

# RINA WESTERN BULLETIN

## Technical Meeting Notice

### Ocean Waves in Conventional and Renewable Applications

When: Thursday, 9<sup>th</sup> December, 17:30 refreshments, 18:00 start

Where: Engineers Australia, 712 Murray St, West Perth

Cost: Free for RINA and Engineers Australia Members

Registration is essential

To register for online or face-to-face attendance: [click here](#)

**Followed by end-of-year (self-funded) drinks** at ~19:00 at Mayfair Lane Pub & Dining Room, 72 Outram St, West Perth

#### WA Section RINA Committee

Chairperson:	Piotr Sujkowski
Vice Chair:	Kenneth Goh
Secretary:	Nathan Chappell
Treasurer:	Cheslav Balash
Members:	Sammar Abbas
	Gino Parisella
	Ian Milne
	Hadiqa Khan

Division

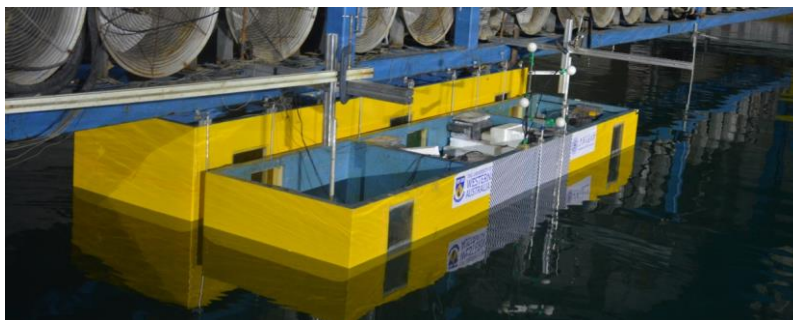
Representative: Yuriy Drobyshevski

## Talk 1: Innovative experiments for wave interactions with floating structures

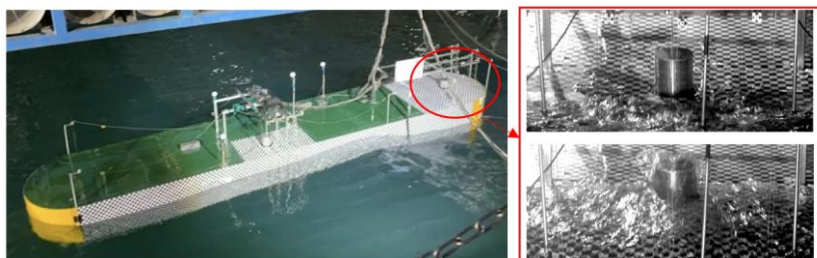
**Dr Wenhua Zhao**  
Senior Research Fellow  
The University of Western Australia

### Abstract

The hydrodynamic performance of floating assets is of great importance, both in operational and extreme conditions. Over the past 5 years, UWA has led the [Off-shore Hub](#), jointly funded by the ARC and industry (including Shell, Woodside, Bureau Veritas and Lloyds Register) to investigate the hydrodynamics of floating offshore structures. Both physical experiments conducted in a world-class wave basin and supercomputer fluid dynamic simulations have been performed, demonstrating advanced experimental methodologies and innovative analysis. The experiments cover (i) LNG Side-by-Side offloading operations in operational sea states – with wave resonance in the gap, and (ii) green water events for FPSOs in extreme sea states – wave on deck, arising from the combination of incoming waves, wave scattering off the hull, ship motions and overtopping. New, interesting and practically important phenomena have been captured for both problems. This presentation will describe how we have unravelled new physics and built efficient prediction models, with practical engineering applications to the fore.



Side-by-side offloading in mild sea state



Green water events in extreme sea states

### About the Presenter

**Dr Wenhua Zhao** is a DECRA fellow and Shell-funded Senior Research Fellow at the University of Western Australia. His research focuses on hydrodynamics and wave-structure interactions, which has led to more than 70 publications spanning from the most renowned academic journal in fluid mechanics to most industry-focused conferences. Wenhua has been serving as a Chief Investigator for the Offshore Hub (<https://www.offshorehub.edu.au>) and the TIDE (<https://tide.edu.au>). He was elected as a By-Fellow in 2020 at Churchill College of Cambridge University, and he is currently a Deputy Editor for the Ocean Engineering journal.

## Talk 2: Wave Energy: History, Fundamentals, and Challenges

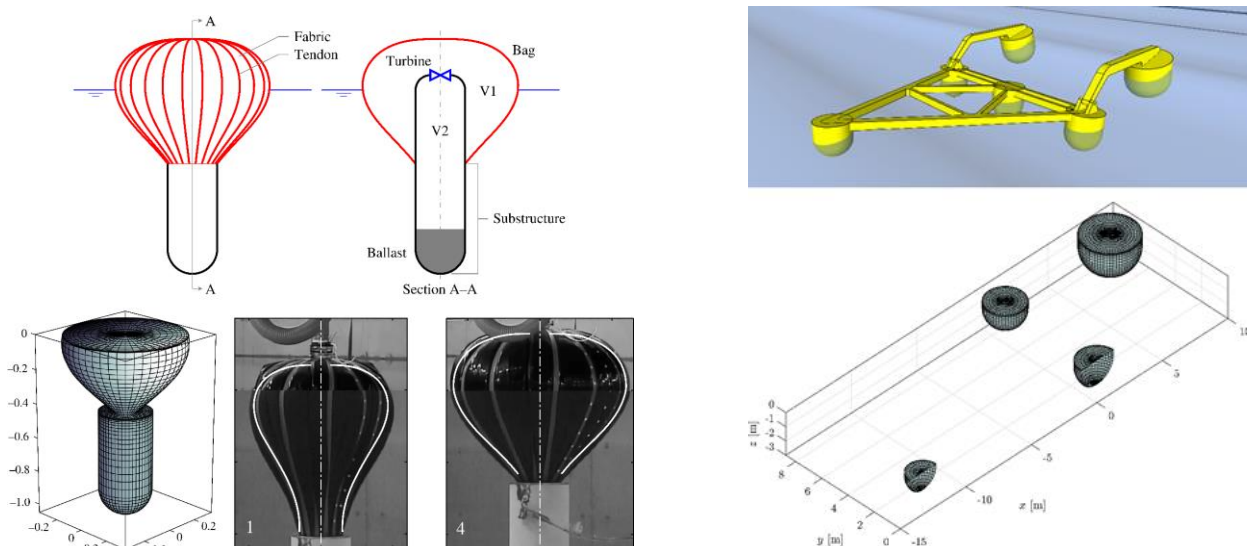
**Dr Adi Kurniawan**

**Research Fellow**

**The University of Western Australia**

### Abstract

There is enough wave energy in the ocean globally to power about 1 billion homes. Not all of it can be practically harnessed, but even a small proportion would mean a lot for the security of our energy supply. The oscillatory nature of waves and, hence, of wave power machines makes wave energy unique compared to other renewables such as wind or solar. To get the most out of the waves, wave power machines need to oscillate with both the right amplitude and phase. This would be easy if ocean waves were of constant amplitude and period, but real ocean waves have varying amplitudes and periods, at all time scales. This talk will begin with a brief overview of the history of wave energy. It will then discuss some fundamentals of wave energy absorption, highlighting some challenges arising from the oscillatory nature of the problem. The talk will conclude with some examples of wave energy converters that we have been investigating recently, including (i) the flexible bag device and (ii) the M4 wave energy converter, as a snapshot of our recent research efforts towards making progress in this fascinating field.



Flexible bag device (left) and M4 wave energy convertor (right)

### About the Presenter

**Dr Adi Kurniawan** is a Research Fellow with the Wave Energy Research Centre, UWA. His research covers aspects of wave energy conversion, wave-structure interactions, and multi-objective optimisation. He has numerically modelled a variety of wave-energy converters. Adi obtained his PhD in Marine Technology from the Norwegian University of Science and Technology. Before joining UWA, he worked at Aalborg University, Denmark, and the University of Plymouth, UK. Adi is the co-author of *Ocean Waves and Oscillating Systems: Linear Interactions Including Wave-Energy Extraction* (2nd edition). He is a member of the Standards Australia Committee EL-066 on Marine energy.

# RINA WESTERN BULLETIN

## **RINA NEWS & Events**

### Message from the Chairman, RINA WA Section

Dear Members and Friends,

We're farewelling another year and are about to welcome a new one. The 2021 has been a year of change not only on account of ongoing battle with the pandemic but also in reaching a critical point in raising urgency for action on global environmental issues. It is good to see that as a professional society we have been able to adapt on all fronts. We have continued our Section activities despite some small setbacks and as a profession made our contributions in research and technology development towards a common global cause in finding or harnessing new energy sources.

I am sure the new year will bring new ideas and new achievements and hope many will come from our profession and also from our own backyard here in WA. Therefore, I invite all our members, friends and interested parties to engage in our technical sessions and share their knowledge, new technology and ideas. Let's make our professional mark, contribute and grow. Our aim for 2022 is to further increase WA RINA Section's activities, so I am looking forward to have your participation and engagement.

On behalf of RINA WA Committee and my own I wish you all a safe, relaxing and joyful Christmas and a happy, prosperous and healthy New Year.

Best regards,

Piotr Sujkowski  
Chairman, RINA WA Section

### WA Naval Architects Recognitions

We would like to recognise and feature our sections naval architect's achievements in our western bulletin, if you have any memberships status change, accreditation, etc to include, please send them to [wa@rina.org.uk](mailto:wa@rina.org.uk).

### YouTube YouTube<sup>AU</sup>

Here is the RINA YouTube channel where presentations from around the world are made available, click the following link to check out what has already been uploaded:

[https://www.youtube.com/channel/UChb1sfHbWfQmG-iwpp\\_QGJg](https://www.youtube.com/channel/UChb1sfHbWfQmG-iwpp_QGJg)

### Continuing Professional Development (CPD) Record

This is a reminder that all Fellows, Members and Associate-Members who are in or seeking active work must maintain and develop their competence and knowledge. This requirement is obligatory. The Institution reserves the right to monitor a member's CPD achievement through inspection of the CPD Record. More information on the CPD and recommendations on the format of the Record can be found on the website:

[https://www.rina.org.uk/continuing\\_professional\\_development.html](https://www.rina.org.uk/continuing_professional_development.html)