research contributions in human sleeping sickness and disease control in Africa highlight her dedication to scientific excellence and impact. Her story serves as an inspiration for women in science, illustrating the challenges and opportunities in leadership roles.

The Zhejiang University Female Professors Association, established in 2001, is one of the first multidisciplinary organizations for female full professors in Chinese universities, promoting high-level academic and professional development.

## Leadership Development Program for Female Students

Established in 2014, the Program has significantly impacted the university and beyond, conducting over 110 sessions and training more than 5,500 female students. At the opening ceremony of the 14th session of the Program on October 23, 2023, CHEN Yueyuan, representing the alumni of the Zhejiang University's Leadership Development Program for Female Students, said: "This program has opened up opportunities for us to explore the limitless possibilities of women's professional paths and to discover the inner strength we possess"

This year's program comprises 110 female students from 31 colleges within Zhejiang University and 10 from Hangzhou City University, representing a diverse and inclusive group dedicated to fostering female leadership and empowerment.



# SDG 06



# CLEAN WATER AND SANITATION

Ensure availability and sustainable management of water and sanitation for all



**218**

RELATED  
RESEARCHERS IN ZJU

**3462**

NUMBER OF  
PUBLICATIONS

**2.26%**

PERCENTAGE OF ALL  
CHINESE PUBLICATIONS

**8**

RANKING AMONG  
CHINESE UNIVERSITIES

**30.18%**

PERCENTAGE OF  
INTERNATIONAL CO-AUTHORED

**1.26**

CITATION IMPACT

**50**

NUMBER OF PUBLICATIONS  
IN TOP 1%

**92**

COURSES COVERING  
THIS GOAL

## ZJU students won second place in Best Undergraduate Paper Award at World Environmental and Water Resources Congress 2023

Three undergraduate students from Zhejiang University-University of Illinois Urbana-Champaign Institute (ZJUI), Zheng Zihan, Hu Run, and Fan Haocheng, who were the first three authors of the paper titled “Optimization of Urban Water Supply Planning for a Mid-Sized City in the Yangtze River Delta”, won second place in the Best Undergraduate Paper Award for their paper at the World Environmental and Water Resources Congress 2023 (EWRI). This awarded paper was included in the planning and management section of the conference’s collection of papers. It is reported that all three students have been admitted to world-class universities and plan to continue pursuing doctoral and master’s degrees at UIUC and Stanford, respectively.

EWRI is one of the highly prestigious and influential academic conferences in the field of environmental and water resources, organized by the American Society of Civil Engineers (ASCE).

## Practices of ZJU Green Origin Association in clean water and sanitation

Founded in 1999, the Green Origin Association (GOA) at Zhejiang University, a five-star student group, organizes diverse activities like birdwatching, water protection, and SDGs lectures to promote environmental awareness. In 2022, GOA received the UN PRME Award for their sustainability and responsible management education efforts. Key initiatives include the Qizhen Lake Water Protection Group, collaborating with administrative departments for cleanup and setting up signs, and the “Naturalist Development Plan” promoting daily eco-consciousness among students. These efforts have notably led to the improved condition of Qizhen Lake, evidenced by the presence of black swan cygnets, symbolizing the success of the “Seeking-Truth River Protection Team” in enhancing the lake’s environment.



## Chinese National Office of Water Conservation’s case study on ZJU: a water-conservation university

With advanced infrastructure and policies in place, Zhejiang University is building itself into a model in water conservation through steps like enhancing leadership in water-saving, implementing standards, using IoT for smart monitoring, and focusing on water-saving in campus development. Educational initiatives are also employed to foster water conservation awareness. Key achievements include ZJU’s average yearly per capita water consumption of 44.67 cubic meters, aligning with national university standards, and a 7.6% pipe network leakage rate. Despite a significant increase in campus size and water users from 2016-2020, ZJU reduced its water consumption annually, decreasing per capita usage by 13.1% and saving over 1.75 million cubic meters of water, resulting in financial savings of over 5 million yuan.

## ZJU students won prizes in 2023 ASCE Mid-Pacific Student Competitions

Students from the College of Civil Engineering and Architecture (CCEA) had a strong showing in the 2023 MidPac ASCE Student Symposium organized by the American Society of Civil Engineers (ASCE) from April 20 to April 22. MidPac is an annual student symposium where students from more than 16 universities participate in various civil engineering competitions addressing challenges in the field.

After nearly four months of arduous preparation, students from CCEA won the first prize in the Water Treatment Competition and the Timber-Strong Design Build Competition as well as a 3rd prize in the GeoWall Challenge under the guidance of CCEA faculties.

At the event, over 500 civil engineering students from 10 universities in California and China put their academic and project management knowledge to the test, participating in annual Society-wide competitions including the ASCE Concrete Canoe and the ASCE Student Steel Bridge Competition.

# SDG 07



# AFFORDABLE AND CLEAN ENERGY

Ensure access to affordable, reliable, sustainable and modern energy for all

**354**

RELATED  
RESEARCHERS IN ZJU

**6846**

NUMBER OF  
PUBLICATIONS

**2.98%**

PERCENTAGE OF ALL  
CHINESE PUBLICATIONS

**9**

RANKING AMONG  
CHINESE UNIVERSITIES

**32.04%**

PERCENTAGE OF  
INTERNATIONAL CO-AUTHORED

**1.35**

CITATION IMPACT

**107**

NUMBER OF PUBLICATIONS  
IN TOP 1%

**348**

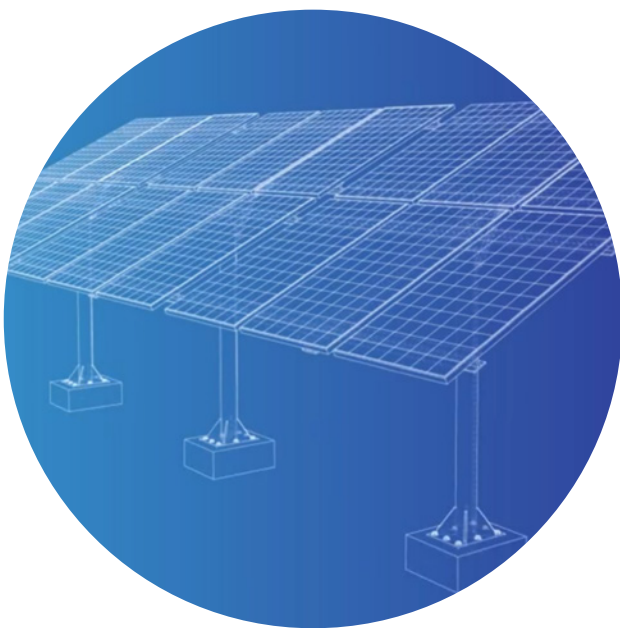
COURSES COVERING  
THIS GOAL



Scan to learn about ZJU's International Campus.

## Institute for Carbon Neutrality

The Institute for Carbon Neutrality of Zhejiang University was established in 2022, administratively affiliated with the College of Energy Engineering. Professor GAO Xiang, member of the Chinese Academy of Engineering, serves as the dean. Building upon ZJU's extensive research portfolio, the Institute, established in 2022, is an interdisciplinary research center committed to conducting cutting-edge clean energy research, fostering training and development opportunities, and showcasing groundbreaking demonstrations. The ultimate aim is to emerge as a global frontrunner and a powerhouse in the areas of research, development, and demonstrations of innovative clean energy solutions to address the pressing issues of climate change and sustainability. The focus areas are carbon emission reduction, advanced energy storage, advanced renewable energy and advanced energy materials.



## Making powerful new building block for solar cells

A global research effort led by XUE Jingjing from the School of Materials Science and Engineering has enhanced the performance of perovskite solar cells. By observing perovskite crystallization using in-situ X-ray diffraction, the team developed a more effective manufacturing method. Perovskites, known for their broad light absorption, are seen as a potential alternative to silicon for solar cells. The team focused on formamidinium lead iodide (FAPbI<sub>3</sub>) and tackled the issue of its unstable crystallization phases. Adding pentanamide hydrochloride (PAD) during production resulted in more efficient and stable solar cells, with increased electricity generation and prolonged device life.

## Innovative green methanol: lighting way for 19th Asian Games in Hangzhou

The 19th Asian Games in Hangzhou showcased a groundbreaking opening ceremony, highlighted by the lighting of the cauldron using green methanol. This marked the first time in the Games' history where green methanol served as the torch fuel. The fuel was innovatively synthesized from recycled carbon dioxide and hydrogen, marking a significant step towards environmental sustainability.

Prof. GAO Xiang, member of the Chinese Academy of Engineering and dean of ZJU's Institute of Carbon Neutrality, led the research team responsible for this feat. Their involvement in the Hangzhou Asian Games encompassed six crucial tasks, including but not limited to the design of the core combustion device for the primary torch, combustion optimization, green fuel production, fuel storage and transportation.

Working late into the night, they conducted multiple tests and monitored air quality to ensure safety and reliability. Prof. GAO's team has long been committed to researching into the optimized and sustainable utilization of energy resources. They have achieved a series of breakthroughs in green fuel production and utilization.

## ZJU's International Campus: a living lab for 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, ZJU's International Campus has committed to building itself into the world's leading sustainable campus.

Since its construction dating back to 2014, a series of measures have been adopted to minimize the collective impact on the earth with a Green Office to oversee green campus planning and construction, operational activities monitoring and community outreach. For instance, the campus rainwater is collected for storage in the central lake, to be filtered and used for irrigation. Every year, around 15% of water resources are conserved and utilized. The International Campus promotes eco-friendly travel options to meet its emission reduction targets. Ten public bicycle rental points allow easy access across the Campus, which are further connected to hundreds of city-wide rental points. The leading sustainable operations and management capacity of the Campus 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. Following the release of its 2020 Accounting Report on Carbon Emission, the Campus received in 2021 the ISO14001:2015 certification, an international standard for the environmental management system.

# SDG 08



# DECENT WORK AND ECONOMIC GROWTH

Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

**32**

RELATED  
RESEARCHERS IN ZJU

**474**

NUMBER OF  
PUBLICATIONS

**2.50%**

PERCENTAGE OF ALL  
CHINESE PUBLICATIONS

**12**

RANKING AMONG  
CHINESE UNIVERSITIES

**39.79%**

PERCENTAGE OF  
INTERNATIONAL CO-AUTHORED

**1.31**

CITATION IMPACT

**9**

NUMBER OF PUBLICATIONS  
IN TOP 1%

**68**

COURSES COVERING  
THIS GOAL



Scan to explore smart Zhejiang with ZJUers.

## ZJU hosted ASEAN-China Digital Economy Workshop

The ASEAN-China Digital Economy Workshop brought together government officials, industry leaders, and academics from ASEAN member countries, including Brunei, Cambodia, Indonesia, Laos, Malaysia, and Myanmar. Rey Sihotang, head of a payment gateway provider, Ayoconnect, from Indonesia expressed his keen interest in Zhejiang province's digital economic development, while attending the workshop and said "This is my first time visiting China, and Zhejiang University is my first stop on this journey in China. Here, it seems like you can solve all your problems with just a smartphone,"

The potential of digital economy in the ASEAN region is immense and Zhejiang province's expertise in the field creates a great opportunity for collaboration between the two sides to foster digital economic development.



## Growth model of SMEs in path of SRDI

The term SRDI (Specialized, Refinement, Differential, Innovation) was introduced at the press conference held in July 2011 pertaining to the Report on China's Industrial Development and Policy. Since then, it has gradually turned into an everyday term for Chinese society. As Chinese small and medium-sized enterprises (SMEs) are continuously growing in size and in numbers, SRDI can serve as a compass for them, providing both guidance of the universal management theory and contextual references to the Chinese Market. Concerning the competitive advantages of SRDI enterprises as well as the growth model that SRDI enterprises can adopt to achieve steady and sustainable growth, Prof. WU Aiqi and Prof. SHI Yujun of Zhejiang University's School of Management published a new book called Expertism Wins: A New Growth Road for SRDI of SMEs, which does an in-depth analysis of the growth model of SMEs in the path of SRDI, while also indicating directions for the strategic development of SMEs.

## Institute for Common Prosperity and Development

On June 6, 2021 the inauguration ceremony of the Zhejiang University Institute for Common Prosperity and Development and the Summit on Common Prosperity were held on Zijingang Campus. The Institute for Common Prosperity and Development, jointly established by the School of Public Affairs and the School of Economics, will implement the concept of shared development and common prosperity. On the basis of the current situation of economic transformation and development, it will explore the path of China's social and economic development, the pattern of income and wealth distribution, and the law regarding fair sharing of development achievements. It will also explain the theory of common prosperity, pay close attention to the process of common prosperity nationwide and province-wide, and contribute wisdom and strength to realizing the goal of common prosperity by means of top-notch studies. The overall goal of the Institute is to produce high-level theoretical achievements revolving around the notion of common prosperity. It aims at exploring approaches to set up common prosperity demonstration areas, integrating research resources and cultivating a multi-disciplinary cohort.

# SDG 09



# INDUSTRY, INNOVATION AND INFRASTRUCTURE

Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation



**156**

RELATED  
RESEARCHERS IN ZJU

**2403**

NUMBER OF  
PUBLICATIONS

**3.05%**

PERCENTAGE OF ALL  
CHINESE PUBLICATIONS

**4**

RANKING AMONG  
CHINESE UNIVERSITIES

**31.54%**

PERCENTAGE OF  
INTERNATIONAL CO-AUTHORED

**1.26**

CITATION IMPACT

**50**

NUMBER OF PUBLICATIONS  
IN TOP 1%

**483**

COURSES COVERING  
THIS GOAL

## **Weird, hard, and elastic matter bounces into view**

A team led by Prof. LIU Zhaoming from the Department of chemistry, has developed a unique hybrid material that exhibits properties of ceramics, plastics, and rubber. This novel substance combines the hardness and strength of ceramics, the elasticity of rubber, and the re-mouldability of plastics. Overcoming the traditional challenge of merging organic and inorganic compounds, the team used small organic molecules as stabilizers for inorganic ionic compounds, creating a material that integrates both organic and inorganic elements.

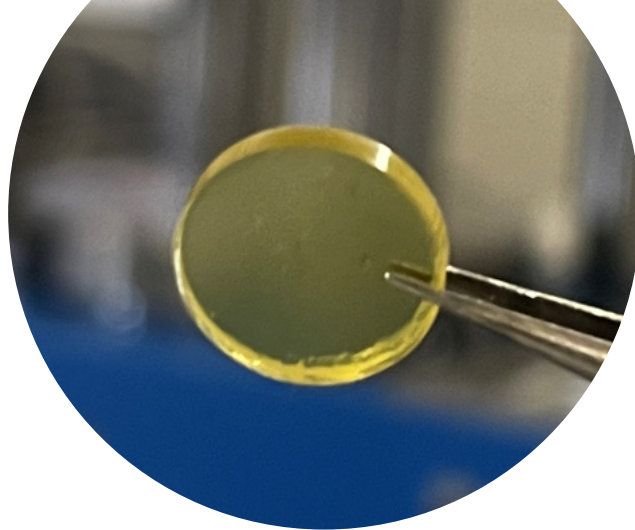
In their recent experiment, the researchers connected calcium carbonate oligomers with an organic molecule, thioctic acid, resulting in a material that is hard like ceramic but can also recover its shape like rubber. Remarkably, it can be remolded under high temperature and pressure, suggesting potential for recycling.

This "elastic-ceramic-plastic" offers promising applications in areas like durable smartphone screens and medical materials. LIU envisions this innovation as the first in a new family of materials that merge organic and inorganic chemistry at the molecular level, potentially leading to more substances with unique, paradoxical properties.

## **ZJU scientists develop approach to transforming polyurethane forms into high-value 3D printing resins**

Prof. XIE Tao's team from the College of Chemical and Biological Engineering has demonstrated a groundbreaking approach to upcycling commodity thermoset polyurethane foams to manufacture high-value, high-performance 3D photo-printing resins. Their findings, published in *Nature Chemistry*, address the environmental challenge posed by polyurethane foams, which often end up in landfills or are incinerated. Initially used for airplane seat safety, polyurethane foams have become ubiquitous, with global annual production exceeding 12 million tons.

Traditionally, recycling these foams involved high-temperature degradation, an inefficient and wasteful process. XIE Tao's team discovered that polyurethane foams, thought to be immutable, actually contain dynamically reversible bonds. This insight led to a simpler process of heating the foams with a solvent and catalyst, transforming them into dissolvable oligomers. These oligomers are then chemically modified into high-performance 3D photo-printing resins, a process that is more cost-effective and environmentally friendly than previous recycling methods. This innovation not only reduces recycling costs but also offers a method to create various high-value products, marking a significant step in managing plastic waste.



## **International Training Workshop of Waste to Energy**

On November 8, 2023, the "7th International Training Workshop of Waste to Energy" concluded successfully. Jointly organized by Zhejiang University, Zhejiang University of Technology, and the International Consultant Committee of Waste to Energy (ICCWTE), the 15-day workshop combined online and offline formats. It trained 35 participants from 20 countries, including Bangladesh, Ecuador, Egypt, Ghana, India, and others, on various aspects of waste-to-energy technology.

The workshop covered China's waste disposal policies, waste treatment technologies, pollutant control, and operational management of waste incineration plants, with a focus on practical learning through virtual site visits. Renowned companies provided in-depth reports and shared experiences in areas like VR site touring and operational management. Participants highly praised the workshop, noting that learning China's technology and experience would help their countries improve waste disposal efforts.

Since 2016, this annual workshop has trained 151 high-level participants from 27 countries, establishing significant international impact and success in promoting waste-to-energy technologies and practices globally.



• Credit: Pixabay



# SDG 10



# REDUCED INEQUALITIES

Reduce inequality within and among countries



**28**

RELATED  
RESEARCHERS IN ZJU

**289**

NUMBER OF  
PUBLICATIONS

**2.11%**

PERCENTAGE OF ALL  
CHINESE PUBLICATIONS

**8**

RANKING AMONG  
CHINESE UNIVERSITIES

**44.64%**

PERCENTAGE OF  
INTERNATIONAL CO-AUTHORED

**1.45**

CITATION IMPACT

**6**

NUMBER OF PUBLICATIONS  
IN TOP 1%

**28**

COURSES COVERING  
THIS GOAL

## SAHZU receives top government award for charity

The 12th China Charity Awards announced its 2023 awardees on September 5. The Mobile Eye Hospital Project of the Second Affiliated Hospital, ZJU's School of Medicine (SAHZU) is highlighted with this top honor for public welfare and charity in China.

For almost thirty years, the SAHZU Mobile Eye Hospital has traveled to more than ten Chinese provinces and regions, covering a cumulative mileage of hundreds of thousands of kilometers. Over 100,000 medical consultations and 10,000 sight-restoration surgeries have been carried out by the project free of charge. It has been considered by many as the oldest branded charity program with the most coverage nationwide.



## International Campus leads in accessibility with comprehensive services and facilities

Zhejiang University's International Campus prioritizes inclusivity, particularly for students with disabilities. This is reflected in its facilities and services designed for safety, convenience, and accessibility.

The campus offers an online guide detailing its accessible features, a 24/7 assistance hotline, and has amenities like reserved parking, accessible pathways, elevators, and restrooms for easy mobility. Accommodations, including student and faculty housing, have been modified with custom interiors and facilities to meet diverse needs. The library provides personalized support, and the campus offers essential assistive devices like wheelchairs and aids such as shower chairs, demonstrating a strong commitment to an inclusive academic environment.

## International Digital Equality Alliance holds inaugural annual meeting

On November 7, 2023, the first Annual Conference of the International Digital Equality Alliance (IDEA) convened in the water town of Wuzhen. Initiated by Zhejiang University and established in 2022, IDEA is dedicated to addressing the challenges of inequality within the global digital economy and society, promoting fairness, justice, and sustainable development in the digital world.

The theme of this year's conference was "From Digital Divide to Digital Opportunity." It brought together renowned scholars and experts in the field of communications from both domestic and international spheres. Experts and scholars from six continents offered in-depth analyses of the global and local scenarios of digital inequality, examining issues from various angles, including geopolitics, platform culture, public health, gender, the Third World, and wealth disparity.

## China Research Center for Disabled Persons' Information and Accessible Technology

Zhejiang University, in collaboration with the China Disabled Persons' Federation, has established the China Research Center for Disabled Persons' Information and Accessible Technology, the first technology research center outside the China Disabled Persons' Federation system. For the past 15 years, it has developed a range of accessible information systems and platforms, including the China Digital Library for Visual Impairment and Accessible Live Streaming System, providing efficient and precise accessible online information services to over 36 million registered disabled individuals in China.

The lab is committed to research on artificial intelligence to aid in information accessibility, combining cutting-edge technologies like computer vision, speech recognition, and natural language processing. It focuses on accessible intelligent media computing, working on projects such as accessible assistive glasses for blind people, text recognition, and automated accessibility testing for websites. Moreover, the Center has formed a joint working group with the China Disabled Persons' Federation and other organizations to develop information accessibility technology standards, some of which are currently used nationwide.

# SDG 11



# SUSTAINABLE CITIES AND COMMUNITIES

Make cities and human settlements  
inclusive, safe, resilient and sustainable

**494**

RELATED  
RESEARCHERS IN ZJU

**10340**

NUMBER OF  
PUBLICATIONS

**2.48%**

PERCENTAGE OF ALL  
CHINESE PUBLICATIONS

**4**

RANKING AMONG  
CHINESE UNIVERSITIES

**34.92%**

PERCENTAGE OF  
INTERNATIONAL CO-AUTHORED

**1.46**

CITATION IMPACT

**275**

NUMBER OF PUBLICATIONS  
IN TOP 1%

**369**

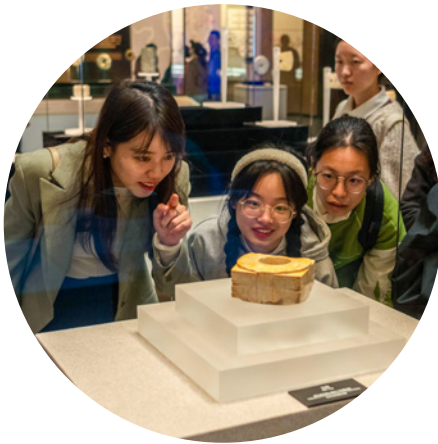
COURSES COVERING  
THIS GOAL



Scan to watch ZJU's Chinese Architecture Course.

## China New Urbanization Research Institute

Established in 2016, China New Urbanization Research Institute is a research institution under Zhejiang University. In 2022, it was selected as a provincial level think tank. The institute focuses on major theoretical, practical, and policy issues of China's new urbanization, fully leveraging the policy coordination role of the National Development and Reform Commission and the comprehensive scientific research advantages of ZJU. It brings together various forces from enterprises, society, and others to provide theoretical and technical support for promoting China's new urbanization plan.



## Unraveling the enigma of Liangzhu civilization

The Archaeological Ruins of Liangzhu City stands as a sacred testament to the rich history of Chinese civilization, spanning an impressive five millennia. The site showcases the world's earliest flood control dam system, and China's earliest palace city and triple-structure layout. It is also the place for collecting the flame for the Hangzhou Asian Games.

In 2019, Liangzhu Ancient City achieved a momentous milestone by being inscribed on the UNESCO World Heritage List. Around the same time, LIU Bin, former director of the Archaeology Department at the Zhejiang Provincial Institute of Cultural Relics and Archaeology, who found traces of Liangzhu Ancient City, joined Zhejiang University, paving the way for the launch of an undergraduate program in archaeology. In 2023, the program gained formal approval from the Ministry of Education.

In recent years, ZJU and the Liangzhu Site Archaeology and Conservation Center have collaborated in various ways in a bid to further unravel the enigma. The team led by Prof. CHEN Hong from the School of Arts and Archaeology owns China's largest lab on microscopic traces. The team has been dedicated to analyzing the traces of jade artifacts, revealing a series of important issues related to ancient human behavior, resources and environment, livelihood patterns, and social conditions.



## Transport Systems and Environment Lab

Transport Systems and Environment Lab is led by Dr. Simon Hu and is part of the Zhejiang University-University of Illinois Urbana-Champaign Institute (ZJU-UIUC). With an interdisciplinary team of researchers, its areas of interest include Transport Systems, Autonomy, Environment and Logistics. Research at the Lab helps to improve understanding between the real-world operation of transport systems and their measurable social, economic and environmental impacts.

## Insights into urbanization and food security debate

Urbanization has often been considered a threat to food security since it is likely to reduce the availability of croplands. In 2021, researchers from Zhejiang University, City University of Hong Kong, the Australian National University, the University of Melbourne, the UK Centre for Ecology & Hydrology and the University of Exeter Medical School published a paper named "Urbanization can benefit agricultural production with large-scale farming in China" in *Nature Food*.

Using spatial statistics and scenario analysis, the team shows that an increase in China's urbanization level from 56% in 2015 to 80% in 2050 would actually release 5.8 million hectares of rural land for agricultural production, equivalent to 4.1% of China's total cropland area in 2015. Even considering the relatively lower land fertility of these new croplands, crop production in 2050 would still be 3.1–4.2% higher than in 2015. In addition, cropland fragmentation could be reduced with rural land release and a decrease in rural population, benefiting large-scale farming and environmental protection. To ensure this, it is necessary to adopt an integrated urban-rural development model, with reclamation of lands previously used as residential lots. These insights into the urbanization and food security debate have important policy implications for global regions undergoing rapid urbanization.

# SDG 12



# RESPONSIBLE CONSUMPTION AND PRODUCTION

Ensure sustainable consumption and production patterns



Scan to check out ZJU Sustainability Month event.

**142**

RELATED  
RESEARCHERS IN ZJU

**1946**

NUMBER OF  
PUBLICATIONS

**2.23%**

PERCENTAGE OF ALL  
CHINESE PUBLICATIONS

**11**

RANKING AMONG  
CHINESE UNIVERSITIES

**26.72%**

PERCENTAGE OF  
INTERNATIONAL CO-AUTHORED

**1.26**

CITATION IMPACT

**24**

NUMBER OF PUBLICATIONS  
IN TOP 1%

**164**

COURSES COVERING  
THIS GOAL

## Predicting customer intentions: a game-changer for sales

CHEN Gang, a distinguished associate research fellow in the Department of Data Science and Engineering Management at the School of Management and his team have dedicated their attention to addressing various challenges in voice customer service dialogues. Their latest scientific research "A Theory-driven Deep Learning Method for Voice-chat-based Customer Response Prediction" has been published in *Information Systems Research* (one of the UTD24 journals) and offers promising solutions to help merchants overcome difficulties and achieve their desired outcomes. The research focuses on the "online voice customer invitation dialogue scenario" and presents a comprehensive model that enables merchants to gain a deeper understanding of consumers' preferences and purchase intentions. This valuable insight provides an important reference value for enhancing customers' purchase conversion rates, ultimately leading to improved business performance.

## Is it ethical to deceive or manipulate users through monetary incentives?

The latest research conducted by Professor WANG Qiuzhen and researcher PENG Xixian from the School of Management was conducted on the app store market and tactics used to increase user traffic on apps.

One of the most commonly used strategies for these apps is the implementation of a reward system based on invitation of new friends and new users: Referral Reward Program (RRP).

The research reveals the disadvantages of monetary reward and explores how to design non-monetary rewards to achieve the best publicity effect focusing on the nature of these rewards and classifying them in three categories: high, medium and low fit, where "fit" stands for the reward's alignment to the app itself, revealing that "medium-fit" rewards are the most efficient ones for the potential recommendation of the app.



## Student association makes technology accessible and sustainable

The Student E Volunteer Association of Zhejiang University has been providing free repair services for ZJUers, for nearly 40 years. Every day, members are on duty here to help repair various equipment for teachers and students of the university. They don't just repair computers; they also fix USB drives, desk lamps, electric fans, and even electronic keyboards. In addition to their campus services, the Association extends their outreach to the surrounding neighborhoods. Their community service initiatives have been benefiting residents in five districts and more than twenty communities in Hangzhou. Through their commitment to repairing and educating individuals about technology, the Student E Volunteer Association has fostered a more accessible and sustainable future. During 2023, the Association has repaired a total of 1,764 devices, boasting a success rate of over 90%. and the number continues to grow each year, highlighting their impact and dedication to sustainable technology.

## Research proves honesty level of Chinese citizens

Professor ZHOU Xinyue from the School of Management and Professor Qian Yang from the School of Public Health have improved the 2019's article "Civic Honesty Around the Globe" by foreign researchers Cohn et al., that shockingly placed Chinese as the least honest among 40 countries, and found a new parameter to take into consideration. The previous study had "the return of a lost wallet" as case study and was limited by only an "e-mail response rate" as per returning method of the wallet. The two Professors found the parameter limited and conducted in-depth research on the issue. They included the "cultural dimension" in their study and incorporated a social culture perspective by adding a "wallet recovery rate". The research received a high response of cases of wallets handled in real-time. They also conducted a formal survey to understand other ways citizens would handle these wallets.

ZHOU Xinyue and her team found that the "wallet recovery rate" reached 77.8%, thus proving that the honesty level of Chinese citizens is much higher and therefore revealing the underlying flaws of Cohn et al.'s study.



# SDG 13



# CLIMATE ACTION

Take urgent action to combat climate change and its impacts

**334**

RELATED RESEARCHERS IN ZJU

**6385**

NUMBER OF PUBLICATIONS

**2.40%**

PERCENTAGE OF ALL CHINESE PUBLICATIONS

**8**

RANKING AMONG CHINESE UNIVERSITIES

**41.24%**

PERCENTAGE OF INTERNATIONAL CO-AUTHORED

**1.37**

CITATION IMPACT

**173**

NUMBER OF PUBLICATIONS IN TOP 1%

**73**

COURSES COVERING THIS GOAL



Scan to watch how ZJU scientists solve fertilizer pollution while feeding the world.



## 🔗 Scientists elucidate emission mechanism of standardized driving behavior

Prof. CHEN Xiqun, Vice Dean of Zhejiang University-University of Illinois Urbana-Champaign Institute (ZJU-UIUC) and director of ZJU's Institute of Intelligent Transportation Systems, has published a paper titled "Future Reductions of China's Transportation Emissions Impacted by Changing Driving Behavior" in *Nature Sustainability*. The paper explores the emission mechanisms of standardized driving behavior and has been selected as a highlight in the journal. In addition, a research briefing titled "Impact of Aggressive Driving on Transport Emissions in China" was also published simultaneously. The author calculates the emissions from driver behavior and projects the potential reduction in carbon emissions through behavioral changes. The findings show that by 2050, it is possible to prevent 400.5 million tons of CO<sub>2</sub> emissions. This research emphasizes the importance of improving driving behavior to mitigate transport emissions and highlights the need for interventions to promote sustainable driving practices. It contributes to the literature by addressing the often-neglected role of human behavior in sustainability efforts.

## 🔗 Increased antibiotic resistance linked to higher air pollution

A study by ZJU researchers indicates that meeting WHO air quality guidelines by 2050 could result in a 17% reduction in antibiotic resistance and prevent 23% of associated premature deaths. Achieving this target would also lead to annual economic savings of \$640bn. The analysis of data from 116 countries between 2000 and 2018 reveals a strong correlation between rising air pollution and increased antibiotic resistance. The study utilized data on 11.5 million test isolates, nine bacterial pathogens, 43 types of antibiotics, and various other factors to investigate the influence of these variables on antibiotic resistance levels. Lead author Professor HONG Chen believes that controlling air pollution could have dual benefits: reducing harmful effects of poor air quality and fighting the rise and spread of antibiotic-resistant bacteria.



## 🔗 Two projects earn spots in Tencent's 2023 CarbonX Program TOP30

Two projects made it to Tencent's CarbonX Program TOP30 in Shenzhen among over 300 projects. These projects are centered around "Physical adsorption-based carbon capture technology for high-temperature and high-humidity scenarios" and "Equipment for direct air carbon capture in a flexible, modular, ultra-low-energy way".

One project, led by Chief Scientist Prof. XING Huabin, focuses on physical adsorption-based carbon capture technology for high-temperature and high-humidity scenarios, while the other project, led by Chief Scientist Prof. WANG Tao, involves direct air carbon capture equipment that is flexible, modular, and low-energy. The first project aims to streamline carbon capture processes by using stable adsorbents, reducing energy consumption and costs. The second project utilizes ultra-low-energy moisture swing technology to develop an efficient air carbon capture system. Both projects contribute to emission reduction efforts and the global goal of carbon neutrality.

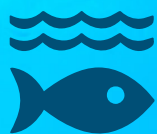


## 🔗 ZJU scientists make new discovery about megalake systems and paleoclimatic dynamics in East Gobi

LI Hongwei and YANG Xiaoping *et al.* at ZJU's School of Earth Sciences, in collaboration with their peers based in China, the USA and Denmark, discovered paleolakes in the East Gobi Desert and reconstructed the hydrological and climatic conditions over the last 120,000 years. Their findings are published in *Nature Communications* and are crucial for predicting future trends in the context of global warming. The researchers identified a large palaeohydrological network consisting of four former lakes, and determined that the winter temperature and precipitation in the area were significantly higher in the past compared to the present. Quite a few scholars attribute Arctic warming to the instability of the westerly jet, thereby inducing cold air to prevail in the mid-latitudes. However, this study indicates that the mid- and high-latitude areas may also become warmer in the years to come. This finding has important implications for the assessment of today's global warming.



# SDG 14



# LIFE BELOW WATER

Conserve and sustainably use the oceans, seas and marine resources for sustainable development

69

RELATED RESEARCHERS IN ZJU

1007

NUMBER OF PUBLICATIONS

2.47%

PERCENTAGE OF ALL CHINESE PUBLICATIONS

9

RANKING AMONG CHINESE UNIVERSITIES

33.10%

PERCENTAGE OF INTERNATIONAL CO-AUTHORED

1.02

CITATION IMPACT

25

NUMBER OF PUBLICATIONS IN TOP 1%

84

COURSES COVERING THIS GOAL

## Why eating fish could make you smarter?

When we speak of fat in food, we will easily associate it with its negative effect of “gaining weight.” However, one type of fat, omega-3 fatty acids, has a “weight-losing” effect. Not only can omega-3 fatty acids reduce fat, but they can also strengthen the brain, regulate the blood pressure, and ease inflammation. Therefore, they can be found in many health products and infant formula powder. Researchers from ZJU’s School of Medicine and Liangzhu Laboratory teamed up with colleagues from Shandong University to unravel this enigma. Through structural determination, molecular dynamics simulations and mutant screening, researchers discovered the transmission ties connecting ligand pockets with downstream physiological responses. They demonstrated that omega-3 fatty acids were beneficial because they added an instruction to their receptor, allowing the signals that might otherwise go in other direction to “turn around” and take a pathway beneficial for metabolism. The understanding of the mechanisms for fatty acids can pave the way for scientists to engage in precise molecular design and develop fatty acid supplements or drugs that are beneficial to human health.



## Role of hydrodynamics for spatial distribution of biological communities in deep ocean

Active hydrothermal vents provide the surrounding submarine environment with substantial amounts of matter and energy, thus serving as important habitats for diverse megabenthic communities in the deep ocean and constituting a unique, highly productive chemosynthetic ecosystem on Earth. Vent-endemic biological communities gather near the venting site and are usually not found beyond a distance of the order of 100 m from the vent. This is surprising because one would actually expect matter ejected from high-temperature vents, which generate highly turbulent buoyancy plumes, to be suspended and carried far away by the plume flows and deep-sea currents. ZJU researchers studied this problem from a fluid dynamics perspective. They found that both low- and high-temperature vents deposit most vent matter relatively close to the plume. In particular, the tendency of turbulent buoyancy plumes to carry matter far away is strongly counteracted by generated entrainment flows back into the plume stem. The deposition ranges of organic and inorganic hydrothermal particles obtained from the simulations for various natural high-temperature vents are consistent with the observed maximum spatial extent of biological communities, evidencing that plume hydrodynamics exercises strong control over the spatial distribution of vent-endemic fauna.

## Growing centimeter-scale fish fillets in lab

A team of ZJU researchers have successfully grown China’s first centimeter-scale fish fillets in the lab using advanced technologies like stem cell isolation and tissue construction, pointing the way for sustainable meat supply on the market. Using the large yellow croaker as the research object, researchers isolated its muscle and fat stem cells. Meanwhile, a three-dimensional culture of muscle fiber bundle is made based on the bionic construction of fish muscle scaffolds, leading to the manufacture of tissue-like cell culture fish meat was realized. Cell-cultured meat is considered to be one of the technologies with the most potential to solve the future human table meat and protein supply and reduce the high dependence of artificially raised meat animals on water and land resources. “The high-quality protein and unsaturated fatty acids contained in marine fish have positive effects on human health. In the future, this technology may provide broader support for the supply of meat and animal protein on the human table, and it will also contribute to the protection of marine fish resources,” said Prof. LIU Donghong, professor of food engineering and leading researcher working on the project.



# SDG 15



## LIFE ON LAND

Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

**114**

RELATED  
RESEARCHERS IN ZJU

**1882**

NUMBER OF  
PUBLICATIONS

**1.83%**

PERCENTAGE OF ALL  
CHINESE PUBLICATIONS

**11**

RANKING AMONG  
CHINESE UNIVERSITIES

**44.37%**

PERCENTAGE OF  
INTERNATIONAL CO-AUTHORED

**1.50**

CITATION IMPACT

**65**

NUMBER OF PUBLICATIONS  
IN TOP 1%

**347**

COURSES COVERING  
THIS GOAL

## 🔗 Primate Genome Project unlocks hidden secrets of primate evolution

Researchers from Zhejiang University and Aarhus University, etc. have jointly led a series of new studies into high quality reference genomes from 50 primate species, of which 27 were sequenced for the first time. These studies provide new insights on the speciation process, genomic diversity, social evolution, sex chromosomes, and the evolution of the brain and other biological traits. With 27 new primate genomes assembled from long-read sequencing technology, the team has doubled the number of primate species with full genome sequences available. Comparative genomic analyses reveal genomic changes that have driven the evolution of the brain, social systems and other traits. Comparative genomics analysis also shows pervasive conflict between the evolutionary history of individual genes and the speciation history of primates. From this incomplete lineage sorting a rich history of natural selection and the number of breeding individuals over the past 80 million years can be inferred. Researchers also reported the first example of homoploid hybrid speciation in primates. Their study strongly suggests that the gray snub-nosed monkey was derived from hybridization event between golden snub-nosed monkey and Black-and-white snub-nosed monkey. It highlights an underappreciated role of hybridization in new species formation and phenotypic diversity in mammals.



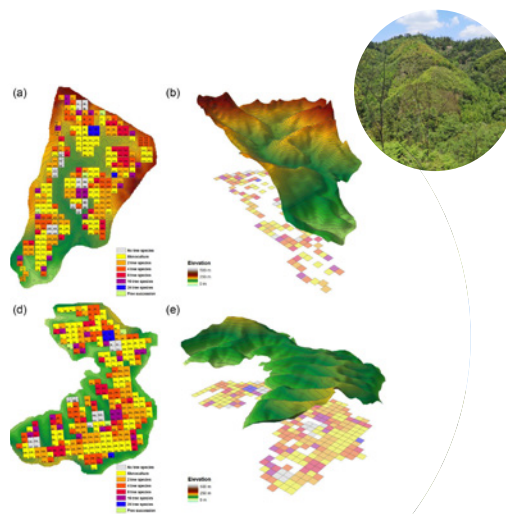
• Credit: QIYANG Guanhai

## 🔗 Tree species richness increases spatial variation but not overall wood decomposition

Deadwood contains 10-20% of the global forest carbon stocks, and variations in their decomposition rate produce a huge impact on regional and even global carbon emissions. Various anthropogenic factors, such as afforestation methods and tree species selection, may accelerate the decomposition rate of woody debris and undermine the efficiency of natural carbon sinks. Researchers from the College of Life Sciences investigated the relationship between tree species richness and wood decomposition. They found that plot species richness increased the spatial variation of wood decomposition but decreased its mean rate. At a finer spatial scale, neighborhood tree species richness could decrease termites' activities during the early decay stage by lowering understory temperature and thus reduce wood decomposition rates. Moreover, different combinations of neighborhood tree species resulted in a significant distinction among microhabitats, which in turn led to spatial heterogeneity in decomposer activities and eventually wood decomposition rates. This study highlights that in young and regenerating subtropical forests where termites are major wood decomposers, tree species richness could remarkably reduce wood decomposition rate, thus effectively mitigate carbon emissions. Furthermore, tree species richness could promote the spatial heterogeneity of wood decomposition, which could contribute to the diversity and long-term coexistence of decomposer communities.

## 🔗 Student club committed to biodiversity conservation

Biodiversity is essential for both aesthetic and cultural factors; it provides a rich heritage and a sense of identity for many places and their inhabitants, including people. In a response to obtaining more knowledge on biodiversity, a group of young eco enthusiasts residing on ZJU's International Campus have established a students' club with a mission to do their best at ensuring a sustainable environment for various creatures and plant species. The Eco Club members are driven by the idea that promoting biodiversity is crucial for maintaining the health and stability of the environment in various ways: from flower pots on our windowsills to gardens, parks, cities and so on. They launched a bio-investigation project in May 2022 to discover and list as many plants as can be found on the International Campus. The students have found more than 250 plant species, which belong to 81 plant families. Next, they will use the same procedure to investigate bird species.



# SDG 16



# PEACE, JUSTICE AND STRONG INSTITUTIONS

Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all level



8

RELATED  
RESEARCHERS IN ZJU

77

NUMBER OF  
PUBLICATIONS

2.80%

PERCENTAGE OF ALL  
CHINESE PUBLICATIONS

11

RANKING AMONG  
CHINESE UNIVERSITIES

38.96%

PERCENTAGE OF  
INTERNATIONAL CO-AUTHORED

1.27

CITATION IMPACT

1

NUMBER OF PUBLICATIONS  
IN TOP 1%

66

COURSES COVERING  
THIS GOAL



## Academy of Social Governance

The objective of the Academy is to lead, advocate for, and influence research on social governance in China. Additionally, it provides policy consulting services to enhance and innovate the social governance framework. The primary focus areas of the institute include advancing theories on social governance, legal studies related to social governance, social organizations and their role in social governance, and grass-roots-level social governance. The Academy has published the esteemed *Journal of Chinese Governance*, which was selected for inclusion in the Social Sciences Citation Index (SSCI) in July 2020. This journal serves as a crucial platform for documenting governance in China and promoting a global understanding of Chinese governance practices.

## ZJU holds International Forum on Rule of Law and Reform

The Ninth International Prominent Forum on the Rule of Law and Reform was held in Hangzhou on November 8, 2023. This year's forum, organized by Zhejiang University and overseen by the China Law Society, centered on the theme of Legal Education and Legal Theory Research in the New Era. Distinguished scholars and practitioners from renowned universities were extended invitations to participate, engaging in discussions on cutting-edge topics related to the cultivation of high-quality legal professionals for the advancement of the rule of law in the modern age. They also explored practical approaches to provide theoretical and intellectual support for the future construction of the rule of law.



## ZJU and Oxford researchers joined force to explain and predict peacekeeping operations effectiveness

This project, led by researchers Andrea Ruggeri from Oxford University and Andre Python from Zhejiang University, analyzed the effectiveness of peacekeeping operations between 1994 and 2019 through theoretically-informed interpretable machine learning algorithms. Complex forms of political violence at policy-relevant scales were reasonably predicted and explained. Furthermore, results showed the interpretability of these algorithms can foster trust between modelers and policymakers, a crucial factor for realizing the full potential of these promising techniques.



## ZHAO Xuehong: first nurse from ZJU to receive Florence Nightingale Medal

On May 12, 2023 the International Committee of the Red Cross announced the recipients of the Florence Nightingale Medal for the year 2023. Among the 37 recipients from 22 countries was ZHAO Xuehong, deputy director of the Nursing Department at the First Affiliated Hospital, ZJU's School of Medicine (FAHZU) and chairperson of the Disaster Nursing Professional Committee, Zhejiang Nursing Association. This remarkable achievement marks a historic milestone as she becomes the first nurse from Zhejiang University to receive this esteemed medal.

ZHAO Xuehong has consistently displayed exceptional courage and dedication in the face of disastrous situations such as SARS, the Wenchuan earthquake, H1N1 influenza, H7N9 avian influenza, the Ebola epidemic in Liberia, and the COVID-19 pandemic. With love, attentiveness, patience, and a sense of responsibility, she has illuminated the nursing profession with the brilliance of her humanity. In response to urgent needs of those affected, she has challenged and surpassed herself, pioneering innovative initiatives to improve and promote high-quality nursing.

# SDG 17



# PARTNERSHIP FOR THE GOALS

Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development



Scan to watch E-seed designed by ZJU and its partners in the US.



## Zhejiang University hosts 3rd Sino-German Sustainable Development Forum in Berlin

On November 14, 2023 Zhejiang University played host to the 3rd Sino-German Sustainable Development Forum in Berlin, Germany. The forum, co-organized by the Marie Curie Alumni Association, convened a galaxy of experts and scholars from 10-plus institutions in China and Germany, including ZJU, Humboldt-Universität zu Berlin, the Charité Universitätsmedizin Berlin, Technische Universität Dresden, Otto von Guericke University Magdeburg, the German Federal Environment Agency, and the Project Management Agency at the German Aerospace Center. Together, they delved into in-depth discussions encompassing critical themes such as climate change and governance, technology and sustainability, global health and well-being. The objective was to explore effective pathways for Sino-German cooperation in promoting sustainable development. Aligned with A Global ZJU for Social Good (Z4G), the forum actively responds to the United Nations' 2030 Agenda for Sustainable Development. With the tenet of transnational, interdisciplinary, and cross-border collaboration, the forum is committed to creating a bilateral academic dialogue mechanism and a platform for cultural exchange, injecting new momentum into the development of Sino-German scientific research cooperation.

## President DU Jiangfeng leads a delegation to visit Europe

From November 16 to 21, 2023, Prof. DU Jiangfeng, President of Zhejiang University, led a delegation to visit Europe in a bid to forge deep partnerships for global sustainable development. During this trip, the delegation was warmly welcomed by important partners including the University of Oslo, KU Leuven and Ghent University. President DU, on behalf of ZJU, signed new cooperative agreements with the University of Oslo, represented by Rector Svein Stølen, as well as with KU Leuven, represented by Vice Rector Peter Lievens. As Secretary General of the Association of University Presidents of China (AUPC), President DU had a virtual meeting with Prof. Kurt Deketelaere, Secretary General of the League of European Research Universities (LERU). Both sides acknowledge the importance of revitalizing interaction and cooperation between higher education communities of China and Europe and looked forward to more joint efforts toward the SDGs.

## Joint statement gains new support

In December 2023, the University of Glasgow became the 62th university that has endorsed the Joint Statement on Sustainable Development initiated by Zhejiang University.

On March 30, 2021 university presidents from 30 countries unite for the first time to announce action on climate change by signing the Joint Statement of Global University Leaders on the 2030 Agenda for Sustainable Development, witnessed by UN officials. At the first global online forum for university leaders, hosted by ZJU in China, presidents from 56 universities across six continents have committed to working together to meet the SDGs. The initiative includes five key aspects which all signatories have agreed to: implementing the concept of sustainable development, improving sustainable development competence, supporting scientific research in response to global challenges, working with global partners to provide innovative solutions and constructive transnational cooperation on specific issues.

### Number of collaborations for SDG publications between 2018 and 2022

170+

170+ countries/regions collaborated on publications

113

>10

113 countries/regions collaborated on >10 publications

#### Top10 countries



USA



UNITED KINGDOM



AUSTRALIA



GERMANY



CANADA



SINGAPORE



JAPAN



PAKISTAN



SWEDEN



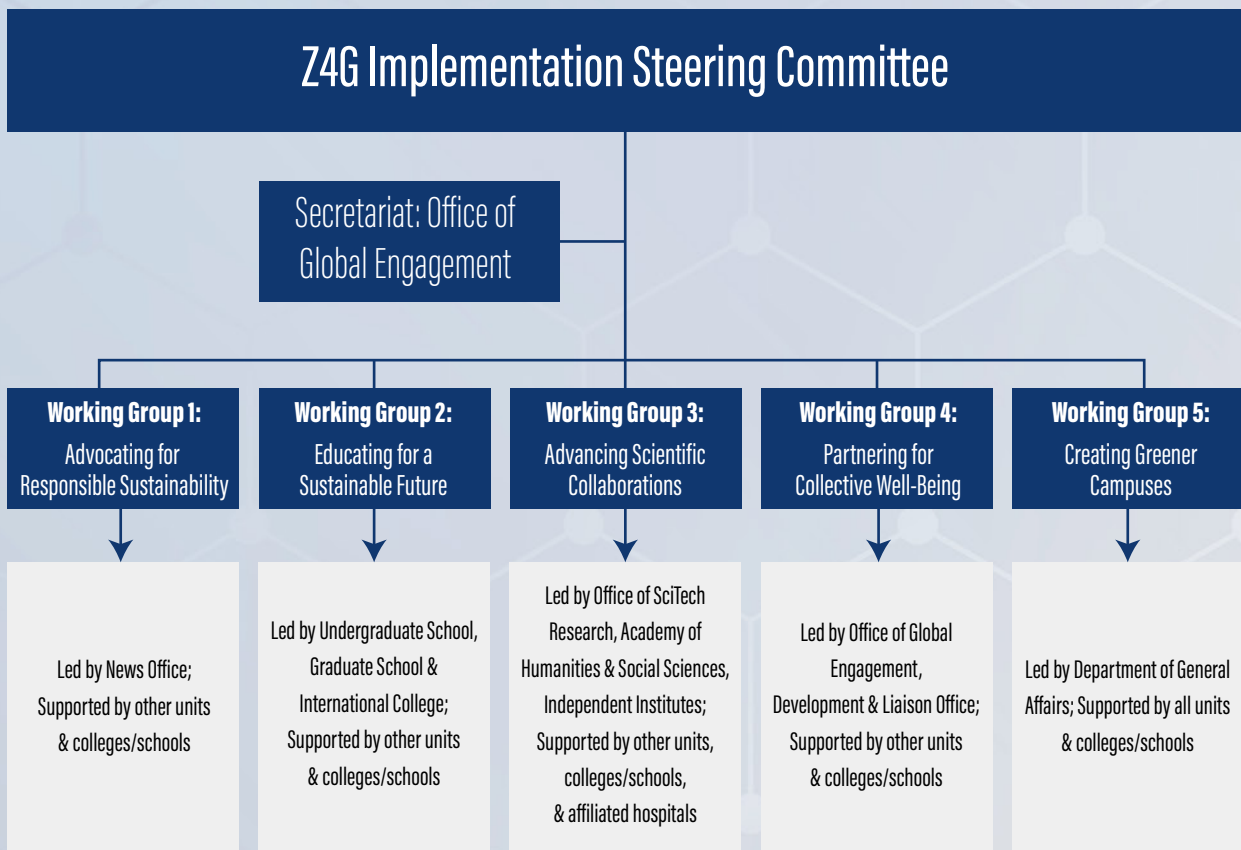
ITALY



# ZJU SUSTAINABILITY ACTION PLAN

Universities are particularly well-placed to contribute to the creation of a sustainable future through their teaching and research activities. As a socially responsible and globally-minded higher education institution, Zhejiang University (ZJU) aspires to make a distinctive and positive impact by strengthening its commitment to the SDGs.

In order to enhance our engagement with the SDGs, we are adopting a Sustainability Action Plan: A Global ZJU for Social Good (Z4G). Z4G establishes five objectives and associated actions to improve our sustainability-related education, research, and practices within the ZJU community and among other stakeholders in China and beyond. These five dimensions are as follows:





**Advocating for Responsible Sustainability.** The University aims to ensure that the concept of Sustainability is deeply rooted in the culture of our community.



**Educating for a Sustainable Future.** We integrate the sense of sustainability into our education, by proactively adapting to the new educational paradigm driven by information technology and cognitive science.



**Advancing Scientific Collaborations.** We launched a university-wide initiative, Innovation 2030, to encourage multi-disciplinary research on tackling big challenges.



**Partnering for Collective Well-Being.** Sustainable development calls for collective resolve, wisdom, and action.



**Creating Greener Campuses.** We aim to position ZJU as a pioneer of low-carbon action and transform our campuses into resource-conserving and eco-friendly living laboratories.

# APPENDIX: METHODOLOGY

» **Representative case studies were identified by** reviewing lists of institutes, programs and student groups in Zhejiang University. Web searches using key terms from the SDGs were also conducted to identify programs included on those lists.

» **Publication data sets for each SDG were created** using preloaded Research Area entities in SciVal and were filtered to include only publications by authors affiliated with Zhejiang University from 2018-2022. The search query methodologies for each SDGs are publicly available from SciVal.

» **Faculty researchers associated with each of the SDGs were identified** through the SciVal bibliometric analysis, which identified Zhejiang University publications.

» **Undergraduate and graduate courses related to the SDGs were identified** using keyword searches of course descriptions, followed by a manual review of the course descriptions with keyword matches to ensure accurate alignment with the SDGs.

*Image: Zhijiang Campus of ZJU is renowned as one of China's most beautiful campuses, distinguished by its enchanting natural setting and rich cultural heritage. It boasts a landscape of lush trees and serene streams, and is home to 22 nationally protected historical buildings.*



# MAKING A POSITIVE IMPACT ON THE WORLD



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<https://www.zju.edu.cn/english/sustainability/>

*Image credit: ZJU staff and students*



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