



**Society of  
FLOATING SOLUTIONS  
(Singapore)**

## WCFS2019: SINGAPORE

World Conference on Floating Solutions, 22-23 April 2019

Venue: Faculty of Engineering, National University of Singapore, Singapore

### INTRODUCTION

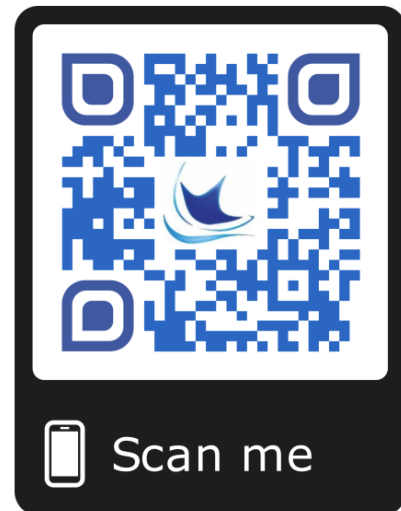
Singapore, once a third world country under British rule, is today the world's most expensive city (sharing the top position with Hong Kong and Paris) according to a 2019 EIU survey. It has achieved striking success in its land reclamation projects to support its urban and economic growth. 25% of its original 578 sq. km footprint has been reclaimed from the sea. Despite this, in the same time period, its population grew by 380%, creating an urban environment that makes it the world's densest country.

In 2013, a White Paper was released by the government essentially preparing this island nation for further population growth that would see it grow from the current 5.7 million to 6.9 million by 2030. The Ministry of National Development projected that Singapore would need to find space amounting to 56 sq km. However, land reclamation has become more challenging year by year, as sand mining is now seen to be ecologically damaging and banned by countries that had traditionally supplied sand to Singapore. Fortunately, it has about 700 sq km of territorial waters well sheltered by a cluster of Indonesian islands to the south. A 65-million TEU capacity mega port is being constructed which will see all port activities on the waterfront of downtown Singapore being diverted to the west.

We believe this opens up huge opportunities for creation of sea space floating solutions for the future. A group of multi-disciplinary professionals with this vision has come together to form the Society of FLOATING SOLUTIONS Singapore (SFSS).

In January 2018, the Society invited Professor Jacopo Buongiorno of the Massachusetts Institute of Technology to speak at the National University of Singapore. He delivered a talk suggesting that to meet Singapore's energy resilience needs and in view of the limited land area, a floating nuclear plant could be considered. We also had other speakers sharing other floating solutions with us on 1 March 2018. Dr. Øyvind Hellan and Dr Arnstein Watn of SINTEF Norway and Dr Masaki Takeuchi of Shimizu Japan spoke at our conference on titled "The Application and technology of Floating Structures" at the Singapore Institute of Technology. In August 2018, the Society organised a one-day seminar on floating farms for a sustainable future. The seminar speakers include Mr Peter van Wingerden (CEO and founder of Belandon) who gave a talk on farming on water, Mr Leow Ban Tat (Founder and Managing Director of AME2) who spoke on floating fish farms, Dr Shinjo Sato (Nihon University) who spoke on floating composite plant factory, Mr Morten Lund Hoffman (Multiconsult Asia Pte Ltd) who gave a talk on floating structures in Norway and Mr Gary Wong (Keppel Offshore and Marine) who spoke on repurposing offshore technology to unlock the potentials of sea space

Continuing on this journey, the Society is organizing a World Conference on Floating Solutions with a view of elevating international awareness of the benefits of floating structures.



QR Code for Registration  
or use this link  
<https://tinyurl.com/WCFS2019>

**Organiser**  
Society of FLOATING  
SOLUTIONS (Singapore)

**When**  
Mon 22nd - Tue 23rd  
Apr 2019

**Where**  
Engineering Auditorium,  
Faculty of Engineering  
National University of  
Singapore  
Kent Ridge, Singapore

**Contact**  
C.M. Wang, Chairman  
[cm.wang@uq.edu.au](mailto:cm.wang@uq.edu.au)



## MISSION OF SOCIETY OF FLOATING SOLUTIONS SINGAPORE

---

The mission of the Society is to facilitate the application of scientific principles and proven offshore technologies to the design, engineering and construction of floating space solutions to enhance the quality of human life, address issues of land scarcity, harvest offshore renewable energy, increase food and water production, overcome the problem of rising sea level due to global warming in ways that are eco-friendly and sustainable.

## WHO SHOULD ATTEND THIS CONFERENCE?

---

This conference is organized for architects, city planners, maritime policy makers, practicing engineers, naval architects, contractors, academics, researchers and other construction professionals who are involved and wish to upgrade their knowledge on the analysis, design and construction of floating structures in their course of work. Students are particularly welcomed.

## REGISTRATION

---

The registration fee is inclusive of a copy of Conference Proceedings, coffee breaks, lunches and admission to the lectures.

For SFSS members: 350 SGD

For non-SFSS members: 450 SGD

For full-time students: 200 SGD

In order to register for the conference, please visit this link:  
<https://tinyurl.com/WCFS2019>

Interested participants should register & complete payment online not later than 15 April 2019

## KEY DATES

---

Deadline for submission of full papers: 15 February 2018

Deadline for registration:  
15 April 2019

Conference Dates:  
22-23 April 2019

## Website

---

[wcfs2019.floatingsolutions.org](http://wcfs2019.floatingsolutions.org)







## SPEAKERS

---



**Mr Koen Olthuis**  
Founder and Principal Architect  
Waterstudio.NL, The Netherlands



**Mr Soon Heng Lim**  
President of the Society of  
FLOATING SOLUTIONS (Singapore)



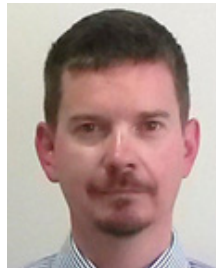
**Prof Torgeir Moan**  
Emeritus Professor  
Marine Technology, NTNU, Norway



**Dr Toshio Nakajima**  
President  
Waterfront Real Estate Co. Ltd.



**Prof Joseph Ee Man Lim**  
Professor  
National University of Singapore



**Dr Cliff Ohl**  
Principal Maritime Engineer  
Royal HaskoningDHV



**Mr H K Tan**  
Co-founder and Director at  
Nature Resources Aquaculture Pte Ltd



**Prof Daolin Xu**  
Professor  
Hunan University, China



**Dr Narasimalu Srikanth**  
Program Director and Senior Scientist  
ERI, Nanyang Technological University,  
Singapore



**Mr Aditya Sankalp**  
Technical Manager  
DEEPBLUE Pte Ltd



**Mr Joe Quirk**  
President  
The Seasteading  
Institute, USA



**Prof Tomoaki  
Utsunomiya**  
Professor  
Kyushu University,  
Japan



**Dr Thomas Reindl**  
Deputy CEO,  
Solar Energy Research  
Institute of Singapore  
(SERIS),  
National University of  
Singapore (NUS)

---



## SPEAKERS

---



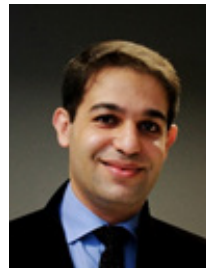
**Dr Kok Keng Ang**  
Associate Professor  
National University of Singapore



**Mr Tor Ole Olsen**  
Dr Techn. Olav Olsen  
Norway



**Mr Sze Tiong Tan**  
Director of HDB Building & Research  
Institute, Singapore



**Dr Sabet Divsholi Bahador**  
Managing Director  
Global Engineering Creators Pt Ltd.



**Dr Kwanghoe Jung**  
General Manager and Chief Structural  
Engineer,  
Hyundai Engineering and Constriction



**Mr William Otto**  
Senior Project Manager  
MARIN, The Netherlands



**Mr Chi Zhang**  
PhD Candidate  
National University of Singapore



**Mr Chun Wei Ng**  
Senior Engineer  
DNV GL Approval Centre, Singapore



**Prof Chien Ming Wang**  
TMR Chair Professor in  
Structural Engineering  
The University of Queensland  
Australia



**Mr David Carrascosa Francis**  
Chief Technology Officer  
Saitec Offshore Technologies, S.L.  
Spain



**Ms Milica  
Simovic**  
University of Nis,  
Serbia



**Mr Petar Lovric**  
Business and  
Development  
Manager  
SEINE DESIGN,  
France



**Ms Karina  
Czapiewska**  
Co-founder of Blue 21



## ORGANISING COMMITTEE

---

Chairman:	Prof Chien Ming Wang	cm.wang@uq.edu.au
Co-Chairman:	Dr Sabet Divsholi Bahador	bsabet@creatprs-global.com
Advisor:	Mr Soon Heng Lim	lsh@sixtrees.com.sg
Secretary:	Mr Charles Lim	milselrahc@gmail.com
Treasurer:	Mr Anil Thapar	anil.thapar@bmtglobal.com
Technical Program:	Dr Zhi Yung Tay	zhiyung.tay@singaporetech.edu.sg
Members:	Dr Paul Ong	paul.ong@nus.edu.sg
	Captain James Fong	jamesfong@gmaritime.com
	Mr Roland Tan	ps654rt@gmail.com
	Mr Ivan Stoytchev	ivan.s.stoytchev@gmail.com
	Mr Dave Kinrade	dkinrade@singnet.com.sg

## PLATINUM SPONSORS OF CONFERENCE

---



## GOLD SPONSORS OF CONFERENCE

---



Waterpolitan Initiative  
WATERFRONT REAL ESTATES CO. LTD.



CONTINENTAL STEEL



Springer

## SUPPORTERS OF CONFERENCE

---



The *Institution*  
of *Structural*  
Engineers



Enterprise  
Singapore

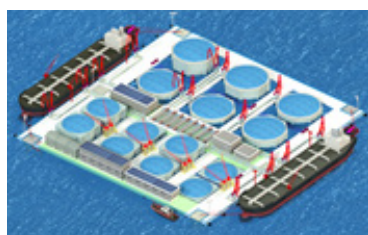
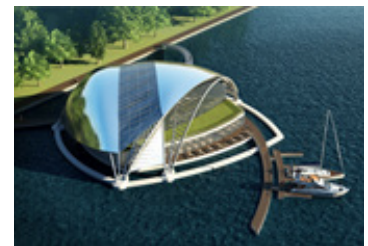






### PAPERS THAT WILL BE PRESENTED AT CONFERENCE

- Design guidelines for upgrading living conditions in wetslums  
Koen Olthuis, Pierre-Baptiste Tartas and Chris Zevenbergen
- Repurposing jack-ups, semi-submersibles and super-barges into offshore and nearshore settlements  
Joseph Lim
- Floating infrastructure: Large scale public spaces on water  
Gerard Ronzatti and Petar Lovric
- Floating shipyard design: concept and application  
Cliff Ohl, Adrian Arnold, Andy Pate, Hannes Uys and Miguel Andrade
- Floating bridges and submerged tunnels in Norway - history and future outlook  
Torgeir Moan and Mathias Egeland Eidem
- Dynamics of super-scale modularized floating airport  
Haicheng Zhang, Daolin Xu, Shuyan Xia, Qijia Shi, Guangyu Yang and Rui Ding
- Design and potential applications of floating structures in Singapore  
Kok Keng Ang, Dai Jian, Øyvind Hellan, Arnstein Watn and James Lee
- Hydrodynamic responses and loads of a model floating hydrocarbon storage tank system for concept validation and numerical verification  
Chi Zhang, Allan R. Magee, Nuno Fonseca, Nianxin Ren, Øyvind Hellan, and Kok Keng Ang
- Wave induced motions of floating mega island  
William Otto, Olaf Waals, Tim Bunnik and Coline Ceneray
- Fish farming in floating structures  
Tor Ole Olsen
- Technology-driven sustainable aquaculture for eco-tourism  
Ban Tat Leow and Hoon Kiang Tan
- Floating forest: a novel floating breakwater-windbreak structure  
Chien Ming Wang, Mengmeng Han, Junwei Lyu, Wenhui Duan, Kwanghoe Jung and Sara Kang An
- Seasteading = More Floating Singapore  
Joe Quirk
- Classification principles for very large floating structures  
Chun Wee Ng and Rongrong Jiang
- Mooring systems for very large floating structures  
Aditya Sankalp and Yves De Leeneer
- Durability of floating concrete platforms  
Sabet Divsholi Bahador
- DemoSATH Project - Demonstrating technical feasibility of disruptive concrete floating offshore wind solution  
David Carrascosa Francis
- Design and construction of concrete floating pier in Golden Harbor, Incheon  
Kwanghoe Jung, Sanghyu Lee, Heesung Kim, Yoonho Choi and Sara Kang
- An integrated floating community based upon a hybrid water system: Toward a super sustainable water city  
Toshio Nakajima and Motohiko Umeyama
- Floating clean multi-energy systems towards driving blue economic growth  
Narasimalu Srikanth
- Floating offshore wind turbines in Goto Islands, Nagasaki, Japan  
Tomoaki Utsunomiya, Iku Sato and Takashi Shiraishi
- The dawn of floating solar – technology, benefits, and challenges  
Haohui Liu, Abhishek Kumar and Thomas Reindl
- Seascape the landscape of Singapore, repurposing land in a land scarce nation  
Soon Heng Lim
- Floating solutions: The new meaning of mobility  
Milica Simovic, Sonja Krasic and Marko Nikolic
- Driving innovations in support of greenery, biodiversity and clean energy initiatives in Singapore  
Johnny Liang Heng Wong, Sze Tiong Tan, Chien Looi Wang, Han Vincent Lim, Chien Ming Wang, Kok Keng Ang, and Jian Dai
- Potential of floating urban development for coastal cities  
B. Dal Bo Zanon, B. Roeffen, K.M. Czapiewska, and R.E. de Graaf-van Dinther





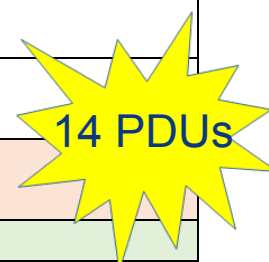
## CONFERENCE PROGRAMME - DAY 1 (MONDAY 22 APRIL 2019)

Programme - Day 1 (Monday, 22 April 2019)	
0800hrs	<b>Registration @ Foyer of Engineering Auditorium, Faculty of Engineering, National University of Singapore</b>
0900hrs	Welcome address <i>Prof Chien Ming Wang (Chairperson of WCFS2019 Organising Committee)</i>
<b>SESSION 1 LIVING: Moderator is Dr Paul Ong</b>	
0910hrs	Design guidelines for upgrading living conditions in wetslums <i>Koen Olthuis (Waterstudio.NL, The Netherlands)</i>
0940hrs	Repurposing jack-ups, semi-submersibles and super-barges into offshore and nearshore settlements <i>Joseph Lim (National University of Singapore, Singapore)</i>
1010hrs	<b>Morning Tea/Coffee Break @ Foyer of Engineering Auditorium</b>
<b>SESSION 2 INFRASTRUCTURE I: Moderator is Mr. Lim Soon Heng</b>	
1040hrs	Floating infrastructure: Large scale public spaces on water <i>Petar Lovric (Seine Design, France)</i>
1110hrs	Floating shipyard design: concept and application <i>Cliff Ohl (Royal HaskoningDHV, United Kingdom)</i>
1140hrs	Floating bridges and submerged tunnels in Norway - the history and future outlook <i>Torgeir Moan (Norwegian University of Science and Technology, Norway)</i>
1210hrs	<b>Networking Lunch @ Foyer of Engineering Auditorium</b>
<b>SESSION 3 INFRASTRUCTURE II: Moderator is Dr Koh Hock Seng</b>	
1330hrs	Dynamics of super-scale modularized floating airport <i>Daolin Xu (Hunan University, China)</i>
1400hrs	Design and potential applications of floating structures in Singapore <i>Kok Keng Ang (National University of Singapore, Singapore)</i>
1430hrs	Hydrodynamic responses and loads of a model floating hydrocarbon storage tank system for concept validation and numerical verification <i>Chi Zhang (National University of Singapore, Singapore)</i>
1500hrs	Wave induced motions of floating mega island <i>William Otto (MARIN, The Netherlands)</i>
1530hrs	<b>Afternoon Tea/Coffee Break @ Foyer of Engineering Auditorium</b>
<b>SESSION 4 FOOD AND ENVIRONMENT: Moderator is Mr Anil Thapar</b>	
1600hrs	Fish Farming in Floating Structures <i>Tor Ole Olsen (Dr.techn.OlavOlsen AS, Norway)</i>
1630hrs	Technology-driven sustainable aquaculture for eco-tourism <i>Hoon Kiang Tan (Nature Resources Aquaculture Pte Ltd, Singapore)</i>
1700hrs	Floating forest: a novel breakwater-windbreak structure <i>Chien Ming Wang (The University of Queensland, Australia)</i>
1715hrs	Seasteading = More Floating Singapore <i>Joe Quirk (The Seasteading Institute, USA)</i>
1730hrs	<b>Presentation of tokens of appreciation by President SFSS Soon Heng Lim Day 1 Programme Ends</b>



## CONFERENCE PROGRAMME - DAY 2 (TUESDAY 23 APRIL 2019)

<b>Programme - Day 2 (Tuesday, 23 April 2019)</b>	
<b>0830hrs</b>	<b>Registration @ Foyer of Engineering Auditorium, Faculty of Engineering, National University of Singapore</b>
<b>SESSION 5 DESIGN OF VLFS: Moderator is Mr Ivan Stoytchev</b>	
0900hrs	Classification principles for very large floating structures <i>Chun Wee Ng (DNV GL, Singapore)</i>
0930hrs	Mooring systems for very large floating structures <i>Aditya Sankalp (DEEPBLUE Pte Ltd, Singapore)</i>
<b>1000hrs</b>	<b>Morning Tea/Coffee Break @ Foyer of Engineering Auditorium</b>
<b>SESSION 6 CONCRETE TECHNOLOGY: Moderator is Dr Tay Zhi Yung</b>	
1030hrs	Durability of floating concrete platforms <i>Sabet Divsholi Bahador (eCreators-global, Singapore)</i>
1100hrs	DemoSATH Project - Demonstrating the technical feasibility of a disruptive concrete floating offshore wind solution <i>David Carrascosa Francis (Saitec Offshore Technologies, S.L., Spain)</i>
1130hrs	Design and construction of concrete floating pier in Golden Harbor, Incheon <i>Kwanghoe Jung (Hyundai Engineering and Construction, South Korea)</i>
<b>1200hrs</b>	<b>Networking lunch @ Foyer of Engineering Auditorium</b>
<b>SESSION 7: SUSTAINABLE CITY I: Moderator is Dr. Sabet Divsholi Bahador</b>	
1330hrs	An integrated floating community based upon a hybrid water system: toward a super-sustainable water city <i>Toshio Nakajima (Waterfront Real Estate Co. Ltd., Japan)</i>
1400hrs	Floating clean multi-energy systems towards driving blue economic growth <i>Narasimalu Srikanth (Nanyang Technological University, Singapore)</i>
1430hrs	Floating wind turbines in Goto Islands, Nagasaki, Japan <i>Tomoaki Utsunomiya (Kyushu University, Japan)</i>
1500hrs	The dawn of floating solar – technology, benefits, and challenges <i>Thomas Reindl (SERIS, Singapore)</i>
<b>1530hrs</b>	<b>Afternoon Tea/Coffee Break @ Foyer of Engineering Auditorium</b>
<b>SESSION 8 SUSTAINABLE CITY II: Moderator is Captain James Fong</b>	
1600hrs	Seascape the landscape of Singapore, Repurposing land in a land scarce nation <i>Soon Heng Lim (President of Society of Floating Solutions Singapore)</i>
1630hrs	Floating solutions: The new meaning of mobility <i>Milica Simovic (University of Nis, Serbia)</i>
1700hrs	Driving innovations in support of greenery, biodiversity and clean energy initiatives in Singapore <i>Sze Tiong Tan (Building &amp; Research Institute, HDB, Singapore)</i>
1730hrs	Potential of floating urban development for coastal cities <i>Karina Czapiewska (Blue 21, The Netherlands)</i>
<b>1745hrs</b>	<b>Presentation of tokens of appreciation and closing remarks by President of SFSS Mr. Soon Heng Lim</b>
<b>1800hrs</b>	<b>End of Conference</b>



Note that there are post conference site visits to the world's largest floating PV testbed at Tengeh Reservoir, Singapore and the Deepwater Ocean Basin in TCOMS.





**Society of Floating Solutions (Singapore)**  
**World Conference on Floating Solutions 2019**

**POST CONFERENCE SITE VISIT**

# **WORLD'S LARGEST FLOATING SOLAR TEST BED**

Visit the world's largest floating solar testbed and see how this technology will contribute to a more sustainable future. Floating Solar is a fast-growing market segment in the global PV industry, with a cumulative installed capacity of more than 1 GWp.

Singapore's Economic Development Board and Public Utilities Board have jointly developed the world's largest floating solar testbed in Tengeh Reservoir. The Floating PV testbed is designed, implemented and operated by the Solar Energy Research Institute of Singapore (SERIS) at the National University of Singapore.

**24 APRIL 2019, WEDNESDAY**

**09:00 AM TO 12:00 PM**

**MEET AT FOYER, ENGINEERING AUDITORIUM**

### **Registration**

Contact Angela, [esplmh@nus.edu.sg](mailto:esplmh@nus.edu.sg), to register.

Site visit, organised by SERIS, is free of charge. Return transport to Tengeh Reservoir will be provided. Limited to 20 places on first come first serve basis. In case of rain, the visit will be cancelled for safety reasons. Protect yourself against sun, wear covered shoes and bring sunglasses for the visit. Photography on-site is strictly prohibited.



# Society of Floating Solutions (Singapore) World Conference on Floating Solutions 2019

POST CONFERENCE SITE VISIT

## DEEPWATER OCEAN BASIN

The Technology Centre for Offshore and Marine Singapore (TCOMS) is a national Centre of Excellence, established by the Agency for Science, Technology and Research and the National University of Singapore, to spur research excellence and advance Singapore's Marine & Offshore Engineering industry. At the heart of TCOMS is the Deepwater Ocean Basin, equipped with smart sensing and the state of the art technology in physical modelling and simulation. TCOMS aims to push the boundary of offshore and marine systems and develop innovative marine solutions.

**24 APRIL 2019, WEDNESDAY**

**10:00 AM OR 11:00 AM**

**LIMITED TO 40 VISITORS PER TIME SLOT**



### Registration

Scan the QR code above or visit [tinyurl.com/WCFS2019-TCOMS](http://tinyurl.com/WCFS2019-TCOMS).

Present your WCFS2019 Conference Pass for entry. No PPE gear is required.

### Directions to TCOMS

Located on 12 Prince George's Park, Singapore 118411. Take A1 & A2 shuttle buses from Kent Ridge MRT or NUS Central Library. Parking available at Car Park 11. Visit [map.nus.edu.sg](http://map.nus.edu.sg) for details.

