MUST 24 周年校慶系列活動 Anniversary Celebration

SCEE 2024

International Forum on Sustainable Coastal Engineering and Environment (SCEE 2024)

April 7-9, 2024









SCEE 2024

澳門科技大學
MACAU UNIVERSITY OF SCIENCE AND TECHNOLOGY

International Forum on Sustainable Coastal Engineering and Environment (SCEE 2024)

April 7-9, 2024

Macau University of Science and Technology

Co-organizer

澳門海洋工程與環境研究中心
Macao Marine Engineering and Environment Research Center

CHEC 振華海灣工程有限公司
ZHEN HWA HARBOUR CONSTRUCTION CO.,LTD.

澳門海岸帶生態環境國家野外科學觀測研究站
National Observation and Research Station of Coastal Ecological Environments in Macao

Supporting organizations

CHEC 中国港湾 CHINA HARBOUR

科學技術發展基金
FDCT

CONTENTS

Macau University of Science and Technology (M.U.S.T.)

Founded in 2000, the Macau University of Science and Technology (M.U.S.T.) has rapidly developed into the largest multi-disciplinary university in Macao. M.U.S.T. endeavors to educate students specialized in various fields, attaches equal importance to teaching and research, focuses on the quality of programs, pursues excellence. The University is located in Taipa with a campus of 210,000 m^2. The beautiful surroundings and convenient transport render it an ideal place for students to pursue higher education and carry out research.

The Macao S.A.R. government has authorized M.U.S.T. to award academic degrees at doctoral, master, and bachelor levels, with some programs being conducted in Portuguese or Spanish. In addition to local students, M.U.S.T. attracts a large number of students from Mainland China, Hong Kong, and Taiwan. Currently, there are more than 19,000 students enrolled at the University, including 7,600 master and doctoral students and 11,800 undergraduate students. As of today, M.U.S.T. has the following faculties/departments: Faculty of Innovation Engineering, School of Business, Faculty of Law, Faculty of Chinese Medicine, Faculty of Hospitality and Tourism Management, Faculty of Humanities and Arts, Faculty of Medicine, University International College, School of Liberal Arts and the Department of General Education, providing a wide range of courses, including Engineering, Science, Law, Management, Business, Medicine and Pharmacy, Tourism, Art, Communication, and Language.

M.U.S.T. has about nine hundred professional staff, including chair professors, professors, distinguished professors, associate professors, and assistant professors. Many academic and research staff have either worked or studied in world-renowned institutions and universities. In addition, M.U.S.T. has invited a group of world-class specialists and experts to teach undergraduate and postgraduate courses. By teaching courses and supervising postgraduates, these outstanding scholars impart the newest knowledge, disseminate the latest research findings, and introduce to students the international horizons and diverse cultures.

Currently, M.U.S.T. has three state-level research platforms: the State Key Laboratory of Quality Research in Chinese Medicine, the State Key Laboratory of Lunar and Planetary Sciences, and the National Observation and Research Station of Coastal Ecological Environments in Macao. Additionally, more than 20 prominent institutes and research centers have been established, to conduct strategically interdisciplinary and cutting-edge research in multiple fields. The University also established Macao's first Laboratory named after a Nobel Prize Winner, "Dr. Neher's Biophysics Laboratory for Innovative Drug Discovery". Furthermore, the Ministry of Education of the People's Republic of China authorized M.U.S.T. to jointly establish the Key Research Institute of Humanities and Social Sciences Partner Base and Joint Laboratory with five higher institutions in Mainland China. The University established the Zhuhai-M.U.S.T. Science and Technology Research Institute in the Guangdong-Macao deep cooperation zone, Hengqin to meet the development needs of core industries of the Greater Bay Area to carry out scientific and technological innovation; extensively pool resources to cultivate and gather industrial talents, while expanding its influence across the country.

Looking ahead, M.U.S.T. will continue to focus on equal importance to teaching and research, by attracting talents from various disciplines, targeting on two key elements "quality" and "innovation", and giving full play to the advantage of a non-profit private university to continue to improve through excellent education and outstanding research and serve the society by fulfilling its mission.

National Observation and Research Station of Coastal Ecological Environments in Macao (NORSCEM)

National Observation and Research Station of Coastal Ecological Environments in Macao was officially established on March 28, 2022 with the approval of the Ministry of Science and Technology of China. It is the first national observation and research station outside mainland China. The establishment of the National Observation and Research Station is the national strategic demand for the construction of the Guangdong-Hong Kong-Macao Greater Bay Area and the forefront of environmental science development. It fills the gap in comprehensive scientific observation of the ecosystem in China's subtropical coastal zone, deepens scientific cognition of the evolution of the coastal ecological environment quality and deals with the regulation mechanism through long-term observation and systematic research, and provides strong scientific and technological support for regional ecological environment improvement and management decision-making.

At present, there are more than 120 researchers and graduate students working in the station. The observation research team is leading by 19 high-level experts and scholars, including chair professors, full professors, distinguished professors, associate professors and assistant professors. All the experts and scholars come from well-known teaching and research institutions in China and from overseas. They have intensive research experience and extensive international vision, forming a multi-disciplinary, well-structured and strong research team. Prof. Ma Yibing is the head of the field station, Academician Yang Zhifeng of the Chinese Academy of Engineering is the head of the Academic committee, and Academician Zhang Yuanhang of the Chinese Academy of Engineering is the deputy director of the Academic committee.

The general positioning and construction of Macao Field Station are stated as below:

As the downstream gathering area of air pollution and water pollution in the Guangdong - Hong Kong - Macao Greater Bay Area, Macao has been significantly affected by regional pollution transmission under the influence of climate change. It has been playing a representative and indicative role in the ecological and environmental changes in the coastal zone of the Guangdong - Hong Kong - Macao Greater Bay Area. The development of the Guangdong - Hong Kong - Macao Greater Bay Area is a major national development strategy. A world-class Bay Area needs to be supported by world-class ecological and environmental quality and strong environmental technology. Aiming at the scientific and technological frontier of ecological effects, collaborative control,

regionally collaborative governance and ecological restoration of environmental pollution under the context of global climate change, Macao Field Station contributes to establish "one platform, one pipeline, three bases"; performs in the effective use of remote sensing technology, artificial intelligence monitoring technology, automatic in situ high resolution monitoring and other advanced technologies; carries out the "intelligent, informative, in situ automation, sky-earth-sea integration" monitoring. It is an important channel for internationally academic exchange and scientific and technological cooperation, especially among the "Belt and Road" countries. To implement the application for demonstration of scientific research achievements, training of outstanding talents and science popularization bases are therefore set up in Macao. It calls for the implementation of the strictest ecological and environmental protection system, and the improvement of Macao's local environmental quality as a guide to improve the quality of the ecological environment.

The research fields focus on ecological environment and climate change, including the studies on coastal environmental process monitoring and simulation, mechanism of pollutant transmigration and transformation across environmental media; environmental effects, theory and technology of environmental composite pollution prevention and control; and mechanisms of coastal environmental process and ecological restoration technology under the influence of climate change.

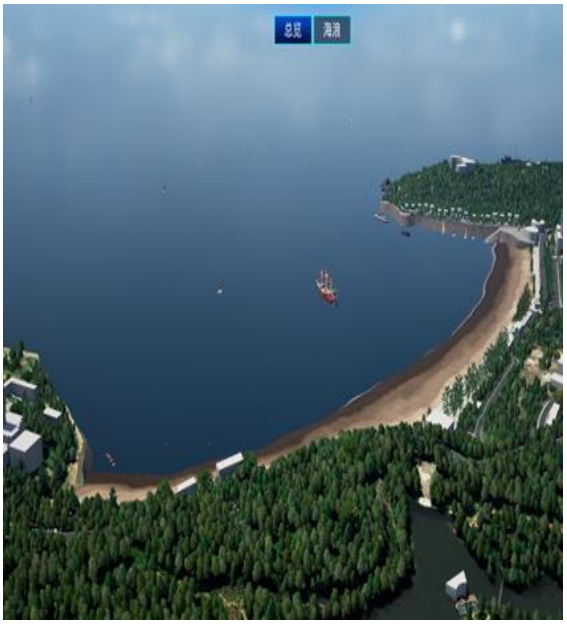
Macao Marine Engineering and Environment Research Center

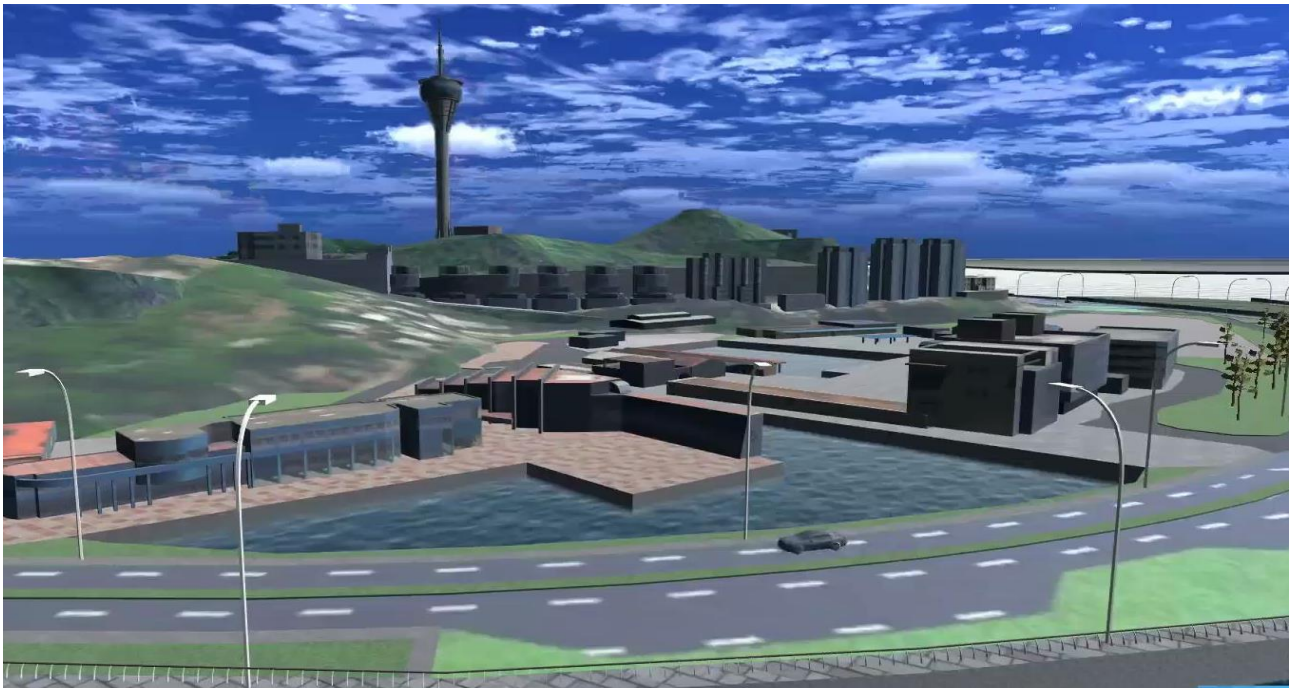
To implement the "Outline Development Plan for the Guangdong-Hong Kong-Macao Greater Bay Area" and promote the moderately diversified development of Macao's economy, as well as to support infrastructure construction, environmental protection, and governance in Macao, M.U.S.T. and China Harbour Engineering Company Limited (CHEC) have cooperated to establish the "Macao Marine Engineering and Environmental Research Center" (MMEERC) in Macao. Leveraging the technological innovation and local platform advantages of M.U.S.T., as well as the spirit of technological leadership and innovative development of CHEC, the center aims to facilitate research and development in marine engineering and environmental protection. The official unveiling of the center took place on May 31, 2023.

Based on M.U.S.T.'s National Observation and Research Station of Coastal Ecological Environments in Macao and the Macao Environmental Research Institute, the Research Center combines CHEC's professional expertise and extensive experience in marine engineering and transportation infrastructure construction in Macao. The aim is to promote the integration of industry, education, and research, strengthen collaboration in aspects such as industry-university-research cooperation, scientific research innovation, engineering consultation, technical services, talent exchange, and cultivation, and jointly establish an authoritative and professional research institution within Macao. MMEERC is dedicated to exerting influence in the fields of marine engineering, environmental protection, and engineering construction, contributing to the comprehensive development and construction of Macao.

Key Laboratory of River Basin Digital Twinning of Ministry of Water Resources

The target of the Key Laboratory of River Basin Digital Twinning of Ministry of Water Resources is: to integrate first-class talents, to carry out innovative research jointly with the Mainland and Macao, and to fully use cloud computing, big data, artificial intelligence, Internet of Things, digital twins and other new-generation information technologies, in order to promote panoramic perception, digital scenarios, precise simulation, intelligent decision-making and intelligent control. The laboratory will be built into a “1 base” and “2 platforms” that provide scientific and technological support for the construction of natural water coefficient fonts for river basins, water conservancy engineering intelligent bodies, industry management intelligent bodies, etc., for the construction of a digital twin watershed system with the functions of “forecast, early warning, rehearsal, and pre-plan”.





About SCEE2024

For historical reasons scientific research on the development of coastal and marine resources in Macao is relatively new; baseline data is scarce relative to the needs to understand issues related to environmental sustainability. In December 2023 the Macao SAR Government has also issued consultation documents on the scientific utilization and planning of the 85 sq.km. of coastal seas under its jurisdiction. The activities of NORSCEM and the DT lab revolve around the advanced scientific monitoring and research to address issues of climate change impacts and coastal hazards and management. Sponsored by China Harbour Engineering Company Ltd. (CHEC), the Macao Marine Engineering and Environment Research Center (MMEERC) has also been established in June 2023 to support focused developments in coastal engineering issues.

The Macao Special Administrative Region (SAR) of China is a world city with over 400 years of cultural heritage and east meeting west – with a world class gaming industry. As an important platform for trade services and culture exchanges between China and Lusophone countries and beyond, Macao has unique advantages in terms of policy, location, economy, culture, history and other aspects. In recent years, since the issue of the national plan to develop the Greater Bay Area into an international innovation and technology hub, and the establishment of the Hengqin (Zhuhai) In-Depth Guangdong-Macao Cooperation Zone, active international exchanges between Macao and the world have been pursued in the area of innovation and technology. The China-Portugal Exchange Forum on Coastal Environment and Innovation Technology for Sustainable Development (CPCET 2023) was organized by M.U.S.T. and NORSCEM to promote the international exchange and cooperation on themes related to the sustainable development of the coastal environment. This forum (SCEE 2024) is a sequel to CPCET 2023. As an inaugural activity of the new marine engineering center, it aims to showcase cutting-edge developments of coastal engineering research and practice in the Greater Bay Area and foster discussion on the latest ideas, research outcomes, and technology transfer experiences among academia, industry, governments, and relevant stakeholders. The forum promises to connect representatives from leading consultants and government in the Greater Bay Area from mainland China, Hong Kong, and Macao with representative international experts and partners. The focused Forum will be a timely event to gather the latest thinking on climate change induced coastal hazards, design and planning issues, and policy related to the sustainable development of coastal and marine resources of Macao, Hong Kong and the region.

Organizing Committee

Honorary Chairman

Prof. Joseph Hun-Wei Lee

Executive Chairman

Prof. Yibing Ma

Organizing Committee

Dr. Yanfu Wei, DESE, FIE (Secretary)

Ir. Wei Wang, Executive Deputy Director of Macao Marine Engineering and Environment Research Center, FIE

Ir. Hailson Yu, Director of Innovation & Entrepreneurship, FIE

Dr. Yang Wu, DESE, FIE

Mr. Eric Zhang, FIE

Program

April 7, 2024 (Sunday)		
10:00 - 19:00	Registration	Outside N101, M.U.S.T.
18:00 - 20:30	Dinner	Seasons M.U.S.T. Training Restaurant, Block N, M.U.S.T.
April 8, 2024 (Monday)		
09:00 - 09:20	Opening Ceremony	N101, M.U.S.T.
09:20 - 12:10	Session 1: Coastal Engineering Innovation and Development	
12:20 - 13:50	Lunch Break	Seasons M.U.S.T. Training Restaurant, Block N, M.U.S.T.
14:00 - 18:00	Session 1 and Session 2 : Environmental Monitoring and Protection (Poster and Entrepreneurship Exhibition)	N101, M.U.S.T.
18:30	Welcome Dinner	Banquet hall on the second floor, Grand Hyatt Macau
April 9, 2024 (Tuesday)		
09:00 - 12:10	Session 3: Land and Sea Coordination and Sustainable Development	N101, M.U.S.T.
12:20 - 13:50	Lunch Break	Seasons M.U.S.T. Training Restaurant, Block N, M.U.S.T.
14:00 - 18:00	**Technical Activities**	
	Visit to the M.U.S.T. History and Achievements Exhibition Hall, the State Key Laboratory of Lunar and Planetary Sciences, the National Observation and Research Station of Coastal Ecological Environments in Macao, and , and degradation of Hac Sa beach in Coloane, Macao.	

Opening Ceremony

April 8	
	Opening Ceremony **Venue: N101, Macau University of Science and Technology**
09:00 - 09:05	Welcome Address by Chair Prof. Joseph Hun-wei Lee - President of M.U.S.T.
09:05 - 09:10	Opening Address by Dr. Ao Peng Kong - President of the Macau Society of Ocean and Hydraulic
09:10 - **09:20**	Forum photography

Session 1 Coastal Engineering Innovation and Development

	Keynote Lectures **Chair: Prof. Joseph Hun-wei Lee and Ir Andy Kwok** **Venue: N101, Macau University of Science and Technology**
09:20 - 09:50	**Exploration of Research Methods in Marine Engineering Technology** Ming Lin- Academician of the Chinese Academy of Engineering and Chief Scientist, China Communications Construction Company Limited (CCCC), China
09:50 - 10:20	**Flood Defence Arising from Storm Surge & Sea Level Rise: A Barrage Scheme in Hong Kong** Ir Andy Kwok - Managing Director, Binnies Hong Kong Limited, China
10:20 - 10:40	Coffee Break
10:40 - 11:10	**Development of Eco-Friendly Port Protection Structures and Dock Structures** Ir Junbiao He - General Manager of the Ministry of Science and Technology of China Harbour Engineering Co., Ltd., China
11:10 - 11:40	**Innovation and Practice in Port Structural Engineering and Technology** Ir Jun Xu**-** CCCC Third Harbor Consultants CO., LTD., China
11:40 - 12:10	**Digital Twin Three Gorges Project – a Pilot Study and the Way forward** (online) Dr. Yan Huang - Deputy Chief Engineer, Yangtse Water Resources Commission, China
12:20 - 13:50	Lunch Break, Seasons M.U.S.T. Training Restaurant, Block N, M.U.S.T.
14:00 - 14:30	**Using on-demand prediction services to build user-tailored coastal Digital** (online) Anabela Oliveira - Senior Researcher, Head, Information Technology in Water and Environment Research, National Civil Engineering Laboratory (LNEC), Portugal
14:30 - 15:00	**Intelligent Simulation and Dynamic Analysis of Coastal Urban Flooding Disasters** Prof. Jiahong Liu - Deputy Director of Department of Water Resources, China Institute of Water Resources and Hydropower Research, China
15:00 - 15:30	**Coastal Facts and Challenges in Spain, Example Plans and Projects** (online) Ir. Jose Maria Grassa - Director, Centre for Harbours and Coastal Studies, Centro de Estudios y Experimentación de Obras Públicas (CEDEX), Spain

	Invited Lectures **Chair Ir Andy Kwok** **Venue: N101, Macau University of Science and Technology**
15:30 - 15:50	**Learning from Fish: A Peek into Future Underwater Vehicles** Prof. Dixia Fan - Westlake University, China
15:50 - 16:10	**Coffee Break**

Session 2 Environmental Monitoring and Protection

April 8

	Keynote Lectures **Chair: Prof. Tang-Huang LIN and Prof. Law Wing Keung, Adrian** **Venue: N101, Macau University of Science and Technology**
16:10 - 16:40	**Close-range Remote Sensing of Coastal Environment – Recent Progress** Prof. Law Wing Keung, Adrian - Department of Civil Engineering, National University of Singapore, Singapore
16:40 - 17:10	**The Potential of Satellite Remote Sensing in the Environmental Monitor and Sustainable Development** Prof. Tang-Huang Lin - Director, Center for Space and Remote Sensing Research, National Central University, Taiwan, China
17:10 - 17:40	**Hyperspectral Remote Sensing for "Reduction of Pollution and Carbon Emissions"** Prof. Cheng Liu - Department of Precision Machinery and Precision Instrumentation, University of Science and Technology of China
	Invited Lectures **Chair: Prof. Law Wing Keung, Adrian** **Venue: N101, Macau University of Science and Technology**
17:40 - 18:00	**Atmospheric Monitoring Technology and Regional Networking Application of Ozone Lidar** Prof. Tianshu Zhang - Hefei Institutes of Physical Science, Chinese Academy of Sciences, China
18:00 - 18:20	**The Framework of Multiple Oceanic Observations System for GBA: A Preliminary Study in the Hong Kong area** Dr. Xian Qin, State Key Laboratory of Marine Pollution, City University of Hong Kong, China
18:30	Welcome Dinner, Banquet hall on the second floor, Grand Hyatt Macau

Session 3 Land and Sea Coordination and Sustainable Development

April 9

	Keynote Lectures **Chair: Prof. Jiahong Liu** **Venue: N101, Macau University of Science and Technology**
09:00 - 09:30	**Challenges and opportunities of sponge city construction in Macao** Nian She - Professor, Tsinghua University Innovation Center in Zhuhai, China
09:30 - 10:00	**Operational Coastal Watch Systems in Taiwan Waters** (online) Dong-Jiing Doong - Professor/Chairman, Department of Hydraulic and Ocean Engineering, National Cheng Kung University, Taiwan, China
10:00 - 10:30	**Land Creation in the Pearl River Delta and its Influence on Ecology** Prof. Zhaoyin Wang - Macau University of Science and Technology, Macao, China
10:30 - 10:50	Coffee Break
10:50 - 11:20	**Damping of solitary waves by coastal vegetation and a new device for coastal protection** (online) Michele Mossa - Chairman, IAHR Eco-hydraulics Committee, Technical University of Bari, Italy
	Invited Lectures **Chair: Prof. Nian She** **Venue: N101, Macau University of Science and Technology**
11:20 - 11:40	**Projecting Water and Nutrient Delivery from the Pearl River Basin to Coastal Waters under a Changing Climate** Dr. Qichun Yang - Hongkong University of Science and Technology (Guangzhou), China
11:40 - 12:00	**Flooding of Estuarine Margins: Problems, Processes and Predictions** (online) André Fortunato - Principal Researcher, National Civil Engineering Laboratory (LNEC), Portugal
12:00 - 12:20	**Research and application of core technology of super ecological seawall against storm surge** Ir Chunding Cao - Deputy Director, Comprehensive Design Institute of China Water Resources Pearl River Planning，Surveying and Designing Co.，Ltd., China
12:30-13:50	Lunch, Seasons M.U.S.T. Training Restaurant, Block N, M.U.S.T.

Technical Activities

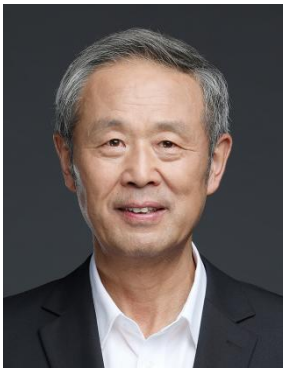
14:00 - 18:00	Visiting the M.U.S.T. History and Achievements Exhibition Hall, the State Key Laboratory of Lunar and Planetary Sciences, the National Observation and Research Station of Coastal Ecological Environments in Macao, and degradation of Hac Sa beach in Coloane, Macao.

Posters and Entrepreneurship Exhibitions

This section will present the research results of environmental monitoring by the National Observation and Research Station of Coastal Ecological Environments in Macao. The current posters are as follows. This section also focuses on relevant entrepreneurship exhibition. Salon and discussions will be conducted so that the audience can sit down and talk to the exhibitor(s) if they are interested in exploring further. Coffee will be provided.

April 8		
	Posters and Exhibitions **14:00-18:00** **Venue: outside N101, Macau University of Science and Technology**	
1	Causes and controls of atmospheric complex pollution in Macao	Yan You, M.U.S.T.
2	Digital Twin Platform for Macao coastal Flood Forecasting	Shan Huang, M.U.S.T.
3	Research on feasibility of water quality buoyin Macao waters	Kai Zhang, M.U.S.T.
4	Storm surge simulation based on three-dimensional model of tide-surge-wave coupling and flooding simulation in Macao	Jinlan Guo, M.U.S.T.
5	Low-cost AI-based Systems for Real-time Onsite Harmful Algal Bloom (HAB) Management	R. Yuan, M.U.S.T.
6	Tidal Currents, Storm Surge and Urban Flooding Simulation - Towards a Real Time Forecasting and Digital Twin System for Emergency Response in Macao	Jinlan Guo, M.U.S.T.
7	China Harbour Engineering Co., Ltd.	
8	China Certification & Inspection Group Macau Co., Ltd.	

Session 1: Coastal Engineering Innovation and Development

Full Name	Ming Lin	
Affiliation	Academician of the Chinese Academy of Engineering, Chief scientist of China Communications Construction Co., LTD	
Speech Topic	Exploration of Research Methods in Marine Engineering Technology	

Abstract

The global population continues to grow, and the extreme weather and sea level rise caused by the greenhouse effect, the demands of food and energy, as well as the urban environmental problems, are becoming more and more significant. This report expounds the ideas of solving the future urban development problem through marine engineering technology, and introduces some research advances in this topic, including future marine engineering technology, research methods and concepts, future trends, etc.

Biography

Prof. Lin Ming is an expert of technology and management in bridge, tunnel and marine engineering. Currently, he is the chief scientist of China Communications Construction Co., LTD, and the Academician of the Chinese Academy of Engineering. He has presided over the construction of a number of national key projects, such as the island and tunnel construction project of the Hong Kong-Zhuhai-Macao Bridge. In recent years, he has organized the researches and developments of a series of applied technologies such as the floating engineering on continental shelf, focusing on the key technologies for engineering design and construction.

Session 1: Coastal Engineering Innovation and Development

Full Name	Andy Kwok	
Affiliation	Managing Director, Binnies Hong Kong Limited	
Speech Topic	Flood Defence arising from Storm Surge & Sea Level Rise: A Barrage Scheme in Hong Kong	

Abstract

In recent years, the global effects of climate change have become prominent with extreme weather occurring more frequently. The Yuen Long district (Hong Kong, China) is flat in topography and susceptible to flooding due to the increase in rainfall intensity and rise in sea levels.

To uplift the flood protection level of Yuen Long town center, the pioneering Barrage Scheme embodies a tidal barrier and a series of large capacity pumps at the downstream end of Yuen Long Nullah to maintain its flood conveyance capacity during high-tide rainstorm events. The scheme allows for cost-effective adjustments on the operation mode of the pumping station (e.g. pump trigger levels) and flexibility for pump upgrades in adapting the uncertainties of future extreme weather.

In addition, emphasis has also been placed to environmental sustainability. The scheme offers an opportunity for evolution of the existing concrete-paved nullah into a pleasant blue-green river corridor with new ecological habitats and enhanced biodiversity. The revitalized channel creates a scenic public space, which aims to improve the living environment of Yuen Long.

Biography

Andy Kwok is the Managing Director of Binnies Hong Kong Limited, overseeing the management and sales of the company's operations across Hong Kong, Mainland China, and Vietnam. He leads a team of over 1,000 individuals, maintaining client relationships and managing a diverse project portfolio. With over 30 years of experience in civil engineering, Andy has a proven track record in delivering complex water, drainage, sewerage, and infrastructural projects.

With a deep expertise in hydrology & hydraulics and the design of drainage works, Andy has directed numerous significant infrastructural projects, such as Yuen Long Barrage Scheme, Happy Valley Stormwater Storage Scheme, Shenzhen River regulation, drainage master plan studies and drainage improvement projects in both Hong Kong and Mainland China. His expertise extends internationally with World Bank / Asia Development Bank-funded projects.

His commitment to excellence is reflected in the numerous awards he has amassed, including the prestigious Dai Yu Science & Technology Medal by China's Ministry of Water Resources and multiple ICE NEC Awards for projects that exemplify innovation, sustainability, and climate resilience.

Session 1: Coastal Engineering Innovation and Development

Full Name	Junbiao He	
Affiliation	Deputy Chief Engineer, General Manager of the Ministry of Science and Technology, China Harbour Engineering Co., Ltd.	
Speech Topic	Development of Eco-Friendly Port Protection Structures and Dock Structures	

Abstract

Against the backdrop of the global economic green transformation, ports, as crucial nodes of the Maritime Silk Road, are witnessing an inevitable trend towards green and intelligent development. China Harbour Engineering Co., Ltd (CHE) actively responds to the national strategy of green development and has embarked on a series of explorations and practices in green port construction in countries along the Belt and Road Initiative. Large-scale port projects such as the Gwadar Commercial Port, the Ashdod Port in Israel, the Second Container Terminal of the Abidjan Port, and the Colombo Port City have been successively constructed. Throughout the construction of these projects, CHE not only emphasizes engineering quality and progress but also prioritizes environmental protection and sustainable development. Guided by green thinking, CHE actively adopts the latest environmental protection technologies in port construction, such as carbon footprint calculation. Through strategic planning, technological innovation, and intelligent automation, the goal of green construction and energy conservation and emission reduction is integrated into port construction projects. This reduces carbon emissions and environmental pollution during construction and operation, contributing to China's efforts in promoting the construction of green shipping corridors.

Biography

Ir Junbiao He is a professor-level senior engineer, Class I Constructor, registered engineer with the Institution of Civil Engineers in the UK, and a chartered surveyor with the Royal Institution of Chartered Surveyors in the UK. With 30 years of experience in project management, technical management, and design management, he has participated as the chief person in charge in major projects both domestically and internationally, including the Phase I project of Shantou Deepwater Port, Zhuhai Qiao'ao Bridge, Pakistan Abazhai Water Conservancy Project, Bangladesh Phase III Highway Project, Saudi Arabia Zawar Port Project, Kuwait Bubyan Island Road and Bridge Project, and UAE Sharjah SD Overpass Bridge Project. He has received 1 National Quality Engineering Award and 10 Provincial and Ministerial Science and Technology Awards, including 3 first prizes, and has published over 10 papers.

Session 1: Coastal Engineering Innovation and Development

Full Name	Jun Xu
Affiliation	Ir/Dr., CCCC Third Harbor Consultants CO., LTD.
Speech Topic	Innovation and Practice in Port Structural Engineering and Technology

Abstract

The innovation and practice of port structural engineering and technology focus on pioneering design and applied research in areas such as prefabricated high-pile wharves, resilient shore protection, and the application of solidified soil in water transportation. Specifically, this encompasses the development of green and efficient design concepts and key technologies for prefabricated high-pile wharves; the understanding of wave-resistant and erosion-resistant resilience mechanisms and evolutionary patterns in resilient shore protection structures (including barrel foundations and semi-vertical ecological shore protections); and the research and application of solidified soil in port erosion control and foundation treatment. Feasibility discussions are also conducted regarding the application of these pioneering technologies in the proposed Macao Ecological Island project.

Biography

Chief engineer Xu has been engaged in consulting, designing, and scientific research in port and coastal engineering for a long time, He has overseen over 100 projects in port and coastal engineering. These projects include national key projects such as Zhoushan National Oil Reserve, the north side of Xiaoyangshan, as well as major projects like the Formosa Ha Tinh Steel Mill Deepwater Port Project in Vietnam, Phase Four of Taicang Port in Suzhou, and the 300,000-ton Crude Oil Terminal of Fushun Refinery. He has designed and completed the first fully prefabricated high-pile wharf in China, demonstrating extensive engineering experience and a solid technical foundation. The design achievements have been honored with two National Quality Engineering Awards, two provincial and ministerial-level scientific and technological awards, and over ten provincial and ministerial-level outstanding design awards, including four first prizes. He has also led the formulation of several technical standards and published over ten core papers.

Session 1: Coastal Engineering Innovation and Development

Full Name	Yan Huang	
Affiliation	Deputy Chief Engineer, Yangtse Water Resources Commission	
Speech Topic	Digital Twin Three Gorges Project – a pilot study and the way forward	

Abstract

A Digital Twin (DT) platform is usually composed of data-board, model platform and knowledge platform, based on this platform, various applications such as flood management, water resources allocation, environmental protection etc., can be developed to serve the river management purpose. Comparing with the traditional Decision Support System (DSS), a DSS developed using the DT concept can provide enhanced capability on timely reflection of the dynamics of the physical world, accurate simulation of the physical phenomena or process, such as prediction or simulation and analysis of floods, water quality/ pollution transportation, or change of the morphology etc., as well as smart decision support capacity with artificial intelligence (such as operation of reservoirs or water infrastructures). This talk explains the development objectives, the overall framework, system components and the preliminary results of the development of Digital Twin Three Gorges project. Key issues and lessons are discussed and highlighted. Considering the new requirements of high-quality development and new quality productivity in the new stage, the future prospects of the Digital Twin Three Gorges Projects are as well presented.

Biography

Dr. Ms. Huang Yan was graduated from Hohai University in 1992 and joined the Changjiang River Water Resource Commission afterwards. During 1997 ~ 2005, she studied in the Netherlands, Denmark, Hong Kong, and the United States, and received the Doctorate degree from the University of Twente in the Netherlands, in Oct 2005. She has been working as the deputy chief engineer for the bureau of hydrology during 2006-2011, and the deputy chief engineer for the Changjiang design company of CWRC during 2011-2020. She is currently the deputy chief engineer of Changjiang River Commission, Chairman of the Flood Assessment and Dam Safety Committee of ICOLD, and member of the 14th national congress of China.

Ms. Huang has long been engaged in technical support for river basin management in Changjiang River, including flood management and drought disaster prevention, joint water infrastructure operation, river basin planning, hydroinformatics etc. He led the development of joint dispatching plans for water projects in the Changjiang River Basin, operation rules of important reservoirs such as the Three Gorges reservoir and Danjiangkou reservoir, the development of digital Twin Changjiang River, development of Ecuador's national planning on river basin and water resources managmeent, Pakistan's hydropower planning and other large-scale planning consulting and research projects at home and abroad. She is also active in research area – led national research project and national foundation project. She has published more than 40 papers.

Session 1: Coastal Engineering Innovation and Development

Full Name	Anabela Oliveira	
Affiliation	Senior Researcher, Head, Information Technology in Water and Environment Research, National Civil Engineering Laboratory (LNEC), Portugal	
Speech Topic	Using on-demand prediction services to build user-tailored coastal Digital Twins	

Abstract

Digital Twins integrate continuously the real and the virtual assets. They provide a virtual representation of a physical asset enabled through data and models. Digital Twins can be used for multiple applications such as real-time forecast of system dynamics, system monitoring and controlling, and support to decision making. Recent tools take advantage of the huge online volume of data streams provided by satellites, IoT sensing and many real-time surveillance platforms, and the availability of powerful computational resources that make process-solving, high-resolution models or AI-based models possible, to build high accuracy replicas of the real world. Herein the concept of Digital Twins is adapted to the coastal zones dynamics and requirements, handling the high non-linear physics and the complexity of monitoring these regions. The work takes advantages of the on-demand, relocatable coastal forecast framework OPENCoastS and the UBEST smart coastal observatory tool, to build a user-centered DT platform. Tailored services, from early-warning tools to collaboratory platforms, are proposed through this DT platform and customized to meet the users' needs.

Biography

Dr. Anabela Oliveira is a Principal Researcher and the Head of the Information Technology Division of the National Laboratory for Civil Engineering, Portugal. She has over 30 years of research activity in the fields of coastal engineering, numerical modeling and forecast systems applied to water dynamics. She is one of the first promoters of the adaptation of the concept of Digital Twins to coastal regions and in this context a member of the Steering Committee of the UN Decade Coast Predict Programme and a member of the Advisory Board of the EDITO Model Lab EU project. She has participate in over 25 externally funded research projects, published over 80 papers and has an H-index of 25.

Session 1: Coastal Engineering Innovation and Development

Full Name	Jiahong Liu	
Affiliation	Deputy Director of Department of Water Resources, China Institute of Water Resources and Hydropower Research	
Speech Topic	Intelligent Simulation and Dynamic Analysis of Coastal Urban Flooding Disasters	

Abstract

To address the escalating coastal inundation disasters in the context of climate change and rapid urbanization, as well as the low level of intelligence in decision analysis, intelligent simulation and dynamic analysis of coastal inundation disasters in coastal cities have been conducted. This includes integrating diverse data and analyzing the formation mechanism and evolution characteristics of inundation disasters in the Guangdong-Hong Kong-Macao Greater Bay Area and Macao. A numerical model of inundation process in the Inner Harbor area of Macao has been constructed, and a machine learning method based on numerical simulation of inundation process has been developed, combined with scenario simulation to analyze the inundation characteristics of the Inner Harbor area of Macao; based on the digital map, the data set of disaster-bearing bodies such as population and transportation were constructed, and the extensive traffic data analysis was superimposed. The risk assessment method for water immersion disasters was erected, and the risk and socio-economic vulnerability assessment of water immersion disasters in typical areas was carried out; combined with historical inundation disaster events and prevention and control needs in Macao, a preliminary digital twin platform for prevention and control of inundation disasters in Macao has been constructed, and scenario-based inundation process deduction analysis has been conducted to provide technological support for the prevention and control of inundation disasters in the Macao region.

Biography

Dr Liu is deputy director of department of water resources in IWHR, and deputy director of the Key Laboratory of River Basin Digital Twining, Ministry of Water Resources. He graduated from Tsinghua University in 2005, awarded bachelor, master and doctorate degree. He has made many innovative contributions in urban hydrology, especially on urban flood control, sponge city construction, etc. He has published more than 300 papers, in which 100+ were indexed by Science Citation Database (Web of Science). Dr. Liu has won one national awards of first prize for scientific and technological progress, and six provincial awards of first prize. In addition, he was awarded the China Youth Science and Technology Award, the Fund of National Youth Talent Support Program, the Excellent Youth Science and Technology Award of Ministry of Water Resources, etc.

Session 1: Coastal Engineering Innovation and Development

Full Name	Jose Maria Grassa
Affiliation	Director, Centre for Harbours and Coastal Studies, Centro de Estudios y Experimentación de Obras Públicas (CEDEX), Spain
Speech Topic	Coastal facts and challenges in Spain, example plans and projects

Abstract

Two circumstances that happen globally also mark the Spanish coasts: the growth of urban settlements and the growth of population living at and depending on coastal areas, giving rise to the urban coast. That implies an extensive change of land use in the nearshore and the need to adapt, protect and increase resilience in these areas highly vulnerable to climate – related hazards: water scarcity, coastal erosion, river, and maritime flooding. There is a need to stablish public policies for the adequate protection of the unique costal and seas environment, biodiversity, and the common welfare, as well as to develop plans and projects to such end and to correct imbalances and restore the coastal environment where damaged.

The presentation will provide first an extended introduction about coastal facts and related challenges and then will discuss some recent coastal engineering projects (2023 – 2024) in Spain (environmental recovery of O' Burgo Estuary, beach restoration at El Saler, Valencia) as well as an example of large-scale planning for increasing resilience of the Ebro river Delta to changing conditions.

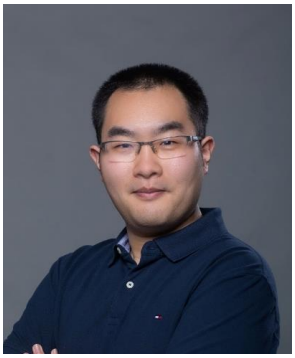
Biography

Jose M. Grassa, MSc Roads, Waterways and Ports, 1982, Polytechnic University of Madrid (UPM), Advanced Studies Diploma, 2010, UPM. I am the Director of Centre for Harbors and Coastal Studies (CEPYC) of CEDEX and associate professor, Maritime Structures, UAX University, Madrid. I have been responsible of writing some and supervising more than 2,000 contracted research, development, and advanced technology CEPYC – issued reports on port and coastal engineering, as well as on environmental quality on coasts and seas and navigation safety.

As Director of CEPYC I have also promoted the continuous buildup of world - class, applied research, capabilities at the Centre: Multidirectional Wave Basin, Large Scale Wave and Wind Flume, Ship Maneuvering Unit, Sea Pollution Fighting Laboratory. My personal work has been dealing with computational modelling of wave transformation and wave – structures interaction using CFD as well as characterization of marine traffic from sea basins to ports, related environmental issues (underwater sound, collision risks with whales) and port planning and management using Big Data.

A member of IAHR since 1989, I was a member of the Maritime Hydraulics Section in the '90s and an elected member of IAHR Council between 1987 – 2001. I was made an IAHR fellow in 2023.

Session 1: Coastal Engineering Innovation and Development

Full Name	Dixia Fan	
Affiliation	Director of i4FSI Lab, Westlake University	
Speech Topic	Learning from Fish: A Peek into Future Underwater Vehicles	

Abstract

The subject of biomimetics looks for inspiration from biological systems to develop innovative, even revolutionary, engineering solutions. For marine science, biomimetics is particularly attractive, as evolution began in the oceans. Animals are found in various strange marine environments, from tropical coral reefs to biting polar ice waters, sunny blue seas, and dark abysses. As a result, different aquatic animals have acquired fantastic survival skills, helping them to overcome various survival challenges. On the contrary, our man-made vehicles still face problems, such as large drag force and limited maneuverability. In this talk, I will learn from amazing creatures such as sea turtles, bluefin tuna, puffins, etc. Then I will discuss the history and current status of bio-inspired research for marine engineering and "peek" into the future of marine technology.

Biography

Dr. Dixia Fan was born in Shanghai in 1990. He obtained his BS.c. from Shanghai Jiao Tong University, China, in 2013, and then received his MS.c and Ph.D. from MIT, the USA, in 2016 and 2019. He then worked as a postdoctorate associate and then a research scientist at MIT Sea Grant, where he established the intelligent hydrodynamics lab. In 2021, he joined Queen's University, Canada as an assistant professor in the department of mechanical and material engineering. In 2022, he joined Westlake University as an assistant professor in charge of the Intelligent and Informational Fluid Mechanics Laboratory.

Session 2 Environmental Monitoring and Protection

Full Name	Law Wing Keung, Adrian	
Affiliation	Professor, Department of Civil and Environmental Engineering National University of Singapore	
Speech Topic	Close-range Remote Sensing of Coastal Environment – Recent Progress	

Abstract

Recent technological advancement has significantly enhanced our capability to perform remote sensing of coastal environment in an on-demand and timely manner. In this talk, further progresses will be presented on the deployment of Unmanned Aerial Vehicle (UAV)-borne hyperspectral and multispectral sensors for close-range observations of the coastal environment. They include the assessment of uncertainties in the ground-truthing processes with in-situ measurements, corrections of GPS stitching (which is essential for featureless coastal water surfaces) due to time stamp delays of images, as well as new algorithms for sun glint corrections derived specifically for close-range remote sensing. Furthermore, the adoption of a shore-based marine x-band radar for close-range remote sensing of currents and waves in the coastal environment will also be discussed, with the long term objective to establish reference information against climate change and sea level rise.

Biography

Dr Law is currently a Professor in the Department of Civil and Environmental Engineering at the National University of Singapore from 2024. He obtained PhD and MSc degrees in Civil and Environmental Engineering from the University of California at Berkeley with specialisations in coastal and hydraulic engineering, and BEng (Civil) from the University of Hong Kong. He was a senior practising engineer in the USA for over 7 years (while pursuing graduate education), before migrating to Singapore to join the academic faculty of the School of Civil and Environmental Engineering, Nanyang Technology University, in 1995. He received the Wesley Horner Award and Karl Emil Hilgard Hydraulic Prize by the American Society of Civil Engineers (ASCE) and two Outstanding Technical Paper Awards by the Bechtel Corporation, USA. He also chaired the Joint IAHR/IWA Committee in Marine Outfall Systems (2014-16) and ASEAN Hydroinformatics Data Centre as Singapore's representative (2022-2023), and is the Editor-in-Chief of the Journal of Hydro-Environment Research as well as Editorial Board members in related technical journals. His recent research work focuses on coastal protection and field monitoring of coastal water environment.

Session 2 Environmental Monitoring and Protection

Full Name	Tang-Huang Lin
Affiliation	Director, Center for Space and Remote Sensing Research, National Central University
Speech Topic	The potential of satellite remote sensing in the environmental monitor and sustainable development

Abstract

To evaluate and analyze those factors induce or contribute into climate change, it is imperative to integrate and interpret traditional and untraditional two- and three-dimensional observation data. Among those untraditional data, satellite observation and value-added retrieval products are suggested to incorporate with traditional data. This will greatly improve the efficiency and performance in environment/climate change monitoring. On the other hand, when untraditional data and traditional data are combined and integrated, we may conduct the proper capability to response the impacts due to environment/climate change, in particular when data are obtained and processed in a near real-time basis. In this presentation, the potential key factor(s) which may conduct and correlate to environment (surface and atmosphere) and climate change will be discussed from satellite observations. It supposes not only to understand the future regional atmospheric environment/climate change tendency, but also to provide references and suggestions for the risk reduction.

Biography

Tang-Huang LIN received the Ph.D. degree from the Institute of Space Science, National Central University (NCU), Taiwan, in 2001. He is a Professor at the National Central University since 2018, and received an appointment as Director of Center for Space and Remote Sensing Research (CSRSR) in Feb., 2021. His research interests focused on the monitoring of environmental and climate changes via satellite observations, including aerosol remote sensing, ambient PM2.5 exposures on public health, urbanization effects on heat island and regional weather. His current focus has been on applying polar (MODIS) and geostationary (Himawari-8) satellite observations to retrieve aerosol optical properties in identifying sandstorm/dust storm, biomass burning (black carbon) and anthropogenic pollutants (sulfate), and drought and rainfall with air-sea parameters retrieved from satellite observations, as well as atmospheric environment monitoring (air pollution and PM2.5).

Session 2 Environmental Monitoring and Protection

Full Name	Cheng Liu	
Affiliation	Professor, Department of Precision Machinery and Precision Instrumentation, University of Science and Technology of China	
Speech Topic	Hyperspectral Remote Sensing for “Reduction of pollution and carbon emissions”	

Abstract

The implementation of the “Reduction of Pollution and Carbon Emissions” strategy requires refined monitoring technologies for greenhouse and pollution gases. This study has developed remote sensing technologies for greenhouse and pollution gases based on Chinese hyperspectral satellites, breaking the long-standing high dependence on foreign satellites. The remote sensing data is served as the standard products of the Ministry Ecology and Environmental Center for Satellite Application on Ecology and Environment, China and is widely used by government departments, such as the China National Environmental Monitoring Center, for environmental protection work. Besides, in view of the data missing of satellite remote sensing due to cloud cover, we used artificial intelligence (AI) analysis to achieve spatial full coverage of remote sensing results, which were used to identify and dynamicly monitor the pollution hotspots across the country. Targeting the pollution hotspots observed by satellites, we further developed hyperspectral three-dimensional targeted imaging remote sensing and unmanned aerial vehicle (UAV) remote sensing technologies. These technologies can map the refined distribution of greenhouse and pollution gases with a meter-level spatial resolution, which achieve recise tracing of carbon and pollution gas emissions at the facility level and imaging monitoring of emissions from offshore vessels.

Biography

Cheng Liu, Professor, Ph.D. supervisor, the Executive Director of the Precision Machinery and Precision Instrumentation Department at the University of Science and Technology of China, funded by the National Science Fund for Excellent Young Scholars. He serves as the Principal Investigator of the National Key Research and Development Program “Comprehensive Treatment of Atmospheric, Soil, and Groundwater Pollution” special project, and member of the overall expert group for the “Earth Observation and Navigation” special project. He is committed in working at the stereoscopic hyperspectral remote sensing of atmospheric greenhouse and pollution gases and developed the remote sensing technology for the first Chinese ultraviolet–visible hyperspectral satellite instrument. In the past five years, He has published more than 60 papers as first and/or corresponding author, including papers in Science Advance, Light: Science & Applications, Earth-Science Reviews, Remote Sensing of Environment, Bulletin of the American Meteorological Society, and Environmental Science & Technology (ES&T). He won the second prize of National Science and Technology Progress Award of China (2nd finisher), the Prize for Scientific and Technological Innovation of the Ho Leung Ho Lee Foundation, the New Cornerstone Science Foundation XPLORER Prize, and the China Youth Science and Technology Award.

Session 2 Environmental Monitoring and Protection

Full Name	Tianshu Zhang
Affiliation	Professor, Anhui Institute of Optics and Fine Mechanics, Hefei Institutes of Physical Science, Chinese Academy of Sciences
Speech Topic	Atmospheric Ozone Lidar Monitoring Technology and Regional Networking Application

Abstract

This report focuses on the introduction of atmospheric ozone lidar detection technology and application methods. Firstly, introduce the importance of vertical monitoring of atmospheric ozone for ecological and climate research; Secondly, review the evolution of ozone LIDAR technology, especially in terms of LIDAR light sources and multi platforms (ground, vehicle, and satellite); Then, discuss how data assimilation technology can help reduce the differences between existing air quality models and real atmospheric environment observations, and introduce the application of data assimilation in ozone lidar, including implementation methods, application effects, typical cases, etc.; Finally, taking the real-time monitoring and long-term tracking of the ozone LIDAR regional network in the Greater Bay Area of China as an example, the focus is on discussing how LIDAR network applications can be used to evaluate regional ozone pollution events, identify local and external sources, and quantitatively analyze physical and chemical processes; This report not only summarizes the ozone LIDAR technology and its application in data assimilation, but also looks forward to the potential and challenges of regional networking in future atmospheric environment monitoring and management.

Biography

Dr. Zhang comes from the Hefei Institutes of Physical Science, Chinese Academy of Sciences and is the Chief Scientist of the 14th Five Year National Key Research and Development Program. He has been committed to new methods and technologies for atmospheric detection using LIDAR for the past twenty years, and has successfully developed and industrialized a series of LIDAR equipment on multiple platforms, including particulate matter, ozone, water vapor, temperature, etc. He has obtained the spatiotemporal distribution and transport characteristics of atmospheric pollutants and environmental meteorological elements in China, promoting the three-dimensional development of China's environmental monitoring network from the ground to three-dimensional space. The achievement has won the first prize of Anhui Province Science and Technology Progress Award and the second prize of National Science and Technology Progress Award. In recent years, Dr. Zhang has presided over and undertaken more than 20 scientific research projects, including the National Key R&D Program and the Strategic Leading Science and Technology Project of the Chinese Academy of Sciences. In the past five years, Dr. Zhang has published over 40 papers and applied for 17 invention patents.

Session 2 Environmental Monitoring and Protection

Full Name	Xian Qin	
Affiliation	State Key Laboratory of Marine Pollution, City University of Hong Kong	
Speech Topic	The Framework of Multiple Oceanic Observations System for GBA: A Preliminary Study in the Hong Kong area	

Abstract

Guangdong-Hong Kong-Macao Greater Bay Area (GBA) comprises nine cities and two special administrative regions in South China. As one of the coastal megalopolis in China, GBA has economic development potential but also owns the strength and regional advantage for scientific and technological development in ocean-related studies. However, although the footprint of scientific topics has been expanded to the mesopelagic and even hadalpelagic zone, a systematical and broad-applicated method for nearshore oceanic observation and monitoring is still less studied and far from complete. Our study aims to integrate multi-dimensional methods for nearshore oceanic observation and monitoring to construct a stereo-framework. Summarily, this method includes acoustic, optical, and aerial surveys. The acoustic survey (e.g., single-beam echo sounders and multibeam echo sounders) is to collect rough information for benthic conditions, the optical survey (e.g., unmanned water drone, drop cameras, and SCUBA diving) is to quantify benthic habitat and collect image and video information, and the aerial survey (e.g., unmanned aerial vehicle) is to obtain the shoreline topographic information. Overall, by this method, we can collect the baseline information for nearshore areas, especially for specific habitats ecological surveys, such as coral reefs, seagrass meadows, and salt marshes. Several ecological surveys have been conducted applying this method, including Victoria Harbour and Tung Ping Chau Marine Park, and will be introduced in the presentation. More importantly, the data obtained by our method can further support related studies, such as long-term habitat monitoring and digital twin ocean construction.

Biography

Graduated as a Doctor of Philosophy in the Department of Chemistry, City University of Hong Kong
I am now working as a Postdoc in the Stake Key Laboratory of Marine Pollution, City University of Hong.

Major:
Underwater Mapping; Ocean observation; Environmental toxicity; Transcriptome; Bioinformatics

Session 3 Land and Sea Coordination and Sustainable Development

Full Name	Nian She
Affiliation	Professor, Tsinghua University Innovation Center in Zhuhai
Speech Topic	Challenges and opportunities of sponge city construction in Macao

Abstract

Macao, a bustling city known for its vibrant culture and tourism, located at the estuary of the Pearl River, is extremely vulnerable to extreme meteorological events such as rising sea levels, typhoons, and storm surges. The impact of climate change and rapid urbanization has exacerbated the frequency of extreme weather events. Unfortunately, the traditional urban infrastructure in Macao is struggling to cope with the sudden influx of stormwater. In particular, the heavy rainfall and storm surge caused by typhoons Hato and Mangkhut caused huge losses to the lives and property of the people of Macao.

To mitigate the catastrophic consequences of flooding, urgent measures are required to enhance the city's resilience to these events. The Sponge City strategy, presented in this context, offers a comprehensive solution to transform urban landscapes into sustainable and resilient environments. By integrating green spaces, permeable pavements, and rainwater harvesting systems, Sponge City construction aims to effectively manage stormwater runoff, mitigate flooding risks, and improve water quality. A pilot area is proposed for the demonstration.

Biography

Dr. She, with over 30 years of expertise, has made significant contributions to the fields of stormwater management and sustainable urban planning. He specializes in water quality, hydrologic/hydraulic modeling, and the design and implementation of low impact development.

Previously, Dr. She served as a senior civil engineering specialist with the City of Seattle. Currently, he holds the esteemed position of director at the Smart Water Utility Research Institute within the Tsinghua University Innovation Center in Zhuhai. His influence extends further as a distinguished professor at Guangzhou University and a guest professor at Peking University, Xian Jiaotong University, and Shenzhen University in China.

Dr. She's active involvement in professional organizations includes roles in the American Society of Civil Engineers (ASCE), the International Water Association (IWA), and the Environmental and Water Resources Institute (EWRI). He currently chairs the Low Impact Development Modeling Committee and serves as a council member for the Urban Water Resource Management Committee.

Session 3 Land and Sea Coordination and Sustainable Development

Full Name	Dong-Jiing Doong
Affiliation	Professor/Chairman, Department of Hydraulic and Ocean Engineering, National Cheng Kung University
Speech Topic	Operational Coastal Watch Systems in Taiwan Waters

Abstract

Meteo-oceanographic data has been widely used for various objectives, such as engineering design, environmental protection, hazard mitigation, navigation, fishery industry, coastal zone management, etc. Taiwan is surrounded by ocean with a coastline of 1988 km. The developments in economic, traffic and recreational activities in Taiwan are strongly linked with oceans. However, Taiwan is one of the most vulnerable areas in the world and frequently suffers from natural disasters including sea hazards such as coastal erosion, extreme waves, storm surges, destructive swells, rip current, coastal flooding, and sea level rise. An oceanographical observation network around Taiwan has been built in order to fulfill the needs of hazard mitigation. The network consists of various type of stations including data buoys, tide stations, radar stations, coastal weather stations and camera stations. In this presentation, the instrument, technologies, experiences, data QC and applications will be reported.

Biography

Dong-Jiing Doong is the Professor and Chairman in the Department of Hydraulic and Ocean Engineering of National Cheng Kung University (NCKU) in Tainan, Taiwan. Prof. Doong's research interests cover ocean-related hazards such as typhoon waves, freak waves, coastal flooding, storm surge, sea level rise, rip current and marine debris. He and his research group develop various measurement systems for above items, as well as the development of warning systems. Prof. Doong is also the director of Coastal Ocean Monitoring Center (COMC) of NCKU. COMC investigates on the latest ocean measurement techniques to assess Taiwanese government in setting-up and operating the long-term meteo-oceanographic monitoring networks in Taiwan Waters. The network has more than 60 stations including Data Buoys, Tide Stations, Weather Stations, Camera Stations, and Microwave Radar Stations. Prof. Doong has published more than 50 papers in peer-reviewed journals and obtained more than 15 patents in the field of ocean measurements.

Session 3 Land and Sea Coordination and Sustainable Development

Full Name	Michele Mossa	
Affiliation	Chairman, IAHR Eco-hydraulics Committee, Technical University of Bari, Italy	
Speech Topic	Damping of solitary waves by coastal vegetation and a new device for coastal protection	

Abstract

Mangroves serve as a natural defense for the coastal strip against extreme waves. Additionally, innovative techniques based on natural coastal defense principles are increasingly employed, aligning with the principles of eco-hydraulics. Therefore, it is crucial to accurately assess wave transmission through cylinder arrays. The attenuation of solitary waves propagating through an array of rigid emergent and submerged cylindrical stems on a horizontal bottom is investigated theoretically, numerically, and experimentally. The theoretical model's results are compared with numerical simulations obtained using the SPH-Smoothed Particle Hydrodynamics meshless Lagrangian numerical code and experimental laboratory data. In the latter scenario, solitary waves were tested against a background current to replicate more realistic sea conditions, as the absence of circulation currents is rare in the sea. The comparison confirmed the validity of the theoretical model, enabling its application for the purposes. Moreover, the study facilitated an evaluation of the bulk drag coefficient of the rigid stem arrays used, considering factors such as their density, stem diameter, and submergence ratio. Additionally, preliminary tests of a device based on the concept of MetaMaterials, which alter wave propagation properties and may attenuate transmitted wave energy, will be presented.

Biography

Michele Mossa (MM) is Full Professor of Hydraulics at the Polytechnic University of Bari, Italy. He is Chair of the Technical Committee on Ecohydraulics of the IAHR, expert member of the ministerial commission for the preparation of the Italian National Research Plan, Chief Scientist of the Coastal Engineering Laboratory of the Polytechnic University of Bari and member of the Council of the National Consortium for Marine Sciences. MM is person in charge of the international cooperations of the Polytechnic University of Bari with the University of Tennessee (USA), the University of Notre Dame (USA), the Institute of Fluid Mechanics and Heat Transfer, TU Wien, Austria, and the Universite Grenoble Alpes.

The main research topics of MM are relevant with the Environmental and Maritime Hydraulics, examining the mechanisms of waves, sea currents, local erosion, buoyant and non-buoyant jets, and channel flows. He is author of 127 papers in journals, 91 book chapters, 59 paper in proceedings of conferences, 12 books, 2 editorship, 2 patents. MM is within the top 2% of scientists of their main subfield discipline (the list was drafted by researchers from Stanford University: Ioannidis, John P.A., 2023). Further information is available on the website: https://www.michelemossa.it/en/

Session 3 Land and Sea Coordination and Sustainable Development

Full Name	Zhaoyin Wang
Affiliation	Professor, Macau University of Science and Technology
Speech Topic	Land creation in the Pearl River delta and its influence on ecology

Abstract

The Pearl River delta is a female delta with high bio-diversity. Deltas are constructed by the rivers with sediment. A male delta develops if the ratio of sediment to water is high and the tidal current is weak. A female delta develops if the ratio is low. Male delta is unstable and has only one or two channels. Female delta is stable and has multiple channels and numerous islands. The estuarine waters in female deltas have good ecology with high biodiversity. Male deltas are unstable and its estuarian waters have much lower biodiversity.

Artificial land creation with sediment has been practiced in all river deltas in China. The total area of artificial land in China has exceeded 10,000 km2. About 60% of the 18,000 km long coastline of China have become man-made coastline. More than 1000 km2 of land in the Pearl River delta and about 2/3 of land in Macao have been created in the past century.

Colonization and competition of various species starts as soon as the new land and new habitats are created. Transformation of muddy and sandy coastal zones into hardened coast line has caused great pressure on invertebrates and reptiles. New species communities are developing. Ecological management of the new land is a challenge and management strategies are needed.

Biography

Zhaoyin WANG (Oct. 1951) is visiting professor of M.U.S.T. and retired professor of Tsinghua University. He is the Chairman of the Advisory Council of the IRTCES-UNESCO. He was president of the World Association of Sedimentation and Erosion Research and vice president of IAHR. He was the chief editor of the “International Journal of Sediment Research” from 1996 to 2013.

His research interests include sediment transportation, river ecology and integrated river management. He has published 240 odd papers in international journals and international conferences, and published 210 papers in Chinese journals. He published 8 books on sedimentation, integrated river management and ecology. The American Society of Civil Engineers awarded him the 2011 Hans Albert Einstein Award. The award citation reads: ”For his unique contributions for understanding of hyperconcentrated flows, debris flows, watershed vegetation-erosion dynamics, stream ecology and restoration, and integrated river basin management.”

Dr. Wang has been invited and delivered 26 keynote lectures and invited lectures at international conferences, including IAHR congresses and symposiums, International Symposia on River Sedimentation, and International Symposium on Eco-hydraulics.

Session 3 Land and Sea Coordination and Sustainable Development

Full Name	André Bustorff Fortunato
Affiliation	Principal Researcher, National Civil Engineering Laboratory (LNEC), Portugal
Speech Topic	Flooding of estuarine margins: problems, processes and predictions

Abstract

This presentation will explore the issue of flooding of estuarine margins. Drawing primarily on examples from Europe's second largest estuary, the Tagus, I will discuss three major topics:

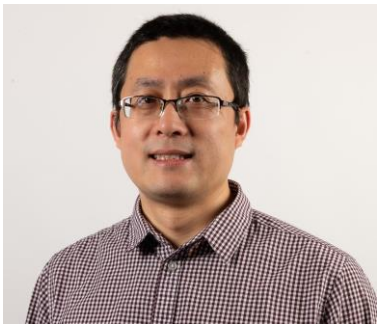
1. why should we care about the inundation of estuarine margins?
2. what drives the inundation of estuarine margins, and what are the relevant processes?
3. what are the challenges associated to the forecasting of the inundation of estuarine margins?

Biography

Dr. André Fortunato is a Principal Researcher in the Estuaries and Coastal Zones Unit of the National Laboratory for Civil Engineering, Portugal, with 35 years of research activity in coastal engineering. His research interests include: 1) the analysis of hydrodynamic processes in coastal zones, such as tides, waves and storm surges, as well as transport processes; 2) the analysis of the morphological evolution of coastal systems, with a major focus on tidal inlets; 3) the development of operational systems; and 4) the development and analysis of numerical models and methods to simulate circulation, morphodynamics and transport in coastal zones, with an emphasis on unstructured grids. He has published 100 journal papers and has a WoS h-index of 29.

Session 3 Land and Sea Coordination and Sustainable Development

Full Name	Qichun Yang
Affiliation	Hongkong University of Science and Technology (Guangzhou)
Speech Topic	Projecting Water and Nutrient Delivery from the Pearl River Basin to Coastal Waters under a Changing Climate



Abstract

The Pearl River Basin (PRB) is expected to experience significant climate changes. In this study, we investigate the delivery of freshwater and nutrients from the Basin to coastal waters under future climate conditions. We first compiled CMIP6 climate projections from three GCMs under four climate change scenarios, and then predicted changes in streamflow, flood inundation, and transport of nitrogen in the PRB. Results indicate that future climate change will result in increases in both precipitation and evapotranspiration. Those changes will lead to increases in streamflow, mainly in the upstream regions of the PRB; Higher streamflows will also increase flood risks in the PRB. Nutrient delivery to the Pearl River Estuary under future climate conditions will be higher than historical levels, posing challenges to the sustainability of the Great Bay area.

Biography

Dr. Yang has been working on understanding how intensifying anthropogenic disturbances and climate change alter water, carbon, and nutrient cycling along the terrestrial-aquatic continuum. In his research, he uses field experiments, data synthesis, data-driven modeling, and process-based modeling to investigate complex interplays between hydrological and biogeochemical processes across the site, watershed, and continental scales. His research has unraveled critical mechanisms regulating water, carbon, and nutrient cycling across the land-river interface. His recent research has centered on developing innovative tools to enhance water forecasting, flood modeling, and water resource management.

Session 3 Land and Sea Coordination and Sustainable Development

Full Name	Chunding Cao
Affiliation	Deputy Director, Comprehensive Design Institute of China Water Resources Pearl River Planning， Surveying and Designing Co.， Ltd.
Speech Topic	Research and Application of Core Technology of Super Ecological Seawall against Storm Surge

Abstract

The core technology puts forward a new idea of managing the estuary coast. It is the first time to propose the transformation from the traditional single rough tide-proof seawall to the diversified waterfront landscape ecological seawall in the innovative concept of seawall design in China. It has successfully resolved the apparent contradiction between urban flood control and landscape hydrophilicity in design, effectively reduced the elevation of traditional embankment, solved the problem of coastal towns walled by levees, realized the real landscape hydrophilic effect of ecological seawall, and satisfied the people 's yearning for a better life and ecological landscape living environment in coastal towns. Its advanced concept and independent innovative technology among other achievements are at the international advanced level and leading position.

Biography

The Deputy Director of the Comprehensive Design Institute of China Water Resources Pearl River Planning，Surveying and Designing Co.，Ltd.(Professor-level senior engineer, working years of 20 years, graduated from North China University of Water Resources and Electric Power), as the design director, has completed more than 30 engineering design results, mainly engaged in the design and research work of ecological seawall waterfront landscape engineering, river network water system connect engineering, river comprehensive improvement engineering, etc. 25 academic papers in provincial and above journals and 2 monographs have been published. 3 national utility model have been patented (all the first inventor). His representative design work is the super ecological seawall project on the north shore of Lingshan Island in Guangdong-Hong Kong-Macao Greater Bay Area. This project is the first super ecological seawall project that has been built in China and has won three international awards and four provincial and ministerial awards. As the general director of the engineering design team, his core role is to lead the independent research and development of three innovative technologies : multi-level wave dissipation platform technology considering landscape, waterfront system drainage technology in seafront, cone hole riding seam self-embedded wave-resistant grass planting integrated block ecological structure technology.

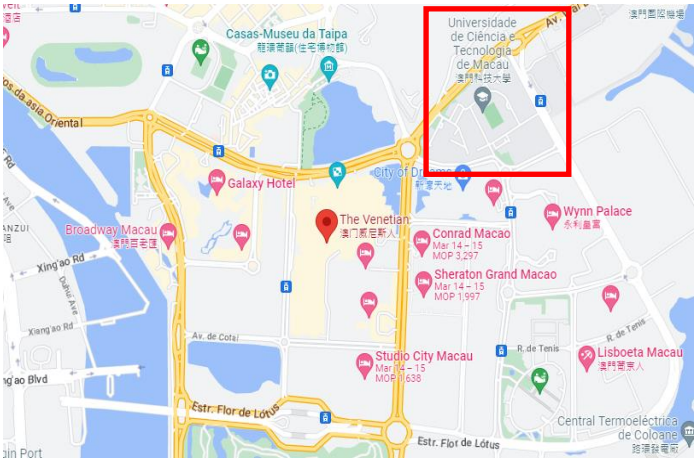
Location and Guidance

Venue: N101, Taipa Campus, M.U.S.T.

Location and Guidance

Getting to the Conference venue

M.U.S.T., located approximately three kilometers from the Taipa Temporary Ferry Terminal. The resort is easily accessible to and from Macau International Airport, Taipa Ferry Terminal and Border Gate. Whether you arrive by land, air, or sea, you can easily reach M.U.S.T. by car, taxi, public transportation, or our convenient shuttle service.



This is the lovely Macao. On our left and upper side, they are Zhuhai City. Over the South China Sea, the right side, it is Hong Kong.

Hengqin Island, Zhuhai City.

Getting to and around Macao

Macau International Airport (MFM) is an international airport located 5 km north of the city, exactly on the island of Taipa.it has rapidly established itself as a vital link between the Pearl River Delta, the fastest growing economic region in the world, and the rest of the world. Macao's hinterland is Zhuhai, one of China's Special Economic Zones, and a regional manufacturing powerhouse. With well-established and efficient direct land and sea links to neighboring regions, Macau International Airport is ideally positioned as a hub for freight and express cargo in the Asia-Pacific.

From here there are several bus lines of the Transport Macau company that allow you to reach different destinations, including the Chinese border. There are also intercity lines directed to various cities in China, including Guangzhou and Dongguan.

Location and Guidance

Hosting City: MACAO

Macao, located on the southeast coast of China, is a special administrative region of the country. Being Asia's well-known gambling Mecca, it is a place to find the traditional Chinese culture while enjoying the exotic Portuguese buildings. Most visitors who have been there conclude that it is a location suited to both tourism and living as it is a beautiful city with clean streets, gardens, and picturesque hilly landscapes. Sunshine, clear air, green lands and all sorts of delicious food contribute to its attractions.

If you visit Macao without experiencing gaming entertainment, you can't say that you have been to this place which is known as China's "Las-Vegas".

Macao, We are in the center of our world map and like all other cities centered in their world map.

We are proximity to Hong Kong, Guangdong Province. Actually, we have shared land border with Zhuhai City of Guangdong Province. You can but not necessarily to take seaway to Macao from Zhuhai. From Hong Kong, you are better to take ferry to Macao. It will take you one hour.

Local Information

Wi-Fi

Free wi-fi will be made available for the Conference Participants to use while at the Conference space. Destination Information.

Weather

Macao weather in March is relatively warm and sunny with an average high of 77 °F (25 °C) and an average low of 55 °F (15 °C).

Time Zone

Macao's time is Macao Standard Time, 8 hours before GMT.

Meeting Space Layout: The Venetian Macao

Estrada da Baia de Nossa Senhora da Esperanca, Macao
Phone: +(853) 2828 8888
https://www.venetianmacao.com/

The Venetian Macao is an incredible, immersive hotel experience, which is recommended in Forbes Travel Guide 2023. Offering only suites, 3000 of them and all more than 70sqm, 1,800-seat luxury Venetian Theatre, 15,000-seat Cotai Arena, which hosts a wide range of entertainment and sporting events, as well as the convention centre and meeting room complex of approximately 1.2 million square feet. 350 world-class shopping choices line a masterfully reconstructed Grand Canal, bridges spanning each bank, just as they do in Venice. An incredible array of dining options, from the food court to the Michelin-starred Golden Peacock to room service, bring guests the best of global cuisines no matter their appetite.

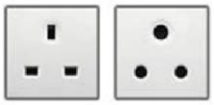
All sections of the conference will be held on the Sicily Room, which can be reached from the Venetian West Lobby.

Currency

The Pataca (MOP$) is divided into 100 avos and it is Macao's official currency.
Roughly 8 Patacas is equivalent to 1 US Dollar.
Roughly 115.97 Patacas is equivalent to 100 Chinese Yuan.
Roughly 103.20 Patacas is equivalent to 100 Hong Kong Dollars.
Foreign currency or travelers' cheques can be changed in hotels, banks and authorized exchange dealers located all around the city.
There are no restrictions on the amount of currency, which can be brought in or taken out of the territory; while most credit cards are accepted in many hotels, shops and restaurants.
Note: Most restaurants and stores do not accept 10 HK Dollars. Changes may be difficult for notes of large values. It is suggested a certain number of small changes be kept. Currency exchange service is available in major tourist spots and casinos.

Electricity

Electricity in Macao is at 220V, 50Hz. The power plugs used in Macao are of the three-pin, square-shaped or round-shaped type. It is suggested to check before using an electrical appliance.



Telephone

If you would like to use your mobile phone while in Macao, please contact the information services below: 1000 (CTM) 1118 (Hutchison Telecom) 1628 (SmarTone) 1888 (China Telecom (Macau) Co., Ltd.). Besides, Hutchison Telecom Network is now providing the Mobile Tour Guide Service. Visitors can listen to the voice information service by dialing the Spot Code #83.

Useful Numbers:	
-	24-hour Emergency: 999
-	Tourist Information: (853) 2833 3000
-	Consumer Council: (853) 8988 9315
-	Telephone Inquiry: 181

Local calls in Macao are free of charge when made from a private phone. When using a public phone, they cost MOP$1.00. Phone cards can be purchased for MOP$50.00, MOP$100.00 or MOP$150.00 and they can be used as well as coins in public phones located all around the city and the islands. In the busiest areas there are also credit card phones.

Internet Access

M.U.S.T. has provided visitors with free wireless Internet access - “M.U.S.T.-guest“ available daily. You can freely access the internet after receiving the verification code by entering a Macao, mainland China, Hong Kong, or Taiwan mobile phone number.
Internet facilities are available at Information Counter at Senado Square, public libraries and major hotels. You may also find several cyber-cafés all over the city. For address and opening hours of public libraries, please visit the following websites: http://www.library.gov.mo; http://library.iacm.gov.mo

查詢 Enquiries:

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