

Ocean University of China

NEWSLETTER

Fall 2019 &
Spring 2020
Issue 5



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OCEAN UNIVERSITY OF CHINA



**Fall 2019 &
Spring 2020,
Issue 5**

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CONTENTS

News & Events

Academic

- GV-971, a New Solution to the Alzheimer's, was Approved to Market(4)
- A New Discovery Made by OUC's Protozoology Team in Tetrahymena(5)
- Marine Life Sciences & Technology* Published Inaugural Issue.....(5)
- OUC Won Two State Science and Technology Awards in 2019(6)
- Nature Climate Change* Publishes the Latest Research on the Control of Atlantic Multidecadal Variability on North Pacific Subtropical¹ Mode Water(6)
- OUC Publishes in *Nature Ecology & Evolution* its Latest Research Results on the Evolutionary Origin of Marine Larvae(7)
- Nature Climate Change* Publishes OUC's Latest Research Results on Synchronized Tropical Pacific(8)
- OUC's Key Laboratory of Physical Oceanography Publishes in *Science* on the New Mechanism of the Strengthening of the Kuroshio Current(8)

Conferences

- Ocean University of China and Saint Petersburg State University Co-hosted the 8th China-Russia Arctic Forum(9)
- Ocean University of China Held the Fourth Forum on Science, Humanities and Future(10)
- International Top-level Forum on Pioneering and Innovative Development of Science and Technology in Ocean Engineering and Hydraulic Engineering Held in Qingdao(11)
- The 4th Symposium on the Oceans in National Income Accounts Held in Qingdao(11)
- The 8th International Oyster Symposium Held in

- Qingdao(12)
- The 17th International Academic Conference on Historical Relations between China and Ryukyu Held at Ocean University of China(12)

Visits

- Oklahoma State University President Burns Hargis Visits OUC..... (13)
- President Yu Zhigang Visits Universiti Malaysia Terengganu and Inaugurates OUC-UMT Joint Ocean Research Center(14)
- Alexander Sokolov, Rector of Moscow Tchaikovsky Conservatory, Visits OUC(14)
- President Yu Zhigang Visits University of Bergen(15)

Spotlight

- Haide College: A Pioneering Exploration of Ocean University of China in Sino-foreign Cooperative Education (17)
- Dong Fang Hong 3 Successfully Completed the First Comprehensive Scientific Expedition in the Deep and High Seas of Western Pacific(19)

People

- Building a Transparent Global Community for the Sustainable Development of the Ocean: Academician Wu Lixin, a Leading Researcher in Marine Science(22)
- Academician Bao Zhenmin, a Leading Researcher in Scallops and his Academic Pursuit(26)

Voices

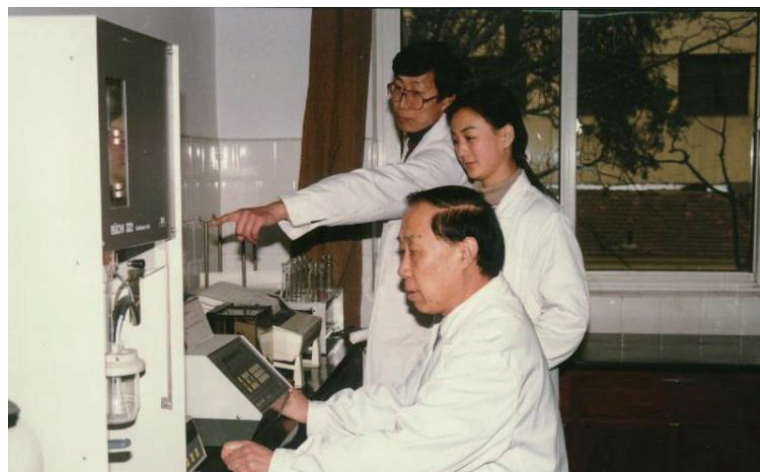
- OUC Delegation to Syracuse(29)
- My Thoughts on Online Learning(33)

News & Events

Academic

GV-971, a New Solution to the Alzheimer's, was Approved to Market

Recently the National Medical Products Administration approved the application of GV-971 to be registered. The drug improves cognitive abilities of patients with mild to moderate Alzheimer's disease (AD). GV-971 is the product of a 22-year study led by Ocean University of China (OUC). It is the first new medicine in the past 17 years with the potential to treat AD, bringing new hopes to millions of AD patients and their families. The approval of GV-971 greatly enhances China's ability to develop original



drugs, representing the huge potential for exploring the ocean as a medical resource. It is believed that

more original advancements in marine science and technology will benefit our society in the new era.■

A New Discovery Made by OUC's Protozoology Team in *Tetrahymena*

The team led by Prof. Gao Shan and Academician Song Weibo of OUC's Institute of Evolution and Marine Biodiversity, made a new discovery in its research of *Tetrahymena thermophila*, a unicellular eukaryote. The study reveals DNA N⁶ - Adenine Methyltransferase 1 (AMT1), which is unique to eukaryotes, and explores its functions. The research

was published on November 13, 2019 in *Nucleic Acids Research*. The study was mostly conducted by Wang Yuanyuan, Sheng Yalan and Liu Yongqiang, doctoral candidates at OUC, and Prof. Gao Shan is the corresponding author. The project has been funded by the National Natural Science Foundation of China and other state and provincial foundations.■

Marine Life Sciences & Technology Published Inaugural Issue

Marine Life Science & Technology (MLST) is an English journal, co-published by OUC and the Pilot National Laboratory for Marine Science and Technology (Qingdao). Its first issue was recently published, contributing to international academic exchanges in this field. MLST will encourage interdisciplinary studies of high impact, and serve as a platform for new discoveries in basic marine biology, marine biotechnology and marine fishery resources. The inaugural issue consists of 11 articles, including 1 editorial, 8 reviews and 2 research articles. These articles, available on the homepage of Springer Nature, have been rigorously reviewed and revised, possessing high academic value.■



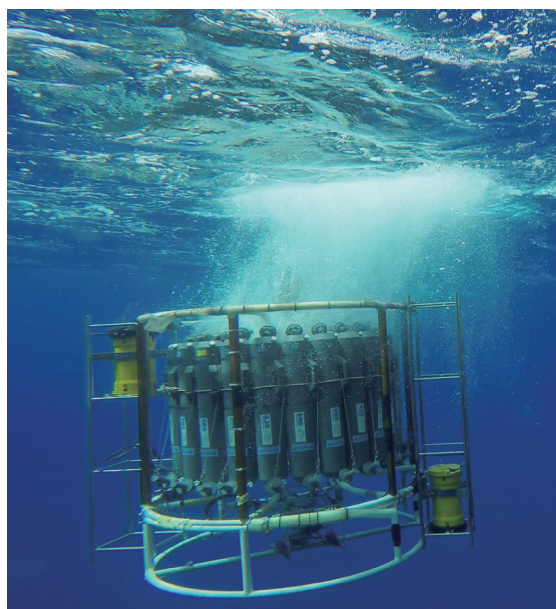
OUC Won Two State Science and Technology Awards in 2019

On Jan. 10, 2020, China's State Science and Technology Awards ceremony was held in Beijing. National leaders presented awards to the winners. OUC won two State Science and Technology Awards. Academician Li Huajun, OUC's Vice President and leader of one of the award-winning projects, was invited to the ceremony. The project led by Academician Li, which centers around "new structure design for coastal and shallow waters, and key construction and safety technologies", won the

second prize of the State Science and Technology Progress Award. Another project, which focuses on the "key technologies and methods in dealing with red tide emergencies in coastal waters", won the second prize of State Technology Invention Award. Prof. Yu Zhigang, OUC's President is the second prize-winner of this project. The awards demonstrate OUC's strong innovation capability and momentum, which are important to its endeavor of becoming a world-class university. ■

Nature Climate Change Publishes the Latest Research on the Control of Atlantic Multidecadal Variability on North Pacific Subtropical Mode Water

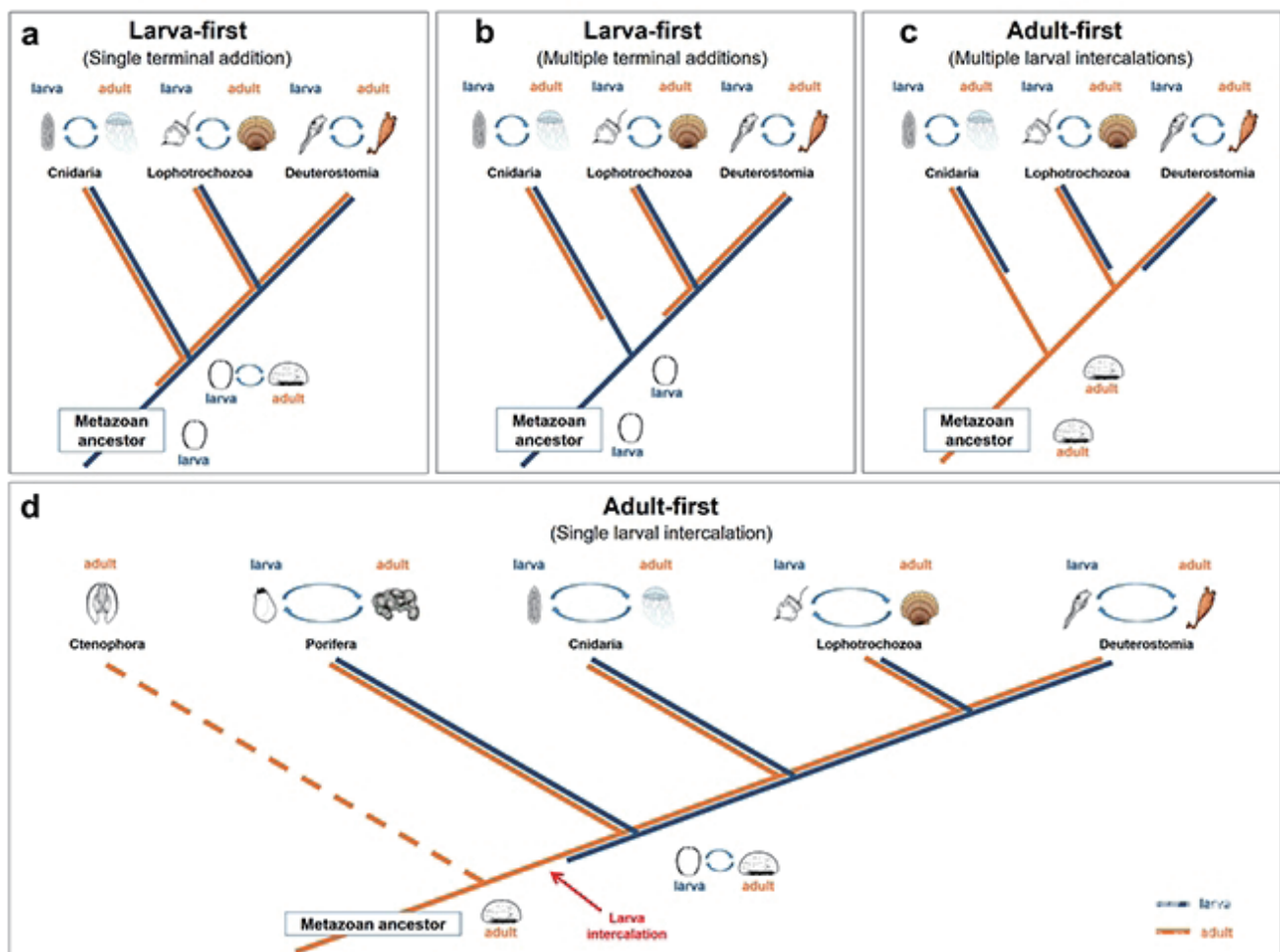
On February 17, 2020, *Nature Climate Change* published the latest research article entitled "North Pacific subtropical mode water is controlled by the Atlantic Multidecadal Variability". This achievement was jointly made by Wu Baolan, a doctoral candidate at OUC and first author of the article, Prof. Lin Xiaopei, the corresponding author, and Prof. Yu Lisan (Woods Hole Oceanographic Institution), the co-author. It is found for the first time that AMV regulates the interannual variation of the subtropical mode water in the North Pacific. The research also highlights the importance of long-term observation of subsurface ocean changes, which is one of the major tasks of the "Transparent Ocean" project. ■



OUC Publishes in *Nature Ecology & Evolution* its Latest Research Results on the Evolutionary Origin of Marine Larvae

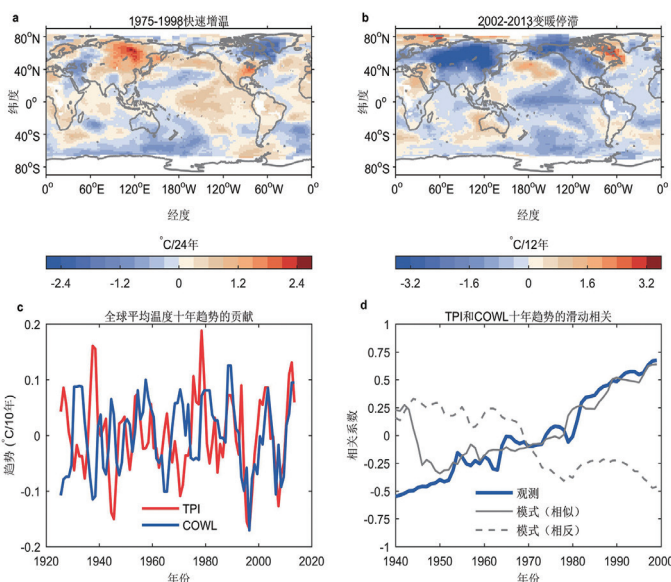
On March 16, 2020, Academician Bao Zhenmin's team at OUC's Key Laboratory for Marine Biogenetics and Breeding under China's Ministry of Education, published the latest research results in *Nature Ecology & Evolution*. The article is entitled "Evolutionary transcriptomics of metazoan biphasic life cycle supports a single intercalation origin of metazoan larvae". This study proposes a new theory

of a single intercalation origin of marine larvae, which negates the current mainstream hypothesis models. By doing so, it provides a new perspective for further understanding the evolution of metazoan biphasic life cycle. It is of great significance to the study on marine animals in terms of evolution, the emergence of diversity and environmental adaptation. ■



Nature Climate Change Publishes OUC's Latest Research Results on Synchronized Tropical Pacific

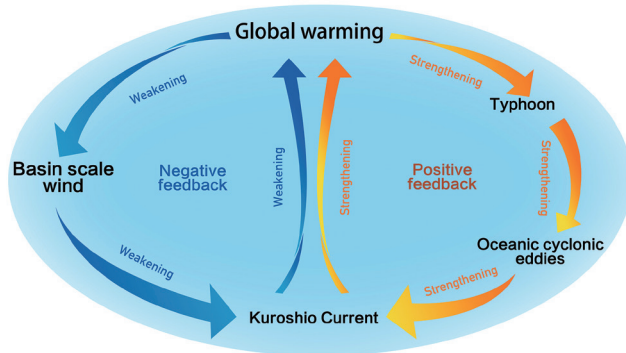
On April 20, 2020, the world's top academic journal *Nature Climate Change* published OUC's latest research results entitled "Synchronized tropical Pacific and extratropical variability during the past three decades". This achievement was jointly accomplished by Dr. Yang Junchao as the first author, Prof. Lin Xiaopei as the corresponding author, Dr. Zhang Yu and Dr. Li Ziguang as co-authors. The study is the first to indicate that the synchronization of tropical and extratropical climate change plays an important role in regulating the stagnation and rapid temperature increase of global warming. ■



OUC's Key Laboratory of Physical Oceanography Publishes in *Science* on the New Mechanism of the Strengthening of the Kuroshio Current

On May 29, 2020, *Science* published an article entitled "Strengthening of the Kuroshio Current by intensifying tropical cyclones" in the form of Research Article. This achievement was made by OUC's Key Laboratory of Physical Oceanography under China's Ministry of Education, with Prof. Zhang Yu as the first author and corresponding author, and Prof. Wang Wei as the co-author. The study is the first to reveal the positive feedback mechanism that typhoon strengthens the Kuroshio Current by influencing ocean gyres, thus aggravating climate warming and further intensifying the typhoon. It is

important to research deeper on this mechanism and include it in the climate model, as it is a key factor to improve the predictability of typhoon intensity and mid to long-term climate in China. ■



Conferences

Ocean University of China and Saint Petersburg State University Co-hosted the 8th China-Russia Arctic Forum

On September 26, 2019, the 8th China-Russia Arctic Forum was jointly held by OUC and Saint Petersburg State University in Sakha (Yakutia) Republic, Russia. Prof. Guo Peiqing, Deputy Director of OUC's Polar Research Institute, delivered a keynote speech. The conference, held within the framework of the "Northern Sustainable Development Forum", focused on the theme of "Arctic Policy in the 21st Century". It attracted more than 100 participants from governments, universities and enterprises of China, Russia, the United States, Canada, France, Iceland, Norway, Finland, South Korea and Japan. The participants had in-depth discussions about the protection, development and governance of the Arctic in the 21st century, with a consensus reached that mutual respect, win-win cooperation and sustainability constitute the main themes of the Arctic policy of this century. ■





Ocean University of China Held the Fourth Forum on Science, Humanities and Future

As part of OUC's 95th anniversary celebrations, the Fourth Forum on Science, Humanities and Future was held on October 19, 2019. Fifteen renowned scientists and sociologists attended the forum and shared their thoughts on the future of humanity with more than 3,000 teachers and students. The forum was spoken high of by the academic community. As

a summit forum for China's communities of science and literature, it has played an important role in promoting the harmonious development of society and strengthening the integration of arts and sciences. It has become one of the brand activities of China's universities. ■



International Top-level Forum on Pioneering and Innovative Development of Science and Technology in Ocean Engineering and Hydraulic Engineering Held in Qingdao

On September 25th and 26th, 2019, the International Top-level Forum on Pioneering and Innovative Development of Science and Technology in Ocean Engineering and Hydraulic Engineering was held in Qingdao. The conference was hosted by the Chinese Academy of Engineering and organized by Ocean University of China and several other institutes.

More than 160 participants from home and abroad attended the forum. A total of 13 theme reports were delivered during the conference. Experts and scholars engaged in in-depth discussions over a range of topics. This forum helped promote scientific and technological innovation, cross-sector cooperation and international cooperation in ocean and hydraulic engineering. ■

The The 4th Symposium on the Oceans in National Income Accounts Held in Qingdao

The 4th Symposium on the Oceans in National Income Accounts, hosted by the National Marine Data Information Center and OUC, was held in Qingdao on October 26, 2019. With the theme of “Challenges and Measurements to Evaluate Marine Economy”, the symposium aimed at promoting the comprehensive, coordinated and sustainable growth of marine economy and laying a

foundation for future cooperation. Prof. Li Huajun, OUC’s Vice President, attended the event and delivered opening remarks. More than 100 experts and scholars from all over the world gathered to discuss topics including the assessment of regional development, the national accounts and green development of marine economy. ■





The 8th International Oyster Symposium Held in Qingdao

The 8th International Oyster Symposium with the theme of “Sustainable Development of the Oyster Industry and Protection of Germplasm Resources” was held in Qingdao on November 6, 2019. The symposium was co-sponsored by OUC and World Oyster Society. Prof. Yu Zhigang, OUC’s President, attended the opening ceremony and delivered remarks. Over 300 scholars, practitioners in the industry and

business representatives from all over the world participated in the symposium. Topics such as oyster genetic breeding, aquacultural technology, immunity and food safety were covered. This symposium promoted cooperation in the field and contributed to the academic research of oysters and the development of the world’s aquacultural industry.■

The 17th International Academic Conference on Historical Relations between China and Ryukyu Held at Ocean University of China

The 17th International Academic Conference on Historical Relations between China and Ryukyu was hosted by OUC from November 15-17, 2019. More than 80 scholars from Japan, China’s Mainland and Taiwan Region attended the conference. Prof. Li Weiran, OUC’s Vice President delivered opening remarks. With the themes of “History and Culture of Ryukyu” and “Ryukyu and East Asian Relations”,

the conference covered topics such as Ryukyu and East Asian waters, relations between China, Ryukyu and Japan, and cultural exchange between China and Ryukyu. It facilitated the academic development of historical relations between China and Ryukyu and promoted the study of East Asia’s marine history, culture and island issues.■

Visits

Oklahoma State University President Burns Hargis Visits OUC

On September 4, 2019, a delegation from Oklahoma State University led by President Burns Hargis visited OUC. President Yu Zhigang pointed out that the two universities have been discussing opportunities of cooperation in liberal arts. Further possibilities of cooperation could be explored in areas of engineering and ocean sciences. President Burns Hargis briefly introduced the history and current

situation of Oklahoma State University, and expressed the hope for further cooperation with OUC in fields of common interests. Professor Paul Tikalsky, Dean of the School of Engineering, introduced his college, especially the latest research achievements in UAV, new energy and marine pollution treatment. The two presidents signed an MOU after the meeting, laying a solid foundation for future cooperation. ■



President Yu Zhigang Visits Universiti Malaysia Terengganu and Inaugurates OUC-UMT Joint Ocean Research Center



On October 28, 2019, the opening ceremony of OUC-UMT Joint Ocean Research Center was held in Trengganu, Malaysia. President Yu Zhigang of OUC and President Noraieni of Universiti Malaysia Terengganu (UMT), jointly signed the cooperation agreement and delivered remarks. President Yu said that the joint center answers the call of our time, and will play an important and unique role in promoting the

innovative development of the two countries' marine research. With a focus on marine life technology, the center will pool resources in marine life, aquatic products, marine drugs and other disciplines. It will also promote the cooperation between OUC and its partners in ASEAN countries, and contribute to the building of a community of shared future for the oceans. ■

Alexander Sokolov, Rector of Moscow Tchaikovsky Conservatory, Visits OUC

On November 11, 2019, a delegation led by Prof. Alexander Sokolov, Rector of Moscow Tchaikovsky Conservatory, visited OUC. Dr. Tian Hui, Chairman of OUC University Council and Vice President Li Weiran received the guests. Dr. Tian Hui said that with high-quality education system and resources, Moscow Tchaikovsky Conservatory has

cultivated a large number of world-known musicians. The cooperation in music and arts will play an important role in training top talent in the field, contributing to the cultural exchanges and friendship between China and Russia. Rector Alexander Sokolov expressed his hope to strengthen cooperation with OUC, especially in the compilation of textbooks, exchanges of teaching



methods and the cultivation of creative musical talent. An MoU for jointly establishing the OUC-

Tchaikovsky Conservatory in Qingdao was signed during the meeting. ■

President Yu Zhigang Visits University of Bergen

From Nov. 11 to 12, 2019, President Yu Zhigang led a delegation to the University of Bergen (UiB), to promote the cooperation between the two universities on the Sars-Fang Research Center for Marine Molecular Biology and China-Norway Marine University Alliance. Prof. Dag Rune Olsen, Rector of UiB, spoke highly of the cooperation with OUC and expressed his hope to facilitate the building of

the Center and the Alliance. The two sides discussed details of the two platforms and signed an MoU for Alliance. The delegation also visited Evolutionary Ecology lab, Industrial and Aquatic Laboratory, Sars International Centre for Marine Molecular Biology, the UiB Museum, Bjerknes Centre for Climate Research, Nansen Environmental and Remote Sensing Center and salmon farm in Bergen. ■





Spotlight

Haide College: A Pioneering Exploration of Ocean University of China in Sino-foreign Cooperative Education

In April 2020, China's Ministry of Education approved the establishment of Haide College, a cooperative institution between Ocean University of China (OUC) and the University of Adelaide (UoA) in Australia. The establishment of Haide College, OUC's first Sino-foreign cooperative education institution, is a milestone for the university in opening up to the world and a significant progress in the implementation of its internationalization strategy.

Haide College offers three four-year undergraduate programs, Biotechnology, Food Sciences and Engineering, and Mathematics and Applied Mathematics with its maximum enrolment capacity

of 1,200 students. It will have its first 300 students enrolled in September. The college has introduced quality courses and top academics from UoA to formulate a unique and cutting-edge education system for prospective young scholars.

UoA is a public university located in Adelaide, South Australia. Established in 1874, it is the third-oldest university in Australia. UoA is a member of the Group of Eight and has been named one of the five-star universities of Australia. As of the end of 2019, the university was associated with five Nobel laureates, accounting for one-third of Australia's total Nobel Laureates, and 110 Rhodes scholars. UoA has

had a considerable impact on the public life of South Australia, having educated many of the state's leading businesspeople, lawyers, medical professionals and politicians. The university has been associated with many notable achievements and discoveries, such as the discovery and development of penicillin, the development of space exploration, Wi-Fi, polymer banknotes and X-ray crystallography, and the study of viticulture and oenology.

The friendship between OUC and UoA dates back to 1986, when Shandong Province, where Ocean University of China is situated, became sister provinces

with South Australia. When Qingdao and Adelaide became sister cities, the ties got even closer. Such exchanges and communication laid a solid foundation for the two universities' collaboration, which is a significant part of the two provinces' and two cities' shared vision to expand cooperation in such fields as economy, education, culture and arts. Since 2009, OUC has sent a number of visiting scholars to UoA, ushering in a chapter of closed academic cooperation and friendship. Given the previous communication and partnership, high-level exchanges between the two universities increased significantly in the past three years.



▲ In May 2018, OUC and UoA signed a cooperation memo

In May 2018, Prof. Yu Zhigang, President of OUC led a delegation to University of Adelaide and had intensive talks with Prof. Peter Rathjen, then Vice-Chancellor of UoA on many issues, including joint scientific research, talent cultivation and the establishment of a

cooperative educational institution. A university-level agreement was signed to deepen the cooperation in academic exchange programs as well as joint research and teaching activities.



◀ Prof. Yu Zhigang, President of OUC, and Prof. Peter Rathjen, then Vice-Chancellor of UoA, after the meeting in May 2018

In September 2019, Prof. Pascale Quester, then Deputy Vice-Chancellor and Vice-President of UoA, led a delegation to OUC, and the two sides held further talks on the establishment of Haide College. After

several rounds of meetings and discussions, the two universities reached consensus on many issues such as the academic programs to build for Haide College, study plans and the joint management committee.

In January 2020, Prof. Yu and Prof. Quester went to Beijing for the evaluation of Haide College by China's Ministry of Education, which was a great success. In March 2020, Prof. Rathjen and Prof. Yu exchanged letters during the COVID-19 pandemic, displaying their strong-will and determination to address the challenge together. They also proposed to visit each other after this pandemic and expressed expectations for the friendship and cooperation between two universities.

The mission of Haide College is to offer challenging academic courses and inspiring learning experiences for aspiring young scholars. Students will acquire skills to make a difference to the world.



▲ Group photo after the evaluation of Haide College by China's Ministry of Education

Dong Fang Hong 3 Successfully Completed the First Comprehensive Scientific Expedition in the Deep and High Seas of Western Pacific

On December 1, 2019, Dong Fang Hong 3, a new-type research vessel and flagship of the Dong Fang Hong research fleet, successfully completed a research task in the deep and high seas of the Western Pacific. This was the fifth voyage of Dong Fang Hong 3 since it was delivered by Shanghai Jiangnan Shipyard on May 31, 2019. According to the plan, the vessel then went on research tasks in the Bohai Sea, the Yellow Sea and the East China Sea after a short stay and replenishment at its home port in Qingdao.

In the voyage, Dong Fang Hong 3 overcame adverse sea conditions caused by typhoons and subtropical cyclones and sailed safely for more than 6,100 nautical miles. It successfully built a real-time observation system for the Kuroshio extension, and efficiently completed a multi-latitudinal investigation on current systems in the Northwestern Pacific. The success marked the first step of the vessel in the Western Pacific, and a significant improvement in OUC's research ability in the key areas of the "two oceans and one sea".

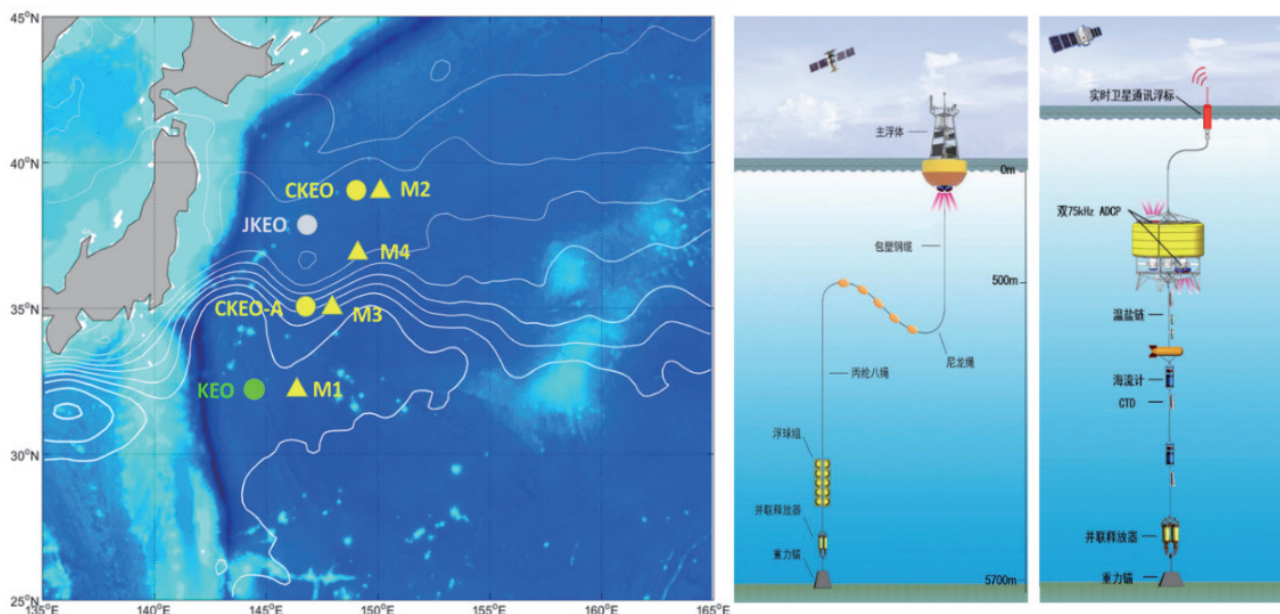
The superior performance, advanced equipment, excellent crew and technical team of Dong Fang Hong 3 ensured the success of this voyage. The deep sea multi-beam system provides accurate reference for the deployment of subsurface and surface buoys, and

the multi-band fish detector system ensures intensive observation of continuous stations. While ensuring a healthy and nutritious diet for the researchers on board, the ship's staff organized a series of activities such as afternoon tea and quiz game. Under the captain's leadership, all departments worked together efficiently to provide a sound environment for the research personnel.

According to Prof. Chen Zhaohui, chief scientist of the voyage, a new large-scale buoy observation system independently developed by OUC was deployed in the strongest current area of the main axis of the Kuroshio extension, and the submarine buoys were transformed for real-time observation. In the Kuroshio extension and the North Equatorial current areas, three sets of 4,000-meter deep-sea self-sustaining intelligent Argo buoys developed by OUC have been deployed. Up to now, nearly a hundred 4,000-meter CTD profiles have been obtained. The construction of a real-time observation system of Kuroshio extension has been completed, which provides the most important data support for the study of multi-scale dynamic process of Kuroshio extension and air-sea interaction.

For the first time in China, the ship carried out a comprehensive survey on the P1 section of the Western Pacific, gaining a large number of observation

黑潮延伸体实时观测系统 Kuroshio Extension Mooring System (KEMS)



data, samples and investigation experience. This has improved the comprehensive investigation ability of OUC in the interdisciplinary research of the deep and high seas, provided important section observation support for the “transparent ocean” system, and laid a solid foundation for China to join the GO-SHIP cross-section observation program.

In the real-time observation system of Kuroshio extension, the United States’ KEO buoys (2004 to the present), Japan’s JKEO buoys (2007 to 2013) and the buoys deployed by OUC are respectively represented by green, grey and yellow dots.

Dong Fang Hong 3 is a new-generation deep-sea research and training vessel, independently developed by China. The building of it was approved and commissioned by China’s Ministry of Education in 2013, and it was designed by Marine Design & Research Institute of China and built by Jiangnan

Shipyards. It was delivered in June, 2019.

The building of the vessel is a comprehensive project, covering multiple disciplines, technologies and engineering applications. Many of its designs and building techniques are original. After two trial voyages with relevant tests, it revealed its high standard in various technical performance indicators. In terms of the control parameters of the underwater radiated noise, vessel vibration and noise and electromagnetic compatibility that affect the working precision of ship-borne equipment and reliability of research findings, the ship has reached an advanced level in many regards and even world-leading level in several aspects.

It is especially worth mentioning that the ship passed the accreditation of DNV-GL and obtained the certification of DNV SILENT-R, becoming the first in China and the fourth in the world to gain such an honor. Among the four certified research vessels, “Dong



Fang Hong 3” is the one with the largest tonnage. Dong Fang Hong 3 has an aggregate tonnage of 5,602, a net tonnage of 1,680, a length of 103.8 meters and a width of 18 meters. It can navigate world-wide, with a maximum service speed of 15 knots, an economical speed of 12 knots, a self-supplying capacity of 60 days and an endurance of 15,000 nautical miles. It is able to carry a maximum of 110 people. Both its deck area of operation and lab area exceed 600 square meters. It has dynamic positioning and anti-rolling functions. When navigating at a speed of 12 knots, the ship’s 61 lodging quarters all meet the standard requirements of CCS comfort level 2 for crew. 56 reach the standard requirements for CCS comfort level 1 for crew, accounting for 92% of the total lodging quarters.

Dong Fang Hong 3 is the most advanced among new-generation marine research vessels in terms of the

carrying capacity, ship resistance and performance, silent technology and electromagnetic compatibility, lodging and working conditions, operation areas of the deck and the labs, intelligent management of data network, as well as shipping and comprehensive research technology and equipment. Dong Fang Hong 3 is equipped with a remote-sensing information observation and validation system, an atmospheric probing system, a seafloor detection system, analysis systems for chemical, biological and bottom sediment samples, an operating and LARS system as well as a teaching and training system. It combines functions for comprehensive research and student training. The ship boasts an integrated, rapid and simultaneous multi-factor spatial observation capability that covers all depths of the ocean. It is also able to conduct rapid and simultaneous regional observation of ocean areas, together with satellites and other research vessels.

People

Building a Transparent Global Community for the Sustainable Development of the Ocean: Academician Wu Lixin, a Leading Researcher in Marine Science

Prof. Wu Lixin is a fellow of the Chinese Academy of Sciences, the Academy of Sciences for the Developing World, American Geophysical Union (AGU), the director of the Pilot National Laboratory for Marine Science and Technology (QNLN) and vice president of OUC. His areas of research include ocean circulation, air-sea interaction, climate change and numerical simulation and prediction of the earth system. He is dedicated to creating a “transparent ocean”, making China a strong maritime country and building a transparent global community for the sustainable development of the ocean.





Thorough Observation, Clear Understanding and Accurate Forecast

Nearly three billion people around the world depend on marine and coastal biodiversity for her livelihood. The ocean absorbs about one-third of the carbon dioxide produced by human beings and more than 90% of the heat surplus, largely slowing down climate warming. However, we do not have a thorough examination on the impacts of human activities on the ocean, including the threats posed by global warming, acidification, anoxia and pollution. Although the ocean covers 71% of the world's surface, less than 5% of the ocean has been explored.

In recent years, Wu and his team have been working on the “Transparent Ocean” project. He interpreted the purpose of the project as having “thorough observation, clear understanding and accurate forecast”, using equipment and technology to perceive what is happening in the ocean. By “clear understanding”, he was referring to the ability of clearly explaining the phenomena and processes in the ocean, and by “accurate forecast”, the ability to accurately predict the future changes in the ocean. With the platform of QNLM, the implementation of the project has been elevated to a new level. The project has initiated the observation, research, forecast and technology R&D targeting the “two oceans and one sea”, having made remarkable progress. The purpose is to reveal the process and mechanism of deep-sea energy transfer and its effects on climate and environment, and to establish a high-resolution coupling numerical prediction system for the extension of the sea areas in question. A number of mobile observation platforms



such as the deep-diving, long-voyage underwater glider and the 4,000-meter deep-sea Argo observation buoys were developed. A shared platform for deep-sea research vessels and a world-class platform of scientific computing and system simulation were established.

In December 2017, the United Nations launched the “Decade of Ocean Science for Sustainable Development (2021-2030)”, which established six goals such as the “Transparent Ocean”. In 2018, the Executive Committee of the UN IOC approved the roadmap of the “Decade of Ocean Science for Sustainable Development (2021-2030)”. The UN encourages member states, international organizations, global marine science and education community to work together to invest more in marine research, strengthen research capacity and technology transfer, and improve marine-related education. All members shall protect and sustain the ocean and marine resources, as part of the effort to achieve the Sustainable Development Goals (SDGs) as soon as possible. The “Transparent Ocean” project will continue to provide technical support for the building of a transparent global community for the ocean and the implementation of the UN “Decade of Ocean Science for Sustainable Development (2021-2030)”.

How does the ocean obtain energy?

Wu has long been engaged in the research of ocean circulation and climate. He discovered the “hot spot” phenomenon in the western boundary current region of the subtropical zone in the 20th century, and illustrated the mechanism of subtropical circulation variation in inter-decadal and long-term climate change in the Pacific Ocean. He developed a dynamic experiment system to determine the role of the mid- and low-latitude air-sea passage in the inter-decadal and long-term climate change. Besides, Wu explored a new path to study the low-frequency modulation of deep-sea mixing with Argo, which pushes the deep-sea mixing research to the global scale and to the time scale beyond seasons. He uncovered the dynamic path of the tropical air-sea coupled system affected by the variations of the Oceanic Thermohaline Circulation, and revealed that the decadal variation mode of the North Atlantic follows the air-sea coupled mode.

“Over the past decade, our team has published in Nature, Nature Geoscience and Nature Climate Change. The main purpose is to find answers to the questions: how does the ocean obtain energy? How does energy transfer from the surface to the deep sea? What leads to the variations of heat transfer caused by circulation? How does the change in heat transfer ultimately affect the climate?” Wu said.

Studies have shown that the ocean absorbs a great amount of heat and carbon dioxide, thus playing a key role in climate change. Although some progress has been made in ocean energy transfer, the lack of systematic research on the mechanism of energy transfer still restricts our knowledge of the variations of ocean temperature and heat content as well as related climate effects. Through quantitative data analysis, Wu and his team found that the energy entering the ocean from the surface can penetrate the main thermocline, stimulate mixing in the sea below 1,000 meters and cause the low-frequency modulation of deep-sea mixing. In other words, when the energy input by the wind changes, the transfer of heat in the deep sea changes accordingly, altering the heat distribution in the ocean, and finally leads to the temperature anomalies of the sea, especially the sea surface. At China's State Science and Technology Awarding Ceremony 2019, Wu's project "Ocean Energy Transfer Process, Mechanism and Climate Effects" won the second prize of natural science.

Winning the AGU award

The ocean is shared by all human beings. As marine science and technology innovation demands large investments and longer cycles, incurs high costs and involves great risks, issues related to the ocean cannot rely on a single country or institution. For many years, Wu has been committed to promoting international exchanges and cooperation in marine science. He has invited leaders of the world's top marine-related research institutes to the Global Ocean Summit in Qingdao. He also initiated the construction of international research bases such as The Center for Southern Hemisphere Oceans Research (CSHOR) and the International Laboratory for High-Resolution Earth System Prediction (IHESP). His efforts have promoted global cooperation in marine-related fields, pooled global resources and established a first-class international research team to jointly address the challenges faced by mankind.

2019 marked the 100th anniversary of the AGU. On Dec. 11, Wu was awarded the Ambassador Award, the highest award for leadership in earth and space sciences, and fellowship by AGU during its awarding ceremony held in San Francisco. Wu was the first Asian scientist to win the award and the first Chinese oceanographer to become an AGU fellow. The award is to recognize "scientists with extraordinary social influence, leadership in science and outstanding contributions to earth and space sciences and talent cultivation. Wu is an outstanding leader in marine dynamics and climate change and a champion of international cooperation in solving major scientific challenges," said Chris McEntee, chief executive of AGU.

To the younger generation

"Passion is important whether for life and research, so never give up pursuing your dreams. As long as we work hard, all problems can be solved. Keep your feet on the ground and never settle for less," said Wu to the younger generation.

Academician Bao Zhenmin, a Leading Researcher in Scallops and his Academic Pursuit

Prof. Bao Zhenmin, fellow of the Chinese Academy of Engineering, is the dean of OUC's College of Marine Life Sciences. Over the past 30 years, he has devoted himself to scallop research. He has bred new scallop varieties such as "Peng Lai Hong", "Peng Lai Hong 2", "Hai Da Jin Bei", "Zhang Zi Dao Hong" and "Hai Yi Fe 12", ending China's long-term dependence of scallop breeding on wild seedlings. For three decades, Bao and his team have been committed to "making the scallop industry prosperous, farmers' lives better and people's dining choices richer". They have been breaking new grounds and contributing to the alleviation of poverty through ocean research.



Breeding new varieties

"Curiosity is the best guide, and interest is the best teacher," Bao said. Ever since he was little, he has been fascinated by the ocean. In 1978, he chose to study biology at Shandong Oceanographic College (the predecessor of OUC) almost without hesitation. He became a teacher at his college when he graduated in 1982.

In the late 1990s, a large-scale epidemic broke out in scallop farming, posing a significant challenge to China's scallop aquaculture in China. As a result, the cultivation of high-yield and disease resistant varieties was high on the agenda and became the focus of Bao and his team.



Ten years' effort was paid off. In 2006, Bao's new scallop variety "Peng Lai Hong" passed the state assessment for fine varieties. As the first scallop variety independently cultivated by Chinese scientists, "Peng Lai Hong" boasts fast growth, high yield, large adductor, strong stress resistance, bright red shell color and stable genetic performance. It soon gained popularity among aquaculture farmers, and won the

first prize of Innovation of the State Oceanic Administration, the first prize of Science and Technology Progress Award of the Ministry of Education, and the second prize of National Science and Technology Progress Award.

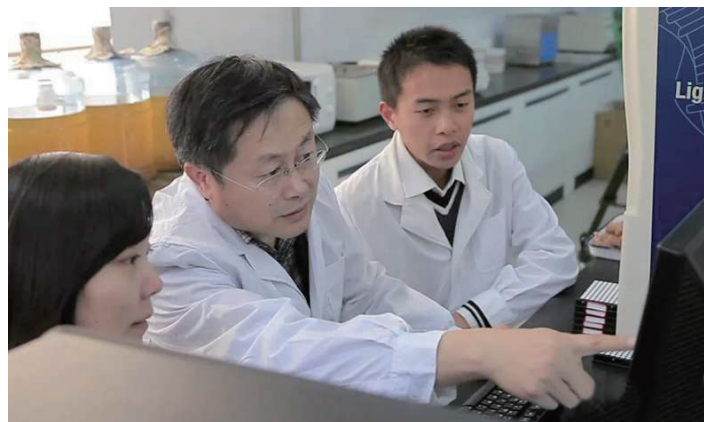
Breaking new grounds

“Our goal is to establish an efficient high-level scallop breeding technology system, so that our scallop breeding industry can develop in an efficient, stable and sustainable manner,” Bao said.

Genome selection is a cutting-edge technology in breeding. Bao took the lead in carrying out research and development on this technology in the breeding of aquatic lives, and successfully reduced the testing cost. This low-cost, high-throughput genome wide genotyping technology added momentum to the whole genome selection breeding of scallops, and it has also been applied to the genetic analysis of more than 80 species such as rice, potato, bee and pig. It is indeed a disruptive technology that leads the innovation and development of seed industry.

Bao and his team also conducted genome mapping for several species of scallop, and analyzed the genetic basis and regulatory mechanism of important economic traits of scallops, laying the foundation for the development of scallop germplasm resources. At the 2019 National Science and Technology Award Conference, Bao won the second prize of Technological Invention with his research achievement “The Establishment of Scallop Molecular Breeding Technology and the Cultivation of New Varieties”, the only National Technological Invention Award in the field of aquatic science that year.





With the innovation in the aquacultural technology and improved breeding technology of scallops in China, the annual output of scallops has increased from 20 tons in the early 1970s to more than 1.9 million tons today. The increase in output has made what once a rare seafood commonplace on people's dining table.

"It's heartening to see these changes. Our efforts finally paid off, making high-protein sea-foods available and affordable to all Chinese people," Bao said.

Staying true to the original aspiration

"You should engage in life-long learning and make the best use of time when you are young," Bao often says to his students. In teaching, he advocates the values of "reason, quality, dedication and pursuit of perfection".

"Prof. Bao is very strict academically. He asks us to never settle for less. Sometimes he works with us all night to solve a problem," said Zhan Aibin, a former student of Bao who now works at the Research Center for Ecological Environment of the Chinese Academy of Sciences.

"When I studied under Prof. Bao, no matter how busy he was, he would always take us to mariculture farms to do field research," said Wang Shi, a professor at OUC's College of Marine Life Sciences. Bao's enthusiasm and academic pursuit keep inspiring his students throughout their lives.

By now, Bao has taught more than 120 master's and doctoral students, most of whom have become leading talent in the field of aquatic seed industry in China.

"On the journey of life, whether it is stormy or sunny, we should stay true to our original aspiration and align our pursuits with the future of our country," said Bao to the Class of 2019. These heart-warming and encouraging words would always be remembered by the OUC graduates, guiding their path as they embarked on new journeys.



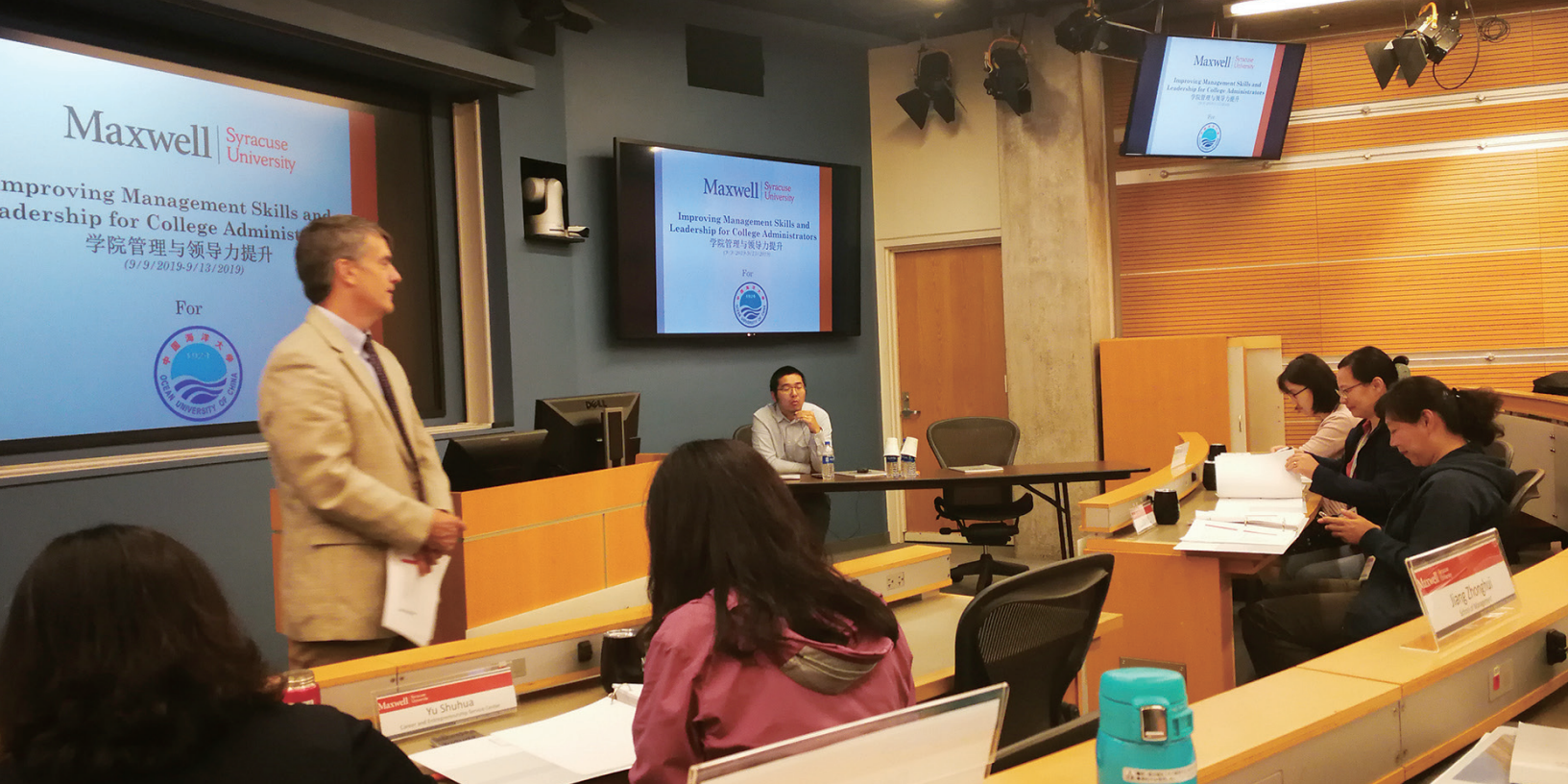
Voices

OUC Delegation to Syracuse

At the invitation of Syracuse University, an OUC delegation of 17 professors and administrative staff participated in the Academic Leadership Program in Sept., 2019. The program offered 11 seminars, 3 workshops and visits to two private universities and

a public university. The participants gained a better understanding of higher education in the US. They had thorough discussions about leadership approach, conflict resolution and changes to leadership.





The program started with a campus tour and a welcome speech by Prof. Steve Lux, director of Advanced Public Management Education at the Maxwell School of Citizenship and Public Affairs. This was followed by an overview of American higher education by Dr. Ma Yingyi, associate professor of sociology. Prof. Catherine Gerard, director of the Conflict and Cooperation Research Program, then led the “Leadership Approach: Four Frameworks” workshop. In the evening, at the invitation of President Kent Syverud and his wife, the delegation went to the president’s house for dinner, where they had discussions over cultures, science and education.

On September 10, Dr. David Van Slyke, Dean of the Maxwell School and professor of Public Management and International Affairs, hosted a seminar on “Leadership and Governance: from the Dean’s Perspective”. Prof. Michael Speaks, Dean of the School of Architecture, chaired a seminar on “Improving Student Experiences”. In the afternoon, the delegation joined a seminar on “Diversity and Inclusion” and had in-depth discussions.

On September 11, Prof. Catherine Gerard shared with the delegation her thoughts on “Collaborative Leadership” in a lecture. Prof. Sean O’Keefe, former administrator of NASA, gave a speech entitled “Five Lessons in Leadership”, which was followed by a workshop on the changes in leadership by Prof. Steve Lux.

On September 12, the delegation visited the Student Overseas Exchange Center at Syracuse University. Dr. Erika Willens and Dr. Louis Berends, directors of overseas programs, shared their observations on “Internationalization of Student Experience” and hosted a discussion. The delegation then left Syracuse for Albany, where they discussed “challenges faced by public universities” with leaders from the Rockefeller School of Public Affairs and Policy at the State University of New York.

On September 13, the delegation visited Columbia University. After a brief campus tour, they attended the lectures on “International Student Service” and “Government Relations”. The delegation then visited



the New York Alumni Association Center of Syracuse University and had a program review with Prof. Steve Lux.

For members of the delegation, who are mostly deans, it is important to cultivate and improve the leadership. In higher education, leaders of colleges and departments face many challenges, such as how to balance research and teaching, how to guarantee the professors' freedom of research, how to deal with administrative work, how to strengthen the weak subjects, and how to deal with the challenges posed by social development. Collaborative management provides a good way to deal with these challenges.

Most people believe that leadership is the ability to direct and inspire people to take actions and achieve goals. But, different from management, leadership means that leaders should put forward a vision and make people coordinate through organizational arrangements, so as to encourage good performance and achieve remarkable changes. The key to leadership is to strengthen adaptability. At the same time, leaders need to see problems clearly and use the most appropriate framework to think and resolve them.

Enhancing the leadership of the deans is important to the optimization of governance at higher education institutions, the promote of higher education and

improvement of national soft power. The goals of leadership in higher education can be diverse and conflicting. Examples are excellent teaching, research output, department and school services, professional services, applied public services and consulting. Appropriate incentives are the key to achieving these goals. A reasonable and feasible incentive mechanism covers teaching, research, services and other aspects. It also includes ranking and evaluation, admissions and recruitment, as well as cross-disciplinary and structural incentives. Leaders should be open-minded, practice diverse and inclusive governance, strengthen

cooperation with other colleges and the outside world, actively absorb and integrate international culture and share it with students. In this way, we can create a diverse, equal and inclusive environment, improving the work efficiency of staff and promoting the overall development of students and faculty.

Through this program, the delegation gained deep knowledge of college management and leadership improvement in higher education. What they have learned in this program will help them better manage their colleges and optimize incentive mechanisms.



My Thoughts on Online Learning

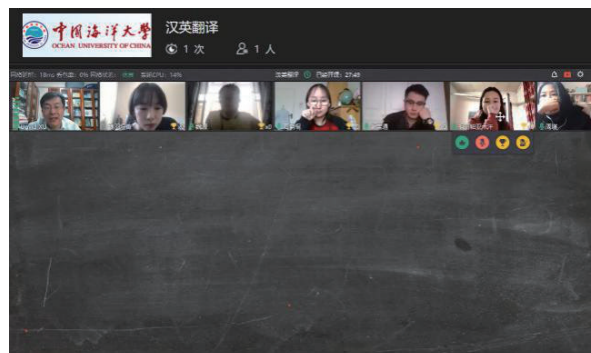
Xia Xiaotong, Student, College of Foreign Languages



With the ringing of the New Year's bell, 2019 has quietly gone, and 2020 has come to us in strides. People, like always, had beautiful hopes for the new year. However, at the beginning of 2020, the world was faced with the challenge of the COVID-19. Everyone in China worked in a concerted effort to address the challenge. The pandemic changed people's lives in many ways. As students were asked not to return to the campus, online classes became the major form of education. Despite the impacts of the pandemic, we were still able to stay connected and continue our studies.

When online teaching was first adopted, everyone was nervous, not sure what to expect. After all, it was the first time for teachers to teach through screens and the first time for students to go to class without even stepping out of their homes. Of course, there were awkward moments. Some teachers forgot to turn on the microphone and talked for an hour without being heard. Some students would enter the class, still speaking to their families, totally forgetting that their microphones were not turned off. Such incidents brought inconveniences at times, but they were tolerated with kind laughter.

What impressed me most was the Chinese-English translation class, in which I benefited a lot from online teaching. Online teaching provides students with more comprehensive and personalized learning materials. There are many high-quality teaching resources on the Internet. Students can find the materials they need according to their own strengths and weaknesses to better understand the knowledge. Besides, various forms of teaching resources such as videos, e-books





and audio have greatly stimulated the students' interest in learning. This allows students to learn independently. In addition, our translation class uses ClassIn, an APP with recording and broadcasting functions. The recording function provides great convenience for students and teachers, who can replay the lesson contents multiple times. It can be seen that although the epidemic has caused us to stay at home temporarily, the students' desire to learn has not diminished.

Online learning facilitates the interaction among students in new ways. Although we all attended classes at home, we were divided into many groups. We could turn on the microphone together to discuss the questions raised by the teacher. After class, we would also look up information together and complete the homework assigned by the teacher. We cherished the opportunities of online discussion even more, because we could not see one another as much as we would like to. The teacher would invite several students to do demonstrations in class. Other students would then offer feedbacks. We learned from one another and online learning reduced many possibilities of distraction that we usually have in physical classrooms.

To conclude, online teaching is a good substitute to face-to-face teaching. It helps teachers and students stay connected during the pandemic and offers us new thoughts on learning.





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