The Hong Kong Polytechnic University
Research Institute for Land and Space (RILS)
RILS Public Lecture Series
Floating Structures for Land Creation

Date & time:	Wednesday 20 July 2022 3:00pm – 4:00pm
Speakers:	**Prof. Chien Ming Wang** *School of Civil Engineering* *The University of Queensland* **Prof. Xiao Lin Zhao** *Department of Civil and Environmental Engineering* *The Hong Kong Polytechnic University* **Ir Prof. Jian-guo Dai** *Department of Civil and Environmental Engineering* *The Hong Kong Polytechnic University*
Location:	Online via Zoom
Registration link:	https://polyu.zoom.us/webinar/register/WN_BcNKr7zwT2-19XSvMgWWQQ All are welcome to attend. An e-certificate of participation will be sent to participants upon request.
Contact us:	Ms Cathy Kwok (RILS Secretary) Tel: 852 2766 5966 E-mail: info.rils@polyu.edu.hk

Co-organisers:

RILS Public Lecture Series
Floating Structures for Land Creation

Prof. Chien Ming Wang

Presentation Title

Floating Solutions for Addressing Global Challenges and UN Sustainable Development Goals

Abstract

This lecture will present a variety of floating solutions that aim to address a diverse set of global challenges and the UN Sustainable Development Goals. The challenges include energy insecurity, water and food shortages, and environmental threats to fragile coastal environments from rising sea levels, extreme storms and pollution. Floating solutions offer a new approach to coastal urban development to support the blue economy while reducing the impact of coastal land pressures, increase connections between communities through connecting infrastructure over deep waters and soft seabed conditions, and address large tidal variations in harbours to allow the expansion of port terminals in deep waters. A vision of hybrid floating cities and satellite floating cities in international waters will also be presented.

Biography of Prof. Chien Ming Wang

Prof. Chien Ming Wang is Professor in Structural Engineering in The University of Queensland (UQ), Australia. Before joining UQ, he was a Professor in the Department of Civil Engineering of the National University of Singapore and held the directorships of the Engineering Science Programme and the Global Engineering Programme. He is a Fellow of the Australian Academy of Technology and Engineering, a Fellow of Academy of Engineering Singapore, a Fellow of Institution of Engineers Singapore, a Fellow of Institution of Structural Engineers and a Fellow of Society of Floating Solutions (Singapore). His research interests are in the areas of structural stability, vibration, optimization, plated structures and Mega-Floats. He has published over 480 journal papers and co-authored 10 books such as Very Large Floating Structures, Structural Vibration, Shear Deformable Beams and Plates and Exact Solutions for Buckling of Structural Members. He is an Editor-in-Chief of the International Journal of Structural Stability and Dynamics and an Editorial Board Member in several journals including Engineering Structures, International Journal of Applied Mechanics, Structures and Ocean Systems Engineering. Currently, he is the Leader of the Offshore Engineering Programme of the Blue Economy Cooperative Research Centre that conducts research projects that combine seafood, renewable energy and offshore engineering for the first time, underpinned by a $70 million cash investment from the Australian Government and $259 million from industry partners over a 10-year period. He is a founding member and Engineering Science Leader of the International Engineering Science Consortium, and the Vice-Chairman of East Asia Pacific Conference on Structural Engineering and Construction steering committee. He has won many awards that include the 2019 Nishino Medal, 2019 JN Reddy Medal, Singapore's Minister of National Development's R&D Award (Special Mention Category), IStructE Singapore Structural Awards, Keith Eaton Award, Lewis Kent Award, IES Prestigious Engineering Achievement Award, IES/IStructE Best Paper Award and the Grand Prize of the Next Generation Container Port Challenge. He was the consultant and advisor on many structural and floating projects that include the world's largest floating performance stage at Marina Bay, multi-purpose floating structures research ($7.13 million) project funded by the Land and Liveability National Innovation Committee and JTC Corporation, Maritime and Port Authority's ($2.14 million) project on uses of the underground space underneath container ports in Tuas, JTC project on floating hydrocarbon storage facility and HDB project on floating wetlands.

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Prof. Xiao Lin Zhao

Presentation Title

Developing Floating Structure Technology to Increase Hong Kong's Capacity for Sustainable Growth and Liveability with Reduced Environmental Impact, Construction Time and Cost

Abstract

To fulfill Hong Kong 2030+ vision, we must overcome the land shortage in Hong Kong, which is estimated to be about 3,000 hectares. Among the solutions suggested by Hong Kong government, more than one third of the shortage will be met by traditional land reclamation (LR). On the other hand, enhancing liveability requires certain percentage of land be used as public facilities for communities. These facilities are often not high-rise buildings (e.g., for residential and office purpose) and could be built using floating structure technology (FST). Adopting FST will add high value to LR to increase Hong Kong's capacity for sustainable growth and liveability with reduced environmental impact, construction time and cost. This lecture will present the scientific and engineering challenges in developing FST for such purpose.

Biography of Prof. Xiao Lin Zhao

Prof. Xiao Lin Zhao is the Chair Professor of Civil Infrastructure at PolyU. Previously he was the Associate Dean (International) in the Faculty of Engineering at the University of New South Wales, Australia, Chair of Civil Engineering and Head of Department of Civil Engineering at Monash University, Australia.

Prof. Zhao is a Fellow of the Australian Academy of Engineering and Technology, a Fellow of American Society of Civil Engineers, a Fellow of the Institution of Engineers, Australia. His current research focuses on high-performance sustainable materials in civil engineering applications, steel-concrete-FRP hybrid construction and floating structure technology. Prof. Zhao has published 9 books and 400 refereed journal papers. He has supervised more than 50 PhD students. He was also selected as Australia's Top Researcher in the fields of Structural Engineering and Civil Engineering in the Australian's Research Magazine in 2019 and 2021 respectively. He has also received a number of prestigious fellowships including the Alexander von Humboldt Fellow hosted by RWTH Aachen University, the Japan Society for the Promotion of Science Invitation Fellow hosted by the Nagoya University, the H. K. Cheng Structural Engineering Fellowship from The University of Hong Kong, the Distinguished Visiting Fellowship of the Royal Academy of Engineering hosted by the Imperial College London, the Swiss National Science Foundation Visiting Professorship at the Swiss Federal Laboratory for Materials Science and Technology, the Changjiang Scholar Chair Professor at Tongji University and the Distinguished Visiting Professorship at Tsinghua University.

Ir Prof. Jian-guo Dai

Presentation Title

Innovative and Environmental-friendly Construction Technologies and Materials for Floating Structure Technology

Abstract

To make the floating structures smart, sustainable and resilient, the extensive use of innovative and environmental-friendly construction technologies and materials is needed. Conventional steel-reinforced concrete or steel structures may suffer from steel corrosion in the marine environment. A brief introduction is presented here on the recent development at PolyU about non-corrosive FRP composites, ultra-high-performance cementitious composites, and energy-saving/eco-friendly materials made of various types of waste, which have good potential for use in floating structures due to their exceptional mechanical and durability performance as well as their low carbon feature.

Biography of Ir Prof. Jian-guo Dai

Ir Prof. Jian-guo Dai graduated with his PhD degree in social infrastructure engineering from Hokkaido University, Japan. His research theme is “Emerging materials and structural systems for sustainable concrete infrastructures”. He has received many awards for his research work, including the “Best Basic Research Paper Award” from American Society of Civil Engineers, Journal of Composites for Construction, “Distinguished Young Scholar of FRP Application Committee of Chinese Society of Civil Engineers”, “International Outstanding Collaboration Award” from Japan Society of Civil Engineers, and “Structural Excellence Award-Grand Award” from Hong Kong Institution of Engineers. Prof. Dai’s research on eco-friendly sub-ambient cooling coating was widely reported by public media like “Ta Kung Pao” and “Hong Kong Economic Journal” in 2020. Prof Dai was in the “World’s Top 2% Scientist-Stanford University Releases List (2020 and 2021)” in “Civil Engineering” and “Materials Science and Engineering” disciplines, in which Prof. Dai has published more than 300 technical papers (including some 170 SCI journal papers).

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Programme

Time	Title
3:00pm – 3:05pm	**Welcome Address** Prof. Xiaoli Ding *Director of RILS* *The Hong Kong Polytechnic University*
3:05pm – 3:20pm	**Floating Solutions for Addressing Global Challenges and UN Sustainable Development Goals** Prof. Chien Ming Wang *School of Civil Engineering* *The University of Queensland*
3:20pm – 3:35pm	**Developing Floating Structure Technology to Increase Hong Kong's Capacity for Sustainable Growth and Liveability with Reduced Environmental Impact, Construction Time and Cost** Prof. Xiao Lin Zhao *Department of Civil and Environmental Engineering* *The Hong Kong Polytechnic University*
3:35pm – 3:50pm	**Innovative and Environmental-friendly Construction Technologies and Materials for Floating Structure Technology** Ir Prof. Jian-guo Dai *Department of Civil and Environmental Engineering* *The Hong Kong Polytechnic University*
3:50pm – 3:55pm	**Closing Remarks** Ir Prof. Jian-guo Dai *Department of Civil and Environmental Engineering* *The Hong Kong Polytechnic University*
3:55pm – 4:00pm	**Q & A Session**