



# ASME 2023 OMAE

42nd International Conference on  
Ocean, Offshore and Arctic Engineering



June 11–16, 2023  
Melbourne, Australia



THE UNIVERSITY OF  
MELBOURNE



**EDITOR-IN-CHIEF:** Lance Manuel, PhD  
The University of Texas at Austin, USA

# Journal of Offshore Mechanics and Arctic Engineering

## OMAE 2023 Conference Attendees: Access and Download Articles of Interest FREE!



OMAE 2023 Conference attendees will have access to view and download articles **FREE** from the *Journal of Offshore Mechanics and Arctic Engineering* from **June 1, 2023 - September 30, 2023**.

### It's Simple, Get Started!


Visit [\*Journal of Offshore Mechanics and Arctic Engineering\*](#) and click on any article.

For questions and assistance, contact **Sharon Giordano:**

[GiordanoS@asme.org](mailto:GiordanoS@asme.org)

# TABLE OF CONTENTS

<b>4</b>	<b>Program at a Glance</b>	<b>22</b>	<b>Plenary Sessions</b>
4	Saturday – June 10	<b>23</b>	<b>Keynotes</b>
4	Sunday – June 11	<b>26</b>	<b>Afternoon Lecture Series</b>
5	Monday – June 12	<b>31</b>	<b>Monday Concurrent Sessions</b>
6	Tuesday – June 13	31	13:30 – 15:00
7	Wednesday – June 14	38	15:30 – 17:30
8	Thursday – June 15	<b>45</b>	<b>Tuesday Concurrent Sessions</b>
<b>9</b>	<b>Floor Plan</b>	45	08:30 – 10:00
<b>10</b>	<b>Welcome from the OMAE 2023 Conference Chairs</b>	51	10:30 – 12:00
<b>12</b>	<b>Melbourne City Map</b>	58	13:30 – 15:00
<b>13</b>	<b>Award Winners</b>	65	15:30 – 17:00
<b>14</b>	<b>Attendee Information</b>	<b>71</b>	<b>Wednesday Concurrent Sessions</b>
<b>17</b>	<b>Social Events</b>	71	08:30 – 10:00
<b>18</b>	<b>Sponsors</b>	77	10:30 – 12:00
<b>19</b>	<b>Exhibitors</b>	84	13:30 – 15:00
<b>20</b>	<b>Technical Program</b>	91	15:30 – 17:00
<b>21</b>	<b>Honoring Symposium</b>	<b>96</b>	<b>Thursday Concurrent Sessions</b>
<b>22</b>	<b>Opening Ceremony</b>	96	10:30 – 12:00
		102	13:30 – 15:00
		<b>107</b>	<b>Technical Tours</b>
		<b>109</b>	<b>Short Courses</b>
		<b>111</b>	<b>Outreach for Engineers</b>
		<b>112</b>	<b>Committees &amp; Organizers</b>
		<b>116</b>	<b>Past and Future Conferences</b>
		<b>118</b>	<b>Author Index</b>
		<b>153</b>	<b>Session Index</b>

 **NAVIGATION TIPS:** The titles above are linked to their respective pages. Hover over the title, then click to follow the link. Or scroll down to read through page by page. All pages have a “Back to Table of Contents” link at the bottom right, which will return you to this page.

## Program at a Glance

### Saturday – June 10

#### Short Courses:

**8:15 – 12:00** Room 207

Experimental Uncertainty Analysis for Hydrodynamic Tests

**8:00 – 17:00** Room 209

WEC Design Practices and Tools

### Sunday – June 11

#### Short Courses:

**8:15 – 12:00** Room 207

Autonomous Maritime Systems

**8:00 – 17:00** Room 208

High-Order Spectral Wave Models

**8:00 – 17:00** Room 209

Outreach

**17:00 – 19:00** Melbourne 1 + Foyer

#### Welcome Reception

OMAE is welcoming its attendees for the first time to Australia. Pick up your name badge from the registration desk and catch up with your colleagues, meet new connections and try some Aussie food and wine.



## Monday – June 12

8:30 – 10:15

Plenary Room 1

Opening Ceremony, Keynote Presentation, Awards

10:15 – 10:45

Melbourne 1 + Foyer

Morning Coffee Break

10:45 – 12:00

Plenary Room 1

Keynote Presentations (Continued)

12:00 – 13:30

Melbourne 1 + Foyer

Lunch

13:30 – 15:00

### Concurrent Sessions

OT	01-02-01	Station Keeping
SSR	02-01-01	Structural Analysis and Optimisation I
SSR	02-02-01	Ultimate Strength I
PRS	04-01-01	Flexible Pipes and Umbilicals I
OSU	05-01-01	New Concepts for Ocean Space Utilization
OE	06-03-01	Fluid-Structure, Multi-body and Wave-body Interaction I
OE	06-04-01	Marine Engineering and Technology I
OE	06-05-01	Marine Hydrodynamics I
PAT	07-01-01	Arctic Frontier Regions and Propulsion in Ice
CVF	08-01-01	Risers, Pipelines & VIV I
ORE	09-01-01	Offshore Wind Energy – Installation
ORE	09-02-01	Wave Energy – Environment
OG	10-01-01	Seabed Properties and Processes and Fluid-Soil-Structure Interaction
PT	11-03-01	Data Science Applications in Drilling Engineering I
BES	13-01-01	Blue Economy I

15:00 – 15:30

Melbourne 1 + Foyer

Afternoon Coffee Break

15:30 – 17:00

### Concurrent Sessions

OT	01-01-01	Offshore Platforms
SSR	02-01-02	Structural Analysis and Optimisation II
SSR	02-02-02	Ultimate Strength II
PRS	04-01-02	Flexible Pipes and Umbilicals II
OSU	05-03-01	Deepsea Mining and Ocean Resources
PAT	07-02-01	Arctic Sea Transportation
CVF	08-01-02	Risers, Pipelines & VIV II
ORE	09-01-02	Offshore Wind Energy – Structural Dynamics
ORE	09-02-02	Wave Energy – Design and Performance Analysis I
OG	10-02-01	Fluid-Soil-Structure Interaction
PT	11-03-02	Data Science Applications in Drilling Engineering II
BES	13-01-02	Blue Economy II
SMN	14-01-01	Small Maritime Nations

17:15 – 18:15

Meeting Room 203 & 204

Afternoon Lecture: Preparing for climate change impacts at the Port interface: PNGPCL Experience

18:15 – 19:15

Melbourne 1 + Foyer

Afternoon Drinks



## Tuesday – June 13

### 08:30 – 10:00

#### Concurrent Sessions

OT	01-04-01	Design & Analysis I
SSR	02-03-01	Collision and Crashworthiness
SSR	02-05-01	Extreme Loads and Responses I
PRS	04-02-01	Rigid Risers I
OSU	05-05-01	Floating Systems for Renewable Energy I
OE	06-03-02	Fluid-Structure, Multi-body and Wave-body Interaction II
OE	06-04-02	Marine Engineering and Technology II
PAT	07-02-02	Arctic Sea Transportation
CVF	08-02-01	Ship & Floating Systems
ORE	09-01-03	Offshore Wind Energy – Aerodynamics
ORE	09-02-03	Wave Energy – Design and Performance Analysis II
OG	10-03-01	Anchors
PT	11-04-01	Well Cementing Theory & Practice I
BES	13-02-01	Blue Economy III

### 10:00 – 10:30

Melbourne 1 + Foyer

#### Morning Coffee Break

### 10:30 – 12:00

#### Concurrent Sessions

OT	01-04-02	Design & Analysis II
SSR	02-05-02	Extreme Loads and Responses II
SSR	02-06-01	Probabilistic Models of Forces and Motions
PRS	04-02-02	Rigid Risers II
OSU	05-01-02	New Concepts for Ocean Space Utilization II
OE	06-03-03	Fluid-Structure, Multi-body and Wave-body Interaction III
OE	06-04-03	Marine Engineering and Technology III
OE	06-05-02	Marine Hydrodynamics II
PAT	07-03-01	Vessels in Ice
CVF	08-02-02	Ship & Floating Systems
ORE	09-01-04	Offshore Wind Energy – Aerodynamic Control
ORE	09-02-04	Wave Energy – Design and Performance Analysis III
OG	10-04-01	Pile Foundations
PT	11-04-02	Well Cementing Theory & Practice II
BES	13-04-01	Blue Economy IV

### 12:00 – 13:30

Melbourne 1 + Foyer

#### Lunch

### 13:30 – 15:00

#### Concurrent Sessions

OT	01-03-01	Computational Offshore Hydrodynamics
SSR	02-07-01	Data-driven Models for Marine Structures I
SSR	02-08-01	Risk and Reliability of Renewable Energy Devices
PRS	04-01-03	Flexible Pipes and Umbilicals III
OSU	05-06-01	High Tide and Tsunamis
OE	06-03-04	Fluid-Structure, Multi-body and Wave-body Interaction IV
OE	06-04-04	Marine Engineering and Technology IV
OE	06-05-03	Marine Hydrodynamics III
PAT	07-03-02	Vessels in Ice
CVF	08-03-01	Free Surface Flows I
ORE	09-01-05	Offshore Wind Energy – Moorings and Cables I
ORE	09-02-05	Wave Energy Control and Power Take Off
OG	10-05-01	Bucket Foundations, Suction Caissons and Spudcans
PT	11-02-01	Well Drilling Fluids and Hydraulics I
BES	13-05-01	Blue Economy V

### 15:00 – 15:30

Melbourne 1 + Foyer

#### Afternoon Coffee Break

### 15:30 – 17:00

#### Concurrent Sessions

OT	01-03-02	Hydrodynamic Industrial Applications
SSR	02-07-02	Data-driven Models for Marine Structures II
MT	03-01-01	Fracture Assessment and Control
PRS	04-01-04	Flexible Pipes and Umbilicals IV
PRS	04-02-03	Rigid Risers III
OSU	05-02-01	Aquaculture and Related Technology I
OE	06-05-04	Marine Hydrodynamics IV
PAT	07-03-03	Vessels in Ice
CVF	08-03-02	Free Surface Flows II
ORE	09-01-06	Offshore Wind Energy – Moorings and Cables II
ORE	09-05-01	Hydrogen and Energy Storage
PT	11-02-02	Well Drilling Fluids and Hydraulics II
BES	13-06-01	Blue Economy VI

### 17:15 – 18:45

Meeting Room 203 & 204

#### Afternoon Lecture: Engineering and Marine Life

## Wednesday – June 14

### 08:30 – 10:00

#### Concurrent Sessions

OT	01-08-01	Digital Twin Applications to Offshore Systems
SSR	02-09-01	Reliability of Mooring and Riser Systems
MT	03-02-01	Fatigue Performance & Inspection Planning
PRS	04-03-01	Mechanics I
OSU	05-05-02	Aquaculture and Related Technology II
OE	06-01-01	Computational Mechanics and Design Applications I
OE	06-04-05	Marine Engineering and Technology V
OE	06-11-01	Ocean Engineering Technology I
OE	06-12-01	Ship Hydromechanics I
PAT	07-04-01	Vessels in Ice and Model Test
CVF	08-04-01	CFD Development I
ORE	09-01-07	Offshore Wind Energy – Hydrodynamics I
PT	11-05-01	Integrity of Well Barriers I
PT	11-08-01	Multiphase Flow & Flow Assurance
BES	13-06-02	Blue Economy VII

### 10:00 – 10:30

Melbourne 1 + Foyer

#### Morning Coffee Break

### 10:30 – 12:00

#### Concurrent Sessions

OT	01-08-02	AI/ML Applications to FPSO and Mooring Systems
SSR	02-10-01	Reliability of Marine Structures
MT	03-05-01	Modeling and Performance of Non-metallics
PRS	04-03-02	Mechanics II
OE	06-11-02	Ocean Engineering Technology II
OE	06-12-02	Ship Hydromechanics II
OE	06-16-01	Wave Mechanics, Modeling and Wave Effects I
PAT	07-05-01	Numerical Ice Modeling
CVF	08-04-02	CFD Development II
ORE	09-01-08	Offshore Wind Energy – Hydrodynamics II
ORE	09-04-01	Hybrid and Novel Renewable Energy Systems I
PT	11-05-02	Integrity of Well Barriers II
PT	11-10-01	Advances in Carbon Capture Utilization and Storage (CCUS) I
IYS	12-01-01	Wave/Ocean/Atmosphere Coupling and Climate Change Impacts on Ocean Waves
BES	13-06-03	Blue Economy VIII

### 12:00 – 13:30

Melbourne 1 + Foyer

#### Lunch

### 13:30 – 15:00

#### Concurrent Sessions

OT	01-08-03	AI/ML Applications to Offshore Systems and Subsurface
SSR	02-11-01	Fatigue and Fracture Reliability I
MT	03-06-01	Materials Selection
PRS	04-01-05	Flexible Pipes and Umbilicals V
OE	06-01-02	Computational Mechanics and Design Applications II
OE	06-11-03	Ocean Engineering Technology III
OE	06-12-03	Ship Hydromechanics III
OE	06-16-02	Wave Mechanics, Modeling and Wave Effects II
PAT	07-06-01	Structures in Ice I
CVF	08-05-01	Model Reduction and Machine Learning
CVF	08-06-01	Internal Flows & FIV
ORE	09-01-09	Offshore Wind Energy – Design Optimization
PT	11-02-03	Well Drilling Fluids and Hydraulics III
PT	11-10-02	Advances in Carbon Capture Utilization and Storage (CCUS) II
IYS	12-03-01	Global Ocean Wave Climate

### 15:00 – 15:30

Melbourne 1 + Foyer

#### Afternoon Coffee Break

### 15:30 – 17:00

#### Concurrent Sessions

OT	01-06-01	CFD Modeling Practice & Verification
SSR	02-11-02	Fatigue and Fracture Reliability II
SSR	02-12-01	Reliability Based Maintenance and Inspection Planning; Life Cycle Cost Optimization
PRS	04-01-06	Flexible Pipes and Umbilicals VI
PRS	04-03-03	Hydrodynamics
OE	06-14-01	Underwater Vehicles and Design Technology I
PAT	07-06-02	Structures in Ice II
CVF	08-07-01	Data-Driven Models and Digital Twins
ORE	09-01-10	Offshore Wind Energy – Data science and Digital Twins
ORE	09-04-02	Hybrid and Novel Renewable Energy Systems II
PT	11-02-04	Well Drilling Hydraulics and Cementing

### 17:15 – 18:45

Meeting Room 203 & 204

#### Afternoon Lecture: Digitalised and Intelligent Ocean Engineering

### 19:30 – 23:00

Crown Palladium

#### Conference Banquet

# PROGRAM AT A GLANCE

## Thursday – June 15

10:00 – 10:30

Melbourne 1 + Foyer

**Morning Coffee Break**

10:30 – 12:00

### Concurrent Sessions

SSR	02-04-01	Extreme and Freak Waves
SSR	02-13-01	Risk Analysis and Safety Management I
PRS	04-01-07	Flexible Pipes and Umbilicals VII
PRS	04-03-04	Thermo-Mechanical
OE	06-02-01	Coastal Engineering I
OE	06-07-01	Metocean, Measurement and Data Interpretation I
OE	06-08-01	Model Tests I
OE	06-14-02	Underwater Vehicles and Design Technology II
CVF	08-08-01	VIV & Offshore Wind Turbines
ORE	09-03-01	Current and Tidal Energy – Design Considerations
ORE	09-04-03	Hybrid and Novel Renewable Energy Systems III
PT	11-01-01	Well Drilling Technology – I
PT	11-07-01	Production Systems and Subsea Operations

12:00 – 13:30

Melbourne 1 + Foyer

**Lunch**

13:30 – 15:00

### Concurrent Sessions

SSR	02-04-02	Probabilistic and Spectral Wave Modelling
SSR	02-13-02	Risk Analysis and Safety Management II
PRS	04-03-05	Pipe-Soil Interaction
PRS	04-04-01	Subsea Systems and Flow Assurance
OE	06-07-02	Metocean, Measurement and Data Interpretation II
OE	06-14-03	Underwater Vehicles and Design Technology III
CVF	08-09-01	Neural Network for Waves & Cylinders, Symposium Summary
ORE	09-03-02	Current and Tidal Energy: Hydrodynamic Analysis
ORE	09-04-04	Floating Solar Energy
PT	11-01-02	Well Drilling Technology I
PT	11-09-01	Development of Unconventional Reservoirs

15:00 – 16:30

Meeting Room 203 & 204

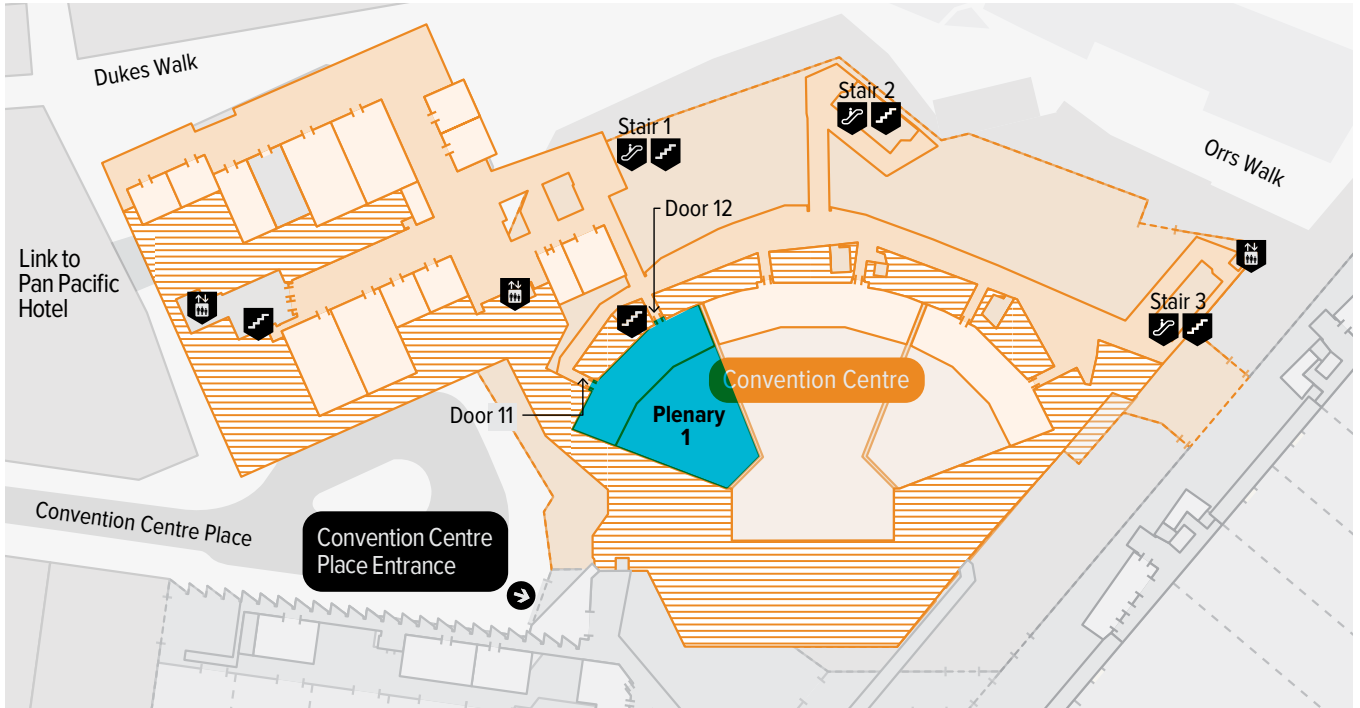
**Farewell Drinks**



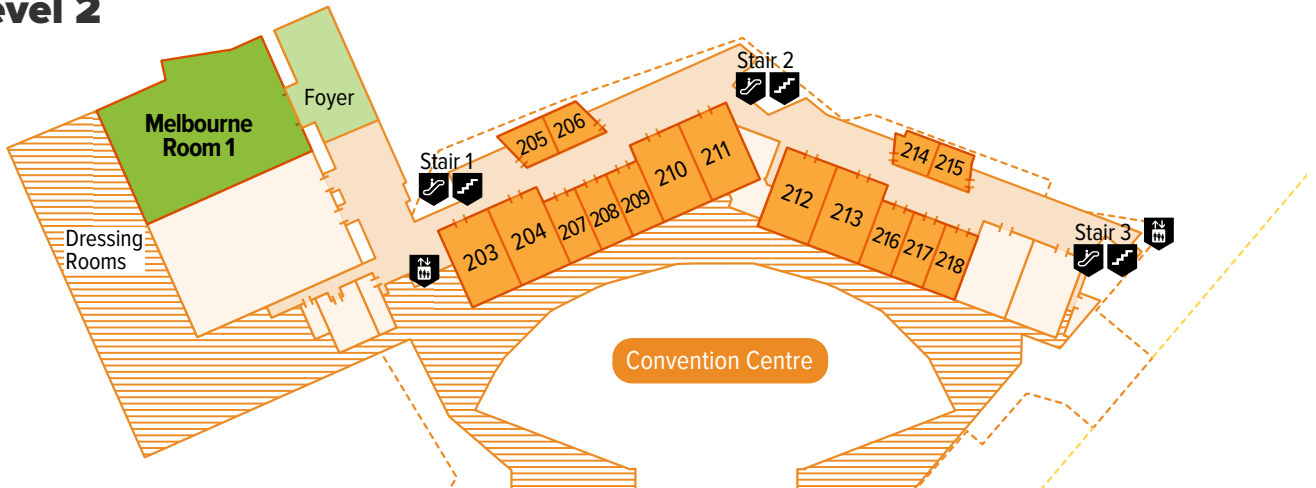


# Floor Plan

## Level 1



## Level 2



- Registration:** Melbourne Room Foyer (Level 2)
- Welcome Reception, Afternoon Drinks, Breaks, Lunches:** Melbourne Room 1 and Melbourne Room Foyer (Level 2)
- Exhibition:** Melbourne Room 1 (Level 2)
- Opening Ceremony and Keynotes:** Plenary 1 (Level 1)
- Concurrent Sessions:** Rooms 203–218 (Level 2)
- Farewell Drinks:** Meeting Room 203 & 204 (Level 2)

# WELCOME LETTER



Alex Babanin  
Conference Co-Chair



Hayden Marcollo  
Conference Co-Chair



Sören Ehlers  
Technical Program Chair

## Welcome from the OMAE 2023 Conference Chairs

**W**elcome to the 42nd Ocean, Offshore and Arctic Engineering Conference (OMAЕ) in Melbourne, Australia, hosted by the OOAЕ Division of ASME. OMAЕ combines Academia with Industry to adapt scientific achievements into practical applications for a smart, sustainable, and safe use of our oceans.

We, the organizers, are very excited to greet you. This is the first time the OMAЕ conference will be held in both the Southern & Eastern Hemispheres simultaneously. OMAЕ 2023 will promote the relevant engineering research and applications in the vast region of Australian waters, and more generally in Oceania and South- Eastern Asia. In return, the visitors will have a chance to meet and learn from researchers and engineers working in unique marine environments whose diversity is unprecedented. We have three exciting special symposia lined up to celebrate Australia's contribution to research, to highlight the nations in the Pacific Ocean and to promote the Blue Economy research activities underway in the region.

Australia's zone of maritime responsibility is 14% of the world ocean. These encompass three oceans, Pacific, Indian and Southern Ocean, with metocean climate ranging from

equatorial and tropical areas in the north through Antarctic waters in the south. Multiple tropical cyclones impact the world-heritage Great Barrier Reef on the east and oil and gas field developments on the west. To the south the Great Australian Bight is a frontier region opening up for oil and gas developments which provides immense engineering challenges as it's arguably home to the largest waves on the planet.

The massive offshore industry of Australia spread across variety hostile marine regions. Historically, it started in Bass Strait between the mainland and Tasmania. On the North-West shelf alone, this industry is currently constructing US\$120b in projects. The oil and gas exploration and production sites have now ventured hundreds of kilometres offshore, posing exceptional challenges and opportunities to offer unique solutions.

OMAЕ-2023 is hosted by the University of Melbourne, in collaboration with AMC University of Tasmania, University of Western Australia, other Australian Universities and broad industry partnerships across Australia and New Zealand. Melbourne, the capital of Victoria, is a spectacular city at Port Phillip Bay, many times voted the most liveable city in the



world. It is also home to the most advanced maritime academic research, industry and consultancy. It is in Williamstown at the west side of Port Phillip where the first Australian tidal observations were started, and now almost in the centre of metropolitan Melbourne this site offers spectacular views of the Bay. The University of Melbourne hosts one of Australia's leading research groups in Maritime Engineering, with collaborative links across Oceania, Asia, North and South America, Europe and Africa. Their research and global applications span swells in Nigeria and sediment transport in Brazil, tropical cyclones in Australia, typhoons in Asia, hurricanes in the Gulf of Mexico, storms in the Southern Ocean and North Atlantic, wave-ice interactions in the Arctic and Antarctic, global satellite observations of wave climate and its trends. Together with co-organisers from the Australian Maritime College (Tasmania) and the University of Western Australia, they share state-of-the-art facilities such as cavitation and directional-wave tanks, wave-ice and extreme wind-wave flumes, as well as the only full-cycle air-sea field observational site in the path of tropical cyclones at the North Rankin Platform of Woodside, Australia's main oil and gas producer.

Seven other Victorian Universities located in Melbourne offer research and courses across a broad range of marine engineering and science disciplines. Research headquarters of the Australian Bureau of Meteorology and of the Marine and Atmospheric Division of the Commonwealth Science and Industry Research Organisation – both responsible for the

waters of the Otway and Gippsland basins. The offshore Gippsland Basin is one of Australia's most prolific systems, having historically generated approximately two thirds of Australia's cumulative oil production and one third of its gas. Port of Melbourne is the largest container port in Australia. Victoria's large consultancy industry, such as AMOG, OMC International, Offshore Weather Services, AECOM, Cardno, among others, provide maritime services at global scale.

The location of the conference is on the Southern side of the Yarra river right across from the CBD (Central Business District). We warmly welcome you to Melbourne and encourage you to take time to wander through the city and experience all the other aspects of life in Melbourne whilst you're here for OMAE 2023.

—Alex Babanin

OMAe 2023 Conference Co-Chair

Professor, Ocean Engineering, University of Melbourne

—Hayden Marcollo

OMAe 2023 Conference Co-Chair

Director, AMOG Consulting Ltd.

—Sören Ehlers

OMAe 2023 Technical Program Chair

German Space Centre (DLR)

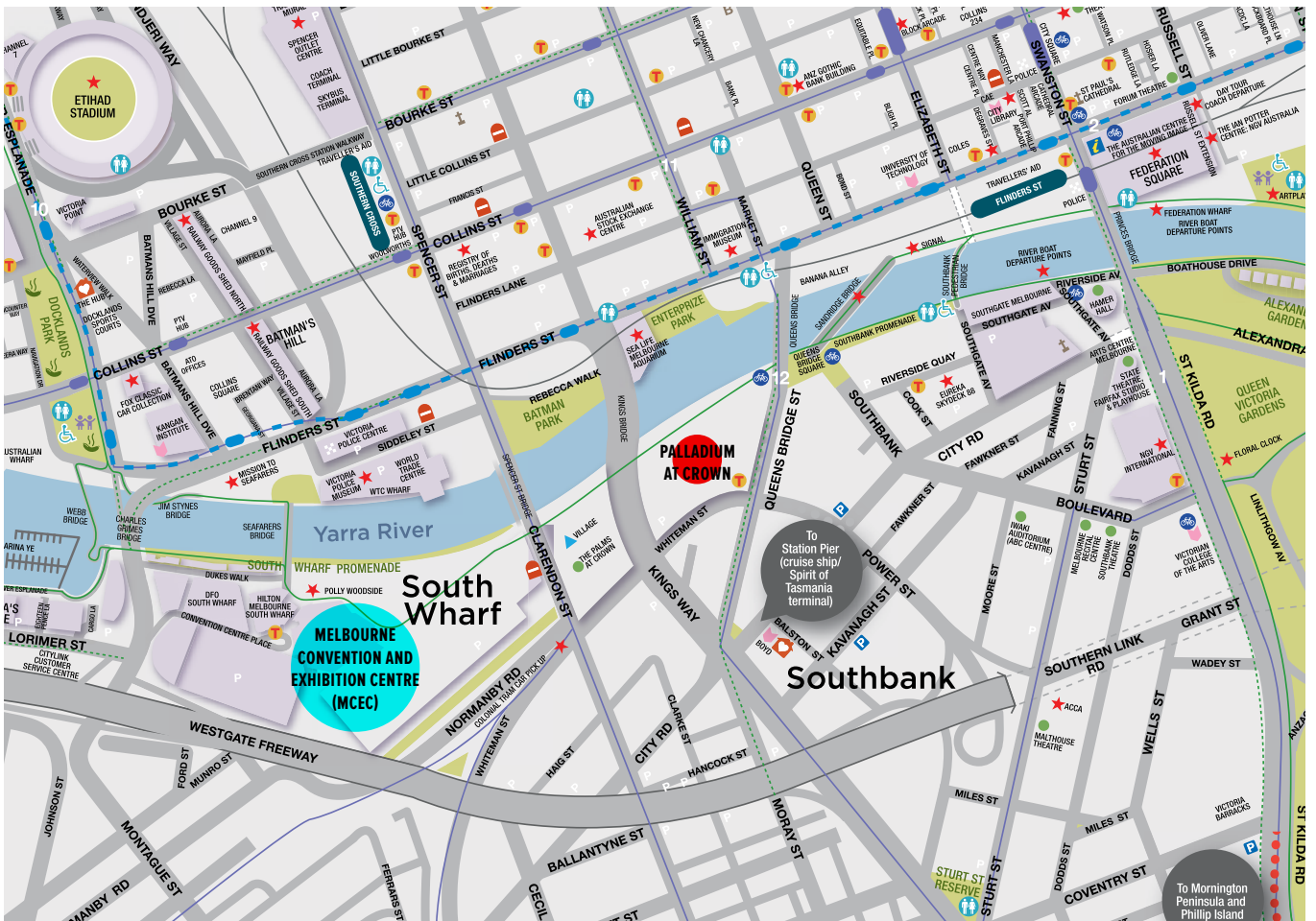
Institute for Maritime Energy Systems

Full Professor for Ship Structural Design and Analysis,

Hamburg University of Technology (TUHH)



## Melbourne City Map



**MELBOURNE CONVENTION AND EXHIBITION CENTRE (MCEC)**  
1 Convention Centre Pl, South Wharf VIC 3006, Australia

**PALLADIUM AT CROWN**  
Level 1 Crown Towers, Crown Melbourne,  
8 Whiteman St, Southbank VIC 3006, Australia



## Award Winners

### THE SUBRATA CHAKRABARTI YOUNG PROFESSIONAL AWARD

Jonas Behnen, for his outstanding presentation and paper OMAE2022-78878

**Hydrodynamic and Mechanic Response of a Floating Flexible Ice Floe in Regular Waves with the ICFD Method** during OMAE2022.

### OMAE 2022 BEST PAPER AWARDS

Offshore Technology Symposium, OMAE2022-79479  
**Finding Dangerous Waves – Towards an Efficient Method to Obtain Wave Impact Design Loads for Marine Structures** by Sanne van Essen and Harleigh Seyffert

Structures, Safety and Reliability Symposium, OMAE2022-81305  
**Blast Loading Profile of Gaseous Hydrogen in Confined Space Under Various Leak Conditions** by Seon Jin Kim, Hyun Ho Lee, Soung Woo Park, Dae Yu Baeg, Jeong Hwan Kim, and Jung Kwan Seo

Materials Technology Symposium, OMAE2022-78556  
**Effect of Low Pretension on the Fatigue Performance of Large Bolts** by Carol Johnston

Pipelines, Risers, and Subsea Systems Symposium, OMAE2022-7991  
**FPSO Second-order Roll Motions and the Impacts on SLWR Riser Design** by Stael Ferreira Senra, Marcos Donato Auler Da Silva Ferreira, Allan Carre De Oliveira, Bernardo Donni De Sena and Vinicius Garcia Prado

Ocean Engineering Symposium, OMAE2022-80594  
**The Impact of the Spectral Tail on the Kurtosis of Random Seas** by Dylan Barratt, Ton Van Den Bremer and Thomas Adcock

Polar and Arctic Sciences and Technology, OMAE2022-80767  
**Scenario-Based Risk Management for Arctic Waters** by Martin Bergström, Thomas Browne, Sören Ehlers, Inari Helle, Hauke Herrnring, Faisal Khan, Jan Kubiczek, Pentti Kujala, Mihkel Kõrgesaar, Bernt Johan Leira, Tuuli Parviainen, Arttu Polojärvi, Mikko Suominen, Rocky Taylor, Jukka Tuhkuri, Jarno Vanhatalo, and Brian Veitch

CFD, VIV & FSI Symposium, OMAE2022-78758  
**Two-Phase Flow Induced Vibrations: Methodology Validation – Part 2** by Olivier Macchion, Paul Emmerson, Mike Lewis, Leszek Stachyra and Steinar Orre

Ocean Renewable Energy Symposium, OMAE2022-78666  
**Analysis of a Hybrid Mooring System Concept for a Semi-submersible Wind Turbine in Intermediate Water Depth under Operational, Extreme, and Yaw Error Conditions** by Qun Cao, Erin Bachynski-Polić, Zhen Gao, Longfei Xiao, Zhengshun Cheng and Mingyue Liu

Petroleum Technology Symposium, OMAE2022-78394  
**Transient Cuttings Transport for Real-Time Systems** by Roger Aragall, Alexander Starostin, Roland May, and Thomas Dahl

Honoring Symposium for Professor Günther F. Clauss on Hydrodynamics and Ocean Engineering, OMAE2022-80042  
**Real-time Ship Motion Prediction Using Artificial Neural Network** by Bhushan Taskar, Kie Hian Chua, Tatsuya Akamatsu, Ryo Kakuta, Song Wen Yeow, Ryosuke Niki, Keita Nishizawa and Allan Magee

## Attendee Information

### CONFERENCE VENUE

OMAE 2023 will be held at the [Melbourne Convention and Exhibition Center](#) (MCEC)

#### Melbourne Convention and Exhibition Center (MCEC)

1 Convention Centre Pl, South Wharf VIC 3006, Melbourne VIC, Australia

### ONSITE REGISTRATION

Pick up your name badge at the Registration Desk located in Melbourne 1 Foyer. The Registration Desk will be open during the following times:

Sunday, June 11th	12:00 – 17:00
Monday, June 12th	07:30 – 17:30
Tuesday, June 13th	08:00 – 17:30
Wednesday, June 14th	08:00 – 17:30
Thursday, June 15th	08:00 – 15:30

### NAME BADGES

In addition to being a means of identification to colleagues, you are required to wear your name badge for admission to conference sessions and events. Room monitors will check name badges before allowing anyone into the session or event. Replacement badges are available at the Registration Desk at a cost of AUD20 per badge. Attendees who have paid the author/member, non-member or student registration fee are entitled to admission to all conference sessions, daily refreshment breaks, the Welcome Reception, the Exhibition, the four Lunches, the Conference Banquet and the Farewell Reception. These attendees will also receive a conference gift.

**Daily Registration:** Attendees who have paid the one-day registration fee qualify for the badge representing the day they have selected to attend. Attendees wearing this badge are entitled to the following on their specified day: admission to conference sessions, refreshment breaks, the Exhibition and food and beverage service. The Conference Banquet is excluded from the daily pass.

**Accompanying Person:** Guests who have registered as an accompanying person qualify for this badge and are entitled to admission to the Welcome Reception, the Conference Banquet and a special sightseeing tour.

**Exhibitors:** Exhibit staff have access to the Exhibition and may participate in the Welcome Reception, the four Lunches, the Conference Banquet, and the Farewell Reception. One representative from each exhibiting company is permitted to attend conference sessions.

**Technical Tours and Social Events:** Pre-purchased tickets for technical tours and social events are provided with your name badge.

### INTERNET

Free Wifi internet is provided by the Conference. Log-in details will be provided on-site.

*Attendee Information continued...*



Photo by Stewart Bonn

### CONFERENCE APP

OMAE 2023 will utilize a mobile event app in place of a printed program to enhance the conference experience for attendees, speakers, exhibitors, and sponsors. You will be able to:

- Connect with Other Attendees
- Access Session Information
- Download Final Papers
- And More!

Keep an eye your email for more information on how to access and navigate the app!

### EXHIBITION HALL

The Exhibition hall will be located in Melbourne 1 and Foyer and will be open during the following hours:

Sunday, June 11th	17:00 – 19:00 (Welcome Reception)
Monday, June 12th	08:30 – 19:30
Tuesday, June 13th	08:30 – 17:30
Wednesday, June 14th	08:30 – 17:30
Thursday, June 15th	08:30 – 13:30

### DIETARY REQUIREMENTS

If you advised of any special dietary requirements when registering for the conference, the caterer has been notified of your needs. MCEC food offerings accommodate vegetarian, vegan and gluten free restrictions and should be easy to identify. Should you have any questions, please see a catering staff member with any questions. If you did not include your special dietary needs during the registration process, advise the staff at the Registration Desk before 17:00 on Sunday, June 11.

### COVID PROTOCOLS

At the time of writing, ASME in-person activities will follow the state and local laws, regulations and guidelines regarding COVID-19 applicable to the location of the event. These mandates are subject to change and should be continuously monitored.

At the time of writing, all meeting room and theatre spaces at MCEC operate at 100% seated capacity. All non-seated event spaces and styles operating at standard venue capacity of 1 person per 1.5sqm density. Floor plans density limits and capacities are subject to restrictions in line with the current [Chief Health Officer directions](#).

### Sanitisation stations

Visitors, customers, contractors and employees are encouraged to sanitise when hand washing facilities are not available. Sanitisation stations containing at least 60 per cent alcohol are located throughout the venue at entry points, customer service desks and other high traffic areas. Please also consider carrying pocket hand sanitiser to use when travelling to MCEC and within the venue.

### HEALTH, SAFETY AND INSURANCE SAFETY

As in all major cities, people should be aware of safety risks. You are advised not to wear your conference name badge outside conference activities. ASME and Sea to Sky Meeting and Association Management Inc. cannot assume any responsibility and will not accept any liability. Triple Zero (000) is Australia's main emergency service number. You should call 000 if you need urgent help from police, fire or ambulance services.

Australia is on the 10th place of the safest countries in the world, so tourists do not need to be afraid when coming to this country since Melbourne is safer than most big cities in the world. The overall rating is 80% which makes it a place where tourists can feel safe walking around. However, as with any big city, it is a good common sense to be careful. In crowded areas, remain cautious and keep your possessions in front of you. The Flinders Street station is considered to be the dangerous part of the city in terms of pickpockets. The part of the year when the pickpocketing is the most frequent is Christmas, the Melbourne Cup or the Footy Grand Finale.



### AUTHOR PRESENTATIONS

#### ALLOCATED TIME FOR PRESENTATIONS

Each presenter has a total of 20 minutes (approximately 15 minutes for presentation and 5 minutes for questions/comments and presenter introduction) for their presentation. The length of presentations will be strictly monitored by the Session Chairs.

#### ORDER OF PRESENTATIONS

If an author is not available to present a paper the session chair will play their video. Authors are asked to be in the session room for the entire session, and to be ready to present at any time.

#### PRESENTATION FORMAT and AUDIO-VISUAL EQUIPMENT

OMAE will provide a data projector, screen and computer loaded with the English version of Microsoft PowerPoint, Adobe Reader, VLC media player, Windows Media Player (for playing movies) and Windows. Please note that screens in the MCEC session rooms have an aspect ratio of 16:9 so prepare your presentation accordingly.

If you are working with presentation software other than PowerPoint or pdf files, please save your presentation as a

Microsoft Windows PowerPoint compatible file, or a pdf file. Computers in meeting rooms WILL NOT support Mac file formats or any presentation software other than Windows PowerPoint or pdf files. Presenters are not permitted to use their own computer for their presentations.

OMAE does not have a mandatory PowerPoint template that presenters must use. Presenters are free to choose their own template.

#### LOADING OF PRESENTATIONS

Presenters are asked to be in their session room 30 minutes prior to the start of the first presentation of their session to upload their presentation, and remain in the room to meet the Session Chairs, and stay for all presentations out of courtesy to the other presenters. Please bring your presentation on a USB stick. You may also upload your presentation on to the computer in your session room at any time prior to your talk on the day of your presentation. So that the session chair may easily locate your presentation, please label your presentation file with time, day, room and surname (ie. 0900 Tues Y12 Smith). Note that we cannot guarantee high speed internet access in session rooms and data is limited to 400MB per device per day and for this reason online presentations are not possible.



## Offshore Weather Services

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## Social Events



### WELCOME RECEPTION

Sunday, June 11

17:00 – 19:00

Melbourne 1 + Foyer

OMAE is welcoming its attendees for the first time to Australia. Pick up your name badge from the registration desk and catch up with your colleagues, meet new connections and try some Aussie food and wine.



### CONFERENCE BANQUET

Wednesday, June 14

19:30 – 23:00

Crown Palladium

The Palladium at Crown is the venue of choice for some of Australia's most prestigious events with a ballroom designed to impress. We hope you will be impressed as well, while enjoying good food and wine and company of your colleagues.

Only walking distance from the conference venue, join us from 7 pm for what we hope will be an evening to unwind and embrace some indigenous culture and entertainment.



### CONFERENCE LUNCHES

Monday, June 11 to Thursday, June 15

12:00 – 13:30

Melbourne 1 + Foyer

Lunch will be provided from Monday to Thursday and is open to all attendees where lunch is included in their fee.

### FAREWELL RECEPTION

Thursday, June 15

15:00 – 16:30

Meeting Room 203 & 204

Hosted by the OMAE 2024 committee, celebrate the end of another amazing conference and find out more about next year's conference in Singapore.



## Sponsors

### SILVER SPONSOR AND SPONSOR OF COFFEE BREAKS

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Australian Government  
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#### Blue Economy CRC

The Blue Economy CRC brings together 44 industry, government and research partners from ten countries with expertise in aquaculture, marine renewable energy, maritime engineering, environmental assessments and policy and regulation. Through targeted industry-focussed research and training, the Blue Economy CRC paves the way for innovative, commercially viable and sustainable offshore developments and new capabilities. Our vision is that our blue economy industries in offshore aquaculture and renewable energy are globally competitive, at the forefront of innovation and are underpinned by a robust environmental planning and management framework which consumers trust and value.

### SYMPOSIUM 9 SPONSOR

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#### World Forum Offshore Wind e.V. (WFOW)

World Forum Offshore Wind (WFO) is the world's only organisation 100% dedicated to fostering the global growth of offshore wind energy. WFO's 100+ international members represent the complete offshore wind value chain including utilities, manufacturers, service firms and other organisations. WFO is registered as a non-profit association (e.V.) in Germany with offices in Hamburg, Toyko, Taipei, and New York. WFO's unique profile facilitates access to governmental and international forums in order to open new markets and to advocate for global offshore wind growth.

### NAME BADGE SPONSOR

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#### Marin

Maritime Research Institute Netherlands (MARIN) is a globally recognised top institute for maritime research. Our mission is 'Better Ships, Blue Oceans': we stand for clean, smart and safe shipping and sustainable use of the sea. We do this as an independent knowledge partner for the maritime sector, government and society. We offer integrated solutions, from concept development and design to operation, making optimal use of our test facilities, computer simulations, simulators and full-scale measurements. In developing, applying and sharing our knowledge, we stimulate innovation and global collaboration. The knowledge and involvement of our people are our strength.

## Exhibitors



### AMC Search

AMC Search has delivered services to the offshore sector for almost 40 years. We have expertise in mooring analysis, navigation assessments, field layout and design, logistics master planning and decommissioning. Our advanced Autonomous Maritime Systems (AMS) facility delivers training in the use and operation, and regulation of autonomous technologies in the maritime sector, and we have deep experience in using AMS technologies in polar and coastal environments. We also provide T&E services for the offshore industry including scale model testing and CFD. Visit our staff in the exhibition hall to find out more about our offshore and Arctic services.



### Canadian Pond.ca Products Ltd

Canadian Pond.ca Products Ltd. specializes in water management for 20 years using our proprietary innovative technology Bubble Tubing®. Bubble Tubing® is used for a multitude of applications. Our air diffusers are used to create a bubble curtain that induces a water current to deflect jellyfishes, debris, plastics, sediment, algae, oil spills and more. It is also used for aeration with one of the highest oxygen transfer rate of the industry and in deicing in winter to protect marine infrastructure ISO 9001:2015 certified since 2019, the Bubble tubing® team of professionals strives to find solutions to optimize good practices in water management.

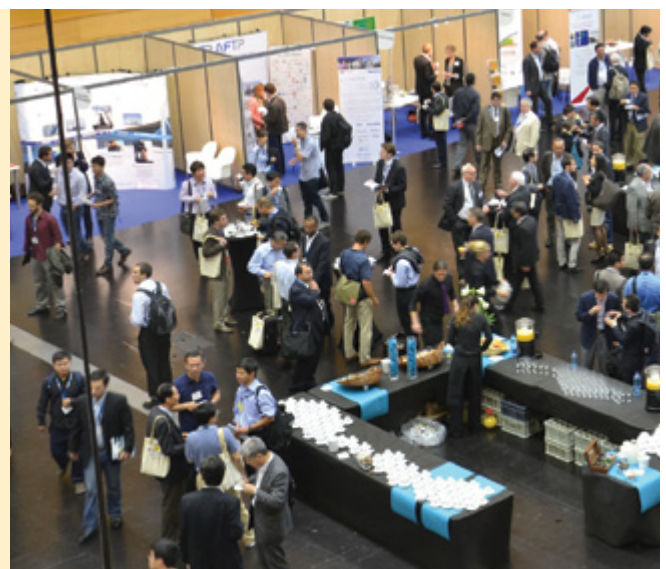
## Exhibition Hours

Visit the exhibits to discover new products and services from some of the industry's leading organizations. Coffee and tea will be served amongst the exhibits during refreshment breaks.

**Location:** Melbourne Room 1

### Dates & Times:

Sunday June 11	17:00 – 19:00
Monday June 12	08:30 – 19:30
Tuesday June 13	08:30 – 17:30
Wednesday June 14	08:30 – 17:30
Thursday June 15	08:30 – 13:30



An aerial photograph of an industrial facility, likely a refinery or chemical plant. The image shows a complex network of pipes, walkways, and large storage tanks. Four prominent, large, orange spherical storage tanks are arranged in a row, connected by a network of pipes and walkways. The facility is situated near a body of water, with a concrete wall and some vegetation visible in the foreground. The sky is clear and blue.

# Technical Program

The program shown here is current as of June 2.  
Please check the conference app or  
Technical Program on the  
ASME website for the most  
up to date version.



Professor Ian Young

## Professor Ian Young Honouring Symposium on Global Ocean Wind and Wave Climate

**P**rofessor Ian Young has made significant contributions to Physical Oceanography and Metocean Engineering in a number of areas, including spectral wave modelling, air-sea interaction, waves in finite water, satellite oceanography, tropical cyclone waves, global wind and wave climate, climate change impacts on the ocean, extreme value analysis, and global impacts of extreme sea levels.

The objective of the Professor Ian Young Honouring Symposium is to provide a forum for the presentation of relevant research, developments, and views on topics that Professor Young has contributed to over his career. Each session will consist of three presentations and then a panel Q&A session.

**Biography:** Ian Young is Kernot Professor of Engineering at the University of Melbourne. Prior to this appointment, he held the administrative roles of Vice-Chancellor of the Australian National University and Vice-Chancellor of the Swinburne University of Technology. Prior to joining Swinburne, he was

Executive Dean, the Faculty of Engineering, Computer & Mathematical Sciences and Pro-Vice-Chancellor (International) at the University of Adelaide. His research interests concern wind-generated ocean waves. He has an extensive publication record in areas such as: the physics of air-sea interaction, the numerical modelling of waves, finite depth waves, satellite remote sensing and ocean wind and wave climate. In recent years, he has conducted a range of studies aimed at understanding global ocean wind and wave climate. These studies use large satellite databases which he has compiled. The studies investigate seasonal wind and wave climate, extremes and long-term trends in wind speed and wave height. He has published extensively in aspects of remote sensing of the oceans with applications to both engineering design and climate. He is the author of more than 150 refereed papers and two major research monographs in the field. He is also a consultant to offshore industries in Australia, the United States, and Asia, as well as an advisor to the US Navy on ocean wave physics.



## Plenary Sessions

### OPENING CEREMONIES AND KEYNOTE PLENARIES

Monday, June 12 | Room Plenary 1 | 08:30 – 12:00

#### OPENING CEREMONIES

Alex Babanin, OMAE 2023 Conference Co-Chair

Hayden Marcollo, OMAE 2023 Conference Co-Chair

Welcome from ASME

Professor Michael Wesley, Deputy Vice-Chancellor Global, Culture and Engagement, University of Melbourne

#### KEYNOTE PRESENTATIONS

##### Pacific Region Perspective – Sustainably Managing Our Blue Pacific Ocean

Henry Puna, Secretary General, Pacific Islands Forum

##### Woodside Energy: Thriving through the Energy Transition

Jayne Baird, Vice President for Carbon Solutions, Woodside

##### Challenges of the Blue Economy for Sustainable Offshore Development

Professor Irene Penesis, Research Director, Blue Economy CRC-Co Ltd.

### AFTERNOON LECTURES

Monday, June 12 | Room 203 & 204 | 17:15 – 18:15

#### Preparing for Climate Change Impacts at the Port Interface: Pngpcl Experience

Mr Vagi Eoima, Chief Infrastructure Officer, PNG Ports Corporation Ltd.

Eunice J. K. Dalton, Civil Engineer, Papua New Guinea

Ms Scholly Masueng, Acting Manager (Projects and Assets), PNG Ports Corporation Ltd

Tuesday, June 13 | Room 203 & 204 | 17:15 – 18:45

#### Engineering and Marine Life

Dr Valeri (Val) Lenchine, Technical Director – Noise and Vibration, GHD, Australia

Scott Bainbridge, Senior Research Scientist, Australian Institute of Marine Science

Wednesday, June 14 | Room 203 & 204 | 17:15 – 18:45

#### Digitalised and Intelligent Ocean Engineering

Phil Watson, Shell Professor of Offshore Engineering and Director of the ARC Industrial Transformation Research Hub on Transforming Offshore Infrastructure through Digital Engineering (TIDE) at the University of Western Australia

Martin Anderson, Principal Data Processor, Fugro

Daniel Carneiro, Wood, Australia

Rasoul Hejazi, University of Western Australia

Kanishka Jayasinghe, Associate Director and Leader of the Digital Team, AMOG

Sean Murray, Pipelines Team Lead, Lloyd's Register

Hema Wadhwa, Remote Monitoring and Digital Services Manager, Worley

Hong Zhang, Professor of Civil Engineering, Griffith University

## Pacific Region Perspective – Sustainably Managing Our Blue Pacific Ocean

Monday, June 12 | Plenary Room 1 | 09:00-09:45



Henry Puna

### Henry Puna

*Secretary General  
Pacific Islands Forum*

**Abstract:** As custodians of the Blue Pacific, we have demonstrated our leadership and collective resolve to protect the Pacific Ocean. It is our endowment

fund, inherited from our ancestors and which we share with future generations. The development of the Pacific Roadmap for Economic Development (PRED) to implement the Resource and Economic Development thematic area of the 2050 Strategy for the Blue Pacific Continent, focuses on harnessing the blue economy potentials to optimize benefits to our island countries. Key to this is innovation and investment. Forum Leaders have called for increased investment in coastal and marine ecosystem restoration and management capacities, sustainable aquaculture development and research activities. Investment is needed for the future of sustainable coastal and marine tourism, economic resilience of fisheries, and community-level economic uplift and food security. Forum Leaders recognised that the Blue Pacific's maritime transport industry plays a critical role and call for the sustainable and resilient development of the maritime industry, including investment in new clean technology and operations, to ensure safe, accessible, efficient, and affordable maritime transport. Additionally, investment in sustainable ocean-based renewable energy – for new economic growth opportunities and energy security – is sought and encouraged, especially with our development partners. The Pacific Island countries face the brunt of the impact of climate change despite their insignificant contribution to the problem. A large focus is then on efforts to increase investment for the establishment of systematic oceans observing systems including oceans acidification, to better understand the impacts of climate change on the ocean, blue carbon protection and restoration initiatives for climate mitigation and adaptation, as well as monitoring and prediction to strengthen natural disaster response and risk reduction strategies for our islands.

**Biography:** Henry Puna is the 10th Secretary General of the Pacific Islands Forum and the first Cook Islander to hold this post.

Born in Aitutaki and raised in Rarotonga, he spent his formative years witnessing the transition of his nation to self-governance. He was one of the first wave of Cook Islands solicitors, studying at Auckland University and University of Tasmania, to be admitted to the bar in 1980

Before politics, Henry Puna served on the board of the South Pacific Ports Association, and the Pacific Forum Line. His executive roles in national government heading Trade, Labour, and Transport as well as operating within the constraints facing regional shipping and transportation, strengthened his affinity for the hardships and vulnerabilities of connecting remote atoll-based communities across ocean states. His formative years combined with his return to atoll life as a pearl farmer and parliamentarian, supplied rich insights and lived knowledge of the resilience and resourcefulness of small island communities bearing the brunt of climate change across the Blue Pacific. Holding portfolios including Foreign Affairs and Immigration, Marine Resources, Energy and Renewable Energy, Climate Change, Tourism, and the Outer Islands, Puna steered his nation on a path that has earned the Cook Islands global recognition for Oceans sustainability and renewable energy.

A key focus in his early years as Prime Minister was transforming access to energy across all inhabited islands of the Cooks. His championing of renewable, clean energy and support ensured the bilateral and global funding partnerships for a successful transition to solar energy, breaking the monopoly of fossil fuel.

At the international level, as the 43rd Forum Chair and host of the 2012 meetings and Leaders Retreat, he invited former US Secretary of State Hilary Clinton to a milestone meeting with Forum Leaders, who renewed their commitment to address human rights for women, through a new Pacific Leaders Gender Equality Declaration.

In 2016, in recognition of his service to the region and academia, he received an honorary Doctorate in Law from the University of the South Pacific, Fiji, and served as Chancellor of the University from 2017-2018.

As a Forum Leader championing climate change, tuna fisheries, and innovative partnerships for oceans and energy sustainability, a landmark global achievement has been the 2017 founding legislation establishing the world's largest multiple-use marine park, the Marae Moana.

## Woodside Energy: Thriving through the Energy Transition

Monday, June 12 | Plenary Room 1 | 10:45 – 11:20



Jayne Baird

### Jayne Baird

*Vice President Carbon*

**Abstract:** Woodside provides energy the world needs to heat and cool homes, keep lights on and enable industry through our portfolio of quality oil and gas assets. The science of climate change is clear: if the

world is to limit temperature rise, it will need to change the way that it produces and consumes energy. The energy transition has begun.

Jayne Baird, Woodside Energy Vice President Carbon Solutions – Carbon Services explores how Woodside, as an energy producer, is evolving its business to meet the challenges and capitalise on the opportunities the energy transition presents. From investing in new energy products such as hydrogen and solar as well as lower-carbon services such as carbon capture and storage, Woodside is exploring the technologies that may be capable of reducing the emissions from existing industries, while also having the potential to support the development of new lower-carbon industries.

**Biography:** Jayne Baird is Woodside's Vice President for Carbon Solutions, a role she has held since November 2018. She is responsible for establishing and delivering Woodside's Carbon Abatement strategy including Offset and CCS solutions.

Previous role VP Exploration: Africa, Europe, and Americas. She has thirty years industry experience across new business development, international new ventures, exploration, development, and subsurface production.

She joined the company in 2005 working in the Mauritania Exploration Team, later as Exploration Manager and Business Development Manager for Africa.

From 2008 she moved into the role of Exploration Manager in the Outer Exmouth Australia Exploration Team, focusing on support for Woodside's core LNG business. She was Senior Manager of Internal Audit in 2011 performing post investment reviews.

From 2012–2014 Jayne was Head of Global New Ventures. Jayne played a critical role in Woodside's return to international exploration. Following the 2016 entry in to the RSSD acreage in Senegal, containing the SNE discovery, Woodside took the Development Lead Role alongside operator Cairn. Jayne led the Sangomar development project for Woodside through appraisal,

until hand over to development for Concept Select.

Before Woodside Jayne worked for Conoco Phillips and the Scott Pickford Group, including a three-year secondment into the BP MAST (mature assets) project.

Jayne holds an honours degree in Geology and a masters degree in Basin Dynamics and was educated London University.

Born and raised in the United Kingdom, Jayne is a dual citizen based in Australia. She is also an internationally published fiction author (Jayne Lyons) with a first feature film and television series based on her, released in 2020.

## Challenges of the Blue Economy for Sustainable Offshore Development

Monday, June 12 | Plenary Room 1 | 11:25 – 12:00



Prof. Irene Peneis

### Professor Irene Peneis

*Research Director*

*Blue Economy CRC-Co Ltd.*

**Abstract:** Established in July 2019, Australia's Blue Economy Cooperative Research Centre (Blue Economy CRC) is aimed at unlocking the potential of the

nation's ocean resources, through sustainable developments of offshore aquaculture and renewable energy production systems. Included in these prospects for the Blue Economy is the offshore co-location and/or integration of both aquaculture and renewable energy production systems, which can potentially have several synergistic benefits that include shared resources, efficient use of ocean space, less competition amongst other user groups of marine space, reduced operational and maintenance (O&M) costs from possible shared activities. However, developing sustainable infrastructure in sites located further offshore have more technical and environmental challenges when compared to nearshore or coastal sites. Therefore, relocating such infrastructure from nearshore to offshore sites will require an extensive review, improvements and new innovations in terms of both design and practice.

In this keynote presentation, the Irene will talk about various design and research challenges related to developing sustainable offshore systems for emerging industries and the Blue Economy CRC's initiatives and solutions to overcome these challenges. This will include the recent R&D projects of novel fish pen designs, short-term improvements required to existing infrastructure in the aquaculture industry like the robust collar tie for fish pens, best practices for managing risks including marine spatial planning and data infrastructure, and



decarbonisation of blue economy industries including multi-use platforms (MoorPower™), offshore hydrogen microgrid and hydrogen-powered vessels.

**Biography:** Professor Irene Penesis is the Research Director for the Blue Economy CRC Co Ltd. Irene was the bid leader responsible for developing the AU \$329 million successful application to the Australian Government's Cooperative Research Centre (CRC) program. Irene's passion for a transition to renewable energy, environmental sustainability and decarbonisation of marine and maritime industries led her to developing the successful application to the Commonwealth's CRC program. Irene is on secondment from the Australian Maritime College, University of Tasmania where she led a multi-disciplinary research team working in the field of marine renewable energy and contributing to educating maritime

engineering students in the Centre for Maritime Engineering and Hydrodynamics.

Irene is the Australian Primary Delegate of the International Energy Agency's Ocean Energy Systems (OES), and on the Steering Committees of the Tasmanian Government's Renewable Energy Action Plan, the Marine Energy Research Australia (MERA) at the University of Western Australia and MERIC Chile's Scientific International Committee. Irene was the Chair of Marine Renewable Energy Specialist Committee of the International Towing Tank Conference (ITTC) between 2011 and 2017, a peak international body developing technical guidelines and procedures relevant to the hydrodynamic testing of wave energy converters, marine current/tidal turbines and offshore wind turbines.

Irene is the next Chairperson for the International Conference on Ocean Energy (ICOE) to be held in Melbourne, Australia in 2024.



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COOPERATIVE RESEARCH CENTRE



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Developing a robust collar tie



Pre-conditions for Offshore Wind Energy in Australia



View all Current Projects

**DELIVERING INNOVATION IN SUSTAINABLE AQUACULTURE & RENEWABLE ENERGY PRODUCTION FOR A MARINE NATION**

Australia has an Exclusive Economic Zone of over 8.2 million square kilometres of well-managed clean oceans that provide enormous potential to increase seafood and renewable energy production sustainably.

Realising this potential requires moving aquaculture and renewable energy systems offshore into high-quality but remote and more exposed high-energy operating environments requiring the development of more robust structures, technologies and production systems.

The Blue Economy CRC is addressing the challenges associated with climate change, decarbonisation, energy transition, sustainability and the development of a new and highly skilled workforce to facilitate a step change in the economic value of Australia's new Blue Economy industries.



Australian Government  
Department of Industry,  
Science and Resources



AusIndustry  
Cooperative Research  
Centres Program

[www.blueeconomycrc.com.au](http://www.blueeconomycrc.com.au)

## Preparing for Climate Change Impacts at the Port Interface: PNGPCL Experience

Monday, June 12 | Rooms 203 & 204 | 17:15 – 18:15

**Abstract:** PNG Ports Corporation Limited (PNGPCL) is Papua New Guinea's state-owned and mandated national port custodian and developer, operating PNG's 16 national seaports across the mainland coastline and five other primary islands of Papua New Guinea (PNG). PNGPCL must prepare to face the impacts of climate change (CC) at its 16 ports. Many of these national ports are run as community service obligations, subsidised by the few more profitable ports, namely Lae and Motukea Ports.

Preparing for CC impacts has had to be strategic and comprehensive in its foundational development before staged implementation can begin. PNGPCL's Infrastructure Division has recently collaborated in a national program to build resilience to CC in PNG; funded by the Australia-PNG Strategic Climate Fund and administered by the ADB. Through this collaboration, PNGPCL and international technical experts have compiled four technical documents for PNGPCL and PNG that form the basis of increasing the CC resilience at the port level, specifically in relation to the port infrastructure. The documents are:

- Historic Data for Distinct Climate Zones for PNG Ports,
- Climate Change Projections and Vulnerability Assessment for Ports in Papua New Guinea,
- Guidance Manual for Undertaking Site-specific Vulnerability Assessments and Formulation of Port Infrastructure Climate Change Risk Management Plans, and
- Guidance Manual for Design of Climate Change Resilient Coastal Port Infrastructure.

This paper presents key components of the four technical documents and how they inform improved CC preparation at the ports: the interface of land and sea-based global trade, long-term infrastructure and the forces of ocean and weather. The paper then highlights the next progression of activities that build upon this technical foundation and their applications to parallel projects and technical interventions that PNGPCL is employing and developing to equip its ports. To conclude, key learnings from the PNGPCL experience are discussed. It is expected that the findings from the PNGPCL experience will also benefit other ports in the Pacific.

### Biographies:



Vagi Eoima

### Mr Vagi Eoima

Mr Vagi Eoima is a Senior Engineer and Executive Manager with vast experience in Project Management, Civil Engineering, Geotechnical Engineering, Structural Engineering, Coastal Engineering and Engineering Division Leadership.

Vagi began his career in the structural design field in 1999, continuously adding successful projects and more branches of civil engineering to his repertoire. Upon joining PNG Ports Corporation Ltd. in 2006, Vagi's career began the transition to executive management moving from Design Engineer to Senior Engineer (2008), Manager Engineering (2014) then Chief Infrastructure Officer (2017), a challenging yet rewarding responsibility which he holds to date.

Vagi is passionate about developing PNG through infrastructure projects and capacity development of his engineers.



Eunice J. K. Dalton

### Eunice J. K. Dalton

A national (PNG) award winning civil engineer with an MSc Environment from Griffith University majoring in climate change adaptation, Eunice J. K. Dalton has worked closely with the PNG BRCC Project on behalf of PNG Ports, to build climate change resilience in PNG. Eunice

is interested in research and developing processes to encourage the incorporation and ease of translation of up-to-date technical guidance, proven best practice and academic findings into practical civil engineering, sustainable development, environmental management and climate change resilience / adaptation projects. Eunice has held roles as part-time lecturer at PNG University of Technology, research assistant with Australian Rivers Institute, chapter vice-president of IEPNG Lae and mentor to a growing number of young engineers. Her career spans mines, municipal water supply and sanitation, project delivery and engagement with extremely remote rural communities, and most areas of civil engineering and project design, scoping, planning, implementation, management, monitoring and audit.



Ms Scholly Masueng

### Ms Scholly Masueng

Ms Scholly Masueng comes from Sandaun Province of Papua New Guinea. She has been working for PNG Ports Corporation Ltd for 13 years in the Infrastructure Division as a Civil Engineer before taking on the role as Acting Manager (Projects and Assets). Passionate about sustainable development that is strategic and SMART, taking into consideration all aspects of the ESG, (Environment, Social and Governance).

## Engineering and Marine Life

Tuesday, June 13 | Rooms 203 & 204 | 17:15 – 18:45

Internationally recognized speakers will present keynotes of their work on the interface between Engineering and Marine Life (EML). The EML panel event will consist of two 20-minute keynotes and two 10-minute presentations from the panelists followed by an “open” panel discussion.

Keynote speaker Dr Valeri Lenchine is the Technical Director for Noise and Vibration at GHD, Melbourne. His work assesses the impact of noise on marine species during construction and operational phases of marine projects. Underwater noise can cause temporary or permanent auditory damage to marine animals, such as whales and dolphins. Valeri will discuss approaches to assessing noise impacts, which are typically applicable to marine infrastructure projects.

Keynote Speaker Scott Bainbridge is representing Mr. David Mead, the Executive Director of Strategy and Development at the Australian Institute of Marine Science (AIMS). AIMS is the managing entity for the Reef Restoration and Adaptation Project (RRAP), a multi-agency long-term research and development program to develop, engineer, test and risk-assess novel interventions to help keep the reef resilient and sustain critical functions and values.

Panelist Alexia Aubault is the Chief Technical Officer of OCERGY (California). She is a leading authority on wind farms with considerable experience in windfarm development and their interfaces with marine life.

The range of topical content will be expanded by Tamsin Dobson from the University of Bristol, U.K. who (with a background in marine biology as well as engineering) is working on the interface between engineering and marine life. Her research focusses on how biofouling (the attachment of organisms to man-made structures) affects metal corrosion in the marine environment (including current findings on the corrosion and biofouling of welded Nickel Aluminium Bronze).

Audience questions will be encouraged and answered by the panel to develop dialogues between attending engineers and marine scientists. The hope is that the event will initiate discussions on the development of sustainable marine engineering projects that are designed around, with and for marine life.

In addition, the wider conference will include 45 papers on EML and related themes within the three Symposiums; Ian Young Honoring Symposium, Blue Economy Symposium and Small Maritime Nation Symposium.

### Biographies:

#### Dr Valeri (Val) Lenchine

Dr Valeri (Val) Lenchine is the Technical Director- Noise and Vibration in GHD's Melbourne office. He has 30 years' experience in acoustic and vibration research, environmental impact assessment and development of mitigation measures. Val conferred a Ph.D. degree majoring in Acoustics & Vibration. He has assessed noise impact from wind farms and other renewable energy plants, industries, infrastructure and marine projects. Val managed multiple projects relevant to development of methodologies and regulatory documents applicable to wind farms, railways, buildings and industries. Results of the projects have been incorporated into planning documents and policies. Prediction of underwater noise from operation and construction of offshore and onshore infrastructure, mining, power generation and transport projects using variety of modelling tools also forms a part of his project portfolio. Valeri has recognition on national and international level which is reflected in scientific publications (approximately 60) and patents.

#### Scott Bainbridge

Scott Bainbridge is a Senior Research Scientist at the Australian Institute of Marine Science (AIMS) in Townsville, North Queensland. While trained as an ecologist, he leads a number of engineering projects that look to apply new technologies to current and emerging issues for coral reefs globally. He led a project that installed wireless sensor networks across the Great Barrier Reef and currently heads a team developing novel marine monitoring and surveying systems. AIMS manages the Reef Restoration and Adaptation Project (RRAP), a multi-million dollar program to develop the technology and underlying engineering to re-seed, re-plant, re-establish and restore reefs at scale. This project looks to develop, test and scale to implementation a range of strategies to reduce the impact of climate change globally on reefs and to assist the natural processes of restoration and adaptation.

## Digitalised and Intelligent Ocean Engineering

Wednesday, June 14 | Rooms 203 & 204 | 17:15 – 18:45

Data-driven models and artificial intelligence have shown great potential for the offshore industry. This session will explore how data is being used to improve engineering practice in the offshore energy sector, and how the blending of data science approaches with traditional engineering is guiding industry application and academic research. Opening remarks from a number of guest speakers will be followed by a panel discussion to examine the state of the art and explore future trends.

**Format:** The session will be organised as follows:

- Opening remarks: 5 minutes (Phil Watson, Director of TIDE)
- Individual speakers: 7 x 7 minutes each, with questions saved for panel discussion
- Panel discussion of around 30 minutes

### Session chair

- Phil Watson (UWA)

### Individual speakers / panel members

- Martin Anderson (Fugro)
- Daniel Carneiro (Wood)
- Rasoul Hejazi (UWA)
- Kanishka Jayasinghe (AMOG)
- Sean Murray (Lloyds Register)
- Hema Wadhwa (Worley)
- Hong Zhang (Griffiths University)

### Biographies:



Phil Watson

### Session Chair: Phil Watson

Phil is the Shell Professor of Offshore Engineering and Director of the ARC Industrial Transformation Research Hub on Transforming offshore Infrastructure through Digital Engineering (TIDE) at the University of Western Australia. He is a Fellow of The Australian Academy of

Technology and Engineering and the Institution of Engineers Australia, and the current Chair of ISSMGE Technical Committee 209 'Offshore Geotechnics'. Phil is passionate about aligning industry and academia to solve challenges facing the offshore sector – and training tomorrow's generation of geotechnical leaders.

### Abstract: The evolution of point cloud processing from gate filters to PointCNN

Point cloud classification is an important part of the survey workflow to identify the position and orientation of subsea

assets from raw sensor data. This presentation explores how Fugro is using machine learning to improve classification accuracy relative to traditional methods. Modern sonar and laser sensors often record billions of points per project therefore scalable cloud computing architectures are discussed to handle these datasets efficiently, in addition to making them more accessible.



Martin Anderson

### Martin Anderson

Martin is a Principal Data Processor with Fugro and holds a degree in computer science from the University of Edinburgh, he has over 15 years of experience analysing offshore and subsea data to produce engineering products. He has helped to develop Fugro's solutions

to some of the key challenges in subsea survey including registration of subsea data, pipeline out of straightness surveys and integrating subsea photogrammetry to supplement sonar and laser surveys. Martin is Fugro's technical point of contact for its pipeline processing suite—Sense Pipelines—which leverages cloud processing and point cloud classification to efficiently produce pipeline engineering deliverables and make them more accessible.



Daniel Carneiro

### Daniel Carneiro

Dr. Daniel Carneiro has 20 years' experience in design and consulting for the energy industry. He's got his degree, masters, and PhD in Civil Engineering from the Federal University of Rio de Janeiro, and has authored over 30 papers, most of them in subsea pipe-

soil interaction. Daniel has joined Wood (then J P Kenny) in Perth, Australia in 2012, moved back to Rio to manage Wood's Consulting business in Brazil from 2017 to 2022, and is since back in Perth. He's also been a consistent volunteer supporter of OMAE, organising sessions in the Pipeline, Risers, and Subsea Systems Symposium since 2010.

### Abstract: Data-Driven Engineering and the Role of Domain Expertise

AI is transforming how we interact with data. Our ever-growing data processing capabilities have revolutionized engineering. But is this really new? In the last half-century, multiple advancements have reshaped how we work. Recent progress has enabled researchers and engineers to extract valuable insights

from diverse datasets, optimize offshore operations, enhance marine ecosystem monitoring, and develop autonomous systems capable of navigating and exploring the ocean depths. However, domain expertise remains vital for problem framing, model validation, and result interpretation. This presentation will showcase examples illustrate the significant insights data-driven engineering offers while emphasizing the critical role of domain experts in guiding data-based decision-making.



Rasoul Hejazi

## Rasoul Hejazi

Rasoul is a dedicated researcher and entrepreneur driven by an unwavering passion for continuous improvement. With ten years of experience in offshore engineering, he has spent the past seven years focused on researching and developing machine learning and

AI-based engineering analysis tools. His primary objective is to enhance offshore engineering practices through the creation of innovative frameworks and intelligent analysis tools for integrity management of offshore assets. Recently, Rasoul launched a start-up that aims to further integrate AI and engineering, with a vision to explore new frontiers and contribute to shaping the future of digital engineering.

### **Abstract: Expanding Horizons: Augmented Intelligence in Engineering**

This presentation explores the realm of augmented intelligence, where the fusion of human expertise, physics-based models, and artificial intelligence (AI) or machine learning (ML) can create a transformational synergy in engineering. By harnessing the potential of AI/ML algorithms, engineers can unlock new possibilities in problem-solving, decision-making, and innovation. The presentation examines the potential and challenges of this dynamic combination, highlighting how it can enhance engineering practices.



Kanishka Jayasinghe

## Kanishka Jayasinghe

Kanishka is an Associate Director and the Leader of AMOG's Digital Team, focussing on the operationalisation of the hardware and software solutions developed through AMOG's consulting business. Kanishka has a background in ocean engineering with many years of experience in mooring

and riser design and analysis, and mooring and riser integrity management. More recently, Kanishka has led the development and product management of AMOG's portfolio of digital products, including its mooring integrity monitoring platform, SMIC, and the SensaWise, LoadWise, and WharfWise suite of smart instrumentation products.

### **Abstract: A scalable approach to integrity monitoring of floating facilities**

Integrity management for moorings and risers/cables of floating assets (including FOWT) will only become more important as we look towards a future of increased scale, arrays, and unmanned facilities. Design plays an important role, as does inspection, but there is a lot of data that can be gathered from these assets. AMOG has developed the Smart Mooring Integrity Checker (SMIC) technology which is now actively monitoring integrity on a number of floating facilities around the world. Retrofitted, or integrated at the design stage, real-time monitoring solutions can not only improve operability and utilization, but increase safety, and reduce risk.



Sean Murray

## Sean Murray

Sean Murray leads Lloyd's Register's Pipelines and Risers group, managing and delivering independent assurance for global onshore and offshore pipeline projects. Sean has 15 years of experience in construction and engineering, 13 of which have been in the offshore industry. Sean

has developed a strong depth of technical knowledge across a broad range of pipeline engineering aspects and holds a Master's degree in Civil & Structural Engineering from the University of Dundee. Sean is active in the wider pipelines industry, participating in code committees and presenting at conferences on a range of topics.

### **Abstract: Challenges of Independent Assurance for Digital Twins and Artificial Intelligence in Offshore Engineering**

The integration of Digital Twins and AI technologies holds great promise for the offshore industry, offering opportunities to significantly enhance operational efficiency, optimize maintenance strategies, and elevate safety standards. However, alongside these benefits, these technologies present unique challenges that must be addressed to ensure the safety, reliability, and trustworthiness of the systems. This presentation will discuss the challenges faced in providing reliable independent assurance for these technologies in offshore engineering and present an assurance framework to help navigate these challenges.



Hema Wadhwa

## Hema Wadhwa

Dr Hema Wadhwa, with her diverse range of experiences, possesses a unique perspective and vision that extends beyond the confines of traditional boundaries and silos. She has been particularly influential in enabling people, remote operations,

and the power industry through digital solutions and unified operations. She recognizes the transformative potential of digital technologies and leverages them to enhance operational efficiency, optimize performance, and streamline processes. She has a keen understanding of market dynamics and emerging trends, enabling her to develop strategic initiatives that drive business success. One of her current major digital enablement projects is being developed through partnership for industry success.



Hong Zhang

### Hong Zhang

Professor Hong Zhang is a Professor of Civil Engineering at Griffith University. With a PhD from The University of Western Australia, she began her career at the Tropical Marine Science Institute in Singapore. Prof Zhang's research focuses primarily on ocean and coastal dynamics,

with a particular emphasis on hydrodynamics, sediment transport, and fluid-structure-soil interactions. She possesses a comprehensive understanding of these complex phenomena and utilizes a combination of data-driven and process-based

modelling techniques to address research challenges. Prof Zhang maintains close ties with academia, government agencies and local consultancies, ensuring her research findings are relevant and applicable to practical engineering solutions.

### **Abstract: Harnessing the Power of Data: Data Driven Models and Process Based Models in Coastal and Ocean Engineering**

In the presentation, the integration of data-driven and process-based models in coastal and ocean engineering is explored. The importance of process-based models, solving equations related to ocean dynamics and sediment transport, is emphasized. Challenges related to data requirements, equation selection, accuracy, and computational power are acknowledged. The presentation highlights the integration of data-driven models and artificial intelligence techniques, utilizing data from various sources. A case study demonstrates how this integration improves the accuracy of process-based models, analyzing the impact of extreme waves on beach erosion for effective coastal protection strategies. The conclusion addresses challenges of handling large data, considering data utilization implications, and fostering national and international collaborations.



# Monday Concurrent Sessions

## CONCURRENT SESSIONS

13:30 – 15:00

### Offshore Technology

#### 01-02-01 Station Keeping

Monday June 12 | Room 205 | 13:30–15:00

Session Organizer: Allan R Magee, Consultant, USA

Session Co-Organizer: Michael Si, TCOMS, Singapore

##### Monitoring the Rotational Performance of a Weathervaning Mooring System OMAE2023-102355

Joerik Minnebo<sup>1</sup> Jiaxing Chen<sup>1</sup> Haoyuan Gu<sup>2</sup>

1. SOFEC, Houston, TX, USA; 2. Texas A&M University, College Station, TX, USA

##### A Dry Monitoring System of Mooring Lines Utilizing Artificial Intelligence OMAE2023-103160

Djoni E. Sidarta<sup>1</sup> Nicolas Tcherniguin<sup>2</sup> Philippe Bouchard<sup>3</sup>

1. Technip Energies, Houston, TX, USA; 2. Technip Energies, Nanterre, France; 3. Technip Energies Cybernetix, Marseille, France

##### Robust and Adaptive Control for a Marine Autonomous Surface Ship (MAAS)

Operations under Harsh Environment OMAE2023-104936

Tanjil Islam<sup>1</sup> Syed Imtiaz<sup>1</sup> Salim Ahmed<sup>1</sup> Mohammad Islam<sup>2</sup> Hasanat Zaman<sup>2</sup> Robert Gash<sup>2</sup>

1. Memorial University of Newfoundland, St. John's, NL, Canada; 2. National Research Council Canada, St. John's, NL, Canada

##### Offloading Operability of Near Shore FLNG with Side-by-Side Moored

LNG Carrier in Shallow Water Depth OMAE2023-101405

Mun Sung Kim<sup>1</sup> J. H. Lim<sup>2</sup> R. H. Yuck<sup>3</sup> H. J. Kim<sup>3</sup> J. K. Heo<sup>4</sup>

1. Samsung Heavy Industries, Seong-nam, Korea; 2. SHI, Seong-nam, Korea; 3. SHI, Daejeon, Korea; 4. DNV, Busan, Korea

### Structures, Safety and Reliability

#### 02-01-01 Structural Analysis and Optimisation I

Monday June 12 | Room 212 | 13:30–15:00

Session Organizer: Jonas Ringsberg, Chalmers University of Technology, Sweden

Session Co-Organizer: Paulo Videiro, CENTEC, Portugal

##### Working Load in a Container Stack Nonlinearity with Twist Lock Separation OMAE2023-101136

Fuminori Yanagimoto, Kinya Ishibashi

Nippon Kaiji Kyokai (Class NK), Tokyo, Japan

##### High Effectiveness of Stays against H-Mode Vibration of a Main Engine Even with a

Foundation Having Reduced Rigidity on a Merchant Ship OMAE2023-102715

Ryo Matsuo, Shuichi Yamatoki, Hiroyuki Onizuka

Namura Shipbuilding Co., Ltd., Imari-Shi, Japan

##### A Monte Carlo Approach for VIV Fatigue Damage Estimation of Subsea Pipelines

Subjected to Design, Installation and Operational Uncertainties OMAE2023-102864

Leonardo Sales, Mohammed Mohammed, Cyprian Gil

Wood PLC, Stavanger, Norway

##### Effect of Nonlinearity on Tubular Joint of Jacket Structure and Its

Response under Dynamics Loading OMAE2023-108068

Ram Kumar, Deepak Kumar

Indian Institute of Technology Madras, Chennai, TN, India

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## Structures, Safety and Reliability

### 02-02-01 Ultimate Strength I

Monday June 12 | Room 213 | 13:30–15:00

**Session Organizer:** Deyu Wang, Shanghai Jiao Tong University, China

**Session Co-Organizer:** Yasuhira Yamada, National Maritime Research Institute, Japan

#### How Loads Interact? A Numerical Investigation of Aluminum Stiffened Panels under Bi-Axial and Lateral Loads OMAE2023-100743

Xintong Wang, Jørgen Amdahl

Norwegian University of Science and Technology, Trondheim, Norway

#### Progressive Collapse Behavior of Ship Structures considering Fluid-Structure Interaction Effect OMAE2023-102755

Ji Zhou<sup>1</sup> Zhiyong Pei<sup>1</sup> Weiguo Wu<sup>1</sup> Jianliang Ding<sup>2</sup>

1. Wuhan University of Technology, Wuhan, China; 2. China Merchants Jinling Dingheng Shipbuilding, Yangzhou, China

#### Application of Different Methods to Determine the Ultimate Strength of Ships in Bending OMAE2023-103731

Thomas Lindemann<sup>1</sup> Alessandro La Ferlita<sup>2</sup> Emanuel Di Nardo<sup>3</sup> Patrick Kaeding<sup>1</sup>

1. University of Rostock, Rostock, Germany; 2. American Bureau of Shipping, ABS Europe Ltd., Hamburg, Germany;

3. University of Naples Parthenope, Department of Science and Technology, Naples, Italy, Napoli, Italy

#### Local Buckling Analysis and Evaluation Method of Dented Submarine Pipelines under the Combined Loadings OMAE2023-104656

Fuheng Hou, Yanfei Chen, Yu Liu, Shengjun Chen, Chunsha Wang, Ruihao Liu

China University of Petroleum, Beijing, China

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## Pipeline, Risers, and Subsea Systems

### 04-01-01 Flexible Pipes and Umbilicals I

Monday June 12 | Room 210 | 13:30–15:00

**Session Organizer:** Zhimin Tan, BH, USA

#### Unbonded Flexible Pipeline Upheaval Buckling Design and Sensitivity Analysis OMAE2023-102019

Morten Eriksen<sup>1</sup> Anders A. Larsen<sup>1</sup> Tommy Pedersen<sup>1</sup> Henrik Ollgaard Larsen<sup>1</sup> Andrew Shanks<sup>2</sup> Thierry Gavouyere<sup>3</sup>

Johan Kristian Boe<sup>4</sup> Rui Caracol<sup>5</sup> Jian Liu<sup>6</sup> Richard Clements<sup>6</sup> Roberta Pires<sup>7</sup> Linfa Zhu<sup>8</sup> Zhimin Tan<sup>8</sup>

1. NOV, Brøndby, Denmark; 2. TechnipFMC UK, Westhill, Aberdeenshire, United Kingdom; 3. TechnipFMC FlexiFrance,

Le Trait, France; 4. TechnipFMC Norway, Lysaker, Norway; 5. TechnipFMC, Lisbon, Portugal; 6. Baker Hughes,

Newcastle Upon Tyne, United Kingdom; 7. Baker Hughes, Lisbon, Portugal; 8. Baker Hughes, Houston, TX, USA

#### Upheaval Buckling Analysis of the Large Deformation of Unbonded Flexible Pipe under Cyclic Pressure and Temperature Loadings OMAE2023-103676

Jian Liu<sup>1</sup> Linfa Zhu<sup>2</sup> Zhimin Tan<sup>2</sup> Andrew Roberts<sup>1</sup> Sean Murray<sup>3</sup> Euan Trousdale<sup>3</sup>

Juliana Patrocínio<sup>3</sup> Clara Casanovas Revilla<sup>3</sup> Mario Augusto Lopes de Castro<sup>4</sup>

1. Baker Hughes, Newcastle, United Kingdom; 2. Baker Hughes, Houston, TX, USA; 3. Lloyd's Register, Aberdeen, United Kingdom

#### New Temporal Approach to Evaluate the Lateral Buckling of Armour Wires OMAE2023-104633

Ludovic Bouy<sup>1</sup> Phellip Frigeri<sup>2</sup> Gilles Lemonnier<sup>1</sup> Pascal Estrier<sup>1</sup>

1. TechnipFMC, Le Trait, France; 2. TechnipFMC Brazil, Rio de Janeiro, RJ, Brazil

#### State-of-the-Art Methodologies for Upheaval Buckling Design of Flexible Pipes OMAE2023-105427

Lars Wist Amdal, Sune Pettersen, Geir Skeie, Sigbjørn Røneid, Leif Collberg

DNV, Høvik, Norway



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## Ocean Space Utilization

### 05-01-01 New Concepts for Ocean Space Utilization I

Monday June 12 | Room 207 | 13:30–15:00

Session Organizer: Tomoki Ikoma, Nihon University, Japan

Session Co-Organizer: Yutaro Sasahara, Tokyo University of Marine Science and Technology, Japan

#### Design and Dynamic Analysis of Shared Mooring System between a Semi-Submersible Offshore Fish Cage and a Spar-Type Floating Offshore Wind Turbine OMAE2023-101055

Yu Ma<sup>1</sup> Lin Li<sup>1</sup> Muk Chen Ong<sup>1</sup> Jingzhe Jin<sup>2</sup> Biao Su<sup>3</sup>

1. University of Stavanger, Stavanger, Norway; 2. Shanghai Jiao Tong University, Trondheim, Norway; 3. SINTEF Ocean, Trondheim, Norway

#### A Design and Study on a New Kelp Culture Facility OMAE2023-103027

Yushun Lian<sup>1</sup> Shutian Shen<sup>1</sup> Jinhai Zheng<sup>1</sup> Samuel Boamah<sup>1</sup> Solomon C. Yim<sup>2</sup>

1. Hohai University, Nanjing, China; 2. Oregon State University, Nanjing, China

#### Innovative Crash Barrier Concepts to Prevent Ship Collisions with Wind Turbines OMAE2023-103850

William Otto, Yvonne Koldenhof, Bas Buchner

Maritime Research Institute Netherlands, Wageningen, Netherlands

#### Development of Integrated Acoustic Communication and Positioning System for Operation of Autonomous Underwater Vehicle and a Sea Trial OMAE2023-106749

Yoshitaka Watanabe<sup>1</sup> Satoshi Kondo<sup>2</sup> Koji Meguro<sup>2</sup> Takuya Shimura<sup>1</sup> Mitsuyasu Deguchi<sup>1</sup> Yukihiro Kida<sup>1</sup>

1. JAMSTEC, Yokosuka, Japan; 2. Hitachi Ltd., Yokohama, Japan

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## Ocean Engineering

### 06-03-01 Fluid-Structure, Multi-body and Wave-body Interaction I

Monday June 12 | Room 204 | 13:30–15:00

Session Organizer: Shuzheng Sun, Harbin Engineering University, China

#### Environmental Loading on a Concrete Gravity-Based Offshore Structure in the Presence of Freak Waves and Currents OMAE2023-101645

M Hasanat Zaman, Ayhan Akinturk

National Research Council Canada, St. John's, NL, Canada

#### Data Informed Sequential Model Test Design with Machine Learning – an Example in Nonlinear Load on Vertical Cylinder. OMAE2023-102682

Tianning Tang<sup>1</sup> Haoyu Ding<sup>2</sup> Saishuai Dai<sup>3</sup> Xi Chen<sup>2</sup> Paul H. Taylor<sup>4</sup> Jun Zang<sup>2</sup> Thomas A. A. Adcock<sup>1</sup>

1. University of Oxford, Oxford, United Kingdom; 2. University of Bath, Bath, United Kingdom; 3. University of Strathclyde, Glasgow, United Kingdom; 4. University of Western Australia, Crawley, WA, Australia

#### Nonlinear Dynamic Feature of the Fluid Resonance in a Recessing-Type Moonpool OMAE2023-100668

Zhiwei Song, Guoqiang Tang, Lin Lu

Dalian University of Technology, Dalian, China

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## Ocean Engineering

### 06-04-01 Marine Engineering and Technology I

Monday June 12 | Room 203 | 13:30–15:00

Session Organizer: Yi-Hsiang Yu, NyCU, Taiwan

#### Digital Twin for Autonomous Surface Vessels to Generate Situational Awareness OMAE2023-100626

Daniel Menges, Simon Mork Sætre, Adil Rasheed

Norwegian University of Science and Technology, Trondheim, Norway

## Modelling and Operation of a Hybrid LNG Propulsion Tugboat OMAE2023-100911

Sharul Baggio Mohamed Roslan<sup>1</sup> Dimitrios Konovessis<sup>2</sup> Joo Hock Ang<sup>3</sup> Nirmal Vineeth Menon<sup>4</sup> Zhi Yung Tay<sup>1</sup>

1. Singapore Institute of Technology, Singapore, Singapore; 2. University of Strathclyde, Glasgow, United Kingdom; 3. Sembcorp Marine, Singapore, Singapore; 4. Sembcorp Marine Limited, Singapore, Singapore

## Lifecycle Assessment of Fuel Saving in Bulk Carrier with a Flettner Rotor OMAE2023-101078

Naoto Sogihara, Kenichi Kume

National Maritime Research Institute, Mitaka-shi, Japan

## Electrification of the Coastal Fishing Fleet Using Hydrogen and Ammonia-Fed Fuel Cells OMAE2023-101707

Sepideh Jafarzadeh<sup>1</sup> Jarle Ladstein<sup>1</sup> Anders Ødegård<sup>2</sup> Kyrre Sundseth<sup>2</sup> Miguel Muñoz Ortiz<sup>2</sup> Randulf Høyli<sup>3</sup> Federico Zenith<sup>4</sup>

1. SINTEF Ocean, Trondheim, Norway; 2. SINTEF Industry, Trondheim, Norway; 3. SINTEF Nord, Tromsø, Norway; 4. SINTEF Digital, Trondheim, Norway

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## Ocean Engineering

### 06-05-01 Marine Hydrodynamics I

Monday June 12 | Room 218 | 13:30–15:00

Session Organizer: Zhengshun Cheng, SJTU, China

#### Hydrodynamic Response Analysis of Ultra-Deep Water FPSO System Using Ansys Aqwa, Wamit, and HydRA OMAE2023-100687

K. Sridhar, S. A. Sannasiraj, R. Sundaravadivelu

Indian Institute of Technology Madras, Chennai, TN, India

#### Numerical Investigation of Hull Vane on a Medium Froude Number Displacement Hull OMAE2023-100975

Sathiyamoorthy Gopinath, Kumar Ashok, Vijayakumar Rajagopalan

Indian Institute of Technology Madras, Chennai, TN, India

#### Motion Response Study of the Floating Dock during the Spar Installation OMAE2023-102792

Soumyashree Pani, Nilanjan Saha, R. Sundaravadivelu

Indian Institute of Technology, Chennai, TN, India

#### Comparison between Experiments and Simulations for a Ship Maneuvering in Waves OMAE2023-103432

Krishnavelu Ramachandran<sup>1</sup> Visharad Borsutkar<sup>2</sup> Abhilash Sharma Somayajula<sup>2</sup>

1. Indian Institute of Technology Madras, Ramanathapuram, TN, India; 2. Indian Institute of Technology Madras, Chennai, TN, India

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## Polar and Arctic Sciences and Technology

### 07-01-01 Arctic Frontier Regions and Propulsion in Ice

Monday June 12 | Room 208 | 13:30–15:00

Session Organizer: Kristjan Tabri, TalTech, Estonia

Session Co-Organizer: Mikko Suominen, Aalto University, Finland

#### SASIL: a Semi-Automated Sea-Ice Labeling Method Based on Erosion Algorithms OMAE2023-102938

Jianxiang Fei, Jinyan Cai, Shifeng Ding, Renwei Liu, Aimin Wang, Sijie Zheng

Jiangsu University of Science and Technology, Zhenjiang, China

#### On the Relationship between Spectral Models of Ice Drift and Wind Turbulence OMAE2023-104751

Chana Sinsabvarodom<sup>1</sup> Bernt J. Leira<sup>1</sup> Knut V. Høyland<sup>1</sup> Wei Chai<sup>2</sup> Arvid Naess<sup>1</sup> Gowtham Radhakrishnan<sup>1</sup>

1. Norwegian University of Science and Technology, Trondheim, Norway; 2. Wuhan University of Technology, Wuhan, China

#### Influence of Propeller-Ice Loads on the Wear Development in Stern Tube Bearings of Marine Propulsion Systems and Identification of Critical Operating Conditions. OMAE2023-102785

Markus Gilges<sup>1</sup> Ahmed Saleh<sup>1</sup> Mohit Jain<sup>1</sup> Anriette Bekker<sup>2</sup> Benjamin Lehmann<sup>1</sup> Georg Jacobs<sup>1</sup>

1. RWTH Aachen - Institute for Machine Elements and System Engineering, Aachen, Germany;

2. Department of Mechanical and Mechatronic Engineering, Stellenbosch University, Stellenbosch, South Africa

## Verification of Inverse Propeller Moment Estimation Using a Scale Laboratory

**Rig: Further Results and Discussion** OMAE2023-104878

Brendon Nickerson, Jaco Laas, Anriette Bekker

*Department of Mechanical and Mechatronic Engineering, Stellenbosch University, Stellenbosch, South Africa*

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## CFD, VIV and FSI

### 08-01-01 Risers, Pipelines & VIV I

Monday June 12 | Room 209 | 13:30–15:00

**Session Organizer:** Jie Wu, SINTEF, Norway

**Session Co-Organizers:** Themistocles Resvanis, MIT, USA; Owen Oakley, Retired, USA

#### Vortex-Induced Vibrations of a Dynamic Power Cable for Floating Wind Turbines

 OMAE2023-100890

Peter Elrick, Vengatesan Venugopal

*University of Edinburgh, Edinburgh, United Kingdom*

#### CFD Simulation of Vortex-Induced Vibration of a Flexible Cylinder with Buoyancy Module under Uniform Flow Using a Two-Way Coupled Model

 OMAE2023-103724

Karthikeyan S, Nallayarasu S

*Indian Institute of Technology Madras  
, Chennai, TN, India*

#### Fluid-Structure Interaction Vibration of Flexible Riser Transporting High-Speed Spiral Flow in Deep-Sea Mining

 OMAE2023-104301

Jiayu Zhang, Nian-Zhong Chen, Cong Shen

*Tianjin university, Tianjin, China*

#### Investigation on Optimization of Helical Strakes Layout of Marine Riser Vortex-Induced Vibration Suppression Device

 OMAE2023-104396

Pengqian Deng, Shixiao Fu, Mengmeng Zhang, Haojie Ren, Yuwang Xu, Tongxiao Sun

*Shanghai Jiao Tong University, Shanghai, China*

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## Ocean Renewable Energy

### 09-01-01 Offshore Wind Energy – Installation

Monday June 12 | Room 216 | 13:30–15:00

**Session Organizer:** Shuaishuai Wang, NTNU, Norway

#### Estimation for the Efficiency of Offshore Installation Process of Floating Offshore Wind Turbines in Japan

 OMAE2023-100973

Tomohiro Hasumi, Takeshi Yokoi, Ken Haneda, Toshiki Chujo, Toshifumi Fujiwara

*National Maritime Research Institute, Mitaka-shi, Japan*

#### Comparative Study for Numerical Modelling and Analysis of Floating Offshore Wind Onsite Installation

 OMAE2023-101206

Sunghun Hong<sup>1</sup> Shuai Yuan<sup>2</sup> Houxiang Zhang<sup>2</sup> Karl Henning Halse<sup>2</sup>

*1. Norwegian University of Science and Technology, Sandnes, Norway;*

*2. Norwegian University of Science and Technology, Ålesund, Norway*

#### Maritime Navigation Simulations to Measure Captain's Perceived Operational Limits for Wind Turbine Feeder Barges

 OMAE2023-107819

Ali Mohtat<sup>1</sup> Melissa Hertel<sup>2</sup> Christopher Hooper<sup>2</sup> Charles Jors<sup>2</sup> Coulston Van Gundy<sup>2</sup> Benjamin Souquet<sup>2</sup>

*1. Crowley Engineering Services, Corvallis, OR, USA; 2. Crowley Engineering Services, Seattle, WA, USA*

#### Predicting Weather Down Time for an Offshore Wind Turbine Installation Vessel (WTIV) with Feeders Using Rapid Spectral Rao-Based Hindcast Vessel Motions in Wave Environment

 OMAE2023-107904

Ali Mohtat<sup>1</sup> Melissa Hertel<sup>2</sup> Christopher Hooper<sup>2</sup> Charles Jors<sup>2</sup> Benjamin Souquet<sup>2</sup> Coulston Van Gundy<sup>2</sup>

*1. Crowley Engineering Services, Corvallis, OR, USA; 2. Crowley Engineering Services, Seattle, WA, USA*

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## Ocean Renewable Energy

### 09-02-01 Wave Energy – Environment

Monday June 12 | Room 217 | 13:30–15:00

**Session Organizer:** Azam Dolatshahi, BMT, Australia

**Session Co-Organizer:** Masoud Hayatdavoodi, The University of Dundee, United Kingdom

#### **Experimental Study of Ocean Wave Refraction Using an Array of Wave Energy Converters** OMAE2023-104119

Nataliia Sergiienko, William Tuck, Patrick Cannard, Mikaela Georgiadis,  
Benjamin Capper, Jesse Schultz, James Cleggett, Benjamin Cazzolato  
*University of Adelaide, Adelaide, SA, Australia*

#### **Techno-Economic Modeling of Marine Energy Systems with the System Advisor Model** OMAE2023-105102

Elena Baca  
*National Renewable Energy Laboratory, Golden, CO, USA*

#### **Optimized U-Shaped OWC Wave Energy Converter in the Mediterranean Sea** OMAE2023-105242

Alessandra Romolo<sup>1</sup> Felice Arena<sup>2</sup>  
1. *University Mediterranea of Reggio Calabria, Reggio Calabria, Italy;*  
2. *NOEL Laboratory - University Mediterranean of Reggio Calabria, Reggio Calabria, Italy*

#### **Parametric Study of Umbilical Cable and Mooring Line Dynamics with Nonlinear Wave Propagation in Varying Sea Conditions** OMAE2023-108186

Bruce Dae Joong Kim, Nasim Adami, Ming Chen, Solomon C. Yim  
*Oregon State University, Corvallis, OR, USA*

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## Offshore Geotechnics

### 10-01-01 Seabed Properties and Processes and Fluid-Soil-Structure Interaction

Monday June 12 | Room 206 | 13:30–15:00

**Session Organizer:** Denby Morrison, Shell, USA

**Session Co-Organizers:** Pauline Kaminski, Hamburg University of Technology, Germany;  
Ashley Dyson, University of Tasmania, Australia

#### **Miniaturised Testing Device for the Qualitative Analysis of Gas Exsolution in Soil** OMAE2023-101605

Pauline Kaminski, Jürgen Grabe, Zeest Fatima  
*Hamburg University of Technology, Hamburg, Germany*

#### **Shansep-Based Approach to Account for Consolidation Induced Strength Gain in Capacity Assessment of Shallow Foundations** OMAE2023-107626

Hongjie Zhou<sup>1</sup> Chao Sun<sup>1</sup> Henry Krisdani<sup>1</sup> Helena Dias<sup>2</sup>  
1. *Norwegian Geotechnical Institute, Perth, WA, Australia;* 2. *Equinor ASA, Oslo, Norway*

#### **Friction Weakening Mechanism of Sandy Seabed around a Suction Pile under Ocean Wave Loading** OMAE2023-101571

Jingyao Ma<sup>1</sup> Dong S. Jeng<sup>2</sup>  
1. *Griffith University, Southport, QLD, Australia;* 2. *Griffith University, Gold Coast, QLD, Australia*

#### **Wave-Induced Dynamic Seabed Response around a Submerged Breakwater with Dynamic Permeability** OMAE2023-103600

Zhengxu Li<sup>1</sup> Dong-Sheng Jeng<sup>2</sup>  
1. *Griffith University, Molendinar, QLD, Australia;* 2. *Griffith University, Gold Coast, QLD, Australia*

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## **Petroleum Technology**

### **11-03-01 Data Science Applications in Drilling Engineering I**

**Monday June 12 | Room 211 | 13:30–15:00**

**Session Organizer:** Arild Saasen, University of Stavanger, Norway

**Session Co-Organizer:** Ergun Kuru, University of Alberta, Canada

#### **Research on Lost Circulation Diagnosis Model Based on Smote-Tomek and Stacking Ensemble Learning** OMAE2023-103412

Liang Han<sup>1</sup> Xianzhi Song<sup>1</sup> Haolin Zhang<sup>2</sup> Zehao Lv<sup>3</sup> Detao Zhou<sup>1</sup> Zhaopeng Zhu<sup>1</sup> Xuezhe Yao<sup>1</sup> Rui Zhang<sup>1</sup>

1. China University of Petroleum, Beijing, China; 2. SINOPEC Research Institute of Petroleum Engineering Co., Ltd, Beijing, China; 3. Petrobras - Petróleo Brasileiro S.A., Beijing, China

#### **Real-Time Automatic Prediction, Detection, and Mitigation of Fluid Loss during Drilling Operation Employing along String Measurement (ASM) Data along Wired Drill Pipes by Using Digital Twin in Norwegian Continental Shelf** OMAE2023-103528

Mostafa Gomar, Behzad Elahifar

Norwegian University of Technology, Trondheim, Norway

#### **Machine Learning Models for Predicting Cuttings Concentration in Annulus Based on Flowloop Experimental Data** OMAE2023-104720

Sartika Dwi Purwandari<sup>1</sup> Bjørnar Lund<sup>2</sup> Sigve Hovda<sup>1</sup>

1. Norwegian University of Science and Technology, Trondheim, Norway; 2. SINTEF, Trondheim, Norway

#### **A Hybrid Approach to Detect Bad Hole Cleaning** OMAE2023-108151

Mandar Tabib<sup>1</sup> Philippe Nivlet<sup>2</sup> Jan Ole Skogestad<sup>2</sup> Roar Nybø<sup>2</sup> Adil Rasheed<sup>3</sup>

1. SINTEF, Trondheim, Norway; 2. SINTEF, Bergen, Norway; 3. Norwegian University of Science and Technology, Trondheim, Norway

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## **Blue Economy Symposium**

### **13-01-01 Blue Economy I**

**Monday June 12 | Room 214 | 13:30–15:00**

**Session Organizer:** Per Arild Aland, DNV, Norway

**Session Co-Organizer:** C M Wang, The University of Queensland, Australia

#### **The Blue Economy Cooperative Research Centre Path to Sustainable Integrated Systems for Offshore Aquaculture: Salmon Production Biology and What It Contributes to Advancing Offshore Aquaculture** OMAE2023-100870

Chris G. Carter

University of Tasmania, Hobart, TAS, Australia

#### **Hydroelastic Analysis of Submersible Circular Seaweed Platform** OMAE2023-100857

H. P. Nguyen<sup>1</sup> C. M. Wang<sup>1</sup> R. Tullberg<sup>1</sup> X. Zhang<sup>1</sup> B. von Herzen<sup>2</sup>

1. The University of Queensland, Brisbane, QLD, Australia; 2. The Climate Foundation, Queensland, QLD, Australia

#### **Jellyfish Deflection from Marine Fish Pens Using Bubbler Technology** OMAE2023-101058

Premkumar Thodi<sup>1</sup> Vandad Talimi<sup>1</sup> Lei Liu<sup>1</sup> Jan Thijssen<sup>1</sup> David Gauthier<sup>2</sup> Mario Paris<sup>2</sup>

1. C-CORE, St. John's, NL, Canada; 2. CanadianPond.ca Products Ltd., Lac-Brome, QC, Canada

#### **Determination of Mooring Load Levels on a Cage Designed for Exposed Aquaculture in Chile** OMAE2023-101308

Cristian Cifuentes<sup>1</sup> Gonzalo Tampier<sup>1</sup> Alonso Echevarría<sup>2</sup> Carlos Hurtado<sup>3</sup>

1. Universidad Austral de Chile, Valdivia, Chile; 2. AEX Group SPA, Puerto Montt, Chile; 3. Pontificia Universidad Católica de Valparaíso, Valparaíso, Chile

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## CONCURRENT SESSIONS

15:30 – 17:30

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### Offshore Technology

#### 01-01-01 Offshore Platforms

Monday June 12 | Room 205 | 15:30–17:00

**Session Organizer:** Anil Sablok, Technip Energies, USA

**Session Co-Organizer:** Allan R Magee, Consultant, USA

**Study on Deformation Analysis and Prediction Method of Multi-Function FPSO Hull** OMAE2023-102830

Hongtao Yuan<sup>1</sup> Huilong Ren<sup>2</sup> Gang Chen<sup>1</sup> Yan Yin<sup>1</sup> Chao Wang<sup>1</sup> Bin Wu<sup>1</sup>

1. Shanghai Waigaoqiao Shipbuilding Co. Ltd., Shanghai, China; 2. Harbin Engineering University, Harbin, China

**Study on Cantilever Weighing Technology of Jackup** OMAE2023-103327

Hankun Yang, Yan Wen, Bo Zhou, Chunhui Li, Shida Fan, Yongsu Yan

Shanghai Waigaoqiao Shipbuilding Co. Ltd., Shanghai, China

**An Efficient Time Domain Structural Assessment of a Floating Wind Turbine Structure** OMAE2023-108155

Hyungtae Lee<sup>1</sup> Joongyu Kim<sup>2</sup> Jongoh Kim<sup>2</sup> Zhirong Shen<sup>1</sup> Johyun Kyoung<sup>1</sup> Aldric Baquet<sup>1</sup> Heejung Lee<sup>1</sup> Jang Whan Kim<sup>1</sup>

1. Front Energies, Houston, TX, USA; 2. Korean Register, Busan, Korea

**Emissions Reduction Action Plan (ERAP) – Proven Approach for Asset Decarbonization** OMAE2023-108469

Felix Ritchie

Worley, Aberdeen, United Kingdom

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### Structures, Safety and Reliability

#### 02-01-02 Structural Analysis and Optimisation II

Monday June 12 | Room 212 | 15:30–17:00

**Session Organizer:** Jonas Ringsberg, Chalmers University of Technology, Sweden

**Session Co-Organizer:** Paulo Videiro, CENTEC, Portugal

**A Tensile Test and Its Finite Element Analysis Prediction of DH36**

**High-Tensile Steel at Cryogenic Temperature** OMAE2023-102747

Haris Nubli<sup>1</sup> Sang Jin Kim<sup>2</sup> Jung Min Sohn<sup>1</sup> Dongho Jung<sup>3</sup> Joung Hyung Cho<sup>1</sup>

1. Pukyong National University, Busan, Korea; 2. National Sun Yat-sen University, Kaohsiung, Taiwan;

3. Korea Research Institute of Ships and Ocean Engineering, Daejeon, Korea

**Research on a General Virtual Visualization Approach of Finite Element**

**Analysis Result Data of Ship Structure** OMAE2023-102376

Pengyu Wei<sup>1</sup> Chuntong Li<sup>2</sup> Naikun Wei<sup>3</sup> Ze Jiang<sup>4</sup> Xiaomeng Luo<sup>3</sup> Deyu Wang<sup>2</sup>

1. Shanghai Jiao Tong University, Wuxi, China; 2. Shanghai Jiao Tong University, Shanghai, China; 3. Shipbuilding

Technology Research Institute, Shanghai, China; 4. China Ship Scientific Research Center, Shanghai, China

**A Preliminary Study on Design Optimisation of Submerged Floating Tunnels** OMAE2023-107918

Wei Lin<sup>1</sup> Yinghui Tian<sup>2</sup> Mark Cassidy<sup>1</sup>

1. University of Melbourne, Melbourne, VIC, Australia; 2. Department of Infrastructure Engineering – Faculty of Engineering and Information Technology, Melbourne, VIC, Australia

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## Structures, Safety and Reliability

### 02-02-02 Ultimate Strength II

Monday June 12 | Room 213 | 15:30–17:00

**Session Organizer:** Deyu Wang, Shanghai Jiao Tong University, China

**Session Co-Organizer:** Yasuhira Yamada, National Maritime Research Institute, Japan

#### Scaling Characteristics of the Unified Similarity Criterion for Geometrically Distorted Scale Models OMAE2023-101312

Yao Wang<sup>1</sup> Qinghu Wang<sup>2</sup> Deyu Wang<sup>1</sup>

1. Shanghai Jiao Tong University, Shanghai, China; 2. Kunming Precision Machinery Research Institute, Kunming, China

#### A Simple Estimation Method for Ultimate Strength of Curved Plates under Axial Compression OMAE2023-102688

Daisuke Shiomitsu<sup>1</sup> Kinya Ishibashi<sup>1</sup> Fuminori Yanagimoto<sup>1</sup> Masahiko Fujikubo<sup>2</sup>

1. Nippon Kaiji Kyokai (Class NK), Chiyoda-ku, Japan; 2. Osaka University and Hiroshima University, Chiyoda-ku, Japan

#### Buckling and Post-Buckling Behaviour of Extruded Aluminium Panels Subject to the Combined Effect of Welding and Pitting Corrosion OMAE2023-105048

Mojtaba Mokhtari, Xintong Wang, Jørgen Amdahl

Norwegian University of Science and Technology, Trondheim, Norway

#### Investigation of Container Ship Structural Dynamic Ultimate Strength under Combined Bending, Torsion and Lateral Pressure OMAE2023-107994

Weilong Zhang, Jinju Cui, Deyu Wang

Shanghai Jiao Tong University, Shanghai, China

## Pipeline, Risers, and Subsea Systems

### 04-01-02 Flexible Pipes and Umbilicals II

Monday June 12 | Room 210 | 15:30–17:00

**Session Organizer:** Celso Pesce, University of Sao Paulo, Brazil

**Session Co-Organizer:** Zhimin Tan, BH, USA

#### An Irregular Wave Approach to Fatigue Life Capacity for Flexible Risers with Severed or Corroded Tensile Armors OMAE2023-101167

Krassimir Doynov<sup>1</sup> Nathan Cooke<sup>2</sup> Dharma Pasala<sup>3</sup> Arya Majed<sup>3</sup>

1. ExxonMobil, Houston, TX, USA; 2. Intecsea, St. John's, NL, Canada; 3. Intecsea, Houston, TX, USA

#### Calibration of Dynamic Riser Analysis Using Measured Motion Data OMAE2023-104682

Karina Bruun Mortensen, Håvard Skjerve

4Subsea, Asker, Norway

#### Frequency Domain Analysis and Machine Learning Technique in Field

##### Fatigue Monitoring of Flexible Risers OMAE2023-104905

Jiabei Yuan<sup>1</sup> Linfa Zhu<sup>2</sup> Yucheng Hou<sup>2</sup> Zhimin Tan<sup>2</sup> Eric Wilson<sup>3</sup>

1. Baker Hughes, Katy, TX, USA; 2. Baker Hughes, Houston, TX, USA; 3. Baker Hughes, Newcastle, United Kingdom

#### Flexible Pipe Fatigue Life Evaluation Based on a Dynamic Full-Scale Test considering a Preconditioning Corrosion Procedure OMAE2023-106952

Tiago Brun Coser<sup>1</sup> Luiz Antonio Sulino de Negreiros<sup>2</sup> George Carneiro Campello<sup>1</sup> Erik Duarte Radke<sup>3</sup>

Carolina Delwing Rosa<sup>3</sup> Derek Fonseca De Souza<sup>3</sup> Luiz Francisco Venturini Rodrigues<sup>3</sup>

Tiago Samuel Renck<sup>3</sup> Mariana dos Reis Tagliari<sup>3</sup> Marcelo Favaro Borges<sup>3</sup>

1. Petrobras, Rio de Janeiro, RJ, Brazil; 2. Petrobras, Santos, SP, Brazil; 3. LAMEF (UFRGS), Porto Alegre, RS, Brazil

## Ocean Space Utilization

### 05-03-01 Deepsea Mining and Ocean Resources

Monday June 12 | Room 207 | 15:30–17:00

**Session Organizer:** Tomoki Ikoma, Nihon University, Japan

**Session Co-Organizer:** Marcio Yamamoto, National Maritime Research Institute, Japan

#### Numerical Simulation on Gas–Liquid–Solid Three-Phase Flow by Gas-Lift Pumping System for Deep Sea Mining OMAE2023-100624

Satoru Takano, Sotaro Masanobu

*National Maritime Research Institute, Mitaka, Japan*

#### Study on Large Particle Slurry Transport in Inclined Pipes with Pulsating Flow for Subsea Mining OMAE2023-100939

Sotaro Masanobu<sup>1</sup> Satoru Takano<sup>1</sup> Marcio Yamamoto<sup>1</sup> Yuichi Murai<sup>2</sup> Yuji Tasaka<sup>2</sup> Hyun Jin Park<sup>2</sup>

*1. National Maritime Research Institute, Mitaka, Japan; 2. Hokkaido University, Sapporo, Japan*

#### Study on the Axial Tension Reduction of a Dual-Bore Vertical Riser System for Deep Sea Mining OMAE2023-101679

Marcio Yamamoto, Joji Yamamoto, Sotaro Masanobu

*National Maritime Research Institute, Mitaka-shi, Japan*

#### Localization and Mapping for Deep-Sea Mining Vehicles with Forward-Looking Sonar OMAE2023-104924

Wenhao Xu, Jianmin Yang, Handi Wei, Haining Lu, Xinliang Tian, Lei Liu

*Shanghai Jiao Tong University, Shanghai, China*

## Polar and Arctic Sciences and Technology

### 07-02-01 Arctic Sea Transportation I

Monday June 12 | Room 208 | 15:30–17:00

**Session Organizer:** Mikko Suominen, Aalto University, Finland

**Session Co-Organizer:** Wei Chai, Wuhan University of Technology, China

#### Towards Functional Design for the Risk Management System of Maritime Accidents in Ice-Covered Arctic Waters from Resilience Perspectives OMAE2023-101081

Shanshan Fu<sup>1</sup> Mingyan Wu<sup>1</sup> Mingyang Zhang<sup>2</sup> Bing Han<sup>3</sup> Zhongdai Wu<sup>3</sup>

*1. Shanghai Maritime University, Shanghai, China; 2. Aalto University, Espoo, Finland;*

*3. Shanghai Ship and Shipping Research Institute, Shanghai, China*

#### Development of Ice-Load Algorithm for Real-Time Feedback during Simulator Training OMAE2023-101443

Logan P. Miller<sup>1</sup> Bruce Quinton<sup>2</sup> Jonathan Soper<sup>2</sup> Brian Veitch<sup>2</sup>

*1. Memorial University of Newfoundland, Truro Heights, NS, Canada; 2. Memorial University of Newfoundland, St. John's, NL, Canada*

#### Challenges of the Digital Transformation for Shipping: Human-Centered

##### Design for Marine Navigation Systems OMAE2023-101455

Jonathan Soper<sup>1</sup> Jennifer Smith<sup>2</sup> Thomas Browne<sup>3</sup> Brian Veitch<sup>1</sup>

*1. Memorial University of Newfoundland, St. John's, NL, Canada; 2. Fisheries and Marine Institute,*

*St. John's, NL, Canada; 3. National Research Council Canada, St. John's, NL, Canada*

#### Assist Observations 2017-2021: Uncertainty, Comparison with Sea Ice Charts, and Ice Concentration from Deep Learning Models OMAE2023-101757

Nabil Panchi<sup>1</sup> Ekaterina Kim<sup>1</sup> Roger Skjetne<sup>1</sup> Nick Hughes<sup>2</sup>

*1. Norwegian University of Science and Technology, Trondheim, Norway; 2. Norwegian Meteorological Institute, Tromsø, Norway*



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## CFD, VIV and FSI

### 08-01-02 Risers, Pipelines & VIV II

Monday June 12 | Room 209 | 15:30–17:00

**Session Organizer:** Themistocles Resvanis, MIT, USA

**Session Co-Organizers:** Jie Wu, SINTEF, Norway; Owen Oakley, Retired, USA

#### **Experimental Investigation on Hydrodynamic Characteristics of Water Intake Riser Undergoing Vortex-Induced Vibration in Uniform Flow** OMAE2023-104436

Yingli Bai, Mengmeng Zhang, Yuwang Xu, Haojie Ren, Shixiao Fu, Jing Wang, Bin Song  
*Shanghai Jiao Tong University, Shanghai, China*

#### **Numerical Simulations of Three-Dimensional Scour below Subsea Pipelines/Cables** OMAE2023-104579

Bingchang Zhang, Hongwei An, Scott Draper, Hongyi Jiang, Liang Cheng  
*The University of Western Australia, Crawley, WA, Australia*

#### **A Report from the Drilling Riser VIV and Wellhead Fatigue Jip: Full-Scale Drilling Riser VIV Measurements and Comparisons with Predictions** OMAE2023-104900

Themistocles Resvanis<sup>1</sup> J. Kim Vandiver<sup>2</sup> Scot Mcneill<sup>3</sup>

*1. Massachusetts Institute of Technology, Boston, MA, USA; 2. Massachusetts Institute of Technology, Cambridge, MA, USA; 3. Stress Engineering Services, Houston, TX, USA*

#### **Stochastic Vortex-Induced Vibration in Free-Stream Turbulence**

**Using a Phenomenological Model** OMAE2023-105249

Rameez Badhurshah<sup>1</sup> Narakorn Srinil<sup>1</sup> John Chaplin<sup>2</sup> Philipp Thies<sup>3</sup> Lars Johanning<sup>3</sup> Alistair Borthwick<sup>4</sup> Vengatesan Venugopal<sup>4</sup>  
*1. Newcastle University, Newcastle Upon Tyne, United Kingdom; 2. University of Southampton, Southampton, United Kingdom; 3. University of Exeter, Penryn, United Kingdom; 4. University of Edinburgh, Edinburgh, United Kingdom*

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## Ocean Renewable Energy

### 09-01-02 Offshore Wind Energy – Structural Dynamics

Monday June 12 | Room 216 | 15:30–17:00

**Session Organizer:** Peter Rohrer, NTNU, Norway

**Session Co-Organizer:** Amy Robertson, NREL, USA

#### **The Adaption of Condition Monitoring Methodologies from Fixed Wind and Floating Oil and Gas to Floating Offshore Wind.** OMAE2023-104715

Kanishka Jayasinghe<sup>1</sup> Jon Gumley<sup>1</sup> Clare Thomas<sup>1</sup> Frank Lemmer<sup>2</sup> Steffen Raach<sup>2</sup>  
*1. AMOG Consulting, Notting Hill, VIC, Australia; 2. Sowento, Stuttgart, Germany*

#### **Damage Initiation in the Coating of Wind Turbine Blades Subjected to Repeated Rain-Drop Impacts: a Continuum Damage Mechanics Approach** OMAE2023-102765

Nikesh Kuthe<sup>1</sup> Vibhuti Bhushan Pandey<sup>1</sup> Suhail Ahmad<sup>1</sup> Puneet Mahajan<sup>1</sup> Leon Mishnaevsky Jr<sup>2</sup>  
*1. Indian Institute of Technology Delhi, Delhi, DL, India; 2. Technical University of Denmark, Roskilde, Denmark*

#### **Wind Turbine Load Monitoring during Model-Test in a Wave Basin** OMAE2023-103266

Sebastien Gueydon<sup>1</sup> Ilmas Bayati<sup>2</sup> Rene Bosman<sup>3</sup> Wouter Van Kampen<sup>3</sup> Erik-Jan de Ridder<sup>3</sup>  
*1. O3 Engineering Consulting (Sole trader), Springwood, NSW, Australia; 2. Peak-wind, Copenhagen, Denmark; 3. Maritime Research Institute Netherlands, Wageningen, Netherlands*

#### **Serviceability Limit State Assessment of Semi-Submersible Floating Wind Turbines** OMAE2023-108172

Shuaishuai Wang, Torgeir Moan  
*Norwegian University of Science and Technology, Trondheim, Norway*

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## **Ocean Renewable Energy**

### **09-02-02 Wave Energy – Design and Performance Analysis I**

**Monday June 12 | Room 217 | 15:30–17:00**

**Session Organizer:** Binbin Zhao, Harbin Engineering University, China

**Session Co-Organizer:** Masoud Hayatdavoodi, The University of Dundee, United Kingdom

#### **Experimental Investigation on Dynamic Responses of Floating-Point Absorber Wave Energy Systems** OMAE2023-102107

**K Aiswaria, Balaji Ramakrishnan**

*Indian Institute of Technology Bombay, Mumbai, MH, India*

#### **Dynamic Response of a Taut-Moored Floating Oscillating Water Column Wave Energy Converter in Extreme Waves** OMAE2023-104590

**Eric Gubesch<sup>1</sup> Nagi Abdussamie<sup>2</sup> Irene Penesis<sup>2</sup> Christopher Chin<sup>2</sup>**

*1. Australian Maritime College, Newnham, TAS, Australia; 2. University of Tasmania, Newnham, TAS, Australia*

#### **Investigation of Theoretical Solutions to a Bottom-Raised Oscillating Surge Wave Energy Converter (OSWEC) through Experimental and Parametric Studies** OMAE2023-106657

**Nhu Nguyen<sup>1</sup> Jacob Davis<sup>2</sup> Krish Thiagarajan<sup>3</sup> Nathan Tom<sup>4</sup> Salman Husain<sup>5</sup>**

*1. Sandia National Laboratory, Albuquerque, NM, USA; 2. University of Washington, Seattle, WA, USA; 3. University of Massachusetts, Amherst, MA, USA; 4. National Renewable Energy Laboratory, Golden, CO, USA; 5. National Renewable Energy Laboratory, Arvada, CO, USA*

#### **Hydrodynamic Performance of Three Different Oscillating Water Column Devices in Regular Waves** OMAE2023-108074

**Sandana Socrates S, Sriram Venkatachalam, Sundar V**

*Indian Institute of Technology Madras, Chennai, TN, India*

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## **Offshore Geotechnics**

### **10-02-01 Fluid-Soil-Structure Interaction**

**Monday June 12 | Room 206 | 15:30–17:00**

**Session Organizer:** Denby Morrison, Shell, USA

**Session Co-Organizers:** Pavel Trapper, Ben-Gurion University of the Negev, Israel;

Ashley Dyson, University of Tasmania, Australia

#### **Coupled Hydrodynamic and Geotechnical Simulation of Floating Offshore Structures** OMAE2023-104397

**Ashley P. Dyson<sup>1</sup> Ali Tolooiyan<sup>2</sup> Gholamreza Kefayati<sup>2</sup>**

*1. University of Tasmania, Blackmans Bay, TAS, Australia; 2. University of Tasmania, Hobart, TAS, Australia*

#### **Integrated Modelling of Mooring Systems** OMAE2023-104437

**Wenlong Liu, Yinghui Tian, Mark Cassidy**

*The University of Melbourne, Melbourne, VIC, Australia*

#### **An Effect of Landslide Trigger Mechanisms on Potential Impact Forces on the Nearby Offshore Infrastructure** OMAE2023-104497

**Pavel A. Trapper<sup>1</sup> Avshalom Ganz<sup>2</sup> Miriam Gindis<sup>3</sup>**

*1. Ben-Gurion University of the Negev, Ashqelon, Israel; 2. Ariel University, Ariel, Israel; 3. Ben-Gurion University of the Negev, Beer Sheva, Israel*

#### **Residual Liquefaction Modeling Based on a Coupled Model: Biot's Partially Dynamic ( $u - p$ ) Model** OMAE2023-104822

**Lin Cui<sup>1</sup> Zhipeng Wan<sup>1</sup> Dong-Sheng Jeng<sup>2</sup>**

*1. Qingdao University of Technology, Qingdao, China; 2. Griffith University, Gold Coast, QLD, Australia*

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## Petroleum Technology

### 11-03-02 Data Science Applications in Drilling Engineering II

Monday June 12 | Room 211 | 15:30–17:00

**Session Organizer:** Arild Saasen, University of Stavanger, Norway

**Session Co-Organizer:** Ergun Kuru, University of Alberta, Canada

**Intelelligent Optimization of Drilling Parameters Based on Multiple Drilling Agents** OMAE2023-101084

Zhijun Pei<sup>1</sup> Xianzhi Song<sup>1</sup> Zhijian Hu<sup>2</sup> Tao Pan<sup>1</sup>

1. China University of Petroleum, Beijing, China; 2. CNPC Engineering Technology R&D Company Limited, Beijing, China

**Early Stuck Detection Using Graph Attention Machine Learning** OMAE2023-101928

Tomoya Inoue<sup>1</sup> Yujin Nakagawa<sup>1</sup> Tatsuya Kaneko<sup>1</sup> Ryota Wada<sup>2</sup> Keisuke Miyoshi<sup>3</sup> Shungo Abe<sup>3</sup>

1. JAMSTEC, Yokosuka, Japan; 2. The University of Tokyo, Kashiwa, Japan; 3. JOGMEC, Tokyo, Japan

**Exploration of Strategies to Improve Continual Learning from Irregular Sequential Drilling Data** OMAE2023-102300

Felix James Pacis<sup>1</sup> Tomasz Wiktorski<sup>2</sup> Adrian Ambrus<sup>3</sup> Sergey Alyaev<sup>4</sup>

1. University of Stavanger, Sola, Norway; 2. University of Stavanger, Stavanger, Norway; 3. Norwegian Research Center (NORCE), Stavanger, Norway; 4. Norwegian Research Center (NORCE), Bergen, Norway

**Transient Temperature and Machine Learning Modeling for Wellbore Drilling** OMAE2023-108000

Juan Camilo Gonzalez Angarita<sup>1</sup> Mesfin Belayneh<sup>2</sup> Bernt Aadnøy<sup>2</sup>

1. Pro Well Plan AS, Stavanger, Norway; 2. University of Stavanger, Stavanger, Norway

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## Blue Economy Symposium

### 13-01-02 Blue Economy II

Monday June 12 | Room 214 | 15:30–17:00

**Session Organizer:** C M Wang, The University of Queensland, Australia

**Session Co-Organizer:** Nagi Abdussamie, Australian Maritime College, Australia

**Hydroelastic Response of Submersible Open Net Fish Pens under Wave Action** OMAE2023-101407

Yun Il Chu<sup>1</sup> Chien Ming Wang<sup>2</sup> Xinyu Zhang<sup>1</sup> Hong Zhang<sup>1</sup> Leigh Savage<sup>3</sup>

1. Griffith University, Southport, QLD, Australia; 2. The University of Queensland, St Lucia, QLD, Australia; 3. Huon Aquaculture Group Ltd., Tasmania, TAS, Australia

**Novel Solution for Mitigating Sloshing in Floating Closed-Containment Aquaculture Tanks** OMAE2023-102097

Johannes Wiegerink, Tom Baldock, David Callaghan, Chien Ming Wang

The University of Queensland, Brisbane, QLD, Australia

**Numerical Modelling of the Performance of Floating Fish Pen in Harsh Environmental Conditions** OMAE2023-103287

Nazhmiddin Nasyrlyayev, Ashley Dyson, Gholamreza Kefayati, Ali Tolooiyan

University of Tasmania, Sandy Bay, TAS, Australia

**A Comparative Study between Morison Equation and Screen-Type Method for Net Cages under Waves and Currents** OMAE2023-104425

Mingyuan Ma<sup>1</sup> Hong Zhang<sup>2</sup> Dong-Sheng Jeng<sup>2</sup> Chien Ming Wang<sup>3</sup>

1. Griffith University, Southport, QLD, Australia; 2. Griffith University, Gold Coast, QLD, Australia; 3. The University of Queensland, Brisbane, QLD, Australia

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## **Small Maritime Nations Symposium**

### **14-01-01 Small Maritime Nations**

**Monday June 12** | Room **218** | **15:30–17:00**

**Session Organizer:** Hong Zhang, Griffith University, Australia

#### **Assessing Underwater Noise Impact for Marine Projects** OMAE2023-104358

Valeri V. Lenchine

*GHD Pty Ltd, Melbourne, VIC, Australia*

#### **Ocean Thermal Energy Conversion and Sustainable Island Nations:**

##### **The Case Study of the Island of Nauru** OMAE2023-104431

Jessica Posterari<sup>1</sup> Takuji Waseda<sup>1</sup> Keiji Kiyomatsu<sup>2</sup>

*1. University of Tokyo, Kashiwa, Japan; 2. Freelancer, Taketashi, Japan*

#### **Preparing for Climate Change Impacts at the Port Interface: P.N.G.P.C.L. Experience** OMAE2023-105556

Eunice Dalton, Vagi Eoima

*PNG Ports Corporation Limited, Port Moresby, Papua New Guinea*

# Tuesday Concurrent Sessions

## CONCURRENT SESSIONS

08:30 – 10:00

### Offshore Technology

#### 01-04-01 Design & Analysis I

Tuesday June 13 | Room 205 | 08:30–10:00

**Session Organizer:** Masoud Hayatdavoodi, The University of Dundee, United Kingdom

**Session Co-Organizer:** Xinshu Zhang, Shanghai Jiao Tong University, USA

#### Wellhead and Well Casing Integrity during an Event of Drift-Off: a Study Case of an Integrated Riser Analysis Solution Using on Site Conditions OMAE2023-100993

Acácio Sarnaglia Do Amaral<sup>1</sup> Edmo Araujo Das Virgens<sup>2</sup> Germain Venero<sup>3</sup> Thiago Mussel Dias Soares da Silva<sup>3</sup> Paul Bohan<sup>4</sup>

1. Petroleo Brasileiro SA Petrobras, Rio das Ostras, RJ, Brazil; 2. Constellation Serviços de Petróleo, Rio das Ostras, RJ, Brazil; 3. Wood PLC, Rio de Janeiro, RJ, Brazil; 4. Wood PLC, Galway, Ireland

#### Derivation of Adapted Soil Springs for the Buckling Analysis of Suction Caissons during Installation OMAE2023-103701

Juan Pablo Ramos<sup>1</sup> Viktor Widerspan<sup>1</sup> Dariya Heinrich<sup>1</sup> Manuela Böhm<sup>2</sup>

1. Fraunhofer Institute for Wind Energy Systems IWES, Hannover, Germany; 2. Leibniz University Hannover, Institute for Steel Construction, Hannover, Germany

#### Subsea Processing Optimization considering Reliability and Maintenance OMAE2023-104399

Leonardo Sales, Thomas Stolpnes, Milan Stanko, Audun Faanes

Norwegian University of Science and Technology, Trondheim, Norway

#### Minimum Operating Pressure to Prevent the Onset of Wrinkling Tendency in Mechanically Lined Pipes during Transient Shutdown Condition OMAE2023-105350

Venu Rao, Jens Fernandez-Vega

Subsea 7, Sutton, United Kingdom

### Structures, Safety and Reliability

#### 02-03-01 Collision and Crashworthiness

Tuesday June 13 | Room 212 | 08:30–10:00

**Session Organizer:** Kristjan Tabri, TalTech, Estonia

**Session Co-Organizer:** Thomas Lindemann, University Rostock, Germany

#### Numerical Investigation of Scoured Bridge Response under Ship Collisions OMAE2023-101126

Zihao Wang, Yanyan Sha, Muk Chen Ong

University of Stavanger, Stavanger, Norway

#### The Safety Assessment of Ship-Bridge Collision Based on a Simplified Dynamic Model OMAE2023-101847

Wenzhe Zhang<sup>1</sup> Jin Pan<sup>1</sup> Na Li<sup>2</sup> Mingcai Xu<sup>3</sup>

1. Wuhan University of Technology, Wuhan, China; 2. China Railway Major Bridge Reconnaissance & Design Institute Co. Ltd., Wuhan, China; 3. Huazhong University of Science and Technology, Wuhan, China

#### Optimal Design for the Crashworthiness of the Hull Side Structure under the Impact of the Raked Bow OMAE2023-102705

Pengyao Yu<sup>1</sup> Chengyu Zhang<sup>1</sup> Runbei Zou<sup>1</sup> Qiang Wang<sup>1</sup> Boran Zhang<sup>2</sup>

1. Dalian Maritime University, Dalian, China; 2. University of Melbourne, Melbourne, VIC, Australia

## Study on Crashworthiness Performance of an Airbag Anti-Collision Device for Vessel-Bridge Collision OMAE2023-103776

Jin Pan<sup>1</sup> Hao Peng<sup>1</sup> Jianqiang Gan<sup>2</sup> Wenzhe Zhang<sup>1</sup> Xiaobin Li<sup>1</sup>

1. Wuhan University of Technology, Wuhan, China; 2. TIANMA Microelectronics Co. Ltd., Xiamen, China

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## Structures, Safety and Reliability

### 02-05-01 Extreme Loads and Responses I

Tuesday June 13 | Room 213 | 08:30–10:00

Session Organizer: Spyros Hirdaris, Aalto University, Finland

Session Co-Organizer: Marco Klein, TUHH, Germany

#### Extreme Wave and Vertical Bending Moment Predictions by Higher Order Spectrum Method and Form OMAE2023-101876

Tomoki Takami<sup>1</sup> Wataru Fujimoto<sup>2</sup> Hidetaka Houtani<sup>3</sup> Sadaoki Matsui<sup>1</sup>

1. National Maritime Research Institute, Mitaka, Japan; 2. ClassNK, Chiyoda-ku, Japan; 3. University of Tokyo, Bunkyo-ku, Japan

#### Scale Effects and Variability in Wave-in-Deck Type of Impact Loading, More Insights into the Results of the Breakin Jip OMAE2023-104288

Jule Scharnke, Joop Helder

Maritime Research Institute Netherlands, Wageningen, Netherlands

#### Numerical Investigation of the Statistics of Vertical Bending Moments of Ships in Nonlinearly Evolving Irregular Waves OMAE2023-104733

Hidetaka Houtani<sup>1</sup> Sadaoki Matsui<sup>2</sup> Wataru Fujimoto<sup>3</sup>

1. The University of Tokyo, Bunkyo-ku, Japan; 2. National Maritime Research Institute, Mitaka-shi, Japan; 3. Nippon Kaiji Kyokai (Class NK), Chiyoda-ku, Japan

#### Validation of a Time Domain Panel Code for Predicting Impulsive Wave Loads on Naval Ships OMAE2023-108091

Frans van Walree<sup>1</sup> Daniel Sgarioto<sup>2</sup> Peter Graham<sup>2</sup>

1. Maritime Research Institute Netherlands, Wageningen, Netherlands;

2. Defence Science & Technology Group, Fishermans Bend, VIC, Australia

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## Pipeline, Risers, and Subsea Systems

### 04-02-01 Rigid Risers I

Tuesday June 13 | Room 210 | 08:30–10:00

Session Organizer: Theodoro Netto, Fundacao Coppetec, Brazil

#### Hydrodynamic Damping of an In-Line Oscillating Cylinder in Steady Flow OMAE2023-101340

Chengjiao Ren<sup>1</sup> Liang Cheng<sup>2</sup> Feifei Tong<sup>3</sup>

1. The University of Western Australia, Crawley, WA, Australia; 2. South China University of Technology, Guangzhou, China; 3. Southern Cross University, Gold Coast, QLD, Australia

#### Hydrodynamic Damping of a Riser Oscillating in an In-Line Steady Current at Low Keulegan-Carpenter Number OMAE2023-102125

Peng Peng, Kun Liu, Jiaxia Wang, Zhenguo Gao

Jiangsu University of Science and Technology, Zhenjiang, China

#### Gimbal Joint Riser – a Novel Concept: Experimental Hydrodynamic Coefficients OMAE2023-103189

Andre Ramiro Amorim<sup>1</sup> Felipe Oliveira Ribeiro<sup>2</sup> Rodrigo Klim Gomes<sup>1</sup> Peyman Asgari<sup>1</sup> Rodrigo Do Nascimento Carvalhal<sup>3</sup> Alexandre Rezende Diezel<sup>4</sup>

1. Subsea 7, Rio de Janeiro, RJ, Brazil; 2. Subsea 7, Niterói, RJ, Brazil; 3. Equinor Brasil, Rio de Janeiro, RJ, Brazil; 4. Repsol Sinopec Brasil, Rio de Janeiro, RJ, Brazil

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## Ocean Space Utilization

### **05-05-01 Floating Systems for Renewable Energy**

Tuesday June 13 | Room 207 | 08:30–10:00

Session Organizer: Tomoki Ikoma, Nihon University, Japan

#### **Estimation of Viscous Damping Force and Nonlinear Wave Force Acting on a Floating Offshore Wind Turbine Using Computational Fluid Dynamics (CFD)** OMAE2023-100664

Haruki Yoshimoto<sup>1</sup> Ichiro Amaya<sup>1</sup> Ken Kamizawa<sup>1</sup> Shunsuke Nishimura<sup>1</sup> Norikazu Sato<sup>2</sup>

1. Japan Marine United Corporation, Yokohama, Japan; 2. JFE Techno-Research Corporation, Kawasaki-city, Japan

#### **A Problem of Long Period Yaw Motion of an Ultra-Large Floating Offshore Wind Turbine and Its Reduction Countermeasure** OMAE2023-102321

Makoto Ota, Motohiko Murai, Isami Otaka, Shuto Kondo

Yokohama National University, Yokohama, Japan

#### **Dynamics of a Cold Water Intaking Pipe Subject to Internal Flow and Motion Excitation** OMAE2023-103375

Ryoya Hisamatsu, Tomoaki Utsunomiya

Kyushu University, Department of Marine Systems Engineering, Fukuoka, Japan

#### **Study on the Effect of Proof Load Test on Mooring Chain Wear for Floating Structures** OMAE2023-104302

Takaaki Takeuchi, Kazuki Kurokawa, Masato Hironaka

Osaka University, Suita-Shi, Japan

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## Ocean Engineering

### **06-03-02 Fluid-Structure, Multi-body and Wave-body Interaction II**

Tuesday June 13 | Room 204 | 08:30–10:00

Session Organizer: Shuzheng Sun, Harbin Engineering University, China

#### **A Meso-Scale Two-Way Coupled Euler-Lagrange Approach for the Simulation of a Dem-Based Bonded-Particle Flexible Net** OMAE2023-103594

Andriarimina Daniel Rakotonirina<sup>1</sup> Nicholas Amato<sup>2</sup> Bruno Sainte-Rose<sup>3</sup>

1. The Ocean Cleanup, Utrecht, Netherlands; 2. Siemens Digital Industries Software, New York, NY, USA; 3. The Ocean Cleanup, Rotterdam, Netherlands

#### **Lumped-Mass Model to Represent the Installation Process of Subsea Equipment** OMAE2023-104192

Filipe Salvador Lopes, Antonio Carlos Fernandes, Joel Sena Sales Junior, Emerson Martins de Andrade, João Paulo Machado

Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brazil

#### **The Hydroelastic Slamming in Oblique Seas** OMAE2023-104304

Sasan Tavakoli<sup>1</sup> Spyros Hirdaris<sup>2</sup>

1. Aalto University, Helsinki, Finland; 2. Aalto University, Espoo, Finland

#### **Scattering of Long Oblique Flexural Gravity Waves by an Articulated Floating Elastic Plate within the Framework of Wave Blocking** OMAE2023-104336

Pawan Negi, Susam Boral, Trilochan Sahoo

Indian Institute of Technology Kharagpur, Kharagpur, WB, India

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## **Ocean Engineering**

### **06-04-02 Marine Engineering and Technology II**

**Tuesday June 13 | Room 203 | 08:30–10:00**

**Session Organizer:** Marcio Igor Luorenco, Federal University of Rio de Janeiro, Brazil

#### **Barriers for Decarbonisation in the Norwegian Coastal Fishing Fleet: a Background Study Focusing on Safety and Environmental Performance** OMAE2023-102113

**Anna Sophia Hüllein<sup>1</sup>** Ingrid Bouwer Utne<sup>1</sup> Børge Rokseth<sup>2</sup> Eirill Bachmann Mehammer<sup>3</sup>

*1. Norwegian University of Science and Technology, Trondheim, Norway; 2. SINTEF Ocean, Trondheim, Norway; 3. SINTEF Energy Research, Trondheim, Norway*

#### **Route Optimization on an Irregular Grid Map Based on Historical AIS Data** OMAE2023-102348

**Seyong Jeong<sup>1</sup>** Joonghoo Park<sup>1</sup> Hyungtaek Kim<sup>1</sup> Tae-Wan Kim<sup>2</sup>

*1. Korea Shipbuilding & Offshore Engineering, Seongnam-si, Korea; 2. Seoul National University, Seongnam-si, Korea*

#### **A Simulation-Based Approach for Evaluating Merchant Fleet Decarbonization Strategies** OMAE2023-102401

**Martin Bergström,** Vaidehi Gosala, Jorgen Depken, Annika Fitz, Frederik Euskirchen, Sören Ehlers

*German Aerospace Center (DLR), Geesthacht, Germany*

#### **Waste Heat Recovery by Binary Vapor Cycle for Gases from Marine Engines** OMAE2023-102501

**Kamille Vieira Machado<sup>1</sup>** Juan Ordóñez<sup>2</sup> Jeferson Avila Souza<sup>1</sup> **Cristofer Hood Marques<sup>1</sup>**

*1. Federal University of Rio Grande, Rio Grande, RS, Brazil; 2. Florida Agricultural and Mechanical University, Tallahassee, FL, USA*

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## **Polar and Arctic Sciences and Technology**

### **07-02-02 Arctic Sea Transportation II**

**Tuesday June 13 | Room 208 | 08:30–10:00**

**Session Organizer:** Jonathan Soper, Memorial University of Newfoundland, Canada

**Session Co-Organizer:** Fang Li, Shanghai Jiao Tong University, Finland

#### **Computer Vision-Based Ice Channel Identification and Ship Target Tracking** OMAE2023-102742

**Dong Wenbo,** Cai Jinyan, Ding Shifeng, Liu Renwei, Wang Aiming, Li Feixu

*Jiangsu University of Science and Technology, Zhenjiang, China*

#### **A Path Planning Method for Polar Ship considering the Influence of Marine Meteorological Environment** OMAE2023-104289

**Hao Liu<sup>1</sup>** Li Zhou<sup>2</sup> Shifeng Ding<sup>1</sup> Renwei Liu<sup>1</sup> Aimin Wang<sup>1</sup>

*1. Jiangsu University of Science and Technology, Zhenjiang, China; 2. Shanghai Jiao Tong University, Zhenjiang, China*

#### **Multi-Target Detection of Sea Ice Based on Computer Vision** OMAE2023-104398

**Dinghan Zeng,** Shifeng Ding, Renwei Liu, Aimin Wang, Jinyan Cai, Jiayi Bian

*Jiangsu University of Science and Technology, Zhenjiang, China*

#### **Probabilistic Methods for Estimation of the Extreme Air Temperature along the Northern Sea Route** OMAE2023-104415

**Yuexiang Huang,** Wei Chai, Jiayan Zeng

*Wuhan University of Technology, Wuhan, China*

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## **CFD, VIV and FSI**

### **08-02-01 Ship & Floating Systems I**

**Tuesday June 13 | Room 209 | 08:30–10:00**

**Session Organizer:** Owen Oakley, Retired, USA

**Session Co-Organizer:** Themistocles Resvanis, MIT, USA

#### **Interceptor Effect on Lift and Drag in High Speed Planing Hull** OMAE2023-100778

**Suneela J<sup>1</sup>** Naveen Korra<sup>2</sup>

*1. AMET University, Chennai, TN, India; 2. Emma Technologies GmbH, Kiel, Germany*



**Simulation and Characterization of Low-Frequency Flow Oscillations over a Symmetrical Sail at Large Attack Angles for an Unmanned Sailboat** OMAE2023-101414

Qingsong Zeng, Wei Cai

Wuhan University of Technology, Wuhan, China

**Seakeeping Behavior of a Helicopter Landing in Waves** OMAE2023-105235

Eduardo Tadashi Katsuno, Andreas Peters, Ould El Moctar

University of Duisburg-Essen, Duisburg, Germany

**Roll Damping Simulations Using CFD for Offshore Wind Installation Operations** OMAE2023-102845

Brecht Devolder, Pedro Ramos, Florian Stempinski

DEME Group, Zwijndrecht, Belgium

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## Ocean Renewable Energy

### 09-01-03 Offshore Wind Energy – Aerodynamics

Tuesday June 13 | Room 216 | 08:30–10:00

**Session Organizer:** Hyunchul Jang, Technip Energies, USA

**Session Co-Organizer:** Leandro Silva, USP, Australia

**Impact of Wake Effect on the Levelized Cost of Energy for a Wind Farm Offshore Rio De Janeiro** OMAE2023-102271

Mojtaba Maali Amiri, Jeferson Osmar de Almeida, Clarissa Bergman Fonte, Milad Shadman, Segen F. Estefen

Federal University of Rio de Janeiro, Rio de Janeiro, RJ, Brazil

**On the Distribution of Aerodynamic Load on Wind Turbine Blade** OMAE2023-104406

My Ha Dao, Quang Tuyen Le, Xiang Zhao

Institute of High Performance Computing, Singapore, Singapore

**A Detailed Analysis Framework of Fully Coupled Dynamic Responses for Offshore Wind Turbine Blade** OMAE2023-104430

Baoxuan Wang<sup>1</sup> Xu Liang<sup>2</sup> Jianwei Zhang<sup>2</sup> Shengjie Rui<sup>3</sup> Xing Zha<sup>1</sup> Shaoyang Wang<sup>2</sup> Yue Chen<sup>2</sup>

1. Zhejiang University, Hangzhou, China; 2. Zhejiang University, Zhoushan, China; 3. Norwegian Geotechnical Institute, Oslo, Norway

**Influence of Tower Design on Floating Offshore Wind Turbine Dynamics** OMAE2023-104864

Francesco Papi, Alessandro Bianchini, Giulio Ferri, Niccolò Bruschi, Enzo Marino

Università degli Studi di Firenze, Firenze, Italy

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## Ocean Renewable Energy

### 09-02-03 Wave Energy – Design and Performance Analysis II

Tuesday June 13 | Room 217 | 08:30–10:00

**Session Organizer:** Binbin Zhao, Harbin Engineering University, China

**Session Co-Organizer:** Masoud Hayatdavoodi, The University of Dundee, United Kingdom

**Numerical Analysis of Flexible Tube Wave Energy Converter Using CFD-FEA Method** OMAE2023-101302

Yang Huang, Qing Xiao, Guillermo Idarraga, Liu Yang, Saishuai Dai, Farhad Abad, Feargal Brennan, Saeid Lotfian

University of Strathclyde, Glasgow, United Kingdom

**FSI Simulations and Analyses of a Non-Resonant Buoyant Wave Energy Converter** OMAE2023-101335

Xinyuan Shao<sup>1</sup> Hua-Dong Yao<sup>1</sup> Jonas W Ringsberg<sup>1</sup> Jan Skjöldhammer<sup>2</sup> Jianfeng Lin<sup>1</sup>

1. Chalmers University of Technology, Gothenburg, Sweden; 2. Novige AB, Västerås, Sweden

**An Efficient Three-Dimensional CFD-Based Numerical Wave Tank for a Wave Energy Converter in Extreme Irregular Waves** OMAE2023-105016

Will Wiley<sup>1</sup> Thanh Toan Tran<sup>1</sup> Thomas Boerner<sup>2</sup> Collin Weston<sup>2</sup> Lu Wang<sup>3</sup>

1. National Renewable Energy Laboratory, Arvada, CO, USA; 2. CalWave, Oakland, CA, USA;

3. National Renewable Energy Laboratory, Golden, CO, USA

**A Preliminary Study of Learning a Wave Energy Converter System Using Physics-Informed Neural Network Method** OMAE2023-105123

Bo-Chen Chen<sup>1</sup> Yi-Hsiang Yu<sup>2</sup>

1. National Yang Ming Chiao Tung University, HsinChu, Taiwan; 2. National Yang Ming Chiao Tung University, Department of Civil Engineering, HsinChu, Taiwan

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**Offshore Geotechnics**

**10-03-01 Anchors**

**Tuesday June 13 | Room 206 | 08:30–10:00**

**Session Organizer:** Denby Morrison, Shell, USA

**Session Co-Organizers:** Junsik Bae, The University of Western Australia, Australia; Rene Kurniadi, University of Melbourne, Australia

**Developing an Optimal Shape for Dynamical Installed Anchor** OMAE2023-101044

Junsik Bae, Youngho Kim, Muhammad Shazzad Hossain

Centre for Offshore Foundation Systems (COFS), Oceans Graduate School, University of Western Australia, Perth, WA, Australia

**A Case Study on the Seabed Trenching Assessment and the Anchor Design in Clay**

**Based on the Hydrodynamic Calculation of the Floater** OMAE2023-104420

Shengjie Rui<sup>1</sup> Zefeng Zhou<sup>1</sup> Baoxuan Wang<sup>2</sup> Hongyu Wang<sup>2</sup> Haojie Zhang<sup>2</sup> Yaru Zhang<sup>2</sup>

1. Norwegian Geotechnical institute, Oslo, Norway; 2. Zhejiang University, Hangzhou, China

**Numerical Investigation of Comprehensive Behaviors of Omni-Max Anchors in Sand** OMAE2023-104477

Chengyang Zhang<sup>1</sup> Haixiao Liu<sup>2</sup> Zhong Xiao<sup>1</sup> Wei Zhang<sup>1</sup>

1. Tianjin University, Tianjin, China; 2. Tianjin University, Jinnan, China

**Suction Caisson Anchor and Dynamically Installed Fish Anchor in Calcareous Silt** OMAE2023-104680

Muhammad Shazzad Hossain, Mohammad Arif Mohiuddin, Kuntan Chang, Kaixiang Koh, Youngho Kim

The University of Western Australia, Perth, WA, Australia

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**Petroleum Technology**

**11-04-01 Well Cementing Theory & Practice I**

**Tuesday June 13 | Room 211 | 08:30–10:00**

**Session Organizer:** Ian Frigaard, University of British Columbia, Canada

**Session Co-Organizers:** Hossein Hassanzadeh, Laval University, Canada; Ergun Kuru, University of Alberta, Canada

**Viscous Fluid Injections in an Inclined Closed-End Pipe with Applications in the Dump Bailing Method** OMAE2023-101070

Soheil Akbari, Hossein Hassanzadeh, Seyed Mohammad Taghavi

Université Laval, Quebec, QC, Canada

**Buoyant Miscible Jets in a Viscoplastic Medium with Applications in Plug and Abandonment of Oil and Gas Wells** OMAE2023-101472

Hossein Hassanzadeh, Saptarshi Joshi, Soheil Akbari, Seyed Mohammad Taghavi

Laval University, Québec City, QC, Canada

**Experimental Investigation of Annular Displacement with Fluids of Different Density** OMAE2023-101611

Bjørnar Lund<sup>1</sup> Jan David Ytrehus<sup>1</sup> Ali Taghipour<sup>1</sup> Arild Saasen<sup>2</sup>

1. SINTEF, Trondheim, Norway; 2. University of Stavanger, Stavanger, Norway

**Placing Off-Bottom Cement Plugs: Effects of Density Difference** OMAE2023-102009

Abdallah M. Ghazal, Ida Karimfazli

Concordia University, Montréal, QC, Canada

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## Blue Economy Symposium

### 13-02-01 Blue Economy III

Tuesday June 13 | Room 214 | 08:30–10:00

**Session Organizer:** Adi Kurniawan, University of Western Australia, Australia

**Session Co-Organizer:** Eric Gubesch, Australian Maritime College, Australia

#### **Numerical Analysis of a New Multi-Use Platform** OMAE2023-104385

Ling Wan<sup>1</sup> Zhiyung Tay<sup>2</sup> Wei Shi<sup>3</sup>

1. Ningbo University, Ningbo, China; 2. Singapore Institute of Technology, Singapore, Singapore; 3. Dalian University of Technology, Dalian, China

#### **Finite Element Analysis of Composite Mooring Tensioner Springs in Wave Energy Converters** OMAE2023-105262

Yuanzhen Cai, Michael Heitzmann

The University of Queensland, Brisbane, QLD, Australia

#### **Performance Feasibility of a Multi-Source Offshore Renewable Energy Platform for Aquaculture** OMAE2023-105346

Sophie Roberts, Damon Howe, Jean-Roch Nader

University of Tasmania, Newnham, TAS, Australia

#### **Techno-Economic Assessment of Developing Combined Offshore**

**Wind and Wave Energy in Australia** OMAE2023-107971

Qiang Gao, Boyin Ding, Nesimi Ertugrul

The University of Adelaide, Adelaide, SA, Australia

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## CONCURRENT SESSIONS

**10:30 – 12:00**

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## Offshore Technology

### 01-04-02 Design & Analysis II

Tuesday June 13 | Room 205 | 10:30–12:00

**Session Organizer:** Masoud Hayatdavoodi, The University of Dundee, United Kingdom

#### **Study on Robust Design for Navigation Dynamics Test for Small Catamaran** OMAE2023-101845

Chun Cheng Lin, Wei Li Liang

Chung Cheng Institute and Technology, Taoyuan City, Taiwan

#### **Annotated Guidelines for the Simulation of Floating Offshore Wind**

**Turbines in a Real Environment** OMAE2023-101926

Francesco Papi, Alessandro Bianchini

University of Florence, Florence, Italy

#### **Ship Performance Evaluation and Green Ship Type Scheme under Complex Channel Conditions** OMAE2023-104450

Zhengchen Lian, Lizheng Wang

Wuhan University of Technology, Wuhan, China

#### **Aerodynamic Shape Optimization of Offshore Wind Turbine Blades** OMAE2023-107794

Jichao Li, Quang Tuyen Le, My Ha Dao

Institute of High Performance Computing, A\*STAR, Singapore, Singapore

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## Structures, Safety and Reliability

### 02-05-02 Extreme Loads and Responses II

Tuesday June 13 | Room 213 | 10:30–12:00

Session Organizer: Spyros Hirdaris, Aalto University, Finland

Session Co-Organizer: Marco Klein, TUHH, Germany

#### Semi-Analytical Load Models Accounting for the Tilt and Motion of a Cylinder Impacted by a Plunging Breaking Wave OMAE2023-107740

Paul Renaud<sup>1</sup> Florian Hulin<sup>1</sup> Marc Batlle Martin<sup>1</sup> Yves-Marie Scolan<sup>2</sup> Alan Tassin<sup>3</sup>  
Nicolas Jacques<sup>2</sup> Jeffrey C. Harris<sup>4</sup> Jean-François Filipot<sup>1</sup>

1. France Energies Marines, Plouzané, France; 2. ENSTA Bretagne, CNRS UMR 6027, IRDL, Brest, France;

3. IFREMER, Plouzané, France; 4. LHSV, Ecole des Ponts, EDF R&D, Chatou, France

#### Simplified Analytical Procedure Efficiently Assessing the Whipping Response of Hull Subject to Undex Effect OMAE2023-108475

DaSol Lee, KwangSik Kim, JangHyun Lee

INHA University, Incheon, Korea

#### Nonlinear and Extreme Wave Group Interactions with a Circular Cylinder OMAE2023-104739

Yuchen He<sup>1</sup> Taiga Kanehira<sup>2</sup> Nobuhito Mori<sup>2</sup> Muhannad Gamaleldin<sup>3</sup> Alexander Babanin<sup>3</sup> Kapil Chauhan<sup>1</sup> Amin Chabchoub<sup>2</sup>

1. The University of Sydney, Sydney, NSW, Australia; 2. Kyoto University, Kyoto, Japan;

3. The University of Melbourne, Melbourne, VIC, Australia

#### Numerical Investigation of Air-Blast Performance of Cross-Filled Honeycomb Sandwich Panel OMAE2023-104526

Murlidhar Patel<sup>1</sup> Shivdayal Patel<sup>1</sup> Suhail Ahmad<sup>2</sup> Carlos Guedes Soares<sup>3</sup>  
1. PDPM Indian Institute of Information Technology Design and Manufacturing Jabalpur, Jabalpur, MP, India; 2. Indian Institute of Technology Delhi, Delhi, DL, India; 3. Centre for Marine Technology and Ocean Engineering (CENTEC), Instituto Superior Técnico, Universidade de Lisboa, Lisbon, Portugal

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## Structures, Safety and Reliability

### 02-06-01 Probabilistic Models of Forces and Motions

Tuesday June 13 | Room 212 | 10:30–12:00

Session Organizer: Carlos Guedes Soares, University of Lisbon, Portugal

#### Directional Wave Spectra during Hurricane Conditions under Different Directional Spreading Formulations OMAE2023-103377

Franklin Farid Ayala Cruz<sup>1</sup> Alexander Babanin<sup>2</sup> Qingxiang Liu<sup>3</sup> Andrés Fernando Osorio Arias<sup>4</sup> Rubén Darío Montoya Ramirez<sup>5</sup>

1. University of Melbourne, Attwood, VIC, Australia; 2. University of Melbourne, Melbourne, VIC, Australia;

3. Ocean University of China, Qingdao, China; 4. Universidad Nacional de Colombia - Sede Medellín, Medellín, Colombia;

5. Universidad de Medellín, Medellín, Colombia

#### On the Gaussianity of Wind and Wave Field Data OMAE2023-102239

Valentina Laface, Felice Arena

Mediterranea University of Reggio Calabria, Reggio Calabria, Italy

#### Bayesian Updating of Estimated Parameters Representing Multi-Modal Directional Wave Spectrum Using Measured Ship Hull Stresses OMAE2023-104224

Hiroimi Kubo<sup>1</sup> Tetsuo Okada<sup>2</sup> Xi Chen<sup>3</sup> Yasumi Kawamura<sup>2</sup> Taiga Mitsuyuki<sup>2</sup> Ginga Hayakawa<sup>4</sup>

1. Graduate School of Engineering Science, Yokohama National University, Hodogaya-Ku Yokohama-Shi, Japan; 2. Faculty of Engineering, Yokohama National University, Hodogaya-Ku Yokohama-Shi, Japan; 3. National Maritime Research Institute, Mitaka, Japan;

4. Faculty of Engineering Technology Section, Yokohama National University, Hodogaya-Ku Yokohama-Shi, Japan

#### Dynamic Bending Ultimate Capacity Analysis of Box Girder under Hammer Impact OMAE2023-101632

Guijie Shi, Deyu Wang

Shanghai Jiao Tong University, Shanghai, China

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## Pipeline, Risers, and Subsea Systems

### 04-02-02 Rigid Risers II

Tuesday June 13 | Room 210 | 10:30–12:00

Session Organizer: Theodoro Netto, Fundacao Coppetec, Brazil

#### Design Drivers for Pre-Lay and Recovery Installation of Deep Water

##### Steel Lazy Wave Riser Systems OMAE2023-101969

Abhilash A. Sebastian, Jaehyeuk Jeon, Vikas Patel, Mayank Lal  
*TechnipFMC, Houston, TX, USA*

#### Steel Lazy Wave Riser Optimization Using Particle Swarm Optimization Algorithm OMAE2023-103743

Mayank Lal<sup>1</sup> Anurag Yenduri<sup>2</sup> Abhilash Sebastian<sup>1</sup>  
*1. TechnipFMC, Houston, TX, USA; 2. TechnipFMC, Chennai, TN, India*

#### Life Extension of Risers and Engineering Criticality Assessment OMAE2023-105131

Ghiath (Guy) Mansour  
*Artifex Engineering, Inc., Houston, TX, USA*

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## Ocean Space Utilization

### 05-01-02 New Concepts for Ocean Space Utilization II

Tuesday June 13 | Room 207 | 10:30–12:00

Session Organizer: Tomoki Ikoma, Nihon University, Japan

Session Co-Organizer: Tomoya Inoue, JAMSTEC, Japan

#### Carbon Footprint Reduction on Aging Offshore Facilities: Case Studies on Electrification and Carbon Capture OMAE2023-108084

Viren Vartak<sup>1</sup> SaiKeong Loh<sup>1</sup> Nitin Repalle<sup>2</sup>  
*1. 2H Offshore, Kuala Lumpur, Malaysia; 2. 2H Offshore, Perth, WA, Australia*

#### Analysis of Swash Flow-Induced Forces on a Human Body Standing on a Slope OMAE2023-104596

Deping Cao<sup>1</sup> Hao Chen<sup>2</sup> Zaibin Lin<sup>3</sup>  
*1. National University of Singapore, Singapore, Singapore; 2. Newcastle University in Singapore, Singapore, Singapore; 3. University of Aberdeen, Aberdeen, United Kingdom*

#### Experimental and Numerical Analysis on the Hydrodynamic Force of an Ice Piece in Model-Scale Brash Ices OMAE2023-104700

Ryota Hayashi<sup>1</sup> Akihisa Konno<sup>1</sup> Jinxin Zhou<sup>2</sup> Qiao Li<sup>2</sup> Shuchuang Dong<sup>2</sup> Daisuke Kitazawa<sup>2</sup>  
*1. Kogakuin University, Hachioji, Tokyo, Japan; 2. Institute of Industrial Science, The University of Tokyo, Chiba-ken, Japan*

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## Ocean Engineering

### 06-03-03 Fluid-Structure, Multi-body and Wave-body Interaction III

Tuesday June 13 | Room 204 | 10:30–12:00

Session Organizer: Zhiyuan Pan, DNV, Norway

#### Experimental Investigation on Response of Ship Rolling Motion Coupled with Liquid Sloshing OMAE2023-104423

Yunhe Wang<sup>1</sup> Shengchao Jiang<sup>2</sup> Tongming Zhou<sup>3</sup>  
*1. The University of Western Australia, Crawley, WA, Australia; 2. Dalian University of Technology, Dalian, China; 3. The University of Western Australia, Perth, WA, Australia*

#### Experimental Study on Flow-Induced Pitch, Roll, and Heave Motions of a Semi-Submersible Floater with Long pontoons OMAE2023-104664

Yuki Naito<sup>1</sup> Shinichiro Hirabayashi<sup>1</sup> Hideyuki Suzuki<sup>2</sup> Rodolfo Gonçalves<sup>2</sup>  
*1. The University of Tokyo, Kashiwa, Japan; 2. The University of Tokyo, Bunkyo-ku, Japan*

## Methodology for the Integration of Experimental and Numerical Fluid Dynamics in the Study of a Floating Body Subjected to Environmental Loads OMAE2023-104676

Guillaume Ducrozet, Benjamin Bouscasse, Félicien Bonnefoy, Vincent Leroy  
*Ecole Centrale de Nantes, Nantes, France*

## Non-Linear Hydrodynamic Forces on Fixed Axi-Symmetric Bodies in Incident Waves OMAE2023-104749

Bryan Tan<sup>1</sup> Jana Orszaghova<sup>2</sup> Adi Kurniawan<sup>2</sup> Hugh Wolgamot<sup>2</sup> Jørgen Hals Todalshaug<sup>3</sup>  
*1. University of Western Australia, Crawley, WA, Australia; 2. University of Western Australia, Perth, WA, Australia; 3. CorPower Ocean, Stockholm, Sweden*

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## Ocean Engineering

### 06-04-03 Marine Engineering and Technology III

Tuesday June 13 | Room 203 | 10:30–12:00

Session Organizer: Marcelo Caire, Federal University of Rio de Janeiro, Brazil

#### A Decentralized Droop-Based Power Management System for Ship Power Systems Using Hybrid Dynamical Systems Framework OMAE2023-102570

Namireddy Praveen Reddy<sup>1</sup> Roger Skjetne<sup>1</sup> Dimitrios Papageorgiou<sup>2</sup>  
*1. Norwegian University of Science and Technology, Trondheim, Norway; 2. Technical University of Denmark, Copenhagen, Denmark*

#### Evaluating Marine Engines under Laboratory Conditions to Achieve Emission Reduction Targets in the Shipping Industry OMAE2023-103192

Lokukaluge Prasad Perera<sup>1</sup> Kostas Belibassakis<sup>2</sup>  
*1. UiT The Arctic University of Norway, Tromsø, Norway; 2. National Technical University of Athens, Athens, Greece*

#### Multiple Model Adaptive Estimation (MMAE) Applied to Marine Engine Nonlinear Function Approximation for Fuel Consumption Prediction for Shipping OMAE2023-103249

Mahmood Taghavi, Lokukaluge Prasad Perera  
*UiT The Arctic University of Norway, Tromsø, Norway*

#### Analysis of Thermal Load of Cylinder Head considering Fluid-Structure Interaction for a Marine Low-Speed Engine OMAE2023-104270

Lei Hu, Hongwei Zhang, Jianguo Yang, Yonghua Yu  
*Wuhan University of Technology, Wuhan, China*

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## Ocean Engineering

### 06-05-02 Marine Hydrodynamics II

Tuesday June 13 | Room 218 | 10:30–12:00

Session Organizer: Sanne Van Essen, Marin, Netherlands

#### A Mesh Convergence Study for Low Frequency Second Order Wave Forces on Floating Bodies OMAE2023-103793

Zhiyuan Pan<sup>1</sup> Taeyoung Kim<sup>2</sup> Jaekyung Heo<sup>3</sup>  
*1. DNV, Høvik, Norway; 2. Samsung Heavy Industries, Busan, Korea; 3. DNV, Daejeon, Korea*

#### Evaluation of Parametric Modeling Method for Ship Maneuvering Motion with Experimental Data OMAE2023-104303

Yu-Xuan Zhong<sup>1</sup> Zi-Hao Wang<sup>1</sup> Zao-Jian Zou<sup>2</sup>  
*1. Shanghai University, Shanghai, China; 2. Shanghai Jiao Tong University, Shanghai, China*

#### Online Modeling of Ship Maneuvering Motion with Varying Loading Conditions OMAE2023-104467

Yao-Hui Yu, Zi-Hao Wang, Dong Qu, Rui Song, Yan Peng  
*Shanghai University, Shanghai, China*

#### Hydrodynamic Forces on a Near-Bottom Pipeline Subject to Wave-Induced Boundary Layer OMAE2023-104495

Guang Yin<sup>1</sup> Muk Chen Ong<sup>1</sup> Naiquan Ye<sup>2</sup>  
*1. University of Stavanger, Stavanger, Norway; 2. SINTEF Ocean, Trondheim, Norway*

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## **Polar and Arctic Sciences and Technology**

### **07-03-01 Vessels in Ice I**

**Tuesday June 13 | Room 208 | 10:30–12:00**

**Session Organizer:** Franciska Müller, Hamburg University of Technology, Germany

**Session Co-Organizer:** Edward Bryson, Memorial University of Newfoundland, Canada

#### **A Statistical Approach for Estimating Sea Ice Thickness** OMAE2023-101554

**Joshua Veber<sup>1</sup> Jeffrey Brown<sup>2</sup> Jungyong Wang<sup>2</sup> Thomas Browne<sup>2</sup> Brian Veitch<sup>3</sup> David Molyneux<sup>3</sup>**

*1. Memorial University of Newfoundland, St. Philip's, NL, Canada; 2. National Research Council Canada, St. John's, NL, Canada; 3. Memorial University of Newfoundland, St. John's, NL, Canada*

#### **An Investigation of the Influence of Added Mass on the Ice Loads in Regular Waves** OMAE2023-101896

**Zongyu Jiang<sup>1</sup> Fang Li<sup>2</sup> Mikko Suominen<sup>1</sup> Sasan Tavakoli<sup>1</sup> Pentti Kujala<sup>1</sup> Spyros Hirdaris<sup>1</sup>**

*1. Aalto University, Espoo, Finland; 2. Shanghai Jiao Tong University, Shanghai, China*

#### **Ice Resistance and Propulsion Performance of a Polar Ship in Brash Ice Channel** OMAE2023-102381

**Sijie Zheng, Shifeng Ding, Chang Xie, Renwei Liu, Aimin Wang**

*Jiangsu University of Science and Technology, Zhenjiang, China*

#### **Empirical Mode Decomposition for Noise Detection and Filtration of Ice-Induced Load Measurements** OMAE2023-102504

**Mikko Suominen, Ahmad Bahootoroody, Osiris Valdez Banda**

*Aalto University, Espoo, Finland*

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## **CFD, VIV and FSI**

### **08-02-02 Ship & Floating Systems II**

**Tuesday June 13 | Room 209 | 10:30–12:00**

**Session Organizer:** Themistocles Resvanis, MIT, USA

**Session Co-Organizer:** Owen Oakley, Retired, USA

#### **Numerical Simulation of Motion Responses of a Cabin-Suspended Catamaran in Head Waves** OMAE2023-103284

**Jialin Han<sup>1</sup> Daisuke Kitazawa<sup>2</sup> Motohiko Murai<sup>1</sup>**

*1. Yokohama National University, Yokohama, Japan; 2. The University of Tokyo, Kashiwa, Japan*

#### **Effect of Wind Speed Profile on Wind Loads of Liquefied Natural Gas FPSIS** OMAE2023-104833

**Byung-Hyuk Lee<sup>1</sup> Sang-Eui Lee<sup>2</sup>**

*1. Korea Shipbuilding & Offshore Engineering, Seoul, Korea; 2. Changwon National University, Changwon, Korea*

#### **Preliminary Assessment of the Effect of Bottom Warp on the Dynamics of Planing Hulls Using OpenFOAM** OMAE2023-104777

**Rubén J. Paredes<sup>1</sup> David Plaza<sup>1</sup> Jose R. Marin<sup>1</sup> Ermina Begovic<sup>2</sup> Raju Datla<sup>3</sup>**

*1. ESPOL Polytechnic University, Escuela Superior Politécnica del Litoral, ESPOL, Guayaquil, Ecuador; 2. University of Naples Federico II, Napoli, Italy; 3. Stevens Institute of Technology, Hoboken, NJ, USA*

#### **Preliminary Investigation into the Dynamic of Planing Hulls in Regular Waves Using the Smoothed Particle Hydrodynamics Method** OMAE2023-105049

**Salvatore Capasso<sup>1</sup> Bonaventura Tagliafierro<sup>2</sup> Simone Mancini<sup>3</sup> Fabio De Luca<sup>3</sup> Iván Martínez-Estévez<sup>4</sup>**

**José Manuel Domínguez<sup>4</sup> Corrado Altomare<sup>2</sup> Alejandro J.C. Crespo<sup>4</sup> Claudio Pensa<sup>3</sup> Giacomo Viccione<sup>1</sup>**

*1. Università degli Studi di Salerno, Fisciano, Italy; 2. Universidad Politécnica de Cataluña - UPC BarcelonaTech, Barcelona, Spain; 3. Università degli Studi di Napoli Federico II, Napoli, Italy; 4. EPhysLab - Universidade de Vigo, Ourense, Spain*

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## Ocean Renewable Energy

### **09-01-04 Offshore Wind Energy – Aerodynamic Control**

Tuesday June 13 | Room 216 | 10:30–12:00

**Session Organizer:** Amy Robertson, NREL, USA

**Session Co-Organizer:** Hyunchul Jang, Technip Energies, USA

#### **Lidar-Assisted Feedforward Pitch Control of 15 Megawatt Floating Offshore Wind Turbines** OMAE2023-100822

**Andrew J. Russell<sup>1</sup>** Maurizio Collu<sup>2</sup> Alasdair McDonald<sup>3</sup> Philipp Thies<sup>4</sup> Alan Mortimer<sup>5</sup> Alexander Quayle<sup>6</sup>

1. IDCORE, Newcastle Upon Tyne, United Kingdom; 2. University of Strathclyde, Glasgow, United Kingdom;  
3. University of Edinburgh, Edinburgh, United Kingdom; 4. University of Exeter, Exeter, United Kingdom;  
5. Wood Group Plc, Glasgow, United Kingdom; 6. Flotation Energy Plc, Edinburgh, United Kingdom

#### **Pitch Motion Control of Spar-Type Floating Wind Turbines** OMAE2023-101218

**Shuang-Rui Yu<sup>1</sup>** Ming Zhang<sup>1</sup> Ming-Lu Chen<sup>2</sup> Zhi-Ming Yuan<sup>1</sup>

1. University of Strathclyde, Glasgow, United Kingdom; 2. Jiangsu University of Science and Technology, Zhenjiang, China

#### **Summary of the Focal Project: Validating Floating Offshore Wind Controls Approaches at Model Scale** OMAE2023-101853

**Amy Robertson<sup>1</sup>** Lu Wang<sup>2</sup> Roger Bergua<sup>2</sup>

1. National Renewable Energy Laboratory, Lakewood, CO, USA; 2. National Renewable Energy Laboratory, Golden, CO, USA

#### **Effects of Controller Dynamics on Aerodynamic Damping of a Semi-Submersible Floating Wind Turbine** OMAE2023-101929

**Can Yang,** Longfei Xiao, Peng Chen, Zhengshun Cheng

State Key Laboratory of Ocean Engineering, Shanghai, China

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## Ocean Renewable Energy

### **09-02-04 Wave Energy – Design and Performance Analysis III**

Tuesday June 13 | Room 217 | 10:30–12:00

**Session Organizer:** Yi-Hsiang Yu, NyCU, Taiwan

**Session Co-Organizer:** Nathan Tom, NREL, USA

#### **A Neural Network Approach to Minimize Line Forces in the Survivability of the Point-Absorber Wave Energy Converters** OMAE2023-102422

**Zahra Shahroozi,** Malin Göteman, Jens Engström

Uppsala University, Uppsala, Sweden

#### **Shape Optimization Design of a Heaving Buoy of Wave Energy Converter under Bimodal Spectral Waves near Islands and Reefs** OMAE2023-109156

**Shuo Huang,** Weiqi Liu, Kai Wang

Sun Yat-sen University, Zhuhai, China

#### **New Developments and Capabilities within WEC-Sim** OMAE2023-105030

**Nathan Tom<sup>1</sup>** Kelley Ruehl<sup>2</sup> Adam Keester<sup>2</sup> Dominic Forbush<sup>2</sup> David Ogden<sup>3</sup> Jorge Leon<sup>2</sup>

**Salman Husain<sup>4</sup>** Jeff Grasberger<sup>2</sup> Mathew Topper<sup>5</sup> Yi-Hsiang Yu<sup>6</sup>

1. NREL, Golden, CO, USA; 2. Sandia National Laboratories, Albuquerque, NM, USA; 3. Velocity Global, Hackney, United Kingdom; 4. National Renewable Energy Laboratory, Golden, CO, USA; 5. Data Only Greater, Maynooth, Ireland; 6. National Yang Ming Chiao University, Taipei, Taiwan

#### **Investigation of a Modified Wells Turbine for Wave Energy Extraction** OMAE2023-100971

**Mohammad Nasim Uddin<sup>1</sup>** Michael Atkinson<sup>2</sup> Frimpong Opoku<sup>3</sup>

1. North Carolina A&T State University, Greensboro, NC, USA; 2. North Carolina A&T State University, Summerfield, NC, USA; 3. Collins Aerospace, Winston-Salem, NC, USA



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## Offshore Geotechnics

### 10-04-01 Pile Foundations

Tuesday June 13 | Room 206 | 10:30–12:00

**Session Organizer:** Denby Morrison, Shell, USA

**Session Co-Organizers:** Guilherme Kronemberger Lopes, LACEO/COPPE/UFRJ, Brazil; Yuxia Hu, The University of Western Australia, Australia

#### **A Numerical Investigation on the Derivation of p-y Curves for Monopile Foundations Installed in Sand** OMAE2023-103227

Guilherme Kronemberger Lopes<sup>1</sup> José Renato Mendes de Sousa<sup>1</sup>

Maria Cascão Ferreira de Almeida<sup>2</sup> Márcio de Souza Soares de Almeida<sup>2</sup>

1. LACEO, Rio de Janeiro, RJ, Brazil; 2. Federal University of Rio de Janeiro, Rio de Janeiro, RJ, Brazil

#### **Relating the Stiffness of Load-Transfer Functions for Monopile**

**Foundations to Elastic Soil Modulus** OMAE2023-106589

James Doherty<sup>1</sup> Mark Randolph<sup>2</sup> Xiao Wan<sup>2</sup>

1. University of Western Australia, Perth, WA, Australia; 2. University of Western Australia, Crawley, WA, Australia

#### **From Offshore Flexible Flowlines to Torpedo Anchors – a Concept Study** OMAE2023-108062

Yuxia Hu, Ming Hui Gao, Scott Draper, Muhammad Shazzad Hossain

The University of Western Australia, Crawley, WA, Australia

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## Petroleum Technology

### 11-04-02 Well Cementing Theory & Practice II

Tuesday June 13 | Room 211 | 10:30–12:00

**Session Organizer:** Ian Frigaard, University of British Columbia, Canada

**Session Co-Organizers:** Ida Karimfazli, Concordia University, Canada; Ergun Kuru, University of Alberta, Canada

#### **Predicting the Rate of Cement Plug Failure** OMAE2023-104587

Scott Charabin, Ian Frigaard

University of British Columbia, Vancouver, BC, Canada

#### **Squeeze Cementing, a Mathematical Model for Cross Flow Filtration** OMAE2023-104944

Mahdi Izadi<sup>1</sup> Ian Frigaard<sup>1</sup> Seyed Mohammad Taghavi<sup>2</sup>

1. University of British Columbia, Vancouver, BC, Canada; 2. Laval University, Quebec, QC, Canada

#### **High Density Microfine Cement for Squeeze Cementing Operations** OMAE2023-104986

Abdullah S. Alyami, Vikrant Wagle

Saudi Aramco, Dhahran, Saudi Arabia

#### **Development of High-Density Self-Healing Cement** OMAE2023-104992

Abdullah S. Alyami, Vikrant Wagle

Saudi Aramco, Dhahran, Saudi Arabia

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## Blue Economy Symposium

### 13-04-01 Blue Economy IV

Tuesday June 13 | Room 214 | 10:30–12:00

**Session Organizer:** Irene Penesis, Blue Economy Cooperative Research Centre (BE CRC-Co.), Australia

**Session Co-Organizer:** Adi Kurniawan, University of Western Australia, Australia

#### **Moorpower: Decarbonising the Aquaculture Industry** OMAE2023-100742

Alexandre Pichard, Joanthan Fievez, Brighid Jay

Carnegie Clean Energy, North Fremantle, WA, Australia

**Blue Economy CRC Hydrogen Microgrid Demonstration Project** OMAE2023-102112

Evan Gray

Griffith University, Nathan, QLD, Australia

**Numerical Modelling in the Development of the M4 Prototype for Albany, Western Australia** OMAE2023-105185

Adi Kurniawan<sup>1</sup> Hugh Wolgamot<sup>2</sup> Christophe Gaudin<sup>2</sup> Chris Shearer<sup>3</sup> Peter Stansby<sup>4</sup> Brad Saunders<sup>5</sup>

1. UWA, Albany, WA, Australia; 2. University of Western Australia, Crawley, WA, Australia; 3. BMT, Melbourne, VIC, Australia; 4. University of Manchester, Manchester, United Kingdom; 5. BMT, Osborne Park, WA, Australia

**A Review: DC Microgrids for Sustainable Power Delivery in Offshore Industries** OMAE2023-103054

Bawantha Indrajith<sup>1</sup> Kosala Gunawardane<sup>2</sup> Hasith Jayasinghe<sup>3</sup>

1. Auckland University of Technology, Galewela, Sri Lanka; 2. Auckland University of Technology, Auckland, New Zealand; 3. Auckland University of Technology, Welipenna, Sri Lanka

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## **CONCURRENT SESSIONS**

**13:30 – 15:00**

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### **Offshore Technology**

**01-03-01 Computational Offshore Hydrodynamics**

Tuesday June 13 | Room 205 | 13:30–15:00

Session Organizer: Weichao Shi, Newcastle University, United Kingdom

**CFD Simulations of the DeepCwind Semi-Submersible in Bichromatic Waves and Validation with the Experiments from OC6 Phase 1b** OMAE2023-101183

Yali Zhang, Harrif Santo

Technology Centre for Offshore and Marine, Singapore, Singapore

**Dynamic Analysis of Launching and Recovering ROV** OMAE2023-102185

Yulin Deng<sup>1</sup> Xiudi Ren<sup>2</sup> Martin Nuernberg<sup>3</sup> Longbin Tao<sup>1</sup>

1. University of Strathclyde, Glasgow, United Kingdom; 2. PowerChina Huadong Engineering Corporation Limited., Hangzhou, China; 3. O.S. Energy, Newcastle Upon Tyne, United Kingdom

**Computational Fluid Dynamic Modelling of Vortex-Induced Motion of Wind Turbine Monopile Foundation during Installation** OMAE2023-104634

Shengnan Liu<sup>1</sup> Petter Moen<sup>1</sup> Fabrizio Fiore<sup>2</sup>

1. Subsea 7, Stavanger, Norway; 2. Seaway 7, Zoetermeer, Netherlands

**Prediction of Short-Term Non-Linear Response Using Screening Combined with Multi-Fidelity Gaussian Process Regression** OMAE2023-100954

Sanne Van Essen<sup>1</sup> Thomas Scholcz<sup>2</sup> Harleigh Seyffert<sup>1</sup>

1. Delft University of Technology, Delft, Netherlands; 2. Maritime Research Institute Netherlands, Wageningen, Netherlands

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### **Structures, Safety and Reliability**

**02-07-01 Data-driven Models for Marine Structures I**

Tuesday June 13 | Room 212 | 13:30–15:00

Session Organizer: YeongAe Heo, Case Western Reserve University, USA

Session Co-Organizer: Carlos Guedes Soares, University of Lisbon, Portugal

**Research on Deformation Characteristics of Cruise Superstructure Based on Digital Twin** OMAE2023-102426

Siyuan Liu<sup>1</sup> Zhiyong Pei<sup>2</sup> Bin Yang<sup>1</sup> Weiguo Wu<sup>2</sup>

1. School of Naval Architecture, Ocean and Energy Power Engineering, Wuhan University of Technology, Wuhan, China; 2. Green & Smart River-Sea-Going Ship, Cruise and Yacht Research Center, Wuhan University of Technology, Wuhan, China

**Fault Diagnosis of Rolling Bearing under Marine Noisy Environments and Varying Working Conditions** OMAE2023-102540

Chao Gao<sup>1</sup> Yongjin Guo<sup>1</sup> Bing Han<sup>2</sup> Xiaofeng Liang<sup>1</sup> Hongdong Wang<sup>1</sup> Hong Yi<sup>1</sup>  
1. Shanghai Jiao Tong University, Shanghai, China; 2. National Engineering Research Center of Ship & Shipping Control System, Shanghai, China

**Acoustic Emission Based Damage Source Localization for Heterogeneous Structure of Wind Turbine Blades Using Long Short-Term Memory Neural Networks** OMAE2023-103331

Zhimin Zhao, Nian-Zhong Chen  
Tianjin University, Tianjin, China

**A Method for Optimization of Sensor Locations for Inverse Calculation of Impact Load on Stiffened Panel** OMAE2023-104702

Xueqian Zhou, Xingzhi Shen, Yishi Xu, Huilong Ren  
Harbin Engineering University, College of Shipbuilding Engineering, Harbin, China

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**Structures, Safety and Reliability**

**02-08-01 Risk and Reliability of Renewable Energy Devices**

Tuesday June 13 | Room 213 | 13:30–15:00

**Session Organizer:** Zhen Gao, Shanghai Jiao Tong University, China

**Session Co-Organizer:** Carlos Guedes Soares, University of Lisbon, Portugal

**Failure Rate and Repair Time Analysis of Offshore Wind Turbines** OMAE2023-101753

Luis Felipe Guarda Brauning, Leonardo Terra, Marcelo Ramos Martins  
Universidade de Sao Paulo, São Paulo, SP, Brazil

**Risk Analysis of Composite Blades of Offshore Vawt for the Indian Ocean** OMAE2023-104820

Prince Arora, Prashant Parmeshwar Atkale, Badri Prasad Patel, Suhail Ahmad  
Indian Institute of Technology Delhi, Delhi, DL, India

**Monopile-Supported Offshore Wind Turbine Ultimate Limit State Design Format from a Structural Reliability Point of View – Impact of Uncertainties in Loads and Strength on the Implied Safety Level** OMAE2023-106479

Hadi Amlashi  
University of South-Eastern Norway, Porsgrunn, Norway

**Evaluation of Fatigue Reliability of an XXL Monopile Offshore Wind Foundation Using Stochastic Availability** OMAE2023-101651

Gaizka Zarraonandia Simeon<sup>1</sup> Eleni Minga<sup>2</sup>  
1. Scottishpower, Bristol, United Kingdom; 2. Empire Engineering, Bristol, United Kingdom

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**Pipeline, Risers, and Subsea Systems**

**04-01-03 Flexible Pipes and Umbilicals III**

Tuesday June 13 | Room 210 | 13:30–15:00

**Session Organizer:** Anh Tuan Do, TechnipFMC, France

**Session Co-Organizer:** Jose Renato De Sousa, UFRJ, Brazil

**Full Scale Validation of Stress Prediction Models for Flexible Pipe Foldless End Fitting Anchoring System** OMAE2023-101201

Alessandro Gallina, Henrique Chiaradia Rigon, Lucas Alban Geusti, Frederico Wallauer, Fabiano Bertoni, Judimar de Assis Clevelario  
SIMEROS, Cachoeirinha, RS, Brazil

**Analytical and Finite Element Models for the Analysis of a Hybrid Flexible Pipe under Combined Axisymmetric Loading** OMAE2023-104679

Inês S. G. Freitas, José Renato M. de Sousa  
LACEO - Laboratory of Analysis and Reliability of Offshore Structures, Rio de Janeiro, RJ, Brazil

**Optimization Method Associated with Analytical Approach to Assess the Optimal Flexible Pipe End Fitting Design** OMAE2023-105040

Marcelo Noboro Ralim Miyazaki<sup>1</sup> Vinicius Ribeiro Machado Da Silva<sup>2</sup> Jose Renato Mendes De Sousa<sup>2</sup> Gilberto Bruno Ellwanger<sup>2</sup>  
1. Universidade Federal do Rio de Janeiro, Paris, France; 2. Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brazil

**FAT Pressure Impact on Residual Stress in Flexible Pipe Pressure Armour** OMAE2023-105422

Dorine Sautreuil<sup>1</sup> Antoine Deheeger<sup>1</sup> Howard Wang<sup>2</sup>  
1. TechnipFMC, Le Trait, France; 2. ExxonMobil, Spring, TX, USA

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## Ocean Space Utilization

### 05-06-01 High Tide and Tsunamis

Tuesday June 13 | Room 207 | 13:30–15:00

**Session Organizer:** Tomoki Ikoma, Nihon University, Japan

**Session Co-Organizer:** Koichi Masuda, Nihon University, Japan

**A Study on Tsunami Disaster Prevention Measures by Floating Tsunami**

**Mooring Bitts for a Vessel Moored at a Wharf** OMAE2023-100844

Chiaki Tsutsui, Kiyokazu Minami, Mitsuhiro Masuda  
Tokyo University of Marine Science and Technology, Koto-ku, Japan

**Large Scale Test of Automatic Tsunami Barrier** OMAE2023-101764

Eigai Hamada  
Anti Tsunami Laboratory, Fujisawa, Japan

**Numerical Study on the Deceleration Effect of Impact Velocity of Tsunami**

**Drifting Objects in Front of Structures** OMAE2023-104612

Mebae Takekawa<sup>1</sup> Yasuhiro Aida<sup>2</sup> Hibiki Nakazawa<sup>2</sup> Ami Sasaki<sup>2</sup> Tomoki Ikoma<sup>2</sup> Koichi Masuda<sup>2</sup>  
1. Nihon University, Chiba-Shi Mihama-Ku, Japan; 2. Nihon University, Funabasi-city, Japan

**An Experimental Study on the Basic Floating Performance of the Floating**

**Disaster Prevention House against Flood Disasters** OMAE2023-104768

Mitsuhiro Masuda, Kiyokazu Minami  
Tokyo University of Marine Science and Technology, Koto-ku, Japan

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## Ocean Engineering

### 06-03-04 Fluid-Structure, Multi-body and Wave-body Interaction IV

Tuesday June 13 | Room 204 | 13:30–15:00

**Session Organizer:** Chengwang Xiong, Harbin Engineering University, China

**Numerical Study of Underwater Implosion of Spherical Pressure Hull on Deep-Sea Submersibles** OMAE2023-104797

Jiancai Zheng, Yupei He, Min Zhao  
Shanghai Jiao Tong University, Shanghai, China

**Wave-Current Interaction with Floating Objects with Square and Circular Waterplane Areas** OMAE2023-105065

Azin Lamei<sup>1</sup> Shuijin Li<sup>1</sup> Masoud Hayatdavoodi<sup>1</sup> H. Ronald Riggs<sup>2</sup>  
1. University of Dundee, Dundee, United Kingdom; 2. University of Hawaii at Manoa, Honolulu, HI, USA

**Flow Induced Vibration Analysis Using a Low-Cost Inertial Measurement Unit** OMAE2023-105138

Aline Peres Leal<sup>1</sup> André Luís Condino Fajarra<sup>2</sup> Rodrigo Matos Carnier<sup>3</sup> Rodolfo Trentin Gonçalves<sup>3</sup> Hideyuki Suzuki<sup>3</sup>  
1. Polytechnic School, University of Sao Paulo, São Bento do Sul, SC, Brazil; 2. Federal University of Santa Catarina, Joinville, SC, Brazil; 3. School of Engineering, The University of Tokyo, Tokyo, Japan

**Experimental Modeling of Typical Types of Green Water Events** OMAE2023-102066

Wei-Liang Chuang<sup>1</sup> Xing-Yu Pan<sup>1</sup> Ting-Chieh Lin<sup>2</sup>  
1. Department of Marine Environment and Ocean Engineering, National Sun Yat-sen University, Kaohsiung, Taiwan;  
2. Department of Harbor and River Engineering, National Taiwan Ocean University, Keelung, Taiwan

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## Ocean Engineering

### 06-04-04 Marine Engineering and Technology IV

Tuesday June 13 | Room 203 | 13:30–15:00

Session Organizer: Marcelo Caire, Federal University of Rio de Janeiro, Brazil

#### The Effect of LNG and Diesel Fuel Emissions of Marine Engines on GHG-Reduction Revenue Policies under Life-Cycle Costing Analysis in Shipping OMAE2023-104508

Hadi Taghavifar, Lokukaluage Prasad Perera  
*UiT the Arctic University of Norway, Tromsø, Norway*

#### Research on Ice Grain Preparation Technology Based on Ice Jet Technology for Marine and Ocean Engineering Industry OMAE2023-104619

Jingru Hu, Jingbin Li, Zhongwei Huang, Zhaoting Chen  
*China University of Petroleum, Beijing, China*

#### Optimal Energy Management for Zero-Emission High-Speed Passenger Vessels OMAE2023-104731

Samieh Najjaran, Roger Skjetne, John Martin Kleven Godø  
*Norwegian University of Science and Technology, Trondheim, Norway*

#### Trustworthiness Evaluation Framework for Digital Ship Navigators in Bridge Simulator Environment OMAE2023-104863

Hosna Namazi, Lokukaluage Prasad Perera  
*UiT The Arctic University of Norway, Tromsø, Norway*

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## Ocean Engineering

### 06-05-03 Marine Hydrodynamics III

Tuesday June 13 | Room 218 | 13:30–15:00

Session Organizer: Sanne Van Essen, Marin, Netherlands

#### Algorithm to Developing Regional Wave Scatter Diagram from Hindcast Data for Offshore Application OMAE2023-104624

Samuel Mangalathu Raj<sup>1</sup> Hossein Enshaei<sup>2</sup> Nagi Abdussamie<sup>2</sup>  
*1. Australian Maritime College, Newnham, TAS, Australia; 2. University of Tasmania, Newnham, TAS, Australia*

#### Slashing Loads Estimation Using a Genetic Programming OMAE2023-104632

Yangjun Ahn  
*Sungshin Women's University, Seongbuk-gu, Korea*

#### Data Driven Identification of Ship Maneuvering Coefficients OMAE2023-104644

Vallabh Vinod Deogaonkar, Aditya Kailas Jadhav, Krishnavelu Ramachandran, Abhilash Sharma Somayajula  
*Indian Institute of Technology Madras, Chennai, TN, India*

#### Current Effect on Nonlinear Wave Height OMAE2023-105333

Arun Kumar, Masoud Hayatdavoodi  
*University of Dundee, Dundee, United Kingdom*

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## Polar and Arctic Sciences and Technology

### 07-03-02 Vessels in Ice II

Tuesday June 13 | Room 208 | 13:30–15:00

Session Organizer: Kristjan Tabri, TalTech, Estonia

Session Co-Organizer: Takahiro Takeuchi, Hachinohe Institute of Technology, Japan

#### A Numerical Simulation Tool of Ship Navigation in Ice under Various Ice Conditions OMAE2023-103403

Fang Li<sup>1</sup> Pentti Kujala<sup>2</sup>  
*1. Shanghai Jiao Tong University, Shanghai, China; 2. Aalto University, Espoo, Finland*

## Experimental and Numerical Analysis of Ice Crushing Tests with Different Shaped Ice Specimens OMAE2023-103425

Franciska Müller<sup>1</sup> Angelo Böhm<sup>1</sup> Hauke Herrnring<sup>1</sup> Rüdiger U. Franz von Bock Und Polach<sup>1</sup> Sören Ehlers<sup>2</sup>

1. Hamburg University of Technology, Hamburg, Germany; 2. German Aerospace Center (DLR) - Institute of Maritime Energy Systems, Geesthacht, Germany

## Spatial Distribution Patterns of Ice Load under Turning Operation in Level Ice OMAE2023-104305

Yuhui Ge, Shifeng Ding, Renwei Liu, Aimin Wang

Jiangsu University of Science and Technology, Zhenjiang, China

## Numerical Simulation of Ice-Propeller Milling Process with Cohesive Element Method OMAE2023-104308

Chao Liu<sup>1</sup> Li Zhou<sup>2</sup> Shifeng Ding<sup>1</sup> Renwei Liu<sup>1</sup> Aimin Wang<sup>1</sup>

1. Jiangsu University of Science and Technology, Zhenjiang, China; 2. Shanghai Jiao Tong University, Zhenjiang, China

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## CFD, VIV and FSI

### 08-03-01 Free Surface Flows I

Tuesday June 13 | Room 209 | 13:30–15:00

**Session Organizer:** Narakorn Srinil, Newcastle University, United Kingdom

**Session Co-Organizers:** Owen Oakley, Retired, USA; Mengmeng Zhang, Shanghai Jiao Tong University, China

#### Numerical Study on Green Water on Deck and Impact Loads of a Ship

**Model Advancing in Head Wave** OMAE2023-102184

Guohua Dong, Chaobang Yao, Wuyang Liu, Dakui Feng

Huazhong University of Science and Technology, Wuhan, China

#### Numerical Simulations of Nonlinear Regular and Irregular Waves Based on HOS-CFD Method OMAE2023-102722

Wuyang Liu<sup>1</sup> Jiawei Yu<sup>1</sup> Guohua Dong<sup>1</sup> Chaobang Yao<sup>1</sup> Fanliang Meng<sup>2</sup>

1. Huazhong University of Science and Technology, Wuhan, China; 2. China Special Vehicle Research Institute, Jingmen, China

#### Numerical Simulation of the Wave-Induced Drift of Flat-Cylinder Floating

**Marine Debris Modelled as Discrete Particles** OMAE2023-103606

Diederik Westerkamp<sup>1</sup> Andriarimina Daniel Rakotonirina<sup>2</sup> Bruno Sainte-Rose<sup>1</sup> Ton van den Bremer<sup>3</sup>

1. The Ocean Cleanup, Rotterdam, Netherlands; 2. The Ocean Cleanup, Utrecht, Netherlands; 3. Delft University of Technology, Delft, Netherlands

#### Analysis of Convergence Behaviour for the Overset Mesh Based

**Numerical Wave Tank in Openfoam** OMAE2023-104586

Hao Chen<sup>1</sup> Ling Qian<sup>2</sup> Deping Cao<sup>3</sup>

1. Newcastle University in Singapore, Singapore, Singapore; 2. Manchester Metropolitan University, Manchester, United Kingdom; 3. Tongji University, Singapore, Singapore

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## Ocean Renewable Energy

### 09-01-05 Offshore Wind Energy – Moorings and Cables I

Tuesday June 13 | Room 216 | 13:30–15:00

**Session Organizer:** Marc Cahay, Technip Energies, France

**Session Co-Organizer:** Zhen Gao, NTNU, Norway

#### Modelling of Fibre Rope Mooring for a Floating Offshore Wind Turbine OMAE2023-102645

Thomas Viuff, Stian H. Sørum, Marit I. Kvittem

SINTEF Ocean, Trondheim, Norway

#### Analytical Model of Non-Linear Load Reduction Devices for Catenary Moorings OMAE2023-100845

Oscar Festa, Susan Gourvenec, Adam Sobey

University of Southampton, Southampton, United Kingdom

#### Comparison Study of Shallow Water and Deepwater Mooring Systems for Floating Offshore Wind Turbine OMAE2023-105073

Hyoungchul Kim, Bonjun Koo, Anil Sablok, Ho-Joon Lim, Tapio Laihomäki

TechnipEnergies, Houston, TX, USA

**Nonlinear Aero-Mooring Effects on Floating Offshore Wind Turbines under Random Wind and Waves: Environmental Direction Effects** OMAE2023-104333

Leandro Souza Pinheiro da Silva<sup>1</sup> Nataliia Y. Sergiienko<sup>2</sup> Benjamin S. Cazzolato<sup>2</sup> Kwong Kiu<sup>1</sup> Rodolfo T. Goncalves<sup>3</sup> Boyin Ding<sup>2</sup>  
1. Delmar Systems, Perth, WA, Australia; 2. The University of Adelaide, Adelaide, SA, Australia; 3. The University of Tokyo, Tokyo, Japan

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**Ocean Renewable Energy**

**09-02-05 Wave Energy Control and Power Take Off**

Tuesday June 13 | Room 217 | 13:30–15:00

Session Organizer: Yi-Hsiang Yu, NyCU, Taiwan

Session Co-Organizer: Daniel Gaebele, Sandia NL, USA

**Incorporating Empirical Nonlinear Efficiency into Control Co-Optimization of Real World Heaving Point Absorber Using WecOptTool** OMAE2023-103899

Daniel T. Gaebele<sup>1</sup> Carlos A. Michelen Strofer<sup>2</sup> Michael C. Devin<sup>2</sup> Jeff T. Grasberger<sup>2</sup> Ryan G. Coe<sup>2</sup> Giorgio Bacelli<sup>2</sup>  
1. Sandia National Laboratories, Corvallis, OR, USA; 2. Sandia National Laboratories, Albuquerque, NM, USA

**On Implementing Cummins Equation to Represent Accurate Wave Radiation Forces in Modelica™** OMAE2023-103996

Ajay Menon<sup>1</sup> Ali Shahbaz Haider<sup>2</sup> Kush Bubbar<sup>2</sup>  
1. Indian Institute of Technology Kharagpur, Coimbatore, TN, India; 2. University of New Brunswick, Fredericton, BC, Canada

**Latching Control of Wave Energy Converters Using Tunable Electrical Load** OMAE2023-104774

Uzair Bin Tahir<sup>1</sup> Jingxin Zhang<sup>2</sup> Richard Manasseh<sup>2</sup>  
1. Swinburne University of Technology, Camberwell, VIC, Australia; 2. Swinburne University of Technology, Hawthorn, VIC, Australia

**Design of a Two-Body Wave Energy Converter Featuring Controllable Geometry** OMAE2023-105020

Nathan Tom<sup>1</sup> David Ogden<sup>2</sup> Michaela Byrne<sup>3</sup>  
1. National Renewable Energy Laboratory, Golden, CO, USA; 2. Velocity Global, Hackney, United Kingdom; 3. Ohio University, Athens, OH, USA

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**Offshore Geotechnics**

**10-05-01 Bucket Foundations, Suction Caissons and Spudcans**

Tuesday June 13 | Room 206 | 13:30–15:00

Session Organizer: Denby Morrison, Shell, USA

Session Co-Organizer: Yuxia Hu, The University of Western Australia, Australia

**Decommissioning Analysis for Suction Caisson Foundations** OMAE2023-102040

Lupamudra Sharma, Julian Bubel  
Ramboll, Hamburg, Germany

**Numerical Analysis of the Effect of Multidirectional Load on the Bearing Capacity of Suction Bucket Foundation** OMAE2023-105425

Bin Yan<sup>1</sup> Wenxuan Zhu<sup>1</sup> Bin Gao<sup>1</sup> Guanlin Ye<sup>1</sup> Yinghui Tian<sup>2</sup>  
1. Shanghai Jiao Tong University, Shanghai, China; 2. The University of Melbourne, Parkville, VIC, Australia

**Research on Strengthening Complex Foundations by Combining Multiple Foundation Treatment Methods** OMAE2023-108141

Fei Xiao, Yonglai Zheng  
Tongji University, Shanghai, China

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## Petroleum Technology

### 11-02-01 Well Drilling Fluids and Hydraulics I

Tuesday June 13 | Room 211 | 13:30–15:00

**Session Organizer:** Arild Saasen, University of Stavanger, Norway

**Session Co-Organizer:** Ergun Kuru, University of Alberta, Canada

#### **Dynamic Filtration Loss Control through Optimization of Drilling Fluid Rheological Properties: a Comparative Study of the Fluid Viscoelasticity versus Shear Viscosity Effects** OMAE2023-100573

Hongbo Chen, Ergun Kuru

*University of Alberta, Edmonton, AB, Canada*

#### **Dual Shear Gun for Efficient Drilling Fluid Shearing – Laboratory Experiments** OMAE2023-104756

Ali Taghipour<sup>1</sup> Bjørnar Lund<sup>1</sup> Jan David Ytrehus<sup>1</sup> Arild Saasen<sup>2</sup> Geir Olav Ånesbug<sup>3</sup> Jan Egil Pallin<sup>3</sup>

*1. SINTEF, Trondheim, Norway; 2. University of Stavanger, Stavanger, Norway; 3. JAGTech, Orkanger, Norway*

#### **Critical Review of the Literature on Curing Losses and Long-Term Shale Inhibition** OMAE2023-105051

Abdullah S. Al-Yami, Muhammad Tahir, Majad Khan, Vikrant Wagle

*Saudi Aramco, Dhahran, Saudi Arabia*

#### **Preparation of a Synthetic Geo-Polymer Based LCM Utilizing Saudi Arabian Volcanic Ash for a Sustainable Development: Method, Lab Testing and Applications** OMAE2023-104959

Khawlah Alanqari, Abdullah Al-Yami, Vikrant Wagle

*Saudi Aramco, Dhahran, Saudi Arabia*

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## Blue Economy Symposium

### 13-05-01 Blue Economy V

Tuesday June 13 | Room 214 | 13:30–15:00

**Session Organizer:** Cristian Cifuentes Salazar, Universidad Austral de Chile, Chile

**Session Co-Organizer:** Yunil Chu, Griffith University, Australia

#### **Reducing Risk in Design and Operation of Exposed High Volume, Advanced Fish Farms** OMAE2023-101782

Per Arild Aland

*DNV, Oslo, Norway*

#### **The Challenges and Opportunities for the Use of Robotic Autonomous Robotic Systems in Support of the Blue Economy** OMAE2023-105124

Damien Guihen

*Australian Maritime College, Newnham, TAS, Australia*

#### **A Facility Location Model for Uncrewed Surface Vessels in the Maritime Survey Industry** OMAE2023-100612

Lucas Moorlag<sup>1</sup>, Xiaoli Jiang<sup>2</sup>

*1. Fugro, Rotterdam, Netherlands; 2. Delft University of Technology, Rotterdam, Netherlands*

#### **Time-Series Forecasting for Real-Time Monitoring of Marine and Offshore Operations** OMAE2023-104628

Mohammad Mahdi Abaei<sup>1</sup> Ahmad Bahootoroody<sup>2</sup> Ehsan Arzaghi<sup>3</sup> Rouzbeh Abbassi<sup>1</sup> Tommi Inkinen<sup>4</sup> Vikram Garaniya<sup>3</sup>

*1. Macquarie University, Sydney, NSW, Australia; 2. Aalto University, Espoo, Finland; 3. University of Tasmania, Launceston, TAS, Australia; 4. University of Turku, Turku, Finland*



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## CONCURRENT SESSIONS

15:30 – 17:00

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### Offshore Technology

#### 01-03-02 Hydrodynamic Industrial Applications

Tuesday June 13 | Room 205 | 15:30–17:00

Session Organizer: Weichao Shi, Newcastle University, United Kingdom

##### A Practical Approach for Wave Loads on Bilge Keels in Irregular Seas OMAE2023-101408

Jinzhu Xia<sup>1</sup> Huaxing Liu<sup>2</sup> Hilmi Sukri<sup>1</sup>

1. MISC Berhad, Kuala Lumpur, Malaysia; 2. OceanSTAR Marine & Offshore, Singapore, Singapore

##### Experimental Study of the Draft and Column Aspect Ratio on the Flow-Induced Motions (FIM) of a Semi-Submersible Platform with Four Square Columns OMAE2023-102704

Rodolfo Gonçalves<sup>1</sup> Matheus Marques<sup>2</sup> Leandro Silva<sup>3</sup> Shinichiro Hirabayashi<sup>4</sup> Hideyuki Suzuki<sup>1</sup>

1. The University of Tokyo, Bunkyo-Ku, Japan; 2. UFPE - Federal University of Pernambuco, Recife, RJ, Brazil; 3. JB Energy - Japan Blue Energy, Chiyoda-ku, Japan; 4. The University of Tokyo, Kashiwa-shi, Japan

##### Frequency Domain Dynamic Response Analysis of Three Parallel Ships in a Twin Marine Lifter System OMAE2023-104660

Huan Zhang, Yanjun Teng, Shida Fan, Yuhan Wang, Chao Wang, Yan Yin

Shanghai Waigaoqiao Shipbuilding Co., Ltd., Shanghai, China

##### On the Development of Aft Body Hull Form for Ship-Type Offshore Structures OMAE2023-104939

Joo-Sung Kim<sup>1</sup> Gisu Song<sup>2</sup> Hyejong Son<sup>1</sup> Bohee Kim<sup>3</sup> Jungki Park<sup>4</sup> Hyunjo Kim<sup>1</sup>

1. Samsung Heavy Industries, Daejeon, Korea; 2. Korea Maritime & Ocean University, Busan, Korea; 3. Samsung Heavy Industries, Seongnam, Korea; 4. Samsung Heavy Industries, Geoje, Korea

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### Structures, Safety and Reliability

#### 02-07-02 Data-driven Models for Marine Structures II

Tuesday June 13 | Room 212 | 15:30–17:00

Session Organizer: YeongAe Heo, Case Western Reserve University, USA

Session Co-Organizer: Carlos Guedes Soares, University of Lisbon, Portugal

##### Data-Driven TLP Tendon Loads from Internal Hull Fiber-Optic Sensors OMAE2023-103309

John D. Hedengren<sup>1</sup> David Brower<sup>2</sup> Kody Kidder<sup>3</sup> Zachary Hillman<sup>1</sup>

1. Brigham Young University, Provo, UT, USA; 2. Astro Technology, Inc., Houston, TX, USA; 3. EnVen Energy Corporation, Houston, TX, USA

##### A Methodology for Tuning of Computational Vessel Models Utilizing Wave Measurements from X-Band Marine Radar And Wave Buoy OMAE2023-104492

Gowtham Radhakrishnan<sup>1</sup> Bernt J. Leira<sup>1</sup> Zhen Gao<sup>1</sup> Svein Sævik<sup>1</sup> Karl E. Kaasen<sup>2</sup> Konstantinos Christakos<sup>1</sup> Johann A. Dirdal<sup>1</sup>

1. Norwegian University of Science and Technology, Trondheim, Norway; 2. SINTEF Ocean, Trondheim, Norway

##### Hydrodynamic Load Prediction of Slosh Flow Using Image-Based Machine Learning OMAE2023-104626

Daegyoun Kim, Ki Jong Kim

KAIST, Daejeon, Korea

##### A Data Driven Decision Support System for Structural Safety of Ships Moving in Waves OMAE2023-104753

Xueqian Zhou<sup>1</sup> Yu Yang<sup>2</sup> Yujie Liu<sup>2</sup> Guoqing Feng<sup>2</sup> Huilong Ren<sup>2</sup>

1. Harbin Engineering University, Harbin, China; 2. Harbin Engineering University, College of Shipbuilding Engineering, Harbin, China

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## Materials Technology

### 03-01-01 Fracture Assessment and Control

Tuesday June 13 | Room 206 | 15:30–17:00

**Session Organizer:** Mamdouh Salama, MMS4AIM LLC, USA

**Session Co-Organizers:** Agnes Marie Horn, DNV, Norway; Myung Hyun Kim, Pusan National University, Korea

#### Stress Intensity Factors and T-Stress Solutions for Mixed-Mode Compact-Tension-Shear (CTS) Specimens with Slanted Propagating Cracks OMAE2023-108192

Pengfei Jin<sup>1</sup> Zheng Liu<sup>1</sup> Xu Chen<sup>1</sup> Xin Wang<sup>2</sup>

1. Tianjin University, Tianjin, China; 2. Carleton University, Ottawa, ON, Canada

#### A Study on the Fracture Toughness Evaluation considering Material Tensile Characteristic for Cryogenic Steel OMAE2023-104718

Ji Hoon Kim<sup>1</sup> Young Cheon Jeong<sup>2</sup> Dong Pil Cho<sup>2</sup> Myung Hyun Kim<sup>1</sup>

1. Pusan National University, Busan, Korea; 2. Samsung Heavy Industry Co. Ltd, Geoje-si, Korea

#### Prediction of Mechanical Strength of Line Pipe Based on Novel Distortional Hardening Model OMAE2023-107939

Seonghwan Choi<sup>1</sup> Soo-Chang Kang<sup>2</sup> Myoung-Gyu Lee<sup>1</sup>

1. Seoul National University, Gwanak-gu, Korea; 2. Steel Solution Research Lab, POSCO, Yeonsu-gu, Korea

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## Pipeline, Risers, and Subsea Systems

### 04-01-04 Flexible Pipes and Umbilicals IV

Tuesday June 13 | Room 210 | 15:30–17:00

**Session Organizer:** Jose Renato De Sousa, UFRJ, Brazil

**Session Co-Organizer:** Anh Tuan Do, TechnipFMC, France

#### Analytical and Finite Element Assessment of Thermoplastic Composite Pipes under Pure Bending and Thermal Gradient OMAE2023-104870

Marcelo Caire<sup>1</sup> Pedro Luna Araújo Oliveira<sup>2</sup> Yangye He<sup>3</sup> Marcus Vinicius Da Cruz<sup>2</sup> Murilo Augusto Vaz<sup>1</sup>

1. COPPE / Federal University of Rio de Janeiro, Rio de Janeiro, RJ, Brazil; 2. Federal University of Rio de Janeiro, Rio de Janeiro, RJ, Brazil; 3. China University of Petroleum, Changping District, China

#### A Theoretical Approach for the Response of Offshore Composite Rubber Hose to the Crush Load OMAE2023-105338

Chuangchuang Li<sup>1</sup> Pan Gao<sup>1</sup> Qiang Gao<sup>2</sup> Yanling Gao<sup>2</sup> Youan Li<sup>3</sup>

1. Shanghai Maritime University, Shanghai, China; 2. Shanghai Maritime University, Pudong, China; 3. Hebei Zebung Rubber Technology Co., Ltd., Hengshui, China

#### Stability of Concrete Mattresses OMAE2023-106777

Dermot O' Brien<sup>1</sup> Scott Draper<sup>2</sup> Hongwei An<sup>2</sup>

1. Atteris Pty Ltd, Perth, WA, Australia; 2. University of Western Australia, Perth, WA, Australia

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## Pipeline, Risers, and Subsea Systems

### 04-02-03 Rigid Risers III

Tuesday June 13 | Room 213 | 15:30–17:00

**Session Organizer:** Theodoro Netto, Fundacao Coppetec, Brazil

#### A Novel Numerical Model for Computing the Global Response of a Steel Catenary Riser Based on Absolute Nodal Coordinate Formulation OMAE2023-104291

Jing Hou<sup>1</sup> Lusheng Jia<sup>1</sup> Yi Liu<sup>1</sup> Dejun Wang<sup>1</sup> Xu Jia<sup>1</sup> Cheng Zhang<sup>2</sup>

1. CNOOC Research Institute, Beijing, China; 2. South China University of Technology, Guangzhou, China

#### Incorporation of Effective Stress Analysis into the Global Model of the Subsea Riser: Accounting for Soil Remoulding and Reconsolidation Effect OMAE2023-104471

Hossein Janbazi, Hodjat Shiri

Memorial University of Newfoundland, St. John's, NL, Canada

## Proposal for How to Assess the Load Reduction Efficiency of Wellhead Load Relief Systems OMAE2023-104891

Stian Sætre<sup>1</sup> Anthony Muff<sup>1</sup> Torfinn Hørte<sup>2</sup> Michael Macke<sup>2</sup> Per Osen<sup>1</sup> Lorents Reinås<sup>1</sup>

1. Equinor, Stavanger, Norway; 2. DNV, Høvik, Norway

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## Ocean Space Utilization

### 05-02-01 Aquaculture and Related Technology I

Tuesday June 13 | Room 207 | 15:30–17:00

**Session Organizer:** Tomoki Ikoma, Nihon University, Japan

**Session Co-Organizers:** Daisuke Kitazawa, IIS, University of Tokyo, Japan; Muk Chen Ong, University of Stavanger, Norway

#### Alternative Rope Materials in Towed Fishing Gear to Reduce Plastic Waste, a Comparative Study of Mechanical Properties and Tolerance against Wear and Tear OMAE2023-104444

Heidi Moe Føre, Hanne Hjelle Hatlebrekke, Eduardo Grimaldo

SINTEF Ocean, Trondheim, Norway

#### Wake Effects on the Drag Force Estimation of Downstream Fish Cages OMAE2023-101705

Hui Cheng, Onur Aydemir, Muk Chen Ong

University of Stavanger, Stavanger, Norway

#### A Physical Model Approach to Mooring Loads and Motion Responses of a Closed Fish Tank Including Internal Free Water OMAE2023-105129

Huaizhi Zhao<sup>1</sup> Shuchuang Dong<sup>1</sup> Jinxin Zhou<sup>2</sup> Qiao Li<sup>2</sup> Daisuke Kitazawa<sup>2</sup>

1. The University of Tokyo, Kashiwa, Japan; 2. Institute of Industrial Science, The University of Tokyo, Kashiwa, Japan

#### An Experimental Study on the Responses of a Spar-Type Floating Structure Integrated with Aquaculture Systems OMAE2023-104637

Qiao Li, Shuchuang Dong, Jinxin Zhou, Daisuke Kitazawa

The University of Tokyo, Kashiwa, Japan

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## Ocean Engineering

### 06-05-04 Marine Hydrodynamics IV

Tuesday June 13 | Room 218 | 15:30–17:00

**Session Organizer:** Masoud Hayatdavoodi, The University of Dundee, United Kingdom

#### A Numerical Study of Wave Impacts on a Semi-Submersible OMAE2023-106568

Yanfei Deng<sup>1</sup> He Li<sup>2</sup> Zixuan Wang<sup>3</sup>

1. Institute of Intelligent Ocean Engineering, Harbin Institute of Technology Shenzhen, Shenzhen, China; 2. School of Mechanical Engineering and Automation, Shenzhen, China; 3. Institute of Intelligent Ocean Engineering, Harbin Institute of Technology (Shenzhen), Shenzhen, China

#### Doppler Shift Approximation for Predicting the Wave-Induced Response of Advancing Vessels in Following Waves OMAE2023-107733

Raphaël E. G. Mounet<sup>1</sup> Ulrik D. Nielsen<sup>1</sup> Astrid H. Brodtkorb<sup>2</sup>

1. Technical University of Denmark, Kongens Lyngby, Denmark; 2. Norwegian University of Science and Technology, Trondheim, Norway

#### A Combined Maneuvering and Seakeeping Model for the ONR Tumblehome OMAE2023-108022

Omotayo Oladele<sup>1</sup> William Lambert<sup>2</sup> Stefano Brizzolaro<sup>2</sup>

1. Virginia Tech, Christiansburg, VA, USA; 2. Virginia Tech, Blacksburg, VA, USA

#### Numerical Study on the Evolution of Vortices Influenced by Downstream Undulating Foil with Different Lateral Distances OMAE2023-102766

Pengfei Wang, Ruoxin Li, Kai Yu

Qingdao Innovation and Development Centre of Harbin Engineering University, Qingdao, China

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## Polar and Arctic Sciences and Technology

### 07-03-03 Vessels in Ice III

Tuesday June 13 | Room 208 | 15:30–17:00

**Session Organizer:** Mojtaba Mokhtari, NTNU, Norway

**Session Co-Organizer:** Franciska Müller, Hamburg University of Technology, Germany

#### **Stress-Strain Predictive Analysis of Ship Structure in Ice Area Based on Neural Network** OMAE2023-104315

Feixu Li, Shifeng Ding, Renwei Liu, Aimin Wang

*Jiangsu University Of Science And Technology, Zhenjiang, China*

#### **Numerical Assessment of Novel Ice Breaking Technology** OMAE2023-104670

Kristjan Tabri<sup>1</sup> Kalju Saar<sup>1</sup> Marie Aanensen<sup>2</sup> Steiner Andersen<sup>3</sup>

*1. Tallinn University of Technology, Marine Technology Competence Centre, Tallinn, Estonia;*

*2. Bifrost Tug Estonia, Tallinn, Estonia; 3. Døbfjorden Slipp AS, Sagvåg, Norway*

#### **Probable Ice Impact Locations and Magnitudes on a Naval Hull Form in**

**Forward Transit through Marginal Ice Zones** OMAE2023-104854

Edward Bryson<sup>1</sup> Bruce W. T. Quinton<sup>2</sup> Claude Daley<sup>2</sup>

*1. Memorial University of Newfoundland, Mount Pearl, NL, Canada; 2. Memorial University of Newfoundland, St. John's, NL, Canada*

#### **Using Non-Linear Finite Element Analysis to Analyze the Effects of Connection**

**Designs on the Ice Strength of a Vessel** OMAE2023-104860

Joshua Gosse<sup>1</sup> Bruce Quinton<sup>1</sup> Claude Daley<sup>1</sup> Andrew Kendrick<sup>2</sup> James Bond<sup>3</sup>

*1. Memorial University of Newfoundland, St. John's, NL, Canada; 2. Vard Marine Inc., Ottawa,*

*ON, Canada; 3. American Bureau of Shipping, Ottawa, ON, Canada*

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## CFD, VIV and FSI

### 08-03-02 Free Surface Flows II

Tuesday June 13 | Room 209 | 15:30–17:00

**Session Organizer:** Mengmeng Zhang, Shanghai Jiao Tong University, China

**Session Co-Organizers:** Owen Oakley, Retired, USA; Narakorn Srinil, Newcastle University, United Kingdom

#### **Study on Self-Propelled Wake Characteristics of Surface Ship** OMAE2023-104552

Han Xiang, Weihua Deng, Yanlin Zou, Xunming Wang, Dakui Feng

*School of Naval Architecture and Ocean Engineering, Wuhan, China*

#### **Design Assessment of Mechanical Wavemakers: a Comprehensive Study towards Wave-Structure Interaction Applications** OMAE2023-104594

Muhannad W. Gamaleldin<sup>1</sup> Alexander V. Babanin<sup>1</sup> Amin Chabchoub<sup>2</sup>

*1. The University of Melbourne, Melbourne, VIC, Australia; 2. Kyoto University, Uji, Japan*

#### **Numerical Prediction of Dynamic Pressure Loads in a Dam Break Case with the Direct Surface Description Method** OMAE2023-107186

Jesper Roland Kjærgaard Qwist, Erik Damgaard Christensen

*Technical University of Denmark, Kgs. Lyngby, Denmark*

#### **A Systematic Approach of Developing a Numerical Wavetank to Simulate Driven Shallow- and Deep-Water Waves** OMAE2023-108097

Wajiha Rehman, Onno Bokhove, Mark Kelmanson

*University of Leeds, Leeds, United Kingdom*

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## Ocean Renewable Energy

### 09-01-06 Offshore Wind Energy – Moorings and Cables II

Tuesday June 13 | Room 216 | 15:30–17:00

Session Organizer: Vegard Longva, SINTEF, Norway

Session Co-Organizer: Naiquan Ye, SINTEF, Norway

#### A Numerical Assessment of Mooring System Modelling Uncertainties in Hydrodynamic Model Testing of Floating Wind Turbines OMAE2023-104699

Petter Andreas Berthelsen<sup>1</sup> Maxime Thys<sup>1</sup> Erin Bachynski-Polić<sup>2</sup>

1. SINTEF Ocean, Trondheim, Norway; 2. Dept. of Marine Technology, Norwegian University of Science and Technology, Trondheim, Norway

#### A Model for Friction Stresses in Cable Core OMAE2023-104817

Geir Skeie, Nils Sødahl, Sune Pettersen, Lars Helge Verde

DNV, Høvik, Norway

#### Application of Stablepipe Method C Assessment to Determine On-Bottom Stability of a Cable Crossing in North Sea Mobile Seabed Conditions OMAE2023-102329

Jack Jorgensen<sup>1</sup> Terry Griffiths<sup>1</sup> Nic Mcgrath<sup>1</sup> Doğukan Görmüş<sup>2</sup> Glenn Severs<sup>2</sup> Bryan Thurstan<sup>1</sup> Fabrizio Pistani<sup>1</sup> Bart Ledoux<sup>2</sup>

1. Aurora Offshore Engineering, Nedlands, WA, Australia; 2. Jan De Nul Group, Aalst, Belgium

#### Improved Reliability Assessment Methods for Subsea Cables on Rocky Seabed Using NPV Calculation OMAE2023-102341

Nicholas McGrath<sup>1</sup> Terry Griffiths<sup>1</sup> Jack Jorgensen<sup>1</sup> Fabrizio Pistani<sup>1</sup> Scott Draper<sup>2</sup> Liang Cheng<sup>2</sup>

1. Aurora Offshore Engineering, Nedlands, WA, Australia; 2. University of Western Australia, Nedlands, WA, Australia

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## Ocean Renewable Energy

### 09-05-01 Hydrogen and Energy Storage

Tuesday June 13 | Room 217 | 15:30–17:00

Session Organizer: Marc Cahay, Technip Energies, France

#### A Novel Conceptual Design of Modularised Offshore Green Hydrogen System OMAE2023-101527

Ming Zhang, Zhi-Ming Yuan, Long-Bin Tao, Wei-Chao Shi

University of Strathclyde, Glasgow, United Kingdom

#### Machine Learning Regression-CFD Models for the Hydrogen Dispersion in Upwind Direction from Various Leakage Location in a Naturally Ventilated Space OMAE2023-104522

Parth Patel<sup>1</sup> Vikram Garaniya<sup>1</sup> Til Baalisampang<sup>1</sup> Ehsan Arzaghi<sup>1</sup> Javad Mohammadpour<sup>2</sup> Rouzbeh Abbassi<sup>3</sup> Fatemeh Salehi<sup>3</sup>

1. University of Tasmania, Launceston, TAS, Australia; 2. Macquarie University, School of Engineering, Sydney, NSW, Australia; 3. Macquarie University, Sydney, NSW, Australia

#### Economic Analysis of Batteries and Fuel Cells for an Offshore Energy Hub OMAE2023-105003

Ramon Abritta Aguiar Santos<sup>1</sup> Alexey Pavlov<sup>1</sup> Damiano Varagnolo<sup>1</sup> Børre T. Børresen<sup>2</sup>

1. Norwegian University of Science and Technology, Trondheim, Norway; 2. Equinor, Trondheim, Norway

#### Energy Storage and Direct Air Carbon Capture for Deep Water Energy Sources OMAE2023-106209

Graydon Hands, Kevin Truong, Yvan Unico, Areeb Ashar, Ali Al-Saiedy, Roman Shor

University of Calgary, Calgary, AB, Canada

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## Petroleum Technology

### 11-02-02 Well Drilling Fluids and Hydraulics II

Tuesday June 13 | Room 211 | 15:30–17:00

**Session Organizer:** Arild Saasen, University of Stavanger, Norway

**Session Co-Organizer:** Ergun Kuru, University of Alberta, Canada

#### **Application of the Yield Stress Concept in Drilling Fluid Engineering** OMAE2023-101294

Arild Saasen<sup>1</sup> Jan David Ytrehus<sup>2</sup> Bjørnar Lund<sup>2</sup>

1. University of Stavanger, Stavanger, Norway; 2. SINTEF, Trondheim, Norway

#### **Lab Development and Field Deployment of Novel High Molecular Weight**

#### **Polyamine-Based Shale Inhibitor for Water-Based Drilling Fluids** OMAE2023-104418

Vikrant Wagle, Abdullah Alyami, Ali Safran, Sara Alkhalaf

Saudi Aramco, Dhahran, Saudi Arabia

#### **Application of Insulated Drill Pipe to Supercritical/Super-Hot Geothermal Well Drilling** OMAE2023-104713

Ajima Kohei, Shigemi Naganawa, Elvar Karl Bjarkason

Akita University, Akita, Japan

#### **Determination of Drilling Fluid's Elasto-Viscoplastic Thixotropic Properties from Gel Strength Measurements and Transient Models** OMAE2023-105303

Kristian Gjerstad

University of Stavanger, Sola, Norway

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## Blue Economy Symposium

### 13-06-01 Blue Economy VI

Tuesday June 13 | Room 214 | 15:30–17:00

**Session Organizer:** Yunit Chu, Griffith University, Australia

**Session Co-Organizer:** Ehsan Arzaghi, AMC, UTAS, Australia

#### **Floating Nuclear Power Plants, a Safe Way Out of the Energy and Climate Conundrum** OMAE2023-100725

Soon Heng Lim

The Society of Floating Solutions, Singapore, Singapore

#### **Human Element and Sustainable Development in the Context of Industry 4.0 and Blue Economy** OMAE2023-101806

Gholam Reza Emad, Mehrangiz Shahbakhsh, Nagi Abdussamie, T. M. Rabiul Islam

University of Tasmania, Launceston, TAS, Australia

#### **Towards Developing a Code of Practice for Offshore Aquaculture Vessels** OMAE2023-101836

Saeed Mohajernasab<sup>1</sup> Nagi Abdussamie<sup>2</sup> Andrew Harris<sup>3</sup> Chris Shearer<sup>4</sup> Nick Tighe<sup>4</sup>

Prashant Bhaskar<sup>5</sup> Chris Chin<sup>5</sup> Rabiul Islam<sup>5</sup> Jonathan Binns<sup>6</sup> Hossein Enshaei<sup>5</sup>

1. Blue Economy CRC, Launceston, TAS, Australia; 2. Blue Economy CRC, Newnham, TAS, Australia; 3. BMT, Prospect, SA, Australia; 4. BMT, Melbourne, VIC, Australia; 5. Australian Maritime College, Newnham, TAS, Australia; 6. Defence Science and Technology Group, Melbourne, VIC, Australia

#### **A Feasibility Study on Green Energy Production at the Location of Offshore Oil and Gas Platforms in Australia** OMAE2023-105112

Vahid Aryai<sup>1</sup> Nagi Abdussamie<sup>2</sup> Rouzbeh Abbasi<sup>3</sup> Irene Penesis<sup>4</sup> Chien-Ming Wang<sup>4</sup> Vikram Garaniya<sup>5</sup>

1. Energy, Commonwealth Scientific and Industrial Research Organization (CSIRO), Newcastle, NSW, Australia; 2. Blue Economy CRC-Co., Riverside, TAS, Australia; 3. School of Engineering, Faculty of Science and Engineering, Macquarie University, Sydney, NSW, Australia; 4. Blue Economy Cooperative Research Centre, Launceston, TAS, Australia; 5. University of Tasmania, Launceston, TAS, Australia

# Wednesday Concurrent Sessions

## CONCURRENT SESSIONS

08:30 – 10:00

### Offshore Technology

#### 01-08-01 Digital Twin Applications to Offshore Systems

Wednesday June 14 | Room 205 | 08:30–10:00

Session Organizer: Rajiv Aggarwal, Reliable Offshore Systems LLC, USA

##### Developments of the Glen Lyon Fpso Digital Twin: Vessel Response and Structural Monitoring OMAE2023-105101

Jonathan Bailey<sup>1</sup> Richard J Bamford<sup>1</sup> Suvabrata Das<sup>2</sup> Soma S Maraju<sup>3</sup> Robert J. Barker<sup>3</sup>

1. BP, Milton Keynes, United Kingdom; 2. BMT Commercial USA Inc., Katy, TX, USA; 3. BMT Commercial USA Inc., Houston, TX, USA

##### Digital Twin Concept for Offshore Wind Farm Jacket Lifting Frame OMAE2023-102440

Sabih Laham, Vijaykumar Mali, Kurinjivelan Palaniyandi

Lamprell Energy Limited, Sharjah, United Arab Emirates

##### Quality Assurance of Digital Twins OMAE2023-105285

Kjell Eriksson, Christian Markussen

DNV, Høvik, Norway

##### Modular Collision Avoidance Using Predictive Safety Filters OMAE2023-103740

Aksel Vaaler, Haakon Robinson, Trym Tengesdal, Adil Rasheed

Norwegian University of Science and Technology, Trondheim, Norway

### Structures, Safety and Reliability

#### 02-09-01 Reliability of Mooring and Riser Systems

Wednesday June 14 | Room 212 | 08:30–10:00

Session Organizer: Ying Min Low, National University of Singapore, Singapore

Session Co-Organizer: Luis Sagrilo, Federal University of Rio de Janeiro, Brazil

##### A Combination of Surrogate Model and Subset Simulation Method for Long-Term

##### Extreme Response Analysis of Marine Risers OMAE2023-101700

Qingqing Miao, Ankang Cheng, Ying Min Low

National University of Singapore, Singapore, Singapore

##### Ge-Narx Based Data-Driven Modelling of Long-Term Riser Response to

##### Irregular Waves considering Wave Directionality OMAE2023-102807

Ankang Cheng, Ying Min Low

National University of Singapore, Singapore, Singapore

##### Rapid Residual Strength Assessment of Degraded Mooring Chains Using a Finite

##### Element Analysis Based Response Surface Modelling Tool OMAE2023-104519

David Gunn, Simon Dimopoulos, Chris Carra

AMOG Consulting, Melbourne, VIC, Australia

##### Structural Reliability of Dynamic Power Cables Used in Floating Wind Turbines – a Review OMAE2023-103433

Rasoul Hejazi

The University of Western Australia, Crawley, WA, Australia

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## Materials Technology

### 03-02-01 Fatigue Performance & Inspection Planning

Wednesday June 14 | Room 206 | 08:30–10:00

Session Organizer: Mamdouh Salama, MMS4AIM LLC, USA

Session Co-Organizers: Agnes Marie Horn, DNV, Norway; David Baker, ExxonMobil Technology and Engineering Company, USA

#### Fatigue Strength of 3" Subsea Pressure Containing Bolts in Air and Seawater Environment OMAE2023-104674

Agnes Marie Horn<sup>1</sup> Arne Fjeldstad<sup>2</sup> Tore Geir Wernø<sup>3</sup> Anthony. D. Muff<sup>4</sup>

1. DNV, Oslo, Norway; 2. DNV, Høvik, Norway; 3. Equinor, Stavanger, Norway; 4. Equinor, Fornebu, Norway

#### Surface Corrosion Fatigue Crack Growth Test in Accelerating Environment

Where General Surface Corrosion Proceed in Parallel OMAE2023-101139

Hitoshi Hayashibara<sup>1</sup> Ryutarō Fueki<sup>1</sup> Norio Yamamoto<sup>2</sup> Tomohiro Sugimoto<sup>2</sup> Takahiro Ando<sup>1</sup>

Shuichi Tsumura<sup>1</sup> Yosuke Anai<sup>1</sup> Chikahisa Murakami<sup>1</sup> Toshio Niwa<sup>1</sup> Toshiaki Iwata<sup>1</sup> Kinya Ishibashi<sup>2</sup>

1. National Maritime Research Institute, Mitaka-shi, Japan; 2. Nippon Kaiji Kyokai (Class NK), Chiyoda-ku, Japan

#### Inspection Planning in the Marine Sector, a Case Study of a Hydrogen-Fueled Fishing Boat OMAE2023-100914

Leonardo Giannini<sup>1</sup> Sepideh Jafarzadeh<sup>2</sup> Alessandro Campari<sup>1</sup> Federico Ustolin<sup>1</sup> Nicola Paltrinieri<sup>2</sup>

1. Norwegian University of Science and Technology, Trondheim, Norway; 2. SINTEF, Trondheim, Norway

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## Pipeline, Risers, and Subsea Systems

### 04-03-01 Mechanics I

Wednesday June 14 | Room 210 | 08:30–10:00

Session Organizer: Julian Hallai, Exponent, USA

#### Experimental Quantification of Collapse Enhancement from Light Thermal Treatment OMAE2023-101113

Chris Timms<sup>1</sup> Duane DeGeer<sup>2</sup> Bruce Chandler<sup>2</sup> Ping Liu<sup>3</sup> Doug Swanek<sup>1</sup> Qishi Chen<sup>1</sup>

1. C-FER Technologies, Edmonton, AB, Canada; 2. Intecsea, Houston, TX, USA; 3. Intecsea, Den Haag, Netherlands

#### Investigation on Residual Contact Pressure of Mechanically Lined Pipe with Partially

Plastified Carrier Pipe Based on Tresca Criterion OMAE2023-101748

Rongzhi Wei<sup>1</sup> Murilo Augusto Vaz<sup>1</sup> Xuefeng Hu<sup>2</sup> Jianing Guo<sup>2</sup>

1. Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brazil; 2. CNOOC Petroleum Brasil Ltda., Rio de Janeiro, RJ, Brazil

#### Lüders Induced Localization in Tubes under Cyclic Bending OMAE2023-101793

Weihan Zhang, Stelios Kyriakides

University of Texas, Austin, TX, USA

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## Ocean Space Utilization

### 05-05-02 Aquaculture and Related Technology II

Wednesday June 14 | Room 207 | 08:30–10:00

Session Organizer: Tomoki Ikoma, Nihon University, Japan

Session Co-Organizer: Motohiko Murai, Yokohama National University, Japan

#### A Basic Investigation of Resonance Characteristics of Water Regions of PW-OWC WECS OMAE2023-104669

Tomoki Ikoma<sup>1</sup> Airi Kuwata<sup>2</sup> Yasuhiro Aida<sup>2</sup> Koichi Masuda<sup>2</sup>

1. Nihon University, Matsudo, Japan; 2. Nihon University, Funabashi, Japan

#### Development of Numerical Model of Floating Body with Air Chamber for the

OWC-WEC Using Two-Phase Flow Mps Method OMAE2023-107202

Yutaro Sasahara, Mitsuhiro Masuda

Tokyo University of Marine Science and Technology, Koto-ku, Japan



**Proposal for Motion Stabilized Platform for Offshore Wind Observations by Doppler Lidar and Its Validation** OMAE2023-104685

Yusuke Yamamoto, Mizuki Kinugasa, Hiroki Morota, Toru Katayama  
*Osaka Metropolitan University, Sakai, Japan*

**LSTM Based Model Predictive Control of Motion Stabilized Platform to Equip Doppler Lidar for Offshore Wind Observations** OMAE2023-108083

Mizuki Kinugasa<sup>1</sup> Yusuke Yamamoto<sup>1</sup> Daisuke Terada<sup>2</sup> Toru Katayama<sup>1</sup>  
*1. Osaka Metropolitan University, Sakai-Shi Naka-Ku, Japan; 2. National Defense Academy of Japan, Yokosuka, Japan*

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## Ocean Engineering

### 06-01-01 Computational Mechanics and Design Applications I

Wednesday June 14 | Room 218 | 08:30–10:00

Session Organizer: Yuzhu Pearl Li, National University of Singapore, Denmark

**Using CFD to Assess the Wind Loads on the Topside of a Self-Propelled Wind Turbine Installation Jack-Up – a Comparative Study of Simplified with Detailed Topside Structures at Model-Scale and Full-Scale** OMAE2023-101096

Zana Sulaiman  
*GustoMSC, Schiedam, Netherlands*

**First Principle Design Load Estimation for LH2 Fuel Tanks by Means of OD Approach** OMAE2023-102581

Tobias Lampe, Lukas Roß, Bright Ebikemefa Okpeke, Sören Ehlers  
*Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR) / German Aerospace Center, Geesthacht, Germany*

**Temporal Discretization Investigation of the Unsteady Loading on an Infinitely Long Cylinder in High Reynolds Numbers Using DES** OMAE2023-104427

Marielle de Oliveira<sup>1</sup> Leandro S. P. da Silva<sup>2</sup> Fabio Saltara<sup>3</sup> Bruno Carmo<sup>1</sup> Rodolfo T. Gonçalves<sup>4</sup>  
*1. University of São Paulo, São Paulo, SP, Brazil; 2. Delmar Systems, Perth, WA, Australia; 3. Dept. of Mechanical Engineering at University of São Paulo, São Paulo, SP, Brazil; 4. University of Tokyo, Tokyo, Japan*

**Study of the Scale Effect on the Resistance of a Double-Bow Ferryboat** OMAE2023-104963

Luis Antonio Matile Cascelli<sup>1</sup> Juan Ordóñez<sup>2</sup> Jeferson Avila Souza<sup>1</sup> Crístofer Hood Marques<sup>1</sup>  
*1. Federal University of Rio Grande, Rio Grande, RS, Brazil; 2. Florida State University, Tallahassee, FL, USA*

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## Ocean Engineering

### 06-04-05 Marine Engineering and Technology V

Wednesday June 14 | Room 203 | 08:30–10:00

Session Organizer: Rodrigo Soares, Federal University of Rio de Janeiro, Brazil

**An Expert Knowledge-Based Multi-Criteria Group Decision-Making Framework for Ship Overall Design Selection in Fuzzy Circumstances** OMAE2023-106039

Cheng Chen<sup>1</sup> Xiangrui Zhang<sup>2</sup> Pei Zhang<sup>2</sup> Feng Feng<sup>1</sup> Cong Sun<sup>1</sup> Xiuyuan Zhang<sup>1</sup>  
*1. College of Shipbuilding Engineering, Harbin Engineering University, Harbin, China; 2. Marine Design and Research Institute of China, Shanghai, China*

**Aerodynamic Investigation of Tower Shadow Effects on the Horizontal Axial Dual-Rotor Wind Turbine** OMAE2023-108147

Mengshang Zhao<sup>1</sup> Ruosi Zha<sup>2</sup> Kai Wang<sup>2</sup> Xiaodi Wu<sup>2</sup> Siqi Chen<sup>2</sup>  
*1. Sun Yat-sen University, Zhuhai, China; 2. School of Ocean Engineering and Technology, Sun Yat-Sen University, Zhuhai, China*

**Dynamic Response Analysis of an End-Anchored Floating Bridge with a Damaged Pontoon under Repair Operation** OMAE2023-101805

Minghao Cui<sup>1</sup> Zhengshun Cheng<sup>1</sup> Peng Chen<sup>1</sup> Torgeir Moan<sup>2</sup>  
*1. Shanghai Jiao Tong University, Shanghai, China; 2. Norwegian University of Science and Technology, Trondheim, Norway*

**Wave Attenuation by Submerged Oscillating Plates** OMAE2023-105070

Yongbo Chen<sup>1</sup> Masoud Hayatdavoodi<sup>2</sup> Binbin Zhao<sup>1</sup> R. Cengiz Ertekin<sup>3</sup>  
*1. Harbin Engineering University, Harbin, China; 2. University of Dundee, Dundee, United Kingdom; 3. University of Hawaii at Manoa, Honolulu, HI, USA*

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## Ocean Engineering

### 06-11-01 Ocean Engineering Technology I

Wednesday June 14 | Room 204 | 08:30–10:00

Session Organizer: Irving David Fontes, Federal University of Rio de Janeiro, Brazil

#### Verification of a Swarm Intelligent Underwater Robot System for Marine Environment Observation with Vehicle Loss Compensation and Functionality Maintenance OMAE2023-101043

Kanako Kobatake<sup>1</sup> Masakazu Arima<sup>2</sup>

1. National Maritime Research Institute, Mitaka-shi, Japan; 2. Osaka Metropolitan University, Sakai, Japan

#### Implementing a Method for Meteorological and Oceanographic Climate and Data Evaluation OMAE2023-101799

Joannes Gullaksen

JG Consultant & Ocean Engineering Services, Basingstoke, United Kingdom

#### Experimental Study on the Hydrodynamic Performance of a U-Shaped Flexible Membrane Breakwater OMAE2023-102079

Jingping Wu<sup>1</sup> Xi Yi<sup>1</sup> Zaojian Zou<sup>2</sup> Peng Zhan<sup>3</sup> Changzhe Chen<sup>2</sup>

1. Wuhan University of Technology, Wuhan, China; 2. Shanghai Jiao Tong University, Shanghai, China; 3. China Classification Society, Beijing, China

#### Numerical Study on the Automatic Ballast Control of a Floating Dock OMAE2023-102873

Xueliang Wen, Alejandro Garcia Conde, Jianan Zhang, Muk Chen Ong

University of Stavanger, Stavanger, Norway

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## Ocean Engineering

### 06-12-01 Ship Hydromechanics I

Wednesday June 14 | Room 217 | 08:30–10:00

Session Organizer: Marcio Yamamoto, National Maritime Research Institute, Japan

#### A 4-Degree of Freedom Velocity / Power Prediction Program for Wind (Assisted) Vessels OMAE2023-101675

Johannes Oettle, Stefan Krüger

Hamburg University of Technology, Hamburg, Germany

#### A Fast Numerical Model for Evaluating the Stability of a Damaged Ship in Regular Beam Waves OMAE2023-102410

Jianwen Duan, Ning Ma, Qiqi Shi, Xiechong Gu

Shanghai Jiao Tong University, Zhenjiang, China

#### Numerical Study on the Hydrodynamic Characteristics of a Small High-Speed Craft OMAE2023-102431

Huizi Lv<sup>1</sup> Chengzhu Wei<sup>2</sup> Xiaofeng Liang<sup>1</sup> Hong Yi<sup>1</sup>

1. Shanghai Jiao Tong University, Shanghai, China; 2. China Ship Development and Design Center, Shanghai, China

#### Reducing Containership Greenhouse Gas Emissions through Speed Optimization by Coupling a Fast Time Manoeuvring Solver to a One-Dimensional Propulsion Model and Under Keel Clearance Prediction System in Shallow Water under Environmental Forcings OMAE2023-103261

Reza Fathi Kazerooni<sup>1</sup> Helena Karatvuo<sup>1</sup> Alex Harkin<sup>1</sup> Timothy Womersley<sup>1</sup> Bugge Jensen<sup>2</sup>

1. Seaport OPX, Surfers Paradise, QLD, Australia; 2. Force Technology, Brøndby, Denmark

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## Polar and Arctic Sciences and Technology

### 07-04-01 Vessels in Ice and Model Test

Wednesday June 14 | Room 208 | 08:30–10:00

Session Organizer: Zou Ming, Shanghai Jiao Tong University, China

Session Co-Organizer: Mikko Suominen, Aalto University, Finland

#### A Preliminary Investigation of Risk Control Options for Maritime Accidents in Arctic Waters OMAE2023-105765

Si Yuan Gu, Shan Shan Fu, Yue Zhang

Shanghai Maritime University, Shanghai, China

## Impact of New Bow Shapes on Fsicr Power Requirements OMAE2023-102474

Riikka Matala<sup>1</sup> Mikko Suominen<sup>2</sup>

1. Aker Arctic Technology Inc, Helsinki, Finland; 2. Aalto University, Espoo, Finland

## Effect of Axial Confinement on Flexural Strength of Freshwater Ice OMAE2023-104638

Taha Anwar<sup>1</sup> Rocky Taylor<sup>1</sup> Jungyong Wang<sup>2</sup>

1. Memorial University of Newfoundland, St. John's, NL, Canada; 2. National Research Council Canada, St. John's, NL, Canada

## Multi-Particle Modelling of Compressive Ice Failure during Indentation by Rock Particles OMAE2023-107769

Thomas Fitzpatrick<sup>1</sup> Rocky S. Taylor<sup>1</sup> Jan Thijssen<sup>2</sup>

1. Memorial University of Newfoundland, St. John's, NL, Canada; 2. CCORE, St. John's, NL, Canada

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## CFD, VIV and FSI

### 08-04-01 CFD Development I

Wednesday June 14 | Room 209 | 08:30–10:00

**Session Organizer:** Owen Oakley, Retired, USA

**Session Co-Organizers:** Rajeev Jaiman, University of British Columbia, Canada; Guang Yin, University of Stavanger, Norway

#### A GPU-Accelerated High-Order Spectral Model for Numerical Analysis of Nonlinear Waves-Current-Structure Interactions OMAE2023-101331

Xin Lu, My Ha Dao, Quang Tuyen Le

Institute of High Performance Computing, Singapore, Singapore

#### Symmetry Breaking of a Rigid-Flexible Coupling System at Low Reynolds Numbers OMAE2023-102999

Huanyu Zhang, Xinliang Tian, Yakun Zhao, Xin Li, Wenyue Lu

State Key Laboratory of Ocean Engineering, Shanghai, China

#### A New Integrated Finite Volume–Finite Volume Numerical Model for Wave-Structure Interactions OMAE2023-103590

Ranjodh S. Rai<sup>1</sup> Zhihua Ma<sup>1</sup> Ling Qian<sup>1</sup> Wei Bai<sup>1</sup> Zaibin Lin<sup>2</sup> Anatoliy Khait<sup>3</sup>

1. Manchester Metropolitan University, Manchester, United Kingdom; 2. University of Aberdeen, Aberdeen, United Kingdom; 3. Ariel University, Ariel, Israel

#### Hydrodynamic Damping of a Circular Cylinder in Current with High Frequency Inline Oscillation OMAE2023-104334

Dan Pang<sup>1</sup> Liang Cheng<sup>2</sup> Hongyi Jiang<sup>1</sup> Feifei Tong<sup>1</sup> Hongwei An<sup>1</sup>

1. University of Western Australia, Perth, WA, Australia; 2. South China University of Technology, Guangzhou, China

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## Ocean Renewable Energy

### 09-01-07 Offshore Wind Energy – Hydrodynamics I

Wednesday June 14 | Room 216 | 08:30–10:00

**Session Organizer:** Sebastien Gueydon, O3 Engineering Consulting, Australia

**Session Co-Organizer:** Jack Jorgensen, UWA, Australia

#### A Wave Run-Up Empirical Modelling Comparison Study for a Scale Model Semi-Submersible Floating WTG Platform OMAE2023-100980

Tegan S. Foster<sup>1</sup> Amin Ghadirian<sup>2</sup> Michael Borg<sup>2</sup> Per C. Hyldahl<sup>2</sup> Vengatesan Venugopal<sup>3</sup> Longbin Tao<sup>4</sup> Lars Johanning<sup>5</sup>

1. Stiesdal Offshore Technology A/S, Stowmarket, United Kingdom; 2. Stiesdal Offshore A/S, Copenhagen, Denmark; 3. The University of Edinburgh, Edinburgh, United Kingdom; 4. University of Strathclyde, Glasgow, United Kingdom; 5. University of Exeter, Penryn, United Kingdom

#### Validation of CFD-Based Numerical Wave Basin for a Floating Offshore Wind Turbine in Irregular Waves and Dynamic Wind OMAE2023-104384

Hyunchul Jang<sup>1</sup> Hakun Jang<sup>1</sup> YihJeng Teng<sup>2</sup>

1. Technip Energies, Houston, TX, USA; 2. Technip Energies, Kuala Lumpur, Malaysia

#### Wave Effects on Vortex-Induced Motions of a Floating Offshore Wind Turbine OMAE2023-104763

Elizabeth Passano, Decao Yin

SINTEF Ocean, Trondheim, Norway

**Investigation of Simulation and Tank Tests for Motion Behavior of Semi-Submersible Platform Deltafloat with a 10 MW Floating Wind Turbine.** OMAE2023-104742

Zheng-Zhang Huang, Shean-Kwang Chou, Cheng-Hsien Chung, Hua-Tung Wu, Hao-Teng Hsu, Yan-Wen Wu, Forng-Chen Chiu  
*Ship and Ocean Industries R&D Center, Tamsui Dist, Taiwan*

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## Petroleum Technology

### 11-05-01 Integrity of Well Barriers I

Wednesday June 14 | Room 211 | 08:30–10:00

**Session Organizer:** Jan David Ytrehus, SINTEF, Norway

**Session Co-Organizer:** Ergun Kuru, University of Alberta, Canada

**Investigation of the Microstructure of Bismuth Alloy and Its Interaction with Cement and Steel Casing** OMAE2023-103843

Andriani Manataki, Paraskevas Kontis, Sigbjørn Sangesland  
*Norwegian University of Science and Technology, Trondheim, Norway*

**The Sealing Behavior of Bismuth-Based Metal Plugs** OMAE2023-104309

Lewaa Hmadeh, Behzad Elahifar, Sigbjørn Sangesland  
*Norwegian University of Science and Technology, Trondheim, Norway*

**Investigation of the Formation and Detection of Casing-Cement Debonding in Small Scale Samples** OMAE2023-104758

Blandine Feneuil, Elie N'gouamba, Idar Larsen, Ragnhild Skorpa  
*SINTEF, Trondheim, Norway*

**Laboratory-Scale Experiments to Predict Barite Sedimentation in Drilling Fluids in Wells** OMAE2023-104790

Blandine Feneuil, Bjørnar Lund, Ragnhild Skorpa  
*SINTEF, Trondheim, Norway*

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## Petroleum Technology

### 11-08-01 Multiphase Flow & Flow Assurance

Wednesday June 14 | Room 213 | 08:30–10:00

**Session Organizer:** Mohammad Azizur Rahman, Texas A&M University at Qatar, Qatar

**Session Co-Organizers:** Stephen D. Butt, Memorial University of Newfoundland, Canada;  
Ergun Kuru, University of Alberta, Canada

**Optimization and Performance Evaluation of a Polymer Gel Plugging Profile Control System on High Water-Cut Reservoirs** OMAE2023-102188

SEDDIQI Khwaja Naweed, Abe Kazunori  
*Akita University, Akita, Japan*

**Study on Influencing Factors of Deep-Water Shallow Gas Jet Height via Numerical Simulation** OMAE2023-102218

Yang Long, Jin Yang, Qishuai Yin, Li Li, Qianling Xue  
*China University of Petroleum, Beijing, China*

**Multiphase Seepage Flow Characteristics of Micro-Fractures in Subsurface Reservoirs by Using the Lattice Boltzmann Method** OMAE2023-104737

Dan Pu<sup>1</sup> Linfang Shen<sup>1</sup> Zhiliang Wang<sup>1</sup> Miao Li<sup>2</sup> Zhenquan Li<sup>3</sup> Pengyu Wang<sup>1</sup>  
*1. Kunming University of Science and Technology, Kunming, China; 2. Charles Sturt University, Bathurst, NSW, Australia; 3. Charles Sturt University, Albury, NSW, Australia*

**Classification of Sensor Measurements from Non-Newtonian Fluids Using Batch and Online Analysis of Data** OMAE2023-108094

M. Ziyen Sheriff<sup>1</sup> Mohamed Nounou<sup>2</sup> Mohammad Rahman<sup>2</sup> Ibrahim Hassan<sup>2</sup> Hazem Nounou<sup>2</sup>  
*1. Texas A&M University, College Station, TX, USA; 2. Texas A&M University at Qatar, Doha, Qatar*

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## Blue Economy Symposium

### 13-06-02 Blue Economy VII

Wednesday June 14 | Room 214 | 08:30–10:00

**Session Organizer:** Ehsan Arzaghi, AMC, UTAS, Australia

**Session Co-Organizer:** Saeed Mohajernasab, Australian Maritime College, Australia

#### Regulatory Reform and the Potential Use of Floating Artificial Reefs under Blue and Ocean Carbon Methodologies OMAE2023-104421

Brydon T. Wang

*University of Queensland, St Lucia, QLD, Australia*

#### Interdependency of Human Factors and Turbine State in Offshore Wind Farm Operations OMAE2023-104609

Nima Golestani<sup>1</sup> Ehsan Arzaghi<sup>2</sup> Vikram Garaniya<sup>2</sup> Rouzbeh Abbasi<sup>3</sup>

*1. University of Tasmania, Sydney, NSW, Australia; 2. University of Tasmania, Launceston, TAS, Australia; 3. Macquarie University, Sydney, NSW, Australia*

#### Numerical Simulation of Marine and Coastal Zone Multidimensional System Sustainable Development OMAE2023-104647

Yue Deng, Yaning Li, Jiarui Li, Yanli Sun, Yingzhi Cao, Jingli Zhao

*National Marine Data and Information Service, Tianjin, China*

#### Research on Offshore Engineering Equipment Industry in Shandong Based on Sustainable Development OMAE2023-104649

Yue Deng, Jingli Zhao, Xiaofeng Duan, Weiling Song, Yue Guo

*National Marine Data and Information Service, Tianjin, China*

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## CONCURRENT SESSIONS

10:30 – 12:00

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## Offshore Technology

### 01-08-02 AI/ML Applications to FPSO and Mooring Systems

Wednesday June 14 | Room 205 | 10:30–12:00

**Session Organizer:** Rajiv Aggarwal, Reliable Offshore Systems LLC, USA

#### Predictions of Wind Load on FPSO with Discrete Empirical Interpolation

**Method Based Data Assimilation** OMAE2023-101352

Xiuqing Xing<sup>1</sup> My Ha Dao<sup>1</sup> Baili Zhang<sup>1</sup> Jing Lou<sup>1</sup> Wei Siang Tan<sup>2</sup> Yongdong Cui<sup>2</sup> Boo Cheong Khoo<sup>2</sup>

*1. Institute of High Performance Computing, A\*STAR, Singapore, Singapore; 2. National University of Singapore, Singapore, Singapore*

#### Combining Model-Based and Data-Driven Methods to Estimate the Roll Motion of a Spread Moored FPSO OMAE2023-102044

Lucas P. Cotrim<sup>1</sup> Alex S. Huang<sup>1</sup> Gustavo A. Bisinotto<sup>1</sup> Rodrigo Da S. Cunha<sup>1</sup>

Rodrigo A. Barreira<sup>2</sup> Anna H. R. Costa<sup>1</sup> Edson S. Gomi<sup>1</sup> Eduardo A. Tannuri<sup>1</sup>

*1. University of São Paulo, São Paulo, SP, Brazil; 2. Petrobras, Rio de Janeiro, RJ, Brazil*

#### Detection of Long-Term Changes in Mooring Stiffness Using Vessel Position Monitoring OMAE2023-104708

Adrian Eassom, Kanishka Jayasinghe, Clare Thomas

*AMOG Consulting, Notting Hill, VIC, Australia*

#### NEMO: a Multi-Draft Mooring Line Failure Detection System Based on FPSO Predicted Motion OMAE2023-104351

Amir Muhammed Sa'ad<sup>1</sup> Rodrigo Da Silva Cunha<sup>1</sup> Rodrigo Augusto Barreira<sup>2</sup>

Eduardo Aoun Tannuri<sup>1</sup> Edson Satoshi Gomi<sup>1</sup> Anna Helena Reali Costa<sup>1</sup>

*1. Universidade de São Paulo, São Paulo, SP, Brazil; 2. Petróleo Brasileiro S.A. (Petrobras), Rio de Janeiro, RJ, Brazil*

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## Structures, Safety and Reliability

### 02-10-01 Reliability of Marine Structures

Wednesday June 14 | Room 212 | 10:30–12:00

Session Organizer: Carlos Guedes Soares, University of Lisbon, Portugal

#### To Improve the Orientation of a Jetty Exposed to Swell and Current to Minimise Operational Downtime OMAE2023-101382

Coen Eggermont, Alex van Deyzen

Royal HaskoningDHV, Rotterdam, Netherlands

#### System Reliability Assessment of Jacket Structures Using Fault Tree Analysis Method OMAE2023-104486

A Renugadevi, S Nallayarasu

Indian Institute of Technology, Chennai, TN, India

#### Basic Study on Monitoring Technique for Concretes Prestressed with Cfrp by Using Fiber-Optic Sensors OMAE2023-104545

Tianjun Zhang<sup>1</sup> Shungo Azuma<sup>1</sup> Daishin Hanaoka<sup>2</sup> Yasushi Tanaka<sup>2</sup> Shinichi Miyazato<sup>2</sup> Kazuro Kageyama<sup>2</sup> Hideaki Murayama<sup>1</sup>

1. The University of Tokyo, Kashiwa, Japan; 2. Kanazawa Institute of Technology, Hakusan, Japan

#### Reliability Analysis of Crack Growth Occurrence of a Secondary Structural Component OMAE2023-104648

Siri Kolle Kleivane, Bernt J. Leira, Sverre Steen

Norwegian University of Science and Technology, Department of Marine Technology, Trondheim, Norway

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## Materials Technology

### 03-05-01 Modeling and Performance of Non-metallics

Wednesday June 14 | Room 206 | 10:30–12:00

Session Organizer: Mamdouh Salama, MMS4AIM LLC, USA

Session Co-Organizers: Agnes Marie Horn, DNV, Norway; David Baker, ExxonMobil Technology and Engineering Company, USA

#### Strength Assessment Methods for Adhesively Bonded Repair OMAE2023-102256

Stéphane Paboeuf<sup>1</sup> Maxime Deydier<sup>1</sup> Quentin Sourisseau<sup>2</sup> Marie-Odette Quéméré<sup>3</sup>

Jean-Philippe Court<sup>3</sup> Christophe Paillusseau<sup>3</sup>

1. Bureau Veritas, Saint-Herblain, France; 2. Université Gustave Eiffel, Bouguenais, France; 3. Cold Pad, Paris, France

#### Tribological Performance of Nylon 6 / Oyster Shell Composite Material OMAE2023-104611

Akshay Krishna Ambika Harikumar<sup>1</sup> Michael Tobias Heitzmann<sup>2</sup> Asanka Basnayake<sup>2</sup> Hadis Khakbaz<sup>2</sup> Darren Martin<sup>2</sup>

1. The University of Queensland, Runcorn, QLD, Australia; 2. The University of Queensland, Brisbane, QLD, Australia

#### Hyperelastic Modelling of Elastomers for Wave Energy Convertors OMAE2023-100523

Guillermo Idarraga, Liu Yang, Farhad Abad, Yang Huang, Saishuai Dai, Qing Xiao, Saeid Lotfian, Feargal Brennan

University of Strathclyde, Glasgow, United Kingdom

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## Pipeline, Risers, and Subsea Systems

### 04-03-02 Mechanics II

Wednesday June 14 | Room 210 | 10:30–12:00

Session Organizer: Julian Hallai, Exponent, USA

#### Dynamic Response and Damage Assessment of Subsea Pipelines under Dropped Object Impacts OMAE2023-101910

Kun Yang<sup>1</sup> Yanyan Sha<sup>2</sup> Zhenhui Liu<sup>3</sup>

1. IKM Ocean Design AS, Sandnes, Norway; 2. University of Stavanger, Stavanger, Norway; 3. Aker Solutions AS, Trondheim, Norway

#### Complexities of Capturing Large Plastic Deformations Using Digital Image Correlation: a Test Case on Full-Scale Pipe Specimens OMAE2023-102308

Tyler Johnson<sup>1</sup> Doug Langer<sup>2</sup> Ethan Frigon<sup>1</sup> Chris Timms<sup>1</sup> Shunichi Kobayashi<sup>3</sup> Eiji Tsuru<sup>4</sup>

1. C-FER Technologies, Edmonton, AB, Canada; 2. Consultant, Edmonton, AB, Canada; 3. Nippon Steel Technology Co., Ltd, Hikari-City, Japan; 4. Nippon Steel Technology Co., Ltd, Futtsu-City, Japan

**HDD Tunnel Pull-in and In-Place Analysis of Pipeline Used for Carbon Capture and Storage Project** OMAE2023-103654

Yi Yu, Stanislav Duplenskiy  
*Subsea 7 AS, Stavanger, Norway*

**Long-Term Corrosion of Parked and Abandoned Offshore Steel Pipelines** OMAE2023-104513

Robert E. Melchers  
*The University of Newcastle, Callaghan, NSW, Australia*

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## Ocean Engineering

### 06-11-02 Ocean Engineering Technology II

Wednesday June 14 | Room 204 | 10:30–12:00

Session Organizer: Murilo Vaz, Federal University of Rio de Janeiro, Brazil

**Development of a Floating Dock Numerical Model and the Ballast Water Distribution Strategy** OMAE2023-102996

Jianan Zhang, Xueliang Wen, Muk Chen Ong  
*University of Stavanger, Stavanger, Norway*

**Augmented Adaptive Filter for Real-Time Sea State Estimation Using Vessel Motions through Deep Learning** OMAE2023-104286

Hamed Majidiyan, Hossein Enshaei, Damon Howe  
*University of Tasmania, Launceston, TAS, Australia*

**Deterministic Sea Wave Prediction Using Temporal Convolutional Networks** OMAE2023-104377

Tak Yin Pang, Boyin Ding, Lingqiao Liu, Natalia Sergiienko  
*University of Adelaide, Adelaide, SA, Australia*

**Design of Mooring System for a 15MW Semi-Submersible, TaidaFloat, in Taiwan Strait** OMAE2023-104394

Chi-Ang Chen<sup>1</sup> Kai-Hung Chen<sup>1</sup> Yuki Igarashi<sup>1</sup> Donghui Chen<sup>2</sup> Kai-Tung Ma<sup>1</sup> Zhao-Yu Lai<sup>1</sup>  
*1. National Taiwan University, Taipei, Taiwan; 2. Genesis Engineering LLC, Taipei, Taiwan*

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## Ocean Engineering

### 06-12-02 Ship Hydromechanics II

Wednesday June 14 | Room 217 | 10:30–12:00

Session Organizer: Guang Yin, University of Stavanger, Norway

**An Approximate Method for Predicting Nonlinear Time Domain Motion of Shallow Draft Ship Taking Motion Attitude Change at Large Amplitude into Account** OMAE2023-103611

Fei Duan<sup>1</sup> Ning Ma<sup>1</sup> Qiqi Shi<sup>1</sup> Xiechong Gu<sup>1</sup> Yaohua Zhou<sup>2</sup>  
*1. Shanghai Jiao Tong University, Shanghai, China; 2. China Classification Society, Shanghai, China*

**Maneuvering of Two Ships with Hydrodynamic Interaction Effect in Calm Water** OMAE2023-104764

Chen Xu, Fan Jiang, Chaozuo Xu, Xueqian Zhou, Huilong Ren  
*Harbin Engineering University, College of Shipbuilding Engineering, Harbin, China*

**Hydrodynamic Performance of a Conceptual Seatrain in Heading Wave Based on Small Water Plane Area Trimaran** OMAE2023-104807

Yan Qin<sup>1</sup> Qing Wang<sup>2</sup> Guohua Dong<sup>1</sup> Chaobang Yao<sup>1</sup> Dakui Feng<sup>1</sup>  
*1. Huazhong University of Science and Technology, Wuhan, China;  
2. Wuhan Second Ship Design And Research Institute, Wuhan, China*

**RANS Simulations of Propeller-Hull Interaction in Model Scale with the Best-Practice Settings** OMAE2023-104885

Shanqin Jin, Heather Peng, Wei Qiu  
*Memorial University of Newfoundland, St. John's, NL, Canada*

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## Ocean Engineering

### 06-16-01 Wave Mechanics, Modeling and Wave Effects I

Wednesday June 14 | Room 203 | 10:30–12:00

Session Organizer: Solomon C. Yim, Oregon State University, USA

#### Two-Sided Wave Generation in a High-Order Spectral Numerical Wave Tank OMAE2023-100850

Tim Aertsens<sup>1</sup> Guillaume Ducrozet<sup>2</sup> Alessandro Toffoli<sup>3</sup> Jaak Monbaliu<sup>1</sup>

1. KU Leuven, Leuven, Belgium; 2. École Centrale de Nantes, Nantes, France;

3. The University of Melbourne, Melbourne, VIC, Australia

#### Third-Order Steady-State Solutions of Bichromatic Bi-Directional Water Waves OMAE2023-102624

Zhe Gao<sup>1</sup> Yi Liu<sup>2</sup> L. S. Jia<sup>2</sup> Yunfei Teng<sup>1</sup> Dejun Wang<sup>2</sup> Xu Jia<sup>2</sup>

1. Guangzhou International Campus South China University of Technology,

Guangzhou, China; 2. CNOOC Research Institute, Beijing, China

#### When Do JONSWAP Spectra Lead to Soliton Gases in Deep Water Conditions? OMAE2023-104326

Yu-Chen Lee<sup>1</sup> Markus Brühl<sup>2</sup> Sander Wahls<sup>1</sup>

1. Delft University of Technology, Delft, Netherlands; 2. Ramboll, Hamburg, Germany

#### Wave-Induced Loading Simulation for a Semi-Submersible FOWT Platform

##### Using CFD-Swense Coupled Solver OMAE2023-104383

Cong Shen, Nian-Zhong Chen

Tianjin University, Tianjin, China

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## Polar and Arctic Sciences and Technology

### 07-05-01 Numerical Ice Modeling

Wednesday June 14 | Room 208 | 10:30–12:00

Session Organizer: Yingjie Gu, University of Stavanger, Norway

Session Co-Organizer: Fang Li, Shanghai Jiao Tong University, Finland

#### Numerical Analysis of Ice Blocks Impact on Stiffened Plates According to a Mohr-Coulomb Material and Node Splitting Technique OMAE2023-102584

Sungwon Yoon, Hauke Herrring, Franciska Müller, Franz von Bock und Polach

Hamburg University of Technology, Hamburg, Germany

#### Ice Resistance Prediction Using Explainable Deep Learning Method OMAE2023-102855

Qianyang Sun<sup>1</sup> Li Zhou<sup>2</sup> Shifeng Ding<sup>1</sup> Renwei Liu<sup>1</sup> Aimin Wang<sup>1</sup> Jiaming Chen<sup>1</sup>

1. School of Naval Architecture and Ocean Engineering, Jiangsu University of Science and

Technology, Zhenjiang, China; 2. Shanghai Jiao Tong University, Zhenjiang, China

#### Numerical Simulation of an Aluminium Panel Subject to Ice Impact Load Using a Rate and Pressure Dependent Elastoplastic Material Model for Ice OMAE2023-104771

Mojtaba Mokhtari, Ekaterina Kim, Jørgen Amdahl

Norwegian University of Science and Technology, Trondheim, Norway

#### The Coupling Effects of Bubble Collapse, Ice Breaking and Structural Response OMAE2023-104794

Qiyang Chen, Chengwang Xiong, Qianqian Dong

Harbin Engineering University, Harbin, China



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## CFD, VIV and FSI

### 08-04-02 CFD Development II

Wednesday June 14 | Room 209 | 10:30–12:00

**Session Organizer:** Owen Oakley, Retired, USA

**Session Co-Organizers:** Rajeev Jaiman, University of British Columbia, Canada; Guang Yin, University of Stavanger, Norway

#### **Numerical Simulation of a Moored Wave-Buoy in Waves and Current by Smoothed Particle Hydrodynamics** OMAE2023-105023

Salvatore Capasso<sup>1</sup> Bonaventura Tagliafierro<sup>2</sup> Raúl González-Ávalos<sup>2</sup> Iván Martínez-Estévez<sup>3</sup> José Manuel Domínguez<sup>3</sup> Corrado Altomare<sup>2</sup> Alejandro j.c. Crespo<sup>3</sup> Giacomo Viccione<sup>1</sup>

1. Università degli Studi di Salerno, Fisciano, Italy; 2. Universidad Politécnica de Cataluña - UPC BarcelonaTech, Barcelona, Spain; 3. EPhysLab - Universidade de Vigo, Ourense, Spain

#### **Numerical Simulation of Jellyfish Deflection Due to Air Bubble Curtain** OMAE2023-104966

Lei Liu<sup>1</sup> Vandad Talimi<sup>1</sup> Premkumar Thodi<sup>1</sup> David Gauthier<sup>2</sup> Mario Paris<sup>2</sup>

1. C-CORE, St. John's, NL, Canada; 2. CanadianPond, Lac-Brome, QC, Canada

#### **A Multiple Flux Boundary Element Method Fully Nonlinear Potential Flow Based Two Dimensional Numerical Wave Tank** OMAE2023-107719

Nitin Babu, Suresh Rajendran

Indian Institute of Technology, Chennai, TN, India

#### **Physics-Informed Deep Generative Adversarial Network for Hull Form Optimisation in High Dimensional Design Spaces** OMAE2023-100580

Shahroz Khan<sup>1</sup> Panagiotis Kaklis<sup>2</sup> Kosa Goucher-Lambert<sup>3</sup> Konstantinos Kostas<sup>4</sup>

1. University of Strathclyde, London, United Kingdom; 2. University of Strathclyde, Glasgow, United Kingdom; 3. University of California Berkeley, Berkeley, CA, USA; 4. Nazarbayev University, Astana, Kazakhstan

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## Ocean Renewable Energy

### 09-01-08 Offshore Wind Energy – Hydrodynamics II

Wednesday June 14 | Room 216 | 10:30–12:00

**Session Organizer:** Petter Andreas Berthelsen, SINTEF, Norway

**Session Co-Organizer:** Hyunchul Jang, Technip Energies, USA

#### **Influence of Hydrodynamic Damping Model on Floater and Mooring Responses of 10 MW Class Floating Offshore Wind Turbine** OMAE2023-107853

Eungsoo Kim<sup>1</sup> Dongeun Kim<sup>2</sup> Sunny Kumar Poguluri<sup>3</sup> Yoon Hyeok Bae<sup>3</sup> Yoon-Jin Ha<sup>4</sup> Ji Yong Park<sup>4</sup> Jeongbin Kim<sup>5</sup>

1. POSCO, Incheon, Korea; 2. Jeju National University, Jeju, Korea; 3. Hongik University, Seoul, Korea; 4. Korea Research Institute of Ships and Ocean Engineering, Daejeon, Korea; 5. Marine Tech-In, Busan, Korea

#### **CFD Investigation of the lea Offshore 15 MW Reference Wind Turbine Performance in Full Scale: a Temporal Discretization Analysis** OMAE2023-105084

Marielle de Oliveira<sup>1</sup> Leandro Silva<sup>2</sup> Rodolfo Puraca<sup>1</sup> Bruno Carmo<sup>1</sup>

1. University of São Paulo - Department of Mechanical Engineering, São Paulo, SP, Brazil; 2. Delmar Systems, Perth, WA, Australia

#### **Numerical Investigation of Sloshing inside a Column of the OC4 Floating Offshore Wind Turbine** OMAE2023-105875

Renjie Zhang, Yuanchuan Liu, Liang Li

Ocean University of China, Qingdao, China

#### **Design and Coupled Analysis of Floating Offshore Wind Turbines with Moses and Aerodyn** OMAE2023-104576

Daniel Veen<sup>1</sup> Spiro J. Pahas<sup>1</sup> Shawn Meng<sup>1</sup> Simon Dillenburg<sup>2</sup>

1. Bentley Systems, Exton, PA, USA; 2. THEC Offshore, Hamburg, Germany

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## Ocean Renewable Energy

### 09-04-01 Hybrid and Novel Renewable Energy Systems I

Wednesday June 14 | Room 218 | 10:30–12:00

**Session Organizer:** Marc Cahay, Technip Energies, France

**Session Co-Organizer:** Sumit Kumar, UTas, Australia

**NextFloat: Disrupting Floating Wind** OMAE2023-102974

Marc Cahay<sup>1</sup> Hedy Mahmoudi<sup>2</sup>

1. Technip Energies, Nanterre, France; 2. X1 Wind, Barcelona, Spain

**Performance Analysis and Optimization of a Wave Energy-Based Zero-Liquid-Discharge Hybrid Desalination System** OMAE2023-104013

Gabriel Glosson, Faete Filho, Jinbo Chen, Tarek Abdel-Salam, Kurabachew Daba  
East Carolina University, Greenville, NC, USA

**Experimental Study on the Combination of Split Heave Point Absorber and TLP-Type Floating Turbine** OMAE2023-104446

Huidong Zhang, Tong Wang, Cong Xu, Hongda Shi

Ocean University of China, Qingdao, China

**Experimental Hydrodynamic Investigation of a Co-Located Wind Turbine and Wave Energy Converter** OMAE2023-105348

Eric Gubesch<sup>1</sup> Jean-Roch Nader<sup>2</sup> Boyin Ding<sup>3</sup> Ben Cazzolato<sup>3</sup> Ye Li<sup>4</sup> Nataliia Sergiienko<sup>5</sup> Irene Penesis<sup>6</sup>

1. Australian Maritime College, Newnham, TAS, Australia; 2. University of Tasmania, Newnham, TAS, Australia; 3. University of Adelaide, Adelaide, SA, Australia; 4. Shanghai Jiao Tong University, Shanghai, China; 5. The University of Adelaide, Adelaide, SA, Australia; 6. Australian Maritime College, University of Tasmania, Newnham, TAS, Australia

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## Petroleum Technology

### 11-05-02 Integrity of Well Barriers II

Wednesday June 14 | Room 211 | 10:30–12:00

**Session Organizer:** Jan David Ytrehus, SINTEF, Norway

**Session Co-Organizer:** Ergun Kuru, University of Alberta, Canada

**Effect of Squeeze Cementing Perforation Pattern on Flow Rate through a Microannulus** OMAE2023-107063

Elizabeth Trudel, Ian Frigaard

University of British Columbia, Vancouver, BC, Canada

**New Alternative Cement for Supercritical Geothermal Well Applications** OMAE2023-107301

Ragnhild Skorpa<sup>1</sup> Blandine Feneuil<sup>1</sup> Toshi Sugama<sup>2</sup> Tatiana Pyatina<sup>2</sup>

1. SINTEF, Trondheim, Norway; 2. Brookhaven National Lab, Upton, NY, USA

**Ultrasonic Well Integrity Logging Using Phased Array Technology** OMAE2023-108101

Tonni Franke Johansen<sup>1</sup> Philip Erik Buschmann<sup>1</sup> Knut Marius Røsberg<sup>1</sup> Anja Diez<sup>1</sup> Erlend Magnus Viggen<sup>2</sup>

1. SINTEF, Trondheim, Norway; 2. Norwegian University of Science and Technology, Trondheim, Norway

**Well Integrity Experience Transfer Using Recurrent Neural Network** OMAE2023-108149

David Semwogerere, Alexey Pavlov, Sigbjørn Sangesland

Norwegian University of Science and Technology, Trondheim, Norway

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## Petroleum Technology

### 11-10-01 Advances in Carbon Capture Utilization and Storage (CCUS) I

Wednesday June 14 | Room 213 | 10:30–12:00

**Session Organizer:** Huazhou Li, University of Alberta, Canada

**Session Co-Organizers:** Ergun Kuru, University of Alberta, Canada; Daoyong (Tony) Yang, University of Regina, Canada

#### Evaluation of Novel Particle Gels to Enhance CO<sub>2</sub> Flooding Sweep and Storage Efficiency OMAE2023-104172

Baojun Bai, Mingzhen Wei

Missouri University of Science and Technology, Rolla, MO, USA

#### Microscale Simulation of Mineralisation of CO<sub>2</sub> Injected in Basalt Layers OMAE2023-104215

Toru Sato<sup>1</sup> Takayoshi Koyama<sup>2</sup> Alan Junji Yamaguchi<sup>1</sup>

1. University of Tokyo, Kashiwa, Japan; 2. University of Tokyo, Tokyo, Japan

#### Experimental Evaluation of Supercritical CO<sub>2</sub> Enhanced Oil Recovery and Storage Capacity Using Dual-Core Flooding Technology for Carbonate Reservoirs OMAE2023-104389

Xianmin Zhou<sup>1</sup> Wei Yu<sup>2</sup> Muhammad Shahzad Kamal<sup>2</sup> Yu-Shu Wu<sup>3</sup> Sarmad Zafar Khan<sup>2</sup> Ridha Al-Abdrabalnabi<sup>2</sup>

1. King Fahd University of Petroleum & Minerals, Cypress, Saudi Arabia; 2. King Fahd University of

Petroleum & Minerals, Dhahran, Saudi Arabia; 3. Colorado School of Mines, Golden, CO, USA

#### Integrated Optimization of Hybrid Steam-Solvent Injection in Post-Chops

Reservoirs under Uncertainty OMAE2023-104485

Senhan Hou, Shikai Yang, Liwu Jiang, Daoyong (Tony) Yang

University of Regina, Regina, SK, Canada

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## Professor Ian Young Honouring Symposium on Global Ocean Wind and Wave Climate

### 12-01-01 Wave/Ocean/Atmosphere Coupling and Climate Change Impacts on Ocean Waves

Wednesday June 14 | Room 207 | 10:30–12:00

**Session Organizer:** Kevin Ewans, MRL, New Zealand

**Session Co-Organizer:** Alexander Babanin, University of Melbourne, Australia

#### Quantum Algorithms for Simulating Nonlinear Ocean Surface Waves at High Order OMAE2023-105072

Alfred R. Osborne

Nonlinear Waves Research Corporation, Alexandria, VA, USA

#### CMIP6 Observation-Based Weighted Projections of Arctic and Antarctic Surface Waves' Climate OMAE2023-102094

Alberto Meucci, Ian Robert Young

University of Melbourne, Parkville, VIC, Australia

#### Is the 100-Year Return Period Significant Wave Height Increasing in the Tasman Sea?

Estimates Based on FIO-ESM v2.0 CMIP6 Data Set OMAE2023-104360

Kevin Ewans<sup>1</sup> Philip Jonathan<sup>2</sup>

1. MetOcean Research Ltd., New Plymouth, New Zealand; 2. Lancaster University, London, United Kingdom

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## Blue Economy Symposium

### 13-06-03 Blue Economy VIII

Wednesday June 14 | Room 214 | 10:30–12:00

**Session Organizer:** Hong Zhang, Griffith University, Australia

**Session Co-Organizer:** Nagi Abdussamie, Australian Maritime College, Australia

#### Ethical Risk in the Offshore Blue Economy Integrity System OMAE2023-104524

Hugh Breakey<sup>1</sup> Charles Sampford<sup>2</sup>

1. Griffith University, Fernvale, QLD, Australia; 2. Griffith University, Brisbane, QLD, Australia

## Dynamics of the Regional Shipping Network: a Case Study of Ports along the Maritime Silk Road OMAE2023-107987

Yong Zhou, Shihui Luo

Shanghai Maritime University, Shanghai, China

## Efficiency Evaluation of Resources Allocation in Port Cluster in the Yangtze River Delta Area Based on BBC-DEA Model OMAE2023-108134

Yong Zhou, Wenkang Lian

Shanghai Maritime University, Shanghai, China

## A New Multi-Criteria Decision-Making Tool for Subsea O&G Asset Decommissioning OMAE2023-108204

Jean-David Caprace<sup>1</sup> Marcelo Igor Lourenço De Souza<sup>1</sup> Claudio Violante Ferreira<sup>2</sup> Eduardo Ribeiro Nicolosi<sup>2</sup>

1. Federal University of Rio de Janeiro, Rio de Janeiro, RJ, Brazil; 2. Petroleo Brasileiro S.A. - Petrobras, Rio de Janeiro, RJ, Brazil

## CONCURRENT SESSIONS

### 13:30 – 15:00

## Offshore Technology

### 01-08-03 AI/ML Applications to Offshore Systems and Subsurface

Wednesday June 14 | Room 205 | 13:30–15:00

Session Organizer: Rajiv Aggarwal, Reliable Offshore Systems LLC, USA

#### Weakly Nonlinear Surface Wave Prediction Using a Data-Driven Method with the Help of Physical Understanding OMAE2023-102780

Jialun Chen<sup>1</sup> Wenhua Zhao<sup>1</sup> Ian A. Milne<sup>1</sup> David Gunawan<sup>2</sup> Paul H. Taylor<sup>1</sup>

1. The University of Western Australia, Perth, WA, Australia; 2. The University of Wollongong, Wollongong, NSW, Australia

#### Motion-Based Wave Inference with Neural Networks: Transfer Learning from Numerical Simulation to Experimental Data OMAE2023-101967

Gustavo Alencar Bisinotto<sup>1</sup> Pedro Cardozo de Mello<sup>1</sup> Fabio Gagliardi Cozman<sup>2</sup> Eduardo Aoun Tannuri<sup>1</sup>

1. Universidade de São Paulo / Numerical Offshore Tank, São Paulo, SP, Brazil; 2. Universidade de São Paulo, São Paulo, SP, Brazil

#### Uncertainty of Virtually Sensed Stress Ranges in Offshore Wind Support Structures OMAE2023-101045

Johan F. Toftekær<sup>1</sup> Jonas T. Vestermark<sup>2</sup> Michael Sandholm Jepsen<sup>2</sup>

1. Vattenfall, København V, Denmark; 2. Vattenfall, Kolding, Denmark

#### Cross-Domain Knowledge Discovery and Sharing in Digital Subsurface Based on Federated Learning OMAE2023-104639

0 Zhang<sup>1</sup> Ye Liu<sup>2</sup> Jiahui Geng<sup>1</sup> Boyu Cui<sup>1</sup> Jungwon Seo<sup>1</sup> Jie Cao<sup>3</sup> Chunming Rong<sup>1</sup>

1. University of Stavanger, Stavanger, Norway; 2. Xian Shiyou University, Xi'an, China; 3. eDrilling AS, Stavanger, Norway

## Structures, Safety and Reliability

### 02-11-01 Fatigue and Fracture Reliability I

Wednesday June 14 | Room 212 | 13:30–15:00

Session Organizer: Yordan Garbatov, Universidade De Lisboa, Instituto Superior Técnico, Portugal

Session Co-Organizer: Carlos Guedes Soares, University of Lisbon, Portugal

#### Comparative Fatigue Damage Estimation Due to Local Wave Loads Using a Developed Methodology for Tubular Joints of Jacket Structures Varying Member Locations along with Depth in Splash Zone OMAE2023-104750

Sambit Supriya Dash, Seeninaidu Nallayarasu

Indian Institute of Technology Madras, Chennai, TN, India

#### Damage Analysis of OC4 Jacket under Fatigue Loading by Peridynamic Approach OMAE2023-105144

Pranitha Bachimanchi, Nilanjan Saha

Indian Institute of Technology, Chennai, TN, India

## Fatigue Crack Propagation Prediction for Pipeline Steel under Gaseous Hydrogen Environment OMAE2023-104210

Tingsen Zheng, Nian-Zhong Chen

Tianjin University, Tianjin, China

## A Study on the Degree of Bending (DOB) in Two-Planar Tubular DYT-Joints of Offshore Jacket Structures: Geometrical Effects and Fatigue Design Formulation OMAE2023-100940

Hamid Ahmadi<sup>1</sup> Hassan Karampour<sup>2</sup> Mahdi Ghorbani<sup>3</sup> Hamid Fard<sup>4</sup>

1. University of Southern Queensland, Toowoomba, QLD, Australia; 2. Griffith University, Gold Coast, QLD, Australia; 3. Tabriz University, Tabriz, Iran; 4. Bureau Veritas, Brisbane, QLD, Australia

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## Materials Technology

### 03-06-01 Materials Selection

Wednesday June 14 | Room 206 | 13:30–15:00

Session Organizer: Mamdouh Salama, MMS4AIM LLC, USA

Session Co-Organizers: Agnes Marie Horn, DNV, Norway; Myung Hyun Kim, Pusan National University, Korea

### UNS S32654 as Alternative CRA Liner Material to UNS N06625 for Offshore Mechanically Lined Pipes OMAE2023-100628

Rodrigo Signorelli<sup>1</sup> Elisabeth Johansson<sup>2</sup> Bjorn Helmersson<sup>2</sup> Tiago Kaspary<sup>3</sup>

1. Outokumpu, São Paulo, SP, Brazil; 2. Outokumpu Stainless AB, Avesta, Sweden; 3. Cladtek Brazil, Santa Cruz, RJ, Brazil

### A Roadmap for Cloning Legacy Assets through an On-Demand Solution Aimed at the Norwegian Continental Shelf – a Case Example OMAE2023-104921

Jon Erik Karlsen, Chandima Ratnayake Mudiyansele

University of Stavanger, Stavanger, Norway

### Manufacturing Method Selection for Mechanical Legacy Assets Aimed at the Norwegian Continental Shelf – a Case Example OMAE2023-104972

Jon Erik Karlsen, Chandima Ratnayake Mudiyansele

University of Stavanger, Stavanger, Norway

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## Pipeline, Risers, and Subsea Systems

### 04-01-05 Flexible Pipes and Umbilicals V

Wednesday June 14 | Room 210 | 13:30–15:00

Session Organizer: Krassimir Doynov, ExxonMobil, USA

Session Co-Organizer: Alan Dobson, TechnipFMC, United Kingdom

### Numerical Simulation to Collapse of a Carcass of a Flexible Riser Using a Dynamic Model with Quasi-Static Behavior through of an Explicit Solve Method OMAE2023-103764

José Luis Párraga Quispe<sup>1</sup> Rodrigo Ribeiro<sup>1</sup> Geovana Drumond<sup>1</sup> Luisa Nogueira Soares<sup>1</sup> Marcelo Igor Lourenço<sup>1</sup>

Anderson Barata<sup>2</sup> Lucas Ramalho Dos Santos Ferreira<sup>2</sup> Alexandre Dos Santos Cordeiro<sup>2</sup>

1. Federal University of Rio de Janeiro, Rio de Janeiro, RJ, Brazil; 2. CENPES - PETROBRAS, Rio de Janeiro, RJ, Brazil

### Simulation of Hydrate Plug Capacity of Flexible Pipe OMAE2023-104730

Henrik Blicher Schmidt, Thomas Iversen Solfeldt, Tommy Pedersen

NOV Flexibles, Brøndby, Denmark

### As-Built Carcass Fatigue Modelling OMAE2023-104781

Michele Bonanni, Phil Nott, Andrew McCormick, Trevor Bailey, Andrew Roberts

Baker Hughes, Newcastle Upon Tyne, United Kingdom

### A Simplified Model of the Carcass Axial Capacity for Unbonded Flexible Pipes under Differential Pressure Loading OMAE2023-104926

Linfa Zhu<sup>1</sup> Jian Liu<sup>2</sup> Zhimin Tan<sup>1</sup> Andrew Roberts<sup>2</sup>

1. Baker Hughes, Houston, TX, USA; 2. Baker Hughes, Newcastle Upon Tyne, United Kingdom

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## Ocean Engineering

### 06-01-02 Computational Mechanics and Design Applications II

Wednesday June 14 | Room 218 | 13:30–15:00

Session Organizer: Rodrigo Soares, Federal University of Rio de Janeiro, Brazil

#### Slamming Effects on Fpso Balconies: Numerical and Experimental Analysis of Alternative Configurations for Impact Attenuation OMAE2023-105066

Daniel Fonseca de Carvalho e Silva<sup>1</sup> Fabio Gouveia Telles de Menezes<sup>1</sup> Dilnei Schmidt<sup>1</sup> Pedro Cardozo de Mello<sup>2</sup>  
1. Petrobras, Rio de Janeiro, RJ, Brazil; 2. University of São Paulo, São Paulo, SP, Brazil

#### Analysis of Offshore Helidecks Turbulence and Hot Gas Plumes – a Systematic Approach OMAE2023-105085

Daniel Fonseca de Carvalho e Silva, Allan Carre de Oliveira, Carlos Eduardo Holmes Chads, Marcos Donato Auler da Silva Ferreira, Denis Alvin Liang, Mauro Cresta de Barros Dolinsky  
Petrobras, Rio De Janeiro, RJ, Brazil

#### Propagation of Hydrodynamic Waves past Two Vertically Submerged Flexible Barriers of Non-Uniform Thickness OMAE2023-100794

Mansi Singh, R. Gayen  
Indian Institute of Technology Kharagpur, Kharagpur, WB, India

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## Ocean Engineering

### 06-11-03 Ocean Engineering Technology III

Wednesday June 14 | Room 204 | 13:30–15:00

Session Organizer: Allan R Magee, Consultant, USA

#### Autonomous Port Navigation with Ranging Sensors Using Model-Based Reinforcement Learning OMAE2023-104455

Siemen Herremans<sup>1</sup> Ali Anwar<sup>1</sup> Arne Troch<sup>1</sup> Ian Ravijts<sup>1</sup> Maarten Vangeneugden<sup>2</sup> Siegfried Merceelis<sup>1</sup> Peter Hellinckx<sup>1</sup>  
1. IDLab, University of Antwerp - imec, Antwerp, Belgium; 2. University of Ghent, Antwerp, Belgium

#### The Study of the Wave Attenuation Performance of Triple Plates Interacting with a Solitary Wave OMAE2023-104566

Chang-Qing Wen, Jing-Ping Wu  
Wuhan University of Technology, Wuhan, China

#### Visibility Enhancement in Turbid Water Based on Polarization and Clahe OMAE2023-104881

Luping Liu<sup>1</sup> Xin Li<sup>1</sup> Xiantao Zhang<sup>1</sup> Fan Zhang<sup>2</sup>  
1. Shanghai Jiao Tong University, Shanghai, China; 2. DNV, Shanghai, China

#### 2D Wave Spectra Forecast Correction Applying Machine Learning OMAE2023-108536

Filipe Salvio<sup>1</sup> Fernanda Achete<sup>2</sup> Bruno Primo<sup>3</sup> Nicholas Barbosa<sup>1</sup> Aline Kaji<sup>3</sup> Andre Ramiro<sup>1</sup>  
1. Subsea 7, Rio de Janeiro, RJ, Brazil; 2. Universidade Federal do Rio de Janeiro, COPPE, Rio de Janeiro, RJ, Brazil; 3. Vortex Mundus, Rio de Janeiro, RJ, Brazil

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## Ocean Engineering

### 06-12-03 Ship Hydromechanics III

Wednesday June 14 | Room 217 | 13:30–15:00

Session Organizer: Guang Yin, University of Stavanger, Norway

#### RANS Simulations of Self-Propulsion Model Tests for a Fishing Vessel OMAE2023-105053

Emre Cilkaya, Heather Peng, Wei Qiu  
Memorial University of Newfoundland, St. John's, NL, Canada

#### Experimental Investigation on the Natural Frequency of the Roll and Damping Coefficient from Vessel Response in Random Seas OMAE2023-105399

Mohammadreza Javanmardi<sup>1</sup> Javad Mehr<sup>2</sup> Zi Heng<sup>2</sup>  
1. OMC International, Abbotsford, VIC, Australia; 2. Australian Maritime College, Newnham, TAS, Australia

**The Experimental Study of AUV Path-Following Control Based on Deep Reinforcement Learning under Wave Conditions** OMAE2023-101588

Yu-Hsien Lin, Zen Chao

National Cheng Kung University, Tainan, Taiwan

**Data Extraction Algorithm for Motion and Wave Added Resistance Analysis of an Operating Vessel Based on Sliding Time Window** OMAE2023-104299

Yiyan Wen<sup>1</sup> Ning Ma<sup>1</sup> Qiqi Shi<sup>1</sup> Yanfei Zhang<sup>2</sup> Ziwen Zhang<sup>1</sup>

1. Shanghai Jiao Tong University, Shanghai, China; 2. Shanghai Ship and Shipping Research Institute Co.,Ltd, Shanghai, China

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## Ocean Engineering

### 06-16-02 Wave Mechanics, Modeling and Wave Effects II

Wednesday June 14 | Room 203 | 13:30–15:00

Session Organizer: Masoud Hayatdavoodi, The University of Dundee, United Kingdom

**Exponential Integrator for Nonlinear Surface Water Waves** OMAE2023-104655

Yan Li<sup>1</sup> Zirui Xin<sup>2</sup> Xin Li<sup>2</sup>

1. University of Bergen, Bergen, Norway; 2. Shanghai Jiao Tong University, Shanghai, China

**Phase-Resolved Wave Prediction in Spread Seas Using an Optimised Array of Buoys: Theory and Validation Using Field Data** OMAE2023-104672

Thobani Hlophe<sup>1</sup> Paul Taylor<sup>2</sup> Adi Kurniawan<sup>1</sup> Jana Orszaghova<sup>2</sup> Hugh Wolgamot<sup>2</sup>

1. The University of Western Australia, Albany, WA, Australia; 2. The University of Western Australia, Crawley, WA, Australia

**Development of Phase-Resolved Real-Time Wave Forecasting with Unidirectional and Multidirectional Seas** OMAE2023-104857

In-Chul Kim, Guillaume Ducrozet, Yves Perignon

Ecole Centrale Nantes, Nantes, France

**Riemann-Hilbert Formulation and Solution of Nonlinear Shallow Water Wave Equations: Nonlocal DBAR Problem as a Unified Approach to Computing Exact Solutions in the Time Domain** OMAE2023-108051

Patrik Nabelek, Solomon Yim

Oregon State University, Corvallis, OR, USA

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## Polar and Arctic Sciences and Technology

### 07-06-01 Structures in Ice I

Wednesday June 14 | Room 208 | 13:30–15:00

Session Organizer: Brendon Nickerson, Stellenbosch University, South Africa

Session Co-Organizer: Thomas Fitzpatrick, Memorial University of Newfoundland, Canada

**On Wear Thickness of Rust Layers of Steel Structure Due to Ice Impact Load** OMAE2023-101599

Takahiro Takeuchi<sup>1</sup> Sinji Kioka<sup>2</sup> Hitoshi Miyazaki<sup>3</sup>

1. Hachinohe Institute of Technology, Hachinohe, Japan; 2. Civil Engineering Research Institute for Cold Region Public Works Research, Sapporo, Japan; 3. Maruta-gumi Corp., Abashiri, Japan

**Simple Experimental and Theoretical Investigation of Erosion-Corrosion of a Steel Structure Caused by Sea Ice-Based Friction** OMAE2023-101702

Shinji Kioka<sup>1</sup> Takahiro Takeuchi<sup>2</sup>

1. Civil Engineering Research Institute for Cold Region, Sapporo, Japan; 2. Hachinohe Institute of Technology, Hachinohe, Japan

**Fixed Wind Turbine Ice Induced Frequency Lock in Vibration Analysis** OMAE2023-101844

Haoyang Yin<sup>1</sup> Bin Wang<sup>2</sup> Shan Gao<sup>2</sup> Zhenju Chuang<sup>3</sup> Yan Qu<sup>1</sup> Diyi Chen<sup>1</sup>

1. South China University of Technology, Guangzhou, China; 2. Key Laboratory of Farshore Wind Power Technology, Hangzhou, China; 3. Dalian Maritime University, Dalian, China

**Numerical Simulation of a Ship Advancing in Pack Ice Area Based on CFD-DEM Method** OMAE2023-102378

Ming Zou, Xiang-Jie Tang, Lu Zou, Zao-Jian Zou, Xinshu Zhang

Shanghai Jiao Tong University, Shanghai, China

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## CFD, VIV and FSI

### 08-05-01 Model Reduction and Machine Learning

Wednesday June 14 | Room 209 | 13:30–15:00

**Session Organizer:** Owen Oakley, Retired, USA

**Session Co-Organizers:** Madhu Agrawal, BP, USA; Muk Chen Ong, University of Stavanger, Norway

#### **Comprehensive Evaluation of Surface Ship Performance Based on Deep Reinforcement Learning** OMAE2023-104322

Shengchen Ji<sup>1</sup> Hao Wang<sup>1</sup> Liang Luo<sup>1</sup> Zhailiu Hao<sup>2</sup> Shengzhong Li<sup>2</sup>

1. Wuhan University of Technology, Wuhan, China; 2. China Ship Scientific Research Center, Wuxi, China

#### **Real-Time Deterministic Prediction of Ship Motion Based on Multi-Layer LSTM** OMAE2023-102195

Guolian He<sup>1</sup> Guohua Dong<sup>1</sup> Chaobang Yao<sup>1</sup> Xiaoshuai Sun<sup>2</sup>

1. Huazhong University of Science and Technology, Wuhan, China; 2. China Marine Development and Research Center, Beijing, China

#### **Deep Learning Based Prediction of Hydrodynamic Forces on Offshore Platforms** OMAE2023-104748

Tharindu Pradeeptha Miyanawala, Yulong Li, Yun Zhi Law, Harrif Santo

Technology Centre for Offshore and Marine, Singapore, Singapore

#### **Predicting Frequency Lock-in Phenomenon Using Deep Learning** OMAE2023-101030

Amir Chizfahm, Rajeev Jaiman

University of British Columbia, Vancouver, BC, Canada

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## CFD, VIV and FSI

### 08-06-01 Internal Flows & FIV

Wednesday June 14 | Room 214 | 13:30–15:00

**Session Organizer:** Owen Oakley, Retired, USA

**Session Co-Organizers:** Madhu Agrawal, BP, USA; Narakorn Srinil, Newcastle University, United Kingdom

#### **Dynamics of a Coupled Rigid-Flexible System in Wind Tunnel Experiments** OMAE2023-102927

Yakun Zhao, Xinliang Tian, Huanyu Zhang, Shuyue Sun, Xiaoxian Guo, Tao Peng

State Key Laboratory of Ocean Engineering, Shanghai, China

#### **Numerical Investigation of Internal Flow Effect on the Cross-Flow Vortex-Induced Vibration** OMAE2023-103416

Guixin Zhao, Shuai Meng

Shanghai Jiao Tong University, Shanghai, China

#### **Dynamic Small-Scale Riser Model Experiments: a Physics-Based Algorithm to Recover Lost Measures from Optical Tracking Systems** OMAE2023-105119

Guilherme J. Vernizzi, Vitor Schwenck Franco Maciel, Wagner A. Defensor Filho,

Renato M. M. Orsino, Guilherme R. Franzini, Celso P. Pesce

Universidade de São Paulo, São Paulo, SP, Brazil

#### **Experimental Modeling of Water-Wave Interactions with a Flexible Beam** OMAE2023-108105

Wajiha Rehman<sup>1</sup> Tim Bunnik<sup>2</sup> Onno Bokhove<sup>1</sup> Mark Kelmanson<sup>1</sup>

1. University of Leeds, Leeds, United Kingdom; 2. Maritime Research Institute Netherlands, Wageningen, Netherlands



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## Ocean Renewable Energy

### 09-01-09 Offshore Wind Energy – Design Optimization

Wednesday June 14 | Room 216 | 13:30–15:00

**Session Organizer:** Zhengshun Cheng, SJTU, China

**Session Co-Organizer:** Peng Chen, SJTU, China

#### Dynamic Power Cable Configuration Design for Floating Offshore Wind Turbines Using Gradient-Based Optimization OMAE2023-102788

Anja Schnepf<sup>1</sup> Knut Erik Teigen Giljarhus<sup>2</sup> Øyvind Johnsen<sup>3</sup> Carlos Lopez-Pavon<sup>4</sup>

1. University of Stavanger, CoreMarine, Stavanger, Norway; 2. University of Stavanger, Stavanger, Norway; 3. CoreMarine, Oslo, Norway; 4. CoreMarine, Leioa, Spain

#### Design Considerations on Semi-Submersible Columns and pontoons for Floating Wind OMAE2023-101503

Glib Ivanov, I Jen Hsu, Kai-Tung Ma

National Taiwan University, Taipei, Taiwan

#### The General Nonlinear Stiffness Matrix of Taut-Leg Platforms, TLPs and Suspension Systems of Cable-Connected Floater-Keel Platforms OMAE2023-104705

Ghaith Esber, Sascha Kosleck

University of Rostock, Rostock, Germany

#### Monopile Depth Optimization of Fixed Offshore Wind Turbines on Indian Territorial Waters: Dynamic Analysis of Towers under Wind and Ocean Loads OMAE2023-104337

Souvik Basak, Nabanita Datta

Indian Institute of Technology Kharagpur, Kharagpur, WB, India

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## Petroleum Technology

### 11-02-03 Well Drilling Fluids and Hydraulics III

Wednesday June 14 | Room 211 | 13:30–15:00

**Session Organizer:** Arild Saasen, University of Stavanger, Norway

**Session Co-Organizer:** Ergun Kuru, University of Alberta, Canada

#### Cuttings Bed Creation and Removal When Circulating Field Applied Oil-Based Drilling Fluids OMAE2023-101628

Jan David Ytrehus<sup>1</sup> Bjørnar Lund<sup>2</sup> Ali Taghipour<sup>2</sup> Arild Saasen<sup>3</sup>

1. SINTEF Petroleum, Trondheim, Norway; 2. SINTEF, Trondheim, Norway; 3. University of Stavanger, Stavanger, Norway

#### Cuttings-Bed Erosion in Horizontal Wells: Effect of Biopolymers and Its Rheological Impact OMAE2023-101694

Camilo Pedrosa<sup>1</sup> Mohsen Baynabaj<sup>1</sup> Kristofer Paso<sup>1</sup> Arild Saasen<sup>2</sup>

1. Norwegian University of Science and Technology, Trondheim, Norway; 2. University of Stavanger, Stavanger, Norway

#### Impact of Cleaning Efficiency on Disc Cutter Drilling Performance OMAE2023-108187

Oluwatimilehin Mary Akindele, Judith Onyedikachi George, Abdelsalam Abugharara, Stephen D. Butt

Memorial University of Newfoundland, St. John's, NL, Canada

#### Application of Drilling Fluid Circulation Technology to Lifting System of Deep-Sea Mineral Resources OMAE2023-104712

Ryuta Kitago, Shigemi Naganawa, Elvar Karl Bjarkason

Akita University, Akita, Japan

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## Petroleum Technology

### 11-10-02 Advances in Carbon Capture Utilization and Storage (CCUS) II

Wednesday June 14 | Room 213 | 13:30–15:00

**Session Organizer:** Daoyong (Tony) Yang, University of Regina, Canada

**Session Co-Organizers:** Ergun Kuru, University of Alberta, Canada; Huazhou Li, University of Alberta, Canada

#### **A Novel Multi-Phase Strategy for Optimizing CO<sub>2</sub> Utilization and Storage in an Oil Reservoir** OMAE2023-107753

Jiangyuan Yao<sup>1</sup> Wanju Yuan<sup>1</sup> Xiaolong Peng<sup>1</sup> Zhuoheng Chen<sup>1</sup> Yongan Gu<sup>2</sup>

1. Natural Resources of Canada, Calgary, AB, Canada; 2. University of Regina, Regina, SK, Canada

#### **Dissociation Pressure of CO<sub>2</sub> Hydrate in Sulfate Solutions** OMAE2023-108222

Ying Zhou, Nobuo Maeda, Huazhou Li

University of Alberta, Edmonton, AB, Canada

#### **Overview of CO<sub>2</sub> Potential Storage Capacity Assessment** OMAE2023-108021

Fatima Al Hameli, Hadi Belhaj, Mohammed Al Duhoori

Khalifa University of Science and Technology, Abu Dhabi, United Arab Emirates

#### **Hydrodynamic Mechanism of Bottom Water Invasion into Oil Storage within**

**Strategic Petroleum Reserve – Weeks Island SPR Case** OMAE2023-104531

Andrew K. Wojtanowicz, Adam T. Bourgoyne Jr.

Louisiana State University, Baton Rouge, LA, USA

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## Professor Ian Young Honouring Symposium on Global Ocean Wind and Wave Climate

### 12-03-01 Global Ocean Wave Climate

Wednesday June 14 | Room 207 | 13:30–15:00

**Session Organizer:** Kevin Ewans, MRL, New Zealand

#### **Ocean Swell Propagation across the Pacific** OMAE2023-101809

Sachini Pathirana, Ian Young, Alberto Meucci

The University of Melbourne, Parkville, VIC, Australia

#### **Numerically Efficient Method for Tropical Cyclone Wave Height Prediction** OMAE2023-103260

Guisela Grossmann-Matheson<sup>1</sup> Ian Young<sup>2</sup> Jose-Henrique Alves<sup>3</sup> Alberto Meucci<sup>2</sup>

1. The University of Melbourne, Point Cook, VIC, Australia; 2. The University of Melbourne, Melbourne, VIC, Australia; 3. NOAA Research, Silver Spring, MD, USA

#### **Have Recent Changes in Global Wave and Storm Surge Climate Had a**

**Measurable Impact on Global Shorelines?** OMAE2023-109008

Mandana Ghanavati<sup>1</sup> Ian Young<sup>1</sup> Ebru Kirezci<sup>2</sup>

1. University of Melbourne, Melbourne, VIC, Australia; 2. Bureau of Meteorology, Melbourne, VIC, Australia

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## CONCURRENT SESSIONS

15:30 – 17:00

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### Offshore Technology

#### 01-06-01 CFD Modeling Practice & Verification

Wednesday June 14 | Room 205 | 15:30–17:00

**Session Organizer:** Guangyu Wu, Chevron, USA

**Session Co-Organizers:** Zhenjia (Jerry) Huang, ExxonMobil, USA; Jang Whan Kim, Front Energies, USA

**Creating a Realistic Piloted Simulation of Helicopter Recovery to an Offshore Platform** OMAE2023-101602

Neale A. Watson<sup>1</sup> Mark Prior<sup>2</sup> Ieuan Owen<sup>1</sup> Mark D. White<sup>1</sup>

1. University of Liverpool, Liverpool, United Kingdom; 2. M Prior Consulting Ltd, Kexby, United Kingdom

**Numerical Study of Wind Loads and Experimental Validation for a FPSO Vessel Model** OMAE2023-102369

Baili Zhang<sup>1</sup> My Ha Dao<sup>1</sup> Xiuqing Xing<sup>1</sup> Jing Lou<sup>1</sup> Wei Siang Tan<sup>2</sup> Yongdong Cui<sup>2</sup> Boo Cheong Khoo<sup>2</sup>

1. Institute of High Performance Computing, Singapore, Singapore; 2. National University of Singapore, Singapore, Singapore

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### Structures, Safety and Reliability

#### 02-11-02 Fatigue and Fracture Reliability II

Wednesday June 14 | Room 212 | 15:30–17:00

**Session Organizer:** Yordan Garbatov, Universidade De Lisboa, Instituto Superior Técnico, Portugal

**Session Co-Organizer:** Carlos Guedes Soares, University of Lisbon, Portugal

**Some Background for the 2023 Revision of the Recommended Practice DNV-RP-C203**

**Fatigue Design of Offshore Steel Structures** OMAE2023-104845

Inge Lotsberg, Arne Fjeldstad

DNV, Høvik, Norway

**A Live Fatigue Monitoring Framework for Offshore Risers Using Accelerometer Data** OMAE2023-104675

Vikas Kejriwal, Eric Hoo, Hamid Nikoo, George Papageorgopoulos

Kent PLC, Perth, WA, Australia

**Intelligent Assessment of Fatigue Damage Based on the Monitoring Data of Offshore Structures** OMAE2023-104540

Xueliang Wang<sup>1</sup> Libin Zhou<sup>2</sup> Guoqing Wu<sup>1</sup> Yucheng Wang<sup>2</sup> Hongtao Mei<sup>3</sup> Hengyang Lu<sup>3</sup> Zhe Liu<sup>2</sup> Wei Fang<sup>2</sup>

1. China Ship Scientific Research Center, Wuxi, China; 2. School of Artificial Intelligence and Computer Science, Jiangnan University, Wuxi, China; 3. Jiangnan University, Wuxi, China

**Prediction of Welding Residual Stress According to Constraint Using Regression**

**Analysis and DNN in V-Groove Butt Welding** OMAE2023-102208

Jeongung Park, Gyubaek An

Chosun University, Gwangju, Korea

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### Structures, Safety and Reliability

#### 02-12-01 Reliability Based Maintenance and Inspection Planning: Life Cycle Cost Optimization

Wednesday June 14 | Room 214 | 15:30–17:00

**Session Organizer:** Bernt Leira, NTNU, Norway

**Session Co-Organizer:** Ge Wang, ABS, USA

**Combined Fatigue Damages of Bridges from Wind and Wave Actions –**

**Application to Offshore Bridge Structures** OMAE2023-101111

Magnus Knoph, Gudfinnur Sigurdsson, Mélanie Devergez

DNV AS, Høvik, Norway

## **A Framework for Defining Risk-Based Inspection Plans for Subsea** OMAE2023-103603

**Adriana M. Schleder<sup>1</sup> Marcos C. Maturana<sup>2</sup> Marcelo Ramos Martins<sup>2</sup> Paulo F. F. Frutuoso e Melo<sup>3</sup> Leonardo de Oliveira Barros<sup>4</sup> Rene Thiago Capelari Orlowski<sup>4</sup>**

1. University of São Paulo, São Paulo, SP, Brazil; 2. Analysis, Evaluation and Risk Management Laboratory – LabRisco, University of São Paulo, São Paulo, SP, Brazil; 3. COPPE, Graduate Program of Nuclear Engineering, Federal University of Rio de Janeiro, Rio de Janeiro, RJ, Brazil; 4. Research and Development Center – CENPES - Petrobras, Rio de Janeiro, RJ, Brazil

## **Probabilistic Approach for Fatigue Life Extension of Subsea Wells Using Pressure Testing** OMAE2023-104800

**Arne Fjeldstad<sup>1</sup> Torfinn Hørte<sup>1</sup> Gudfinnur Sigurdsson<sup>1</sup> Stian Sætre<sup>2</sup>**

1. DNV, Høvik, Norway; 2. Equinor, Fornebu, Norway

## **Structural Integrity Risk Assessment of Offshore Terminals Based on Key Measurable Indicators** OMAE2023-107731

**Sam Mazaheri**

Daly Bay Terminal, Mount Waverley, VIC, Australia

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## **Pipeline, Risers, and Subsea Systems**

### **04-01-06 Flexible Pipes and Umbilicals VI**

**Wednesday June 14 | Room 210 | 15:30–17:00**

**Session Organizer:** Krassimir Doynov, ExxonMobil, USA

#### **Decommissioning of Umbilicals and Flexible Pipes – a Sensitivity**

**Analysis in Decision-Making Process** OMAE2023-101121

**Luisa Nogueira Soares<sup>1</sup> Marcelo Igor Lourenço<sup>1</sup> Ilson Paranhos Pasqualino<sup>1</sup>**

**Eduardo Ribeiro Nicolosi<sup>2</sup> Claudio Violante Ferreira<sup>2</sup>**

1. Subsea Technology Laboratory, Rio de Janeiro, RJ, Brazil; 2. Petrobras - Petróleo Brasileiro S.A., Rio de Janeiro, RJ, Brazil

#### **Lateral Buckling of Tensile Armor Wires in Flexible Pipe Subject to Axial**

**Compressive and Cyclic Bending Load** OMAE2023-104823

**Naiquan Ye<sup>1</sup> Guomin Ji<sup>2</sup> Svein Saevik<sup>3</sup>**

1. SINTEF Ocean, Trondheim, Norway; 2. Norwegian University of Science and Technology, Gjøvik, Norway; 3. Norwegian University of Science and Technology, Trondheim, Norway

#### **DEA Model Applied to Risk Based Inspection for Offshore Flexible Pipelines**

**with Virtual Relative Risk Frontier from Event Trees** OMAE2023-105095

**Henrique Jaques Honorato<sup>1</sup> Theodoro Antoun Netto<sup>2</sup> Marcelo Igor Lourenço De Souza<sup>2</sup> Carolina Ferraz Netto<sup>2</sup>**

1. Federal University of Rio de Janeiro, Niterói, RJ, Brazil; 2. Federal University of Rio de Janeiro, Rio de Janeiro, RJ, Brazil

#### **Low and High Cycle Fatigue Performance Limits of Seamless and Seam-Welded**

**Umbilical Super Duplex Stainless Steel Tubes** OMAE2023-108686

**Hauwa Raji<sup>1</sup> Jamie Fletcher-Woods<sup>2</sup> Alan Dobson<sup>1</sup>**

1. TechnipFMC, Newcastle Upon Tyne, United Kingdom; 2. TechnipFMC Umbilicals Ltd, Newcastle Upon Tyne, United Kingdom

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## **Pipeline, Risers, and Subsea Systems**

### **04-03-03 Hydrodynamics**

**Wednesday June 14 | Room 213 | 15:30–17:00**

**Session Organizer:** Julian Hallai, Exponent, USA

#### **Two-Degree-of-Freedom Flow-Induced Vibrations of a Circular Cylinder Close to a Free Surface** OMAE2023-104736

**Xiang Qi<sup>1</sup> Shaoshi Dai<sup>1</sup> Chengjiao Ren<sup>2</sup> Qianqian Dong<sup>1</sup> Chengwang Xiong<sup>1</sup>**

1. Harbin Engineering University, Harbin, China; 2. University of Western Australia, Perth, WA, Australia

#### **Identification of Interacting Free-Spans in a Subsea Pipeline** OMAE2023-107635

**Rajil Saraswat<sup>1</sup> Palash Patil<sup>2</sup> Edward Cieccko<sup>3</sup> Parul Koul<sup>4</sup>**

1. ExxonMobil Services and Technology Private Limited, Bangalore, KA, India; 2. ExxonMobil Services and Technology Private Limited, Bengaluru, KA, India; 3. Esso Exploration Angola Limited, Torres Atlantico, Luanda, Angola; 4. ExxonMobil PNG Limited, Port Moresby, Papua New Guinea

**Hydrodynamic Forces of Subsea Small-Diameter Pipeline in a Deep/Wide Trench** OMAE2023-103310

Zinan Liu<sup>1</sup> Liang Cheng<sup>2</sup> Chengjiao Ren<sup>3</sup> Terry Griffiths<sup>3</sup> Feifei Tong<sup>3</sup>

1. South China University of Technology, Crawley, WA, Australia; 2. The South China University of Technology, Guangzhou, China; 3. The University of Western Australia, Crawley, WA, Australia

**Hydrodynamic Forces Acting on Small-Diameter Pipelines under**

**Random Waves and Currents: a Case Study** OMAE2023-104379

Yunfei Teng<sup>1</sup> Zhanjie Chen<sup>2</sup> Terry Griffiths<sup>3</sup> Hongwei An<sup>3</sup> Scott Draper<sup>4</sup> Henning Mohr<sup>3</sup> Xin Cheng<sup>2</sup> Xiaoyuan Hu<sup>1</sup> Liang Cheng<sup>1</sup>

1. South China University of Technology, Guangzhou, China; 2. Dalian University of Technology, Dalian, China; 3. The University of Western Australia, Perth, WA, Australia; 4. The University of Western Australia, Dalian, WA, Australia

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## Ocean Engineering

### 06-14-01 Underwater Vehicles and Design Technology I

Wednesday June 14 | Room 217 | 15:30–17:00

**Session Organizer:** Muk Chen Ong, University of Stavanger, Norway

**Session Co-Organizer:** Xueliang Wen, Norway

**Modelling and Analysis of the Bending Moment in a Subsea Shuttle Tanker under the Effect of Waves Using a Multi-Body Approach** OMAE2023-100707

Karan Sandipkumar Patel, Yucong Ma, Yihan Xing, Lin Li

Univeristy of Stavanger, Stavanger, Norway

**Uncertainty Analysis of the Safety Operating Envelope of a Subsea Shuttle Tanker** OMAE2023-101027

Hassan Hasan Yousef<sup>1</sup> Yucong Ma<sup>1</sup> Yihan Xing<sup>1</sup> Xiaosen Xu<sup>2</sup>

1. University of Stavanger, Stavanger, Norway; 2. Jiangsu University of Science and Technology, Stavanger, China

**A Computational Study to Predict Seakeeping Performance of a Surfaced Submarine in Irregular Waves** OMAE2023-102771

Doojin Jung<sup>1</sup> Sanghyun Kim<sup>2</sup>

1. Daewoo Shipbuilding & Marine Engineering Co., Ltd., Siheung-si, Korea; 2. INHA University, Incheon, Korea

**Numerical Simulation of Implosions in Chain Reaction and the Analysis of Different Implosion Beginning Positions** OMAE2023-102820

Sun Shengxia, Min Zhao

Shanghai Jiao Tong University, Shanghai, China

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## Polar and Arctic Sciences and Technology

### 07-06-02 Structures in Ice II

Wednesday June 14 | Room 208 | 15:30–17:00

**Session Organizer:** Thomas Fitzpatrick, Memorial University of Newfoundland, Canada

**Session Co-Organizer:** Brendon Nickerson, Stellenbosch University, South Africa

**Feasibility Study on Bottom-Fixed Offshore Wind Development in the Arctic** OMAE2023-102822

Yingjie Gu<sup>1</sup> Muk Chen Ong<sup>1</sup> Marek Jan Janocha<sup>1</sup> Atle Blomgren<sup>2</sup>

1. Department of Mechanical and Structural Engineering and Materials Science, University of Stavanger, Stavanger, Norway; 2. Norwegian Research Center (NORCE), Stavanger, Norway

**Numerical Investigation of Mooring System and First-Year Ice Ridge Keel Interaction** OMAE2023-104251

Jiaming Chen<sup>1</sup> Li Zhou<sup>2</sup> Shifeng Ding<sup>1</sup> Renwei Liu<sup>1</sup> Yi Ding<sup>1</sup>

1. Jiangsu University of Science and Technology, Zhenjiang, China; 2. Shanghai Jiao Tong University, Shanghai, China

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## CFD, VIV and FSI

### 08-07-01 Data-Driven Models and Digital Twins

Wednesday June 14 | Room 209 | 15:30–17:00

**Session Organizer:** Owen Oakley, Retired, USA

**Session Co-Organizers:** Madhu Agrawal, BP, USA; Muk Chen Ong, University of Stavanger, Norway

#### Parameter Estimation for 1-Eq./2-Eq. Turbulence Models by EnKF Data

**Assimilation: Twin Experiment with 2D Flat Plate** OMAE2023-101237

Nobuaki Sakamoto

*National Maritime Research Institute, Mitaka-shi, Japan*

#### Methodology for Selection of Co-Simulation Platform for Digital Twin

**Development of Maritime Energy Systems** OMAE2023-101505

Vaidehi Gosala<sup>1</sup> Ludger Hachmeister<sup>2</sup> Sophie Stutz<sup>1</sup> Jan-Erik Giering<sup>1</sup> Sören Ehlers<sup>1</sup>

*1. DLR Institute of Maritime Energy Systems, Geesthacht, Germany; 2. RWTH Aachen, Aachen, Germany*

#### On the Digital Twin of the Ocean Cleanup Systems

OMA2023-103055

Andriarimina Daniel Rakotonirina<sup>1</sup> Martin Gonzalez<sup>2</sup> Bruno Sainte-Rose<sup>2</sup>

*1. The Ocean Cleanup, Utrecht, Netherlands; 2. The Ocean Cleanup, Rotterdam, Netherlands*

#### Extrapolating Fluid Dynamics with Spatiotemporal Convolution Networks

OMA2023-101031

Indu Kant Deo, Rajeev Jaiman

*University of British Columbia, Vancouver, BC, Canada*

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## Ocean Renewable Energy

### 09-01-10 Offshore Wind Energy – Data Science and Digital Twins

Wednesday June 14 | Room 216 | 15:30–17:00

**Session Organizer:** Zhen Gao, NTNU, Norway

**Session Co-Organizer:** Peter Rohrer, NTNU, Norway

#### Bayesian Network Modelling of Aero-Mechanical Performance of Wind Turbine

OMA2023-102743

My Ha Dao<sup>1</sup> Quang Tuyen Le<sup>1</sup> Xiang Zhao<sup>1</sup> Chin Chun Ooi<sup>1</sup> Trung Pham Duong Luu<sup>2</sup> Nagarajan Raghavan<sup>2</sup>

*1. Institute of High Performance Computing, Singapore, Singapore;*

*2. Singapore University of Technology and Design, Singapore, Singapore*

#### Demonstration of a Standalone, Descriptive, and Predictive Digital Twin

**of a Floating Offshore Wind Turbine** OMAE2023-103112

Florian Stadtmann, Henrik Andreas Gusdal Wassertheurer, Adil Rasheed

*Norwegian University of Science and Technology, Trondheim, Norway*

#### Time Domain Structural Analysis and Digital Twin Application for Floating Offshore Wind Turbine

OMA2023-105074

Ho-Joon Lim<sup>1</sup> Sagar Samaria<sup>1</sup> Sukjoo Choi<sup>2</sup> Anil Sablok<sup>1</sup> Hakun Jang<sup>1</sup> Bonjun Koo<sup>1</sup>

*1. Technip Energies, Houston, TX, USA; 2. Technip Energies, Genesis, Houston, TX, USA*

#### Gradient-Based Design Optimization of Fully-Flexible Floating Wind

**Turbines Using Modal Analysis** OMAE2023-101930

Peter J. Rohrer<sup>1</sup> Erin E. Bachynski-Polić<sup>1</sup> John Marius Hegseth<sup>2</sup>

*1. Norwegian University of Science and Technology, Trondheim, Norway; 2. Dr.Techn. Olav Olsen, Lysaker, Norway*

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## Ocean Renewable Energy

### 09-04-02 Hybrid and Novel Renewable Energy Systems II

Wednesday June 14 | Room 218 | 15:30–17:00

**Session Organizer:** Narakorn Srinil, Newcastle University, United Kingdom

**Session Co-Organizer:** Weilin Chen, NUS, Singapore

#### **Optimising the Interactions between an Offshore Wind Turbine and a Co-Located WEC** OMAE2023-105352

Shelby Hewins<sup>1</sup> Jean-Roch Nader<sup>2</sup> Eric Gubesch<sup>1</sup> Nataliia Sergiienko<sup>3</sup>

1. Australian Maritime College, University of Tasmania, Newnham, TAS, Australia; 2. University of Tasmania, Newnham, TAS, Australia; 3. University of Adelaide, Adelaide, SA, Australia

#### **Non-Linear and Survivable Experimental Modelling of a WEC Co-Located with an OWT** OMAE2023-105353

Jack Crawford<sup>1</sup> Eric Gubesch<sup>1</sup> Jean-Roch Nader<sup>2</sup>

1. Australian Maritime College, University of Tasmania, Newnham, TAS, Australia; 2. University of Tasmania, Newnham, TAS, Australia

#### **Motion Suppression of a Floating Offshore Wind Turbine Using Heaving**

**Point Absorbers: a Case Study in Australia** OMAE2023-104330

Leandro Souza Pinheiro da Silva<sup>1</sup> Nataliia Y. Sergiienko<sup>2</sup> Benjamin S. Cazzolato<sup>2</sup> Fantai Meng<sup>3</sup> Marielle de Oliveira<sup>4</sup> Boyin Ding<sup>2</sup>

1. Delmar Systems, Perth, WA, Australia; 2. The University of Adelaide, Adelaide, SA, Australia; 3. Shanghai Jiao Tong University, Shanghai, China; 4. University of São Paulo, São Paulo, SP, Brazil

#### **A Site Selection Decision Framework for Offshore Wind-Powered**

**Hydrogen Production Infrastructure** OMAE2023-104627

Sumit Kumar<sup>1</sup> Ehsan Arzaghi<sup>2</sup> Til Baalisampang<sup>2</sup> Vikram Garaniya<sup>2</sup> Rouzbeh Abbassi<sup>3</sup>

1. Australian Maritime College, University of Tasmania, Prospect Vale, TAS, Australia; 2. Australian Maritime College, University of Tasmania, Launceston, TAS, Australia; 3. Macquarie University, Sydney, NSW, Australia

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## Petroleum Technology

### 11-02-04 Well Drilling Hydraulics and Cementing

Wednesday June 14 | Room 211 | 15:30–17:00

**Session Organizer:** Arild Saasen, University of Stavanger, Norway

**Session Co-Organizer:** Ergun Kuru, University of Alberta, Canada

#### **A Coupled Fluid-Structure Model for Estimation of Hydraulic Forces on the Drill-Pipes** OMAE2023-104443

Lucas P. Volpi<sup>1</sup> Eric Cayeux<sup>2</sup> Rune Wiggo Time<sup>1</sup>

1. University of Stavanger, Stavanger, Norway; 2. Norwegian Research Center (NORCE), Stavanger, Norway

#### **Dynamic Torque and Drag Model Coupled with Transient Hydraulic** OMAE2023-104704

Eric Cayeux<sup>1</sup> Espen Jettestuen<sup>2</sup> Adrian Ambrus<sup>3</sup>

1. Norwegian Research Center (NORCE), Sandnes, Norway; 2. Norwegian Research Center (NORCE), Oslo, Norway; 3. Norwegian Research Center (NORCE), Stavanger, Norway

#### **Investigation of Polymer Latex Effects on Cement Mechanical Properties**

**for Improved Wellbore Integrity** OMAE2023-105029

Abdullah S. Al-Yami, Hussam Al-Qahtani, Nizar Jaber, Majad Khan, Vikrant Wagle

Saudi Aramco, Dhahran, Saudi Arabia

# Thursday Concurrent Sessions

## CONCURRENT SESSIONS

10:30 – 12:00

### Structures, Safety and Reliability

#### 02-04-01 Extreme and Freak Waves

Thursday June 15 | Room 212 | 10:30–12:00

Session Organizer: Carlos Guedes Soares, University of Lisbon, Portugal

##### Nonlinear Fourier Analysis Using Quasiperiodic Fourier Series OMAE2023-101978

Alfred R. Osborne

Nonlinear Waves Research Corporation, Alexandria, VA, USA

##### Are Rogue Waves Predictable from Field Measurements? OMAE2023-103020

Thomas Breunung, Balakumar Balachandran

University of Maryland, College Park, College Park, MD, USA

##### How Incoming Wave Directions from the Southern Ocean Affect Wave Propagation in the Austral Winter Antarctica Ice Cover OMAE2023-104207

Takehiko Nose<sup>1</sup> Tomotaka Katsuno<sup>1</sup> Takuji Waseda<sup>1</sup> Tsubasa Kodaira<sup>1</sup> Jean Rabault<sup>2</sup> Shuki Ushio<sup>3</sup> Mario Hoppmann<sup>4</sup>

1. The University of Tokyo, Kashiwa, Japan; 2. Norwegian Meteorological Institute, Blindern N, Norway; 3. National Institute of Polar Research, Tachikawa, Japan; 4. Alfred Wegener Institute, Bremerhaven, Germany

##### Slope Effect on the Evolution of Kurtosis over a Shoal OMAE2023-107884

Saulo Mendes<sup>1</sup> Jérôme Kasparian<sup>2</sup>

1. University of Geneva, Onex, Switzerland; 2. University of Geneva, Geneva, Switzerland

### Structures, Safety and Reliability

#### 02-13-01 Risk Analysis and Safety Management I

Thursday June 15 | Room 208 | 10:30–12:00

Session Organizer: Ângelo Teixeira, Instituto Superior Técnico, Universidade de Lisboa, Portugal

Session Co-Organizer: Carlos Guedes Soares, University of Lisbon, Portugal

##### A Fire Safety Assessment Method for the Cruise Ship Space Based on Firefighting Contribution OMAE2023-101935

Wei Cai<sup>1</sup> Zhiyan Yu<sup>1</sup> Min Hu<sup>1</sup> Xinyun Zhang<sup>1</sup> Ziyu Wang<sup>2</sup>

1. Wuhan University of Technology, Wuhan, China; 2. Wuhan University of Technology, Guangzhou, China

##### A New Approach for Natural Gas and Hydrogen Blast Loading Analysis: a Fixed Mass Perspective OMAE2023-104306

Hyunho Lee, Jungkwan Seo

Pusan National University, Busan, Korea

##### A Risk-Based Fire Protection Design of a LNG Fueled Ship OMAE2023-104652

Hyunpyo Kim, Hyunjoon Nam, Ga Hyeong Kang, Min Joo Kim, Sunghye Kim, Dongkyu Shin, Sung-In Park

Korea Shipbuilding & Offshore Engineering, Seongnam-si, Korea

##### Offshore Oil Wells: Indicators for Configuration Selection OMAE2023-105150

Joaquim Rocha dos Santos<sup>1</sup> Danilo Taverna Martins Pereira de Abreu<sup>1</sup> Danilo Colombo<sup>2</sup> Marcelo Ramos Martins<sup>1</sup>

1. University of São Paulo, São Paulo, SP, Brazil; 2. Petrobras, Rio de Janeiro, RJ, Brazil



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## Pipeline, Risers, and Subsea Systems

### 04-01-07 Flexible Pipes and Umbilicals VII

Thursday June 15 | Room 214 | 10:30–12:00

Session Organizer: Alan Dobson, TechnipFMC, United Kingdom

Session Co-Organizer: Celso Pesce, University of Sao Paulo, Brazil

#### Comparison of VIV Response of Lazy-Wave and W-Shaped FOWT Power Cable Configurations OMAE2023-103244

Alex Fuglsang<sup>1</sup> Anesu J. Kusangaya<sup>1</sup> Craig Dillon-Gibbons<sup>2</sup> Peter Bauer<sup>2</sup> Hayden Marcollo<sup>1</sup>

1. AMOG Consulting, Notting Hill, VIC, Australia; 2. AMOG Inc., Houston, TX, USA

#### Torque Evaluation under Cable Transport OMAE2023-104935

Decao Yin<sup>1</sup> Philippe Mainçon<sup>1</sup> Vegard Longva<sup>1</sup> Sjoerd Warringa<sup>2</sup> Carl Smith<sup>2</sup>

1. SINTEF Ocean, Trondheim, Norway; 2. DEME Group, Breda, Netherlands

#### Reliability Challenges Associated with 66KV Dynamic Submarine Cables OMAE2023-107668

Alan Dobson

TechnipFMC, Newcastle Upon Tyne, United Kingdom

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## Pipeline, Risers, and Subsea Systems

### 04-03-04 Thermo-Mechanical

Thursday June 15 | Room 210 | 10:30–12:00

Session Organizer: Julian Hallai, Exponent, USA

#### Thermo-Mechanical Assessment and Challenges of Mero 1 HPHT Flowlines OMAE2023-102939

Adel Jebali<sup>1</sup> Rafael F. Solano<sup>2</sup> Marcio Scultori<sup>3</sup> Matthieu Novel<sup>3</sup> Carlos Valer<sup>3</sup> Olivier Mustiere<sup>4</sup>

1. TechnipFMC, Nîmes, France; 2. Petrobras, Rio de Janeiro, RJ, Brazil; 3. TechnipFMC, Rio de Janeiro, RJ, Brazil; 4. TechnipFMC, Aberdeen, United Kingdom

#### Anchoring System of Rigid Riser – Flowline Connection with Torpedo Piles OMAE2023-102990

Matthieu Novel<sup>1</sup> Rachel C. Genzani<sup>2</sup> Rafael F. Solano<sup>2</sup> Adel Jebali<sup>3</sup> Marcio Scultori<sup>1</sup>

Florent Camilleri<sup>1</sup> Carlos Valer<sup>1</sup> Olivier Mustiere<sup>4</sup>

1. TechnipFMC, Rio de Janeiro, RJ, Brazil; 2. Petrobras, Rio de Janeiro, RJ, Brazil; 3. TechnipFMC, Nîmes, France; 4. TechnipFMC, Courbevoie, France

#### Demonstrating Electrically Heat Traced Flowline Performance – As-Built Engineering Model vs. Field Data, the Perfect Matching OMAE2023-104729

Guy Mencarelli<sup>1</sup> Yves Minier<sup>1</sup> Donald Silcock<sup>2</sup> Camille Pradeilles<sup>1</sup> Xavier Michel<sup>1</sup> David Gibson<sup>3</sup>

1. Subsea 7, Suresnes, France; 2. Subsea 7, Aberdeen, United Kingdom; 3. AkerBP, Stavanger, Norway

#### Deepwater RCM and SRI Design of Production Rigid Flowline Loops OMAE2023-104359

Nikolaos Chatzimanolis, Hossein Jalali, Arek Bedrossian, Min Xie, Mark Lewis

Subsea 7, Sutton, United Kingdom

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## Ocean Engineering

### 06-02-01 Coastal Engineering

Thursday June 15 | Room 203 | 10:30–12:00

Session Organizer: Yuzhu Pearl Li, National University of Singapore, Denmark

#### Bragg Resonance of Surface Gravity Waves by Surface-Piercing Vertical Multi-Plate Breakwaters OMAE2023-100531

Chen Chang-Zhe<sup>1</sup> Jing-Ping Wu<sup>2</sup> Jun Pan<sup>3</sup> Zao-Jian Zou<sup>1</sup>

1. Shanghai Jiao Tong University, Shanghai, China; 2. Wuhan University of Technology, Wuhan, China; 3. Sany Marine Heavy Industry Co., Ltd Testing institute, Zhuhai, China

## Hydrodynamic Forces on Near-Bed Cylinders in Steady Currents OMAE2023-104297

Xiaoyuan Hu<sup>1</sup> Liang Cheng<sup>1</sup> Feifei Tong<sup>2</sup> Yunfei Teng<sup>1</sup> Yan Qu<sup>3</sup> Hongyi Jiang<sup>4</sup>

1. South China University of Technology, Guangzhou, China; 2. Southern Cross University, Perth, WA, Australia; 3. South China University of Technology, Guangzhou, China; 4. The University of Western Australia, Perth, WA, Australia

## High-Order Phase-Resolving Method for Wave Transformation over Natural Shorelines OMAE2023-104544

Wen-Huai Tsao, Rebecca Schurr, Christopher E. Kees

Louisiana State University, Baton Rouge, LA, USA

## Spatial and Temporal Evolution Characteristics of Water Quality in the Port Waters – a Case Study of Zhanjiang Port, China OMAE2023-104716

Jianqun Guo<sup>1, 2</sup> Zhonglian Jiang<sup>1</sup> Zhen Yu<sup>3</sup> Jianglong Ying<sup>1, 2</sup>

1. National Engineering Research Center for Water Transport Safety, Wuhan University of Technology, Wuhan, China; 2. School of Transportation and Logistics Engineering, Wuhan University of Technology, Wuhan, China; 3. Changjiang Waterway Institute of Planning and Design, Wuhan, China

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## Ocean Engineering

### 06-07-01 Metocean, Measurement and Data Interpretation I

Thursday June 15 | Room 205 | 10:30–12:00

Session Organizer: Kai Wang, Sun Yat-Sen University, China

#### Comparison of Ocean Wave Directional Spectra Estimated Using an Array of Three Optech Lasers and a Directional Waverider Buoy OMAE2023-101196

Pramod Kumar Jangir, Kevin C. Ewans, Ian R. Young

The University of Melbourne, Melbourne, VIC, Australia

#### Resolving Observational Differences in Measurements of Tropical Cyclone Wave Spectra OMAE2023-101592

Ian R. Young

University of Melbourne, Melbourne, VIC, Australia

#### Echo State Networks for Surface Current Forecasting in a Port Access Channel OMAE2023-103265

Felipe Marino Moreno, Jefferson Fialho Coelho, Marlon Sproesser Mathias, Marcel Rodrigues de Barros, Caio Fabricio Deberaldini Netto, Lucas Palmiro de Freitas, Marcelo Dottori, Fabio Gagliardi Cozman, Anna Helena Reali Costa, Edson Satoshi Gomi, Eduardo Aoun Tannuri

Universidade de São Paulo, São Paulo, SP, Brazil

#### What a Wave Buoy Actually Measures in 3D: analysis of a Mild Sea State OMAE2023-104281

Yue Ding<sup>1</sup> Paul H. Taylor<sup>2</sup> Wenhua Zhao<sup>2</sup> Jean-Noel Dory<sup>3</sup>

1. The University of Western Australia, Innaloo, WA, Australia; 2. The University of Western Australia, Perth, WA, Australia; 3. BW Ideol, La Ciotat, France

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## Ocean Engineering

### 06-08-01 Model Tests

Thursday June 15 | Room 204 | 10:30–12:00

Session Organizer: Motohiko Murai, Yokohama National University, Japan

#### Wakes of Surface-Piercing Cylinders OMAE2023-101473

Douglas Potts<sup>1</sup> Zhi Leong<sup>1</sup> Jonathan Binns<sup>2</sup> Hayden Marcollo<sup>3</sup> Alex Skvortsov<sup>4</sup>

1. Australian Maritime College, Launceston, TAS, Australia; 2. Defence Science and Technology Group (DSTG), Launceston, TAS, Australia; 3. AMOG Consulting, Notting Hill, VIC, Australia; 4. Defence Science and Technology Group (DSTG), Newnham, TAS, Australia

#### Evaluation of Seakeeping Model Tests in Open Waters Using Two Submarine Hull Forms OMAE2023-101872

Wiebke Büsken, Stefan Krüger

Hamburg University of Technology, Hamburg, Germany

## Use of Low-Cost Drifter Buoys by Students to Update Ocean Current Models OMAE2023-101202

Dan Dickerson<sup>1</sup> Evan Li<sup>2</sup> Nikhil Mehta<sup>2</sup> Joseph Dickerson<sup>3</sup> Petros Katsioloudis<sup>4</sup> Shawn Moore<sup>3</sup>

1. East Carolina University, Gatesville, NC, USA; 2. East Carolina University - Summer Ventures, Greenville, NC, USA;

3. East Carolina University, Greenville, NC, USA; 4. Old Dominion University, Norfolk, VA, USA

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## Ocean Engineering

### 06-14-02 Underwater Vehicles and Design Technology II

Thursday June 15 | Room 217 | 10:30–12:00

Session Organizer: Muk Chen Ong, University of Stavanger, Norway

Session Co-Organizer: Xueliang Wen, Norway

#### Sea Trials of Multiple Heterogenous Cruising AUVs and ASV with Basic Formation Control OMAE2023-103370

Takumi Sato<sup>1</sup> Kangsoo Kim<sup>1</sup> Masahiko Sasano<sup>1</sup> Akihiro Okamoto<sup>1</sup> Shogo Inaba<sup>1</sup> Satoshi Kondo<sup>2</sup>

Hiroshi Matsumoto<sup>2</sup> Takashi Murashima<sup>2</sup> Toshifumi Fujiwara<sup>1</sup> Hiroyuki Osawa<sup>2</sup>

1. National Maritime Research Institute, Mitaka, Japan; 2. Japan Agency for Marine-Earth Science and Technology, Yokosuka, Japan

#### Experimentally Determined Motion Response Due to Waves of a

Loitering Remote Operated Vehicle OMAE2023-104393

Johnathan D. Marks<sup>1</sup> Joseph T. Klamo<sup>2</sup>

1. United States Navy, Monterey, CA, USA; 2. Naval Postgraduate School, Monterey, CA, USA

#### Investigating the Free Surface Effect on the Hydrodynamics of an ROV

Moving along a Straight Path at Design Speed OMAE2023-106517

Ruinan Guo<sup>1</sup> Yingfei Zan<sup>1</sup> Fuxiang Huang<sup>2</sup> Duanfeng Han<sup>1</sup> Baozhong Li<sup>3</sup>

1. Harbin Engineering University, Harbin, China; 2. Offshore Oil Engineering Co., Ltd., Tianjin,

China; 3. China Classification Society Tianjin Branch., Ltd., Tianjin, China

#### Numerical Estimation of Hydrodynamic Derivatives of a Biomimetic Autonomous

Underwater Vehicle by Captive Model Tests OMAE2023-108006

Vignesh D<sup>1</sup> Pramod Suresh Jadhav<sup>1</sup> Asokan Thondiyath<sup>1</sup> Rajagopalan Vijayakumar<sup>1</sup> Parameswaran Krishnankutty<sup>2</sup>

1. Indian Institute of Technology Madras, Chennai, TN, India; 2. Indian Institute of Technology Madras, Kochi, TN, India

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## CFD, VIV and FSI

### 08-08-01 VIV & Offshore Wind Turbines

Thursday June 15 | Room 209 | 10:30–12:00

Session Organizer: Rajeev Jaiman, University of British Columbia, Canada

Session Co-Organizer: Owen Oakley, Retired, USA

#### Toward Environmental and Structural Digital Twinning of Offshore Wind Turbine OMAE2023-101859

Xiang Zhao, My Ha Dao, Quang Tuyen Le

Institute of High Performance Computing, Singapore, Singapore

#### A Hybrid Numerical Framework for Engineering Design of Floating

Offshore Wind Turbine Foundations OMAE2023-102429

Pietro D. Tomaselli<sup>1</sup> Xerxes Mandviwalla<sup>2</sup> Bjarne Jensen<sup>1</sup>

1. DHI, Hørsholm, Denmark; 2. Vattenfall, Hørsholm, Denmark

#### Evaluation of VIV Prediction Practice of Deep-Water Steel Lazy Wave Risers (SLWRS) OMAE2023-105583

Jie Wu<sup>1</sup> Fengjian Jiang<sup>2</sup> Halvor Lie<sup>2</sup> Elizabeth Passano<sup>2</sup> Decao Yin<sup>2</sup> Svein Sævik<sup>3</sup>

Guttorm Grytøyr<sup>4</sup> Brendan Francis Hogg<sup>4</sup> Themistocles Resvanis<sup>5</sup> Kim Vandiver<sup>5</sup>

1. SINTEF, Trondheim, Norway; 2. SINTEF Ocean, Trondheim, Norway; 3. Norwegian University of Science and Technology,

Trondheim, Norway; 4. Equinor, Fornebu, Norway; 5. Massachusetts Institute of Technology, Cambridge, MA, USA

#### Flow Induced Vibration of Flexible Risers with Spanwise Grooves OMAE2023-105214

Arun Periyal<sup>1</sup> Harsh Pipal<sup>1</sup> Ritwik Ghoshal<sup>1</sup> Vaibhav Joshi<sup>2</sup>

1. Indian Institute of Technology Kharagpur, Kharagpur, WB, India; 2. Birla Institute of

Technology & Science (BITS) Pilani - K K Birla Goa Campus, Goa, GA, India

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## Ocean Renewable Energy

### 09-03-01 Current and Tidal Energy – Design Considerations

Thursday June 15 | Room 216 | 10:30–12:00

Session Organizer: Kelley Ruehl, Sandia NL, USA

#### A Parametric Study to Enhance the Design of Hydrokinetic Turbine OMAE2023-103329

Cheng Yee Ng<sup>1</sup> Nauman Riyaz Maldar<sup>2</sup> Lee Woen Ean<sup>3</sup> Bak Shiiun Wong<sup>4</sup> Hooi Siang Kang<sup>5</sup>

1. Universiti Teknologi PETRONAS, Seri Iskandar, Malaysia; 2. Department of Civil, Environmental, and Ocean Engineering, Stevens Institute of Technology, Hoboken, NJ, USA; 3. Institute of Sustainable Energy, Universiti Tenaga Nasional, Kajang, Malaysia; 4. Petronas Global Technical Solutions, Miri, Malaysia; 5. Universiti Teknologi Malaysia, Johor Bahru, Malaysia

#### Analysis of Turbulence Parameters for a Tidal Energy Site in a Wave-Current Environment OMAE2023-104347

Tian Tan, Vengatesan Venugopal, Brian Sellar

The University of Edinburgh, Edinburgh, United Kingdom

#### Possibility of Tidal Farms for the Gulf of Kutch OMAE2023-107680

Vijaya Lakshmi Thiagarajan, Abdus Samad, Suresh Rajendran

Indian Institute of Technology Madras, Chennai, TN, India

#### Energy for Tidal in Indonesia: Opportunity and Challenges OMAE2023-108028

Ahmad Firdaus

Bandung Institute of Technology, Bandung, Indonesia

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## Ocean Renewable Energy

### 09-04-03 Hybrid and Novel Renewable Energy Systems III

Thursday June 15 | Room 218 | 10:30–12:00

Session Organizer: Jean-roch Nader, UTAS, Australia

Session Co-Organizer: Parth Patel, UTAS, Australia

#### Energy Harvesting from Multiple Responses of an Elastically Mounted D-Section Prism OMAE2023-104810

Weilin Chen, Yuzhu Li

National University of Singapore, Singapore, Singapore

#### Experimental Observation on Chaotic Vortex-Induced Vibration of

#### Circular Cylinder in Turbulent Flow OMAE2023-101301

Yan Naung Aye, Narakorn Srinil

Newcastle University, Newcastle Upon Tyne, United Kingdom

#### Optimisation of Energy Extraction of Multiple Wave Energy Converter in

#### Moonpool and Channel Using Anti-Node OMAE2023-102732

Zhi Yung Tay<sup>1</sup> Ling Wan<sup>2</sup>

1. Singapore Institute of Technology, Singapore, Singapore; 2. Ningbo University, Ningbo, China

#### Hydrodynamic Modelling of Membrane Floats Floating PV System in Offshore Environments OMAE2023-104432

Marvin Ananda Taneli<sup>1</sup> Farid Putra Bakti<sup>2</sup>

1. Institut Teknologi Bandung, Jakarta Utara, Indonesia; 2. Institut Teknologi Bandung, Bandung, Indonesia

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## Petroleum Technology

### 11-01-01 Well Drilling Technology I

Thursday June 15 | Room 211 | 10:30–12:00

**Session Organizer:** Stephen D. Butt, Memorial University of Newfoundland, Canada

**Session Co-Organizers:** Mohammad Azizur Rahman, Texas A&M University at Qatar, Qatar; Ergun Kuru, University of Alberta, Canada

#### **Analytical, Numerical and Field Data Investigation for Deriving the Condition of Stick-Slip Drill String Vibration** OMAE2023-102439

Tatsuya Kaneko<sup>1</sup> Tomoya Inoue<sup>2</sup> Ryota Wada<sup>3</sup> Tokihiro Katsui<sup>4</sup> Hiroyoshi Suzuki<sup>5</sup>

1. Japan Agency for Marine–Earth Science and Technology, Yokohama, Japan; 2. Japan Agency for Marine–Earth Science and Technology, Yokosuka, Japan; 3. The University of Tokyo, Kashiwa, Japan; 4. Kobe University, Kobe, Japan; 5. Osaka University, Suita, Japan

#### **Evaluation of Wear and Damage on Large-Diameter Disc Cutters** OMAE2023-103836

Oluwafemi Tytler, Zijian Li, Judith George, Stephen Butt

Memorial University of Newfoundland, St. John's, NL, Canada

#### **The Sidetracking Configuration Optimization and Detailed Scheme Design in a Oilfield Middle East** OMAE2023-108061

Zhen Nie, Shuzhe Shi, Zhengxue Du, Xueqin Huang, Bohong Wu, Chunpeng Wang, Yanna Zhang

Research Institute of Petroleum Exploration and Development, Beijing, China

#### **Evaluation of Granite Deformation through Non-Compliant versus Compliant Indirect Tensile Strength Application** OMAE2023-105090

Abdelsalam Abugharara, Stephen Butt

Memorial University of Newfoundland, St. John's, NL, Canada

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## Petroleum Technology

### 11-07-01 Production Systems and Subsea Operations

Thursday June 15 | Room 213 | 10:30–12:00

**Session Organizer:** Marcio Yamamoto, National Maritime Research Institute, Japan

**Session Co-Organizers:** Ergun Kuru, University of Alberta, Canada; Sergio Bordalo, University of Campinas, Brazil

#### **The Dynamic Optimization of Lower Completion Configurations Based on the Liquid/Gas Flow Streamline in an Middle East Oilfield** OMAE2023-101346

Shuzhe Shi<sup>1</sup> Bohong Wu<sup>1</sup> Zhen Nie<sup>1</sup> Yong Li<sup>1</sup> Xin Li<sup>1</sup> Lufeng Zhang<sup>2</sup>

1. The Research Institute of Petroleum Exploration and Development, CNPC, Beijing, China; 2. SINOPEC Petroleum Exploitation and Production Research Institute, Beijing, China

#### **Maintaining Constant Oil and Gas Export Rates in Offshore Installations Powered by Fluctuating Wind Energy** OMAE2023-102454

Leila Eyni<sup>1</sup> Milan Stanko<sup>1</sup> Heiner Schümann<sup>2</sup>

1. Norwegian University of Science and Technology, Trondheim, Norway; 2. SINTEF Industri, Trondheim, Norway

#### **Development of an Ipm Tool for Subsea System Design considering Lifecycle Production/injection Performance** OMAE2023-103289

Yuxi Wang<sup>1</sup> Cheng Hong<sup>2</sup> Segen Estefen<sup>1</sup>

1. Federal University of Rio de Janeiro, Rio de Janeiro, RJ, Brazil; 2. Ningbo University, Ningbo, China

#### **A Dynamics Experiment with a Submerged and Suspended Vertical Riser Pipe Small Scale Model Undergoing Forced Motions at the Top** OMAE2023-104375

Caio Cesar de Oliveira Trigo, Sergio Nascimento Bordalo, Celso Kazuyuki Morooka

University of Campinas, Campinas, SP, Brazil

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## CONCURRENT SESSIONS

13:30 – 15:00

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### Structures, Safety and Reliability

#### 02-04-02 Probabilistic and Spectral Wave Modelling

Thursday June 15 | Room 212 | 13:30–15:00

Session Organizer: Carlos Guedes Soares, University of Lisbon, Portugal

##### A Joint Probability Distribution Model for Multivariate Wind and Wave Conditions OMAE2023-101961

Erik Vanem<sup>1</sup> Elias Fekhari<sup>2</sup> Nikolay Dimitrov<sup>3</sup> Mark Kelly<sup>3</sup> Alexis Cousin<sup>4</sup> Martin Guiton<sup>4</sup>

1. DNV Group Research & Development, Høvik, Norway; 2. EDF R&D, Nanterre, France;

3. DTU, Roskilde, Denmark; 4. IFPEN, Rueil-Malmaison, France

##### Directional Wave Spectra by Means of a Fully Nonlinear Wave Model OMAE2023-102095

Omar Zain Torres Rios<sup>1</sup> Alexander Babanin<sup>1</sup> Ian Young<sup>1</sup> Sannasi Annamalaisamy Sannasiraj<sup>2</sup>

1. University of Melbourne, Parkville, VIC, Australia; 2. Indian Institute of Technology, Chennai, TN, India

##### Sea Spray Production During Extreme Marine Weather Conditions:

##### Observations During Tropical Cyclones Olwyn and Veronica OMAE2023-104355

Joey Voermans<sup>1</sup> Xingkun Xu<sup>2</sup> Alexander Babanin<sup>2</sup>

1. University of Melbourne, Parkville, VIC, Australia; 2. University of Melbourne, Melbourne, VIC, Australia

##### On Nonlinear Wave Evolution Under the Ice OMAE2023-104435

Takuji Waseda<sup>1</sup> Alberto Alberello<sup>2</sup> Takehiko Nose<sup>1</sup> Takenobu Toyota<sup>3</sup> Tsubasa Koraira<sup>1</sup> Yasushi Fujiwara<sup>4</sup>

1. The University of Tokyo, Kashiwa, Japan; 2. University of East Anglia, Norwich, United Kingdom; 3. Institute of

Low Temperature Science, Sapporo, Japan; 4. Low Temperature Lab, Hokkaido University, Kobe, Japan

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### Structures, Safety and Reliability

#### 02-13-02 Risk Analysis and Safety Management II

Thursday June 15 | Room 213 | 13:30–15:00

Session Organizer: Ângelo Teixeira, Instituto Superior Técnico, Universidade de Lisboa, Portugal

Session Co-Organizer: Carlos Guedes Soares, University of Lisbon, Portugal

##### Application of Technique for Early Consideration of Human Reliability in the Specification of the Maximum Acceptable Probability of Failure on Demand and the Maximum Spurious Operation

##### Frequency of a Floating Nuclear Power Plant Safety Control System OMAE2023-104971

Marcos Coelho Maturana, Danilo Taverna M. Pereira Abreu, Marcelo Ramos Martins

University of São Paulo, São Paulo, SP, Brazil

##### Cognitive Models for Human Reliability Analysis Applications in the Oil and Gas Industry OMAE2023-105027

Marco Antonio Bayout Alvarenga<sup>1</sup> Paulo Fernando Frutuoso e Melo<sup>2</sup> Marcos C. Maturana<sup>3</sup> Marcelo Ramos Martins<sup>3</sup>

1. National Commission of Nuclear Energy, Rio de Janeiro, RJ, Brazil; 2. COPPE, Graduate Program of Nuclear

Engineering, Federal University of Rio de Janeiro, Rio de Janeiro, RJ, Brazil; 3. LABRISCO/USP, São Paulo, SP, Brazil

##### Offshore Oil Wells Integrity: Safety Analysis of an Offshore Oil Well at the Production

##### Phase Using STPA (System-Theoretic Process Analysis) OMAE2023-105039

Lucas Ribeiro de Almeida, Joaquim Rocha dos Santos, Marco Aurélio Pestana, Marcelo Ramos Martins

Escola Politécnica - Universidade de São Paulo (USP), São Paulo, SP, Brazil

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## Pipeline, Risers, and Subsea Systems

### 04-03-05 Pipe-Soil Interaction

Thursday June 15 | Room 210 | 13:30–15:00

Session Organizer: Julian Hallai, Exponent, USA

#### Testing to Reveal Soil Stiffness and Damping at Pipeline Free-Span ‘Shoulders’ OMAE2023-101816

Vasileios Papavasileiou, Fraser Bransby, Phil Watson, Michael O’ Neill

*The University of Western Australia, Perth, WA, Australia*

#### Seabed Proximity Effect on Free Spanning Pipelines: the FIST JIP OMAE2023-103464

Mário Caruso<sup>1</sup> James Sutherland<sup>2</sup>

1. DNV, Bærum, Norway; 2. HR Wallingford, Wallingford, United Kingdom

#### Predicting the As-Laid Embedment of Surface-Laid Pipelines in Sandwave Regions OMAE2023-104434

Zhechen Hou<sup>1</sup> Fraser Bransby<sup>1</sup> Phil Watson<sup>1</sup> David White<sup>2</sup> Jean-Christophe

Ballard<sup>3</sup> Pierre Delvosal<sup>3</sup> Raphael Denis<sup>3</sup> Han Eng Low<sup>4</sup>

1. The University of Western Australia, Crawley, WA, Australia; 2. University of Southampton, Southampton, United Kingdom;  
3. Fugro Belgium, Ottignies-Louvain-la-Neuve, Belgium; 4. Fugro Australia Marine, West Perth, WA, Australia

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## Pipeline, Risers, and Subsea Systems

### 04-04-01 Subsea Systems and Flow Assurance

Thursday June 15 | Room 208 | 13:30–15:00

Session Organizer: Theodoro Netto, Fundacao Coppetec, Brazil

#### Linearized Model for Subsea Installation Based on Natural KC Number OMAE2023-100990

Antonio C. Fernandes<sup>1</sup> Rodrigo Batista Soares<sup>2</sup> Emerson Martins de Andrade<sup>1</sup> Joel Sena Sales Junior<sup>1</sup>

1. Federal University of Rio de Janeiro, Rio de Janeiro, RJ, Brazil; 2. Federal University of Rio de Janeiro, Itaguaí, RJ, Brazil

#### Design Assessment and Optimization of a Barrier Valve for Subsea Application OMAE2023-102907

Mehman Ahmadli, Tor Berge Gjersvik, Sigbjørn Sangesland

*Norwegian University of Science and Technology, Trondheim, Norway*

#### A Mechanistic Model for Predicting the Formation of the Riser Blockage OMAE2023-104475

Deping Sun, Haixiao Liu

*Tianjin University, Tianjin, China*

#### Impact of Chemical Impurities on the Integrity of Carbon Dioxide Transport Pipelines OMAE2023-105428

Stephen Stokes<sup>1</sup> Hooman Haghighi<sup>2</sup> Craig Mckay<sup>2</sup>

1. Wood plc, Perth, WA, Australia; 2. Wood plc, Aberdeen, United Kingdom

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## Ocean Engineering

### 06-07-02 Metocean, Measurement and Data Interpretation II

Thursday June 15 | Room 205 | 13:30–15:00

Session Organizer: Kai Wang, Sun Yat-Sen University, China

#### Modeling Oceanic Variables with Graph-Guided Networks for Irregularly

Sampled Multivariate Time Series OMAE2023-104603

Jefferson Fialho Coelho, Marcel Rodrigues de Barros, Caio Fabricio Deberaldini Netto, Felipe Marino Moreno, Lucas Palmiro de Freitas, Marlon Sproesser Mathias, Fabio Gagliardi Cozman, Marcelo Dottori, Edson Satoshi Gomi, Eduardo Aoun Tannuri, Anna Helena Reali Costa

*University of São Paulo, São Paulo, SP, Brazil*

#### Retrieval of Ocean Wave Spectra From X-Band Marine Radar Images Using Inversion Schemes Based on Auto-Spectral Analysis OMAE2023-104877

Gowtham Radhakrishnan, Bernt J. Leira, Zhen Gao, Svein Sævik, Konstantinos Christakos

*Norwegian University of Science and Technology, Trondheim, Norway*

## The Effect of Steady Currents in Weather Downtime Assessment OMAE2023-104910

Bepo Schira<sup>1</sup> Gohar Shoukat<sup>1</sup> Indrasenan Thusyanthan<sup>2</sup>

1. Gavin & Doherty Geosolutions Ltd., Dublin, Ireland; 2. Gavin & Doherty Geosolutions Ltd., London, United Kingdom

## Wind-Wave Misalignment and Dynamic Response of Fixed-Bottom Offshore Wind Turbine OMAE2023-100910

Hiroaki Kashima<sup>1</sup> Haruo Yoneyama<sup>1</sup> Chathura Manawasekara<sup>2</sup> Yoji Tanaka<sup>2</sup>

1. Port and Airport Research Institute, Yokosuka, Japan; 2. Ecoh Corporation, Daito-ku, Japan

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## Ocean Engineering

### 06-14-03 Underwater Vehicles and Design Technology III

Thursday June 15 | Room 217 | 13:30–15:00

Session Organizer: Allan R Magee, Consultant, USA

#### UUV Target Tracking Method Based on High Order CGHF Algorithm OMAE2023-109014

Kai Zhang<sup>1</sup> Hongjian Wang<sup>1</sup> Weiquan Huang<sup>1</sup> Shihao Huang<sup>2</sup>

1. Harbin Engineering University, Harbin, China; 2. The University of Melbourne, Parkville, VIC, Australia

#### Application of Extended Game in Multi-UUV Pursuit-Escape Task OMAE2023-109449

Dan Yu<sup>1</sup> Hongjian Wang<sup>1</sup> Weiquan Huang<sup>1</sup> Shihao Huang<sup>2</sup>

1. Harbin Engineering University, Harbin, China; 2. The University of Melbourne, Parkville, VIC, Australia

#### An Experimental Study on Vortex Induced Motion of a Submerged

Cylindrical Buoy with a Short Tether Chain OMAE2023-103312

Thomas Ledoux, Florentin Anne, Cédric Béguin, Frédéric Gosselin, Stéphane Étienne

École Polytechnique de Montréal, Montréal, QC, Canada

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## CFD, VIV and FSI

### 08-09-01 Neural Network for Waves & Cylinders, Symposium Summary

Thursday June 15 | Room 209 | 13:30–15:00

Session Organizer: Owen Oakley, Retired, USA

Session Co-Organizer: Rajeev Jaiman, University of British Columbia, Canada

#### A Physics-Informed Neural Operator for the Simulation of Surface Waves OMAE2023-104950

Marlon Sproesser Mathias<sup>1</sup> Caio Fabricio Deberaldini Netto<sup>1</sup> Felipe Marino Moreno<sup>1</sup> Jefferson Fialho Coelho<sup>1</sup> Lucas Palmiro De Freitas<sup>1</sup> Marcel Rodrigues De Barros<sup>1</sup> Pedro Cardozo De Mello<sup>1</sup> Marcelo Dottori<sup>1</sup> Fábio Gagliardi Cozman<sup>1</sup> Anna Helena Reali Costa<sup>1</sup> Alberto Costa Nogueira Junior<sup>2</sup> Edson Satoshi Gomi<sup>1</sup> Eduardo Aoun Tannuri<sup>1</sup>

1. Universidade de São Paulo, São Paulo, SP, Brazil; 3. IBM Research, São Paulo, SP, Brazil

#### On the Performance of a Backward Compatible Physics Informed Neural Network (BC-PINN) for Prediction of a Flow Past a Cylinder OMAE2023-105343

Vamsi Sai Krishna Malineni, Suresh Rajendran

Indian Institute of Technology Madras, Chennai, TN, India

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## Ocean Renewable Energy

### 09-03-02 Current and Tidal Energy: Hydrodynamic Analysis

Thursday June 15 | Room 216 | 13:30–15:00

Session Organizer: Kelley Ruehl, Sandia NL, USA

#### The Effect of Power Take-Off System on S-Shaped Vertical Axis Autorotation Current Turbine OMAE2023-100991

Rodrigo Soares<sup>1</sup> Antonio Carlos Fernandes<sup>2</sup> Joel Sena Sales Junior<sup>2</sup>

1. Federal University of Rio de Janeiro, Itaguaí, RJ, Brazil; 2. Federal University of Rio de Janeiro, Rio de Janeiro, RJ, Brazil

#### Open Water Blade Strain Measurements on a Vertical-Axis Tidal Turbine OMAE2023-101076

Aidan Bharath<sup>1</sup> Hannah Ross<sup>1</sup> Casey Nichols<sup>1</sup> Andrew Simms<sup>1</sup> Mark Murphy<sup>1</sup>

Robert Raye<sup>1</sup> Patrick O'byrne<sup>2</sup> Michael Monahan<sup>2</sup> Martin Wosnik<sup>2</sup>

1. National Renewable Energy Laboratory, Golden, CO, USA; 2. University of New Hampshire, Durham, NH, USA



## Numerical Study of the Effects of Lateral Blockage and Free Surface on the Performance of a Novel Vertical-Axis Turbine

OMAE2023-103551

Hao Wu<sup>1</sup> Renjing Cao<sup>2</sup> Enhao Wang<sup>1</sup>

1. Tsinghua University, Shenzhen, China; 2. Southern University of Science and Technology, Shenzhen, China

## Computational Fluid Dynamics Study of a Cross-Flow Marine Hydro-Kinetic Turbine and the Combined Influence of Struts and Helical Blades

OMAE2023-105021

Will Wiley<sup>1</sup> Thanh Toan Tran<sup>1</sup> Michael Lawson<sup>1</sup> Matthew Barrington<sup>2</sup>

1. National Renewable Energy Laboratory, Arvada, CO, USA; 2. Ocean Renewable Power Company, Portland, ME, USA

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## Ocean Renewable Energy

### 09-04-04 Floating Solar Energy

Thursday June 15 | Room 218 | 13:30–15:00

**Session Organizer:** Marc Cahay, Technip Energies, France

**Session Co-Organizer:** Parth Patel, UTas, Australia

#### Hazard Analysis of Floating PV Systems

OMAE2023-101868

Shengnan Zhao, Ying Min Low, Carlos David Rodriguez Gallegos, Thomas Reindl

National University of Singapore, Singapore, Singapore

#### Hydrodynamic Modelling of Modularized Floating Photovoltaics Arrays

OMAE2023-102530

De-Qing Zhang<sup>1</sup> Jun-Feng Du<sup>1</sup> Zhi-Ming Yuan<sup>2</sup> Ming Zhang<sup>2</sup> Feng-Shen Zhu<sup>2</sup>

1. Ocean University of China, Qingdao, China; 2. University of Strathclyde, Glasgow, United Kingdom

#### Hydrodynamic Analysis of Pontoon-Type Floating Photovoltaic Based on Frequency-Domain Model

OMAE2023-103443

Yongkang Shi<sup>1</sup> Yanji Wei<sup>2</sup> Zuogang Chen<sup>1</sup>

1. Shanghai Jiao Tong University, Shanghai, China; 2. Eastern Institute for Advanced Study, Ningbo, China

#### CFD-Based Simulation for the Stability of Floating Solar Arrays

OMAE2023-108232

Prince Arora<sup>1</sup> Badri Prasad Patel<sup>2</sup> Suhail Ahmad<sup>2</sup> Arvind Kumar Jain<sup>2</sup> C S Joe Joe<sup>3</sup> Pratham Aggarwal<sup>4</sup>

1. Floatex Solar Private Limited, Delhi, DL, India; 2. Indian Institute of Technology Delhi, Delhi, DL, India; 3. Great Waters Maritime LLC, Dubai, United Arab Emirates; 4. Floatex Solar Pvt. Ltd, Delhi, DL, India

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## Petroleum Technology

### 11-01-02 Well Drilling Technology II

Thursday June 15 | Room 211 | 13:30–15:00

**Session Organizer:** Stephen D. Butt, Memorial University of Newfoundland, Canada

**Session Co-Organizers:** Mohammad Azizur Rahman, Texas A&M University at Qatar, Qatar; Ergun Kuru, University of Alberta, Canada

#### A Novel Hybrid Transfer Learning Method for Bottom Hole Pressure Prediction

OMAE2023-103302

Rui Zhang<sup>1</sup> Xianzhi Song<sup>1</sup> Gensheng Li<sup>1</sup> Zehao Lv<sup>2</sup> Zhaopeng Zhu<sup>1</sup> Chengkai Zhang<sup>1</sup> Chenxing Gong<sup>3</sup>

1. China University of Petroleum, Beijing, China; 2. Petrochina Oil&Gas and New Energy Company, Beijing, China, Beijing, China; 3. Research Institute of Oil & Gas Technology, PetroChina Changqing Oilfield Company, Xi'an, China

#### Study of the Influence of Microwave Irradiation on Hard Formation Property Alteration through Nondestructive/Destructive Tests and Drilling/Coring Operations

OMAE2023-105113

Abdelsalam Abugarara, Salum Mafazy, Stephen Butt

Memorial University of Newfoundland, St. John's, NL, Canada

#### Deepwater Oil and Gas Well Automatic Control Pressure System and Indoor Simulation Experiment

OMAE2023-108010

Wang Chen<sup>1</sup> Jun Li<sup>2</sup> Hongwei Yang<sup>1</sup> Zhenyu Long<sup>1</sup> Ming Luo<sup>3</sup> Wentuo Li<sup>3</sup>

1. China University of Petroleum, Beijing, China; 2. China University of Petroleum, Karamay, China; 3. CNOOC China Limited, Zhanjiang, China

## Investigation of the Relation Between Coring Parameters and Formation Representation OMAE2023-105315

Abdelsalam Abugharara, Stephen Butt

Memorial University of Newfoundland, St. John's, NL, Canada

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## Petroleum Technology

### 11-09-01 Development of Unconventional Reservoirs

Thursday June 15 | Room 214 | 13:30–15:00

Session Organizer: Hadi Belhaj, Khalifa University, U.A.E.

Session Co-Organizer: Ergun Kuru, University of Alberta, Canada

#### Pilot Application of Re-fracturing in Deep Tight Sandstone Gas Reservoir by Using Weighted Fracturing Fluid OMAE2023-104546

Lufeng Zhang<sup>1</sup> Haibo Wang<sup>1</sup> Fengxia Li<sup>1</sup> Shuzhe Shi<sup>2</sup>

1. Sinopec Petroleum Exploration and Production Development Research Institute, Beijing, China;

2. Research Institute of Petroleum Exploration and Development, Beijing, China

#### Investigation on “One Stage-One Policy” Differential Staged Fracturing in Shale Oil Reservoir OMAE2023-104573

Haibo Wang, Lufeng Zhang, Fengxia Li, Shuzhe Shi

SINOPEC, Beijing, China

#### Advancements of Transient Pressure/Rate Analysis for Multifractured Horizontal Wells (MFHWs) in a Tight Formation by Considering Complex Fracture Networks and Flow Dynamics OMAE2023-107874

Daoyong (Tony) Yang<sup>1</sup> Liwu Jiang<sup>2</sup> Yunhao Zhang<sup>2</sup> Tongjing Liu<sup>3</sup> Yee-Chung Jin<sup>2</sup>

1. Petroleum Systems Engineering, Regina, SK, Canada; 2. University of Regina, Regina,

SK, Canada; 3. China University of Petroleum, Beijing, China

#### Scale Modelling, Prediction and Management Strategy in High Temperature High Salinity Reservoir in Middle East OMAE2023-107230

Bohong Wu, Jingyao Wang, Shuzhe Shi, Yanna Zhang, Zhen Nie, Yong Li

Research Institute of Petroleum Exploration and Development, Beijing, China

## Technical Tours

### TOUR OF THE AUSTRALIAN MARITIME COLLEGE AT THE UNIVERSITY OF TASMANIA IN LAUNCESTON AND QUEEN VICTORIA MUSEUM

**Fee:** AUD \$335

**Date:** Friday, June 16, 2023, 07:30 – 17:40

**Capacity:** 20 people maximum

As this tour involves two short commercial flights it is non-transferable. Registration cut off May 31st.

The Australian Maritime College (AMC) is the national institute for maritime education, training, and research and also one of the seven founding members of the International Association of Maritime Universities.

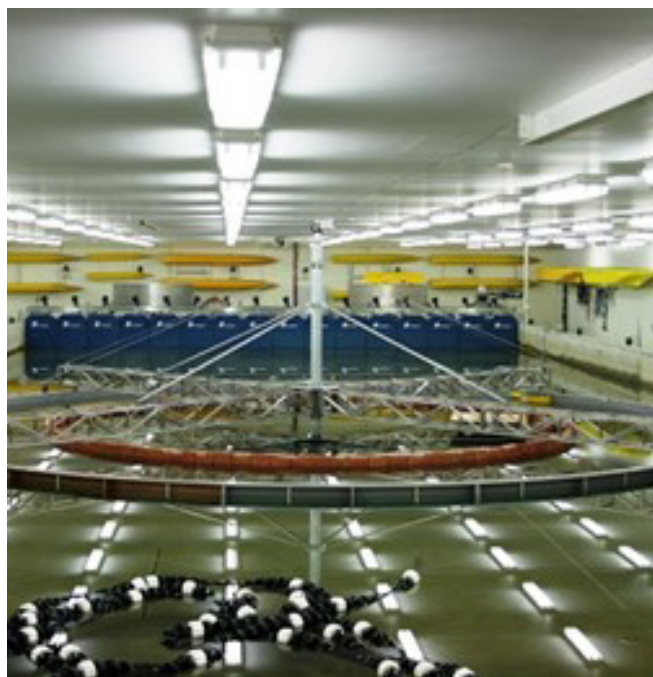
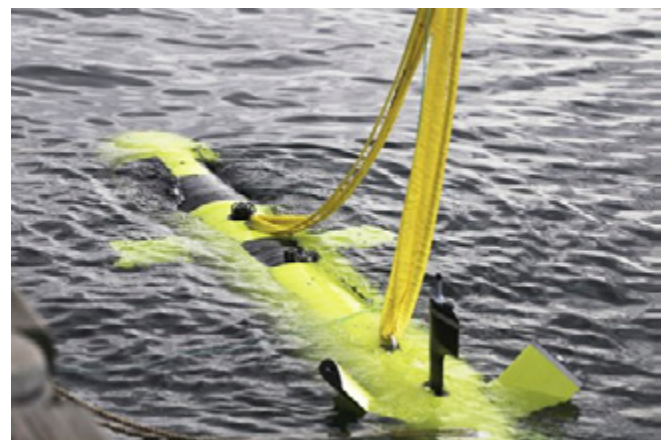
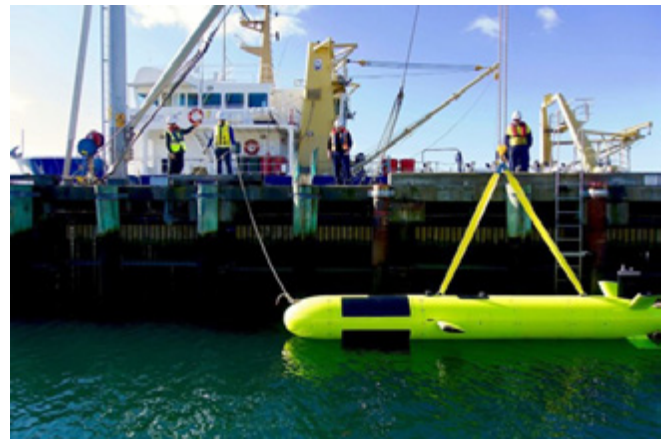
AMC with its specialist maritime research and learning facilities, known as the most advanced in the Southern Hemisphere, has developed a global reputation for the highest quality education and research, producing first-class graduates keenly desired by industry.

During this technical tour, you will have the chance to visit the AMC testing facilities including:

- the hydrodynamic facilities,
- the upgraded Cavitation Laboratory,
- a state-of-the-art Maritime Simulation Centre, and,
- the recently established autonomous maritime research facilities, with a fleet of underwater robots for sub-sea and Antarctic exploration.

*Tour description continued on next page.*

**AMC AUV:** The AUV is capable of diving up to 5,000 meters, operating underneath the ice and gathering data on the Antarctic research missions. The polar vehicle was granted the name nupiri muka, which means 'Eye of the Sea' in palawa kani, the language of Tasmanian Aborigines.



**AMC Model Test Basin (MTB):** Our 35 metre long Model Test Basin simulates maritime operations in shallow water environments such as ports, harbours, rivers and coastal regions.

Photo copyright: AMC/UTAS; Photos: A courtesy of Dr Damien Guihe

## TECHNICAL TOURS (Cont'd)

Following the technical tour, you will visit the Queen Victoria Museum which is Northern Tasmania's home of art, history, and natural science. The tour will take you to the Museum facility where you can explore collections of natural sciences displays, transport and railway memorabilia, blacksmith workshops, the iconic Launceston Planetarium and artefacts from Australia's oldest merchant shipwreck.

### Schedule:

07:30	Meet at MCEC to take shuttle to the Melbourne Airport (bring passport or ID)
09:25 – 10:35	Flight to Launceston and transfer to Australian Maritime College
11:00 – 13:30	<b>Welcome and morning tea Technical tour of Australian Maritime College followed by lunch</b>
13:30	Bus transfer to Queen Victoria Museum at Inveresk
13:40 – 15:15	<b>Tour of Queen Victoria Museum at Inveresk</b>
15:15	Bus transfer for the Launceston airport
16:20 – 17:25	Flight to Melbourne
17:40	Bus transfer to MCEC



*The Blacksmith Shop, Queen Victoria Museum at Inveresk. Photo: QVMAG*



*Transforming the Island: railways in Tasmania exhibition at the Queen Victoria Museum at Inveresk. Photo: QVMAG*

## TOUR OF THE PORT OF MELBOURNE BY BOAT

**Date:** Friday, June 16, 2023, 10:00 – 12:00

**Capacity:** 70 people maximum

**Cost:** Free

The [Port of Melbourne](#) is Australia's largest container and general cargo port, handling more than one-third of the nation's container trade.

This technical tour offers a great opportunity to explore the Port from the water and you will have the chance to see and learn about:

- Overview of the Port ownership model (i.e. landlord port model)
- Melbourne's unique port location
- Victoria and Appleton docks – current tenants and potential future uses.
- Swanson dock swing basin – challenges with maneuvering larger vessels into Swanson Dock.
- Swanson Dock East and West – operations, types of cargo and the size of vessels that call, current remediation project at SDW.
- Pipelines and liquid bulk facilities.
- Under the Westgate – discussion on height limitations, vessel sizes and safety measures.



- Webb dock – discussion on facilities, automation, Tasmanian Trades and Ro-ros, potential expansion at Webb Dock.

### Schedule:

10:00	Arrive at 55 Victoria Harbour Promenade for tour with Magic Charters
10:15	Tour departs 10:15 sharp
12:00	Tour concludes with return to Victoria Harbour Promenade

## Short Courses

### WEC Design Practices and Tools

**Date: Saturday, June 10, 2023, 08:00 – 17:00**

**Instructors:**

- **Kelley Ruehl**, Senior R&D Engineer, Sandia National Laboratories
- **Nathan Tom**, Researcher IV-Mechanical Engineering/Water Power Program, National Renewable Energy Laboratory
- **Daniel Gaebele**, Ph.D. Postdoctoral appointee, Sandia National Laboratories

**Course Description:**

While similar in many ways to other ocean systems, wave energy converters (WECs) pose a number of novel design challenges. This course reviews several considerations related to design and operation of wave energy converters and demonstrates a series of design tools/methods. Fundamentals of hydrodynamics, power take-off (PTO) systems, and implementation of controls for WECs are presented and the complete WEC system will be model from wave to wire. Best practices for designing experiments and performing system identification to obtain numerical models for WECs will also be discussed. The course also covers background and practical considerations for WEC design optimization as well as design load analysis for WEC system and components.

**Course Highlights:**

- Introduction to WECs
- Operational and survival wave conditions
- Fundamentals of hydrodynamics for WECs
- PTO systems for WECs
- Implement WEC control
- Model WEC from wave to wire (with introduction to WEC-Sim)
- System identification and experimental testing of WECs
- Extreme response and fatigue analyses (design load case study and WDRT)

**You will learn to:**

- Understand basic WEC design concepts, components and subcomponents
- Identify challenges in WEC design and applications
- Model WECs from wave to wire, including hydrodynamics, PTO, and control
- Design experiments and perform system identification to obtain numerical models for WECs

**Who should attend:**

Those interested in learning more about the current state of WEC design practices

### Experimental Uncertainty analysis for Hydrodynamic Tests

**Date: Saturday, June 10, 2023, 08:15 – 12:00**

**Instructor:**

**Michael Woodward**, Associate Professor in Marine Engineering, AMC/AMC Search/UTAS

**Course Description:**

**Aims and Objectives:** The aim of the course is to provide a working knowledge (including CPD) for the practicing maritime engineer and/or project manager, with respect to Experimental Uncertainty Analysis (EUA). The objective is to, for the practicing engineer, build competency through broader engineering knowledge and, for the project manager, inform decision making when precuring/contracting hydrodynamic tests.

**Topics Covered:**

The course will introduce the fundamental concepts of EUA, and the underlying mathematics. It will provide case study examples for typical hydrodynamic situations, that will be tackled in an experiential learning environment. It will cover the roles of regulatory bodies and present the methodologies agreed in the hydrodynamic community for standard experiments.

**Pre-requisites and Materials:**

- Introductory level understanding of statistics and basic naval architecture.
- Bring a pen, paper, and a laptop with Spread Sheet application (Excel or similar).

### Autonomous Maritime Systems

**Date: Sunday, June 11, 2023, 08:15 – 12:00**

**Instructor: Dr. Damien Guihen**

**Course Description:**

Autonomous Maritime Systems (AMS) are advancing rapidly and will play an increasingly important role in the offshore industry, including supporting logistics and the provision of hydrographic survey. This short course covers an overview of Autonomous Underwater Vehicle and Unmanned Surface Vehicles technology, key terminology, operating concepts, and system capabilities/limitations.

*Short courses continued...*

### What will students learn in your course:

The elements of autonomous maritime systems will be illustrated. Their operation will be described and used to explore the current operational contexts and development trajectories for autonomous operation in the maritime environment.

The meaning of autonomy will be discussed, and placed within technical, operational, and legislative contexts.

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## High-Order Spectral Wave Models

**Date: Sunday, June 11, 2023, 8:00-17:00**

### Instructor:

**Guillaume Ducrozet**, Associate Professor, PhD, Ecole Centrale Nantes, LHEEA Lab (France)

### Course Description:

The design of marine structures is mainly driven by the forces induced by ocean waves. Then, the accurate description of those nonlinear waves is essential in ocean engineering. To understand, model and reproduce the propagation of complex wave fields (irregular, short-crested) in domains of significant size, the most relevant approach relies on the use of potential flow theory. Different approaches can be used to discretize and solve numerically the problem. This course aims to present one accurate and efficient methodology to address the fully nonlinear wave propagation problem, namely the High-Order Spectral (HOS) method. It includes a theoretical description

of this nonlinear wave model with a focus on the numerical properties of the method. The advantages and drawbacks, compared to other existing approaches, are presented. Special emphasis is placed on the practical use of HOS models with recommended practices, taking as reference the open-source codes HOS-ocean and HOS-NWT. A specific section introduces the possibility of coupling between HOS and other models requiring the description of the velocity/pressure fields induced by the waves (such as CFD models to address the wave-structure interaction problems). The course is primarily intended for industry professionals, researchers, and graduate students in marine and offshore engineering who desire an introduction on nonlinear wave propagation models as well as those who are eager to perform nonlinear wave simulations for specific applications: Digital Twin of an experimental wave tank, specific irregular sea state configuration in open ocean, wave-structure interactions, etc.

### You will learn:

The students will learn the theoretical background of the HOS models as well as their numerical properties (convergence, efficiency, accuracy). They will learn how to use the open-source solvers HOS-ocean and HOS-NWT as well as how to choose the numerical parameters. After the course, they will be able to perform numerical simulations of nonlinear wave propagation of different types of sea states (regular waves, irregular waves, long- and short-crested) in an open-ocean context as well as in a wave tank. Finally, they will know the proper methodology to couple the HOS solvers to other numerical codes such as CFD.



## Outreach for Engineers

### 15TH ANNUAL OUTREACH FOR ENGINEERS SPECIALTY FORUM

This is the fifteenth year of the Outreach for Engineers Specialty Forum. Highlights of the Forum will include presentations of the various technologies required (e.g. from ocean /or offshore engineering, civil engineering, petroleum engineering, aerospace engineering, mechanical/ structural engineering project management), types of job opportunities, possible career paths, and a team building activity. In addition, the Outreach for Engineers Specialty

Forum delegates are provided with the opportunity to participate at the 42nd International Conference on Ocean, Offshore Arctic Engineering as full conference delegates.

Through funding provided by the OOAEE Division of ASME and corporate sponsors, the organizers of the Forum will be offering scholarships to cover registration costs and a limited number of travel subsidies. The scholarships are open to students' and early professionals from around the world.

### PRELIMINARY AGENDA FOR SUNDAY, JUNE 11, 2023

Co-Chairs: Jon Mikkelsen and Jillian Hansen

Time (including Q&A)	Topic	Presenter
9:00 – 9:45	Introduction and Scene Setting	Jon Mikkelsen (University of British Columbia)
9:45 – 10:55	An Overview of Offshore Wind Systems Design and Technology, with a Focus on NREL's Research Areas	Amy Robertson (NREL)
10:55 – 11:10	Refreshment break	
11:10 – 12:00	Life Cycle of a Floating Wind Project	Alexia Aubault (Oceergy)
12:00 – 13:00	Networking Lunch	
13:00 – 13:50	Overview of Nearshore and Offshore Receiving LNG Terminals	Laurent Le Berre (Advisian)
13:50 – 14:40	Marine Renewable Energy Current Perspectives and Development	Nathan Tom (NREL)
14:40 – 14:55	Refreshment break	
14:55 – 15:45	Title TBD	Daniel Veen (Bentley)
15:45 – 16:30	Panel Session: Career Paths & Outlook <ul style="list-style-type: none"> <li>• How has your path lead you to your current role?</li> <li>• Your most rewarding experiences?</li> <li>• Biggest challenges faced by the industry today?</li> </ul>	All Speakers
16:30 – 17:00	Closing remarks	Jon Mikkelsen and all



## Committees & Organizers

### Chairs

#### OMAE 2023 Conference Co-Chairs

- Alex Babanin, Professor, Ocean Engineering, University of Melbourne
- Hayden Marcollo, Director, AMOG Consulting Ltd.

#### OMAE 2023 Technical Program Chair

- Sören Ehlers, German Space Centre (DLR). Institute for Maritime Energy Systems  
Full Professor for Ship Structural Design and Analysis, Hamburg University of Technology (TUHH)

### Volunteers

The Conference Organizing Committee would like to express their gratitude to all the OMAE 2023 volunteers. We sincerely appreciate all the support they provide!

### Technical Program Committee

#### SYMP 1: Offshore Technology

Symposium Coordinator: R. Cengiz Ertekin, *University of Hawaii*

#### SYMP 2: Structures, Safety and Reliability

Symposium Coordinator: Carlos Guedes Soares, *Instituto Superior Técnico*

#### SYMP 3: Materials Technology

Symposium Coordinator: Mamdouh Salama, *ConocoPhillips*

#### SYMP 4: Pipelines, Risers, and Subsea Systems

Symposium Coordinator: Theodoro Netto, *COPPE-Federal University of Rio de Janeiro*  
Symposium Co-Coordinator: Duane Degeer, *INTECSEA*

#### SYMP 5: Ocean Space Utilization

Symposium Coordinator: Tomoki Ikoma, *Nihon University*

#### SYMP 6: Ocean Engineering

Symposium Coordinator: Solomon Yim, *Oregon State University*  
Symposium Co-Coordinator: Antonio Carlos Fernandes, *UFRJ/COPPE*

#### SYMP 7: Polar and Arctic Sciences and Technology

Symposium Coordinator: Sören Ehlers, *German Space Centre (DLR). Institute for Maritime Energy Systems. Full Professor for Ship Structural Design and Analysis, Hamburg University of Technology (TUHH)*  
Symposium Co-Coordinator: Walter Kuehnlein, *terra.blue*

#### SYMP 8: CFD, VIV & FSI

Symposium Coordinator: Yiannis Constantinides, *Chevron*

#### SYMP 9: Ocean Renewable Energy

Symposium Coordinator: Krish Thiagarajan Sharman, *University of Massachusetts*

#### SYMP 10: Offshore Geotechnics

Symposium Coordinator: Dr. Denby Morrison, *FASME, Retired Shell Major Projects*

#### SYMP 11: Petroleum Technology

Symposium Coordinator: Ergun Kuru, *University of Alberta*

#### SYMP 12: Professor Ian Young Honouring Symposium on Global Ocean Wind and Wave Climate

Symposium Coordinator: Kevin Ewans, *MRL*

#### SYMP 13: Blue Economy Symposium

Symposium Coordinator: Nagi Abdussamie, *AMC, UTAS*

#### SYMP 14: Small Maritime Nations Symposium

Symposium Coordinator: Hong Zhang, *Griffith University*  
Symposium Co-Coordinator: Venket Naidu, *P & M Consultants Pty Ltd.*

### Topic Organizers

#### SYMP 1: Offshore Technology

- 01-01 Offshore Platforms:** Anil Sablok, *Technip Energies, USA*
- 02-01 Station Keeping:** Allan R Magee, *Consultant, USA*
- 03-01 Computational Offshore Hydrodynamics:** Weichao Shi, *Newcastle University, United Kingdom*
- 03-02 Hydrodynamic Industrial Applications:** Weichao Shi, *Newcastle University, United Kingdom*
- 04-01 Design & Analysis I:** Masoud Hayatdavoodi, *The University of Dundee, United Kingdom*
- 04-02 Design & Analysis II:** Masoud Hayatdavoodi, *The University of Dundee, United Kingdom*
- 06-01 CFD Modeling Practice & Verification:** Guangyu Wu, *Chevron, USA*
- 08-01 Digital Twin Applications to Offshore Systems:** Rajiv Aggarwal, *Reliable Offshore Systems LLC, USA*
- 08-02 AI/ML Applications to FPSO and Mooring Systems:** Rajiv Aggarwal, *Reliable Offshore Systems LLC, USA*
- 08-03 AI/ML Applications to Offshore Systems and Subsurface:** Rajiv Aggarwal, *Reliable Offshore Systems LLC, USA*

#### SYMP 2: Structures, Safety and Reliability

- 01-01 Structural Analysis and Optimisation I:** Jonas Ringsberg, *Chalmers University of Technology, Sweden*
- 01-02 Structural Analysis and Optimisation II:** Jonas Ringsberg, *Chalmers University of Technology, Sweden*
- 02-01 Ultimate Strength I:** Deyu Wang, *Shanghai Jiao Tong University, China*
- 02-02 Ultimate Strength II:** Deyu Wang, *Shanghai Jiao Tong University, China*
- 03-01 Collision and Crashworthiness:** Kristjan Tabri, *TalTech, Estonia*
- 04-01 Extreme and Freak Waves:** Carlos Guedes Soares, *University of Lisbon, Portugal*
- 04-02 Probabilistic and Spectral Wave Modelling:** Carlos Guedes Soares, *University of Lisbon, Portugal*
- 05-01 Extreme Loads and Responses I:** Spyros Hirdaris, *Aalto University, Finland*
- 05-02 Extreme Loads and Responses II:** Spyros Hirdaris, *Aalto University, Finland*
- 06-01 Probabilistic Models of Forces and Motions:** Carlos Guedes Soares, *University of Lisbon, Portugal*
- 07-01 Data-driven Models for Marine Structures I:** YeongAe Heo, *Case Western Reserve University, USA*
- 07-02 Data-driven Models for Marine Structures II:** YeongAe Heo, *Case Western Reserve University, USA*



# LISTING OF COMMITTEES & ORGANIZERS

- 08-01 Risk and Reliability of Renewable Energy Devices:** Zhen Gao, *Shanghai Jiao Tong University, China*
- 09-01 Reliability of Mooring and Riser Systems:** Ying Min Low, *National University of Singapore, Singapore*
- 10-01 Reliability of Marine Structures:** Carlos Guedes Soares, *University of Lisbon, Portugal*
- 11-01 Fatigue and Fracture Reliability I:** Yordan Garbatov, *Universidade De Lisboa, Instituto Superior Técnico, Portugal*
- 11-02 Fatigue and Fracture Reliability II:** Yordan Garbatov, *Universidade De Lisboa, Instituto Superior Técnico, Portugal*
- 12-01 Reliability Based Maintenance and Inspection Planning; Life Cycle Cost Optimization:** Bernt Leira, *NTNU, Norway*
- 13-01 Risk Analysis and Safety Management I:** Ângelo Teixeira, *Instituto Superior Técnico, Universidade de Lisboa, Portugal*
- 13-02 Risk Analysis and Safety Management II:** Ângelo Teixeira, *Instituto Superior Técnico, Universidade de Lisboa, Portugal*

## SYMP 3: Materials Technology

- 01-01 Fracture Assessment and Control:** Mamdouh Salama, *MMS4AIM LLC, USA*
- 02-01 Fatigue Performance & Inspection Planning:** Mamdouh Salama, *MMS4AIM LLC, USA*
- 05-01 Modeling and Performance of Non-metallics:** Mamdouh Salama, *MMS4AIM LLC, USA*
- 06-01 Materials Selection:** Mamdouh Salama, *MMS4AIM LLC, USA*

## SYMP 4: Pipeline, Risers, and Subsea Systems

- 01-01 Flexible Pipes and Umbilicals I:** Zhimin Tan, *BH, USA*
- 01-02 Flexible Pipes and Umbilicals II:** Celso Pesce, *University of Sao Paulo, Brazil*
- 01-03 Flexible Pipes and Umbilicals III:** Anh Tuan Do, *TechnipFMC, France*
- 01-04 Flexible Pipes and Umbilicals IV:** Jose Renato De Sousa, *UFRJ, Brazil*
- 01-05 Flexible Pipes and Umbilicals V:** Krassimir Doynov, *ExxonMobil, USA*
- 01-06 Flexible Pipes and Umbilicals VI:** Krassimir Doynov, *ExxonMobil, USA*
- 01-07 Flexible Pipes and Umbilicals VII:** Alan Dobson, *TechnipFMC, United Kingdom*
- 02-01 Rigid Risers I:** Theodoro Netto, *Fundacao Coppetec, Brazil*
- 02-02 Rigid Risers II:** Theodoro Netto, *Fundacao Coppetec, Brazil*
- 02-03 Rigid Risers III:** Theodoro Netto, *Fundacao Coppetec, Brazil*
- 03-01 Mechanics I:** Julian Hallai, *Exponent, USA*
- 03-02 Mechanics II:** Julian Hallai, *Exponent, USA*
- 03-03 Hydrodynamics:** Julian Hallai, *Exponent, USA*
- 03-04 Thermo-Mechanical:** Julian Hallai, *Exponent, USA*
- 03-05 Pipe-Soil Interaction:** Julian Hallai, *Exponent, USA*
- 04-01 Subsea Systems and Flow Assurance:** Theodoro Netto, *Fundacao Coppetec, Brazil*

## SYMP 5: Ocean Space Utilization

- 01-01 New Concepts for Ocean Space Utilization I:** Tomoki Ikoma, *Nihon University, Japan*
- 01-02 New Concepts for Ocean Space Utilization II:** Tomoki Ikoma, *Nihon University, Japan*
- 02-01 Aquaculture and Related Technology I:** Tomoki Ikoma, *Nihon University, Japan*
- 03-01 Deepsea Mining and Ocean Resources:** Tomoki Ikoma, *Nihon University, Japan*
- 05-01 Floating Systems for Renewable Energy:** Tomoki Ikoma, *Nihon University, Japan*
- 05-02 Aquaculture and Related Technology II:** Tomoki Ikoma, *Nihon University, Japan*
- 06-01 High Tide and Tsunamis:** Tomoki Ikoma, *Nihon University, Japan*

## SYMP 6: Ocean Engineering

- 01-01 Computational Mechanics and Design Applications I:** Yuzhu Pearl Li, *National University of Singapore, Denmark*
- 01-02 Computational Mechanics and Design Applications II:** Rodrigo Soares, *Federal University of Rio de Janeiro, Brazil*
- 02-01 Coastal Engineering:** Yuzhu Pearl Li, *National University of Singapore, Denmark*
- 03-01 Fluid-Structure, Multi-body and Wave-body Interaction I:** Shuzheng Sun, *Harbin Engineering University, China*
- 03-02 Fluid-Structure, Multi-body and Wave-body Interaction II:** Shuzheng Sun, *Harbin Engineering University, China*
- 03-03 Fluid-Structure, Multi-body and Wave-body Interaction III:** Zhiyuan Pan, *DNV, Norway*
- 03-04 Fluid-Structure, Multi-body and Wave-body Interaction IV:** Chengwang Xiong, *Harbin Engineering University, China*
- 04-01 Marine Engineering and Technology I:** Yi-Hsiang Yu, *NyCU, Taiwan*
- 04-02 Marine Engineering and Technology II:** Marcio Igor Luorencio, *Federal University of Rio de Janeiro, Brazil*
- 04-03 Marine Engineering and Technology III:** Marcelo Caire, *Federal University of Rio de Janeiro, Brazil*
- 04-04 Marine Engineering and Technology IV:** Marcelo Caire, *Federal University of Rio de Janeiro, Brazil*
- 04-05 Marine Engineering and Technology V:** Rodrigo Soares, *Federal University of Rio de Janeiro, Brazil*
- 05-01 Marine Hydrodynamics I:** Zhengshun Cheng, *SJTU, China*
- 05-02 Marine Hydrodynamics II:** Sanne Van Essen, *Marin, Netherlands*
- 05-03 Marine Hydrodynamics III:** Sanne Van Essen, *Marin, Netherlands*
- 05-04 Marine Hydrodynamics IV:** Masoud Hayatdavoodi, *The University of Dundee, United Kingdom*
- 07-01 Metocean, Measurement and Data Interpretation I:** Kai Wang, *Sun Yat-Sen University, China*
- 07-02 Metocean, Measurement and Data Interpretation II:** Kai Wang, *Sun Yat-Sen University, China*
- 08-01 Model Tests:** Motohiko Murai, *Yokohama National University, Japan*
- 11-01 Ocean Engineering Technology I:** Irving David Fontes, *Federal University of Rio de Janeiro, Brazil*
- 11-02 Ocean Engineering Technology II:** Murilo Vaz, *Federal University of Rio de Janeiro, Brazil*
- 11-03 Ocean Engineering Technology III:** Allan R Magee, *Consultant, USA*
- 12-01 Ship Hydromechanics I:** Marcio Yamamoto, *National Maritime Research Institute, Japan*
- 12-02 Ship Hydromechanics II:** Guang Yin, *University of Stavanger, Norway*
- 12-03 Ship Hydromechanics III:** Guang Yin, *University of Stavanger, Norway*
- 14-01 Underwater Vehicles and Design Technology I:** Muk Chen Ong, *University of Stavanger, Norway*
- 14-02 Underwater Vehicles and Design Technology II:** Muk Chen Ong, *University of Stavanger, Norway*
- 14-03 Underwater Vehicles and Design Technology III:** Allan R Magee, *Consultant, USA*
- 16-01 Wave Mechanics, Modeling and Wave Effects I:** Solomon C. Yim, *Oregon State University, USA*
- 16-02 Wave Mechanics, Modeling and Wave Effects II:** Masoud Hayatdavoodi, *The University of Dundee, United Kingdom*

# LISTING OF COMMITTEES & ORGANIZERS

## SYMP 7: Polar and Arctic Sciences and Technology

- 01-01 **Arctic Frontier Regions and Propulsion in Ice:** Kristjan Tabri, *TalTech, Estonia*
- 02-01 **Arctic Sea Transportation I:** Mikko Suominen, *Aalto University, Finland*
- 02-02 **Arctic Sea Transportation II:** Jonathan Soper, *Memorial University of Newfoundland, Canada*
- 03-01 **Vessels in Ice I:** Franciska M<sup>v</sup>oller, *Hamburg University of Technology, Germany*
- 03-02 **Vessels in Ice II:** Kristjan Tabri, *TalTech, Estonia*
- 03-03 **Vessels in Ice III:** Mojtaba Mokhtari, *NTNU, Norway*
- 04-01 **Vessels in Ice and Model Test:** Zou Ming, *Shanghai Jiao Tong University, China*
- 05-01 **Numerical Ice Modeling:** Yingjie Gu, *University of Stavanger, Norway*
- 06-01 **Structures in Ice I:** Brendon Nickerson, *Stellenbosch University, South Africa*
- 06-02 **Structures in Ice II:** Thomas Fitzpatrick, *Memorial University of Newfoundland, Canada*

## SYMP 8: CFD, VIV and FSI

- 01-01 **Risers, Pipelines & VIV I:** Jie Wu, *SINTEF, Norway*
- 01-02 **Risers, Pipelines & VIV II:** Themistocles Resvanis, *MIT, USA*
- 02-01 **Ship & Floating Systems I:** Owen Oakley, *Retired, USA*
- 02-02 **Ship & Floating Systems II:** Themistocles Resvanis, *MIT, USA*
- 03-01 **Free Surface Flows I:** Narakorn Srinil, *Newcastle University, United Kingdom*
- 03-02 **Free Surface Flows II:** Mengmeng Zhang, *Shanghai Jiao Tong University, China*
- 04-01 **CFD Development I:** Owen Oakley, *Retired, USA*
- 04-02 **CFD Development II:** Owen Oakley, *Retired, USA*
- 05-01 **Model Reduction and Machine Learning:** Owen Oakley, *Retired, USA*
- 06-01 **Internal Flows & FIV:** Owen Oakley, *Retired, USA*
- 07-01 **Data-Driven Models and Digital Twins:** Owen Oakley, *Retired, USA*
- 08-01 **VIV & Offshore Wind Turbines:** Rajeev Jaiman, *University of British Columbia, Canada*
- 09-01 **Neural Network for Waves & Cylinders, Symposium Summary:** Owen Oakley, *Retired, USA*

## SYMP 9: Ocean Renewable Energy

- 01-01 **Offshore Wind Energy - Installation:** Shuaishuai Wang, *NTNU, Norway*
- 01-02 **Offshore Wind Energy - Structural Dynamics:** Peter Rohrer, *NTNU, Norway*
- 01-03 **Offshore Wind Energy - Aerodynamics:** Hyunchul Jang, *Technip Energies, USA*
- 01-04 **Offshore Wind Energy - Aerodynamic Control:** Amy Robertson, *NREL, USA*
- 01-05 **Offshore Wind Energy - Moorings and Cables I:** Marc Cahay, *Technip Energies, France*
- 01-06 **Offshore Wind Energy - Moorings and Cables II:** Vegard Longva, *SINTEF, Norway*
- 01-07 **Offshore Wind Energy - Hydrodynamics I:** Sebastien Gueydon, *O3 Engineering Consulting, Australia*
- 01-08 **Offshore Wind Energy - Hydrodynamics II:** Petter Andreas Berthelsen, *SINTEF, Norway*
- 01-09 **Offshore Wind Energy - Design Optimization:** Zhengshun Cheng, *SJTU, China*
- 01-10 **Offshore Wind Energy - Data Science and Digital Twins:** Zhen Gao, *NTNU, Norway*
- 02-01 **Wave Energy - Environment:** Azam Dolatshahi, *BMT, Australia*
- 02-02 **Wave Energy - Design and Performance Analysis I:** Binbin Zhao, *Harbin Engineering University, China*

- 02-03 **Wave Energy - Design and Performance Analysis II:** Binbin Zhao, *Harbin Engineering University, China*
- 02-04 **Wave Energy - Design and Performance Analysis III:** Yi-Hsiang Yu, *NyCU, Taiwan*
- 02-05 **Wave Energy Control and Power Take Off:** Yi-Hsiang Yu, *NyCU, Taiwan*
- 03-01 **Current and Tidal Energy - Design Considerations:** Kelley Ruehl, *Sandia NL, USA*
- 03-02 **Current and Tidal Energy: Hydrodynamic Analysis:** Kelley Ruehl, *Sandia NL, USA*
- 04-01 **Hybrid and Novel Renewable Energy Systems I:** Marc Cahay, *Technip Energies, France*
- 04-02 **Hybrid and Novel Renewable Energy Systems II:** Narakorn Srinil, *Newcastle University, United Kingdom*
- 04-03 **Hybrid and Novel Renewable Energy Systems III:** Jean-roch Nader, *UTas, Australia*
- 04-04 **Floating Solar Energy:** Marc Cahay, *Technip Energies, France*
- 05-01 **Hydrogen and Energy Storage:** Marc Cahay, *Technip Energies, France*

## SYMP10: Offshore Geotechnics

- 01-01 **Seabed Properties and Processes and Fluid-Soil-Structure Interaction:** Denby Morrison, *Shell, USA*
- 02-01 **Fluid-Soil-Structure Interaction:** Denby Morrison, *Shell, USA*
- 03-01 **Anchors:** Denby Morrison, *Shell, USA*
- 04-01 **Pile Foundations:** Denby Morrison, *Shell, USA*
- 05-01 **Bucket Foundations, Suction Caissons and Spudcans:** Denby Morrison, *Shell, USA*

## SYMP11: Petroleum Technology

- 01-01 **Well Drilling Technology I:** Stephen D. Butt, *Memorial University of Newfoundland, Canada*
- 01-02 **Well Drilling Technology II:** Stephen D. Butt, *Memorial University of Newfoundland, Canada*
- 02-01 **Well Drilling Fluids and Hydraulics I:** Arild Saasen, *University of Stavanger, Norway*
- 02-02 **Well Drilling Fluids and Hydraulics II:** Arild Saasen, *University of Stavanger, Norway*
- 02-03 **Well Drilling Fluids and Hydraulics III:** Arild Saasen, *University of Stavanger, Norway*
- 02-04 **Well Drilling Hydraulics and Cementing:** Arild Saasen, *University of Stavanger, Norway*
- 03-01 **Data Science Applications in Drilling Engineering I:** Arild Saasen, *University of Stavanger, Norway*
- 03-02 **Data Science Applications in Drilling Engineering II:** Arild Saasen, *University of Stavanger, Norway*
- 04-01 **Well Cementing Theory & Practice I:** Ian Frigaard, *University of British Columbia, Canada*
- 04-02 **Well Cementing Theory & Practice II:** Ian Frigaard, *University of British Columbia, Canada*
- 05-01 **Integrity of Well Barriers I:** Jan David Ytrehus, *SINTEF, Norway*
- 05-02 **Integrity of Well Barriers II:** Jan David Ytrehus, *SINTEF, Norway*
- 07-01 **Production Systems and Subsea Operations:** Marcio Yamamoto, *National Maritime Research Institute, Japan*
- 08-01 **Multiphase Flow & Flow Assurance:** Mohammad Azizur Rahman, *Texas A&M University at Qatar, Qatar*
- 09-01 **Development of Unconventional Reservoirs:** Hadi Belhaj, *Khalifa University, U.A.E.*
- 10-01 **Advances in Carbon Capture Utilization and Storage (CCUS) I:** Huazhou Li, *University of Alberta, Canada*
- 10-02 **Advances in Carbon Capture Utilization and Storage (CCUS) II:** Daoyong (Tony) Yang, *University of Regina, Canada*

# LISTING OF COMMITTEES & ORGANIZERS

## SYMP12: Professor Ian Young Honouring Symposium on Global Ocean Wind and Wave Climate

- 01-01 Wave/Ocean/Atmosphere Coupling and Climate Change Impacts on Ocean Waves:** Kevin Ewans, *MRL, New Zealand*
- 03-01 Global Ocean Wave Climate:** Kevin Ewans, *MRL, New Zealand*

## SYMP13: Blue Economy Symposium

- 01-01 Blue Economy I:** Per Arild Aland, *DNV, Norway*
- 01-02 Blue Economy II:** C M Wang, *The University of Queensland, Australia*
- 02-01 Blue Economy III:** Adi Kurniawan, *University of Western Australia, Australia*
- 04-01 Blue Economy IV:** Irene Penesis, *Blue Economy Cooperative Research Centre (BE CRC-Co.), Australia*
- 05-01 Blue Economy V:** Cristian Cifuentes Salazar, *Universidad Austral de Chile, Chile*
- 06-01 Blue Economy VI:** Yunil Chu, *Griffith University, Australia*
- 06-02 Blue Economy VII:** Ehsan Arzaghi, *AMC, UTAS, Australia*
- 06-03 Blue Economy VIII:** Hong Zhang, *Griffith University, Australia*

## SYMP14: Small Maritime Nations Symposium

- 01-01 Small Maritime Nations:** Hong Zhang, *Griffith University, Australia*

## Event Organizer

Sea to Sky Meeting and Association Management Inc.  
 President: Ian Holliday  
 Project Director: Ian Holliday  
 Project Managers: Kat Duda  
 Registration Manager: Katrina Sutela

## Co-sponsoring Organizations

Association/Institution	Country
American Society of Mechanical Engineers International	USA
American Concrete Institute	USA
American Society of Civil Engineers, Coasts, Oceans, Ports, and Rivers Institute	USA
Associazione Italiana di Ingegneria Offshore e Marina	Italy
Università degli Studi Mediterranea di Reggio Calabria	Italy
Brazilian Society of Naval Architects	Brazil
Canadian Association of Petroleum Producers	Canada
Canadian Society for Mechanical Engineering	Canada
Chinese Society of Ocean Engineers	China
Conseil de Liaison des Assoc. de Recherche sur les Ouvrages en Mer	France
Energy Polymer Group	
Engineering Committee on Oceanic Research	
European Safety and Reliability Association	Portugal
German Association for Marine Technology	Germany
Institute of Materials	
Institution of Engineers of Ireland	Ireland
Institution of Mechanical Engineers	UK
Instituto Brasileiro de Petróleo	Brazil
Japan Society of Mechanical Engineers	Japan
Japan Society of Naval Architects of and Ocean Engineers	Japan
Korean Institute of Metals	Korea
Marine Technology Society	USA
National Association of Corrosion Engineers	USA
Norwegian Society of Chartered Engineers	Norway
Office of Science and Technology, Australia	Australia
Portuguese Engineering Association	Portugal
The Petroleum Society of CIM (Canadian Institute of Mining)	Canada
Royal Flemish Engineers Association	Belgium
Society of Danish Engineers	Denmark
Society of Naval Architects and Marine Engineers	USA
Society of Naval Architects and Marine Engineers	Taiwan, China
Society for Underwater Technology	UK
TWI (formerly The Welding Institute)	UK

# Past and Future Conferences

## PAST CONFERENCES



1982 New Orleans, USA  
 1983 Houston, USA  
 1984 New Orleans, USA  
 1985 Dallas, USA  
 1987 Houston, USA  
 1988 Houston, USA



1986 Tokyo, Japan



1989 The Hague, Netherlands



Jin S. Chung  
Chair 1982–1989



Hisaaki Maeda  
Co-chair  
1986

Virgil Lunardini  
Co-chair  
1984 & 1985



1990 Houston, USA



1991 Stavanger, Norway



1992 Calgary, Canada



1993 Glasgow, U.K.



Mamdouh Salama  
Chair, 1990–1991



Bjorn Lian  
Co-chair



M. Idris Mansor  
Chair

R. Brawn  
Co-chair



Geoff Booth  
Chair



1994 Houston, USA



1995 Copenhagen, Denmark



1996 Florence, Italy



1997 Yokohama, Japan



James N. Brekke  
Chair



Christian Aage  
Chair



Daniela Mercati  
Chair



Hisaaki Maeda  
Chair



Koichiro Yoshida  
Co-chair



1998 Lisbon, Portugal



1999 St. John's, Canada



2000 New Orleans, USA



2001 Rio de Janeiro, Brazil



Carlos Guedes Soares  
Chair



Stephen Jones  
Chair



Terry Jones (1934–2005)  
Chair



Segen Farid Estefen  
Chair



2002 Oslo, Norway



2003 Cancun, Mexico



2004 Vancouver, Canada



2005 Halkidiki, Greece



Arvid Naess  
Chair



Oscar Valle Molina  
Chair



Sander Calisal  
Chair



Jon Mikkelsen  
Co-chair



Spyros A. Mavrakos  
Chair



Michael M. Bernitsas  
Co-chair

# PAST AND FUTURE CONFERENCES (Cont'd)

 **2006**  
Hamburg,  
Germany

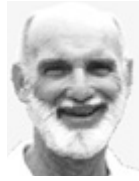


Walter L. Kuehnlein  
Chair

 **2007**  
San Diego, USA



John Halkyard  
Chair



Richard Seymour  
Co-chair



Barbara Fletcher  
Co-chair

 **2008**  
Estoril,  
Portugal



Carlos Guedes Soares  
Chair

 **2009**  
Honolulu, USA



R. Cengiz Ertekin  
Chair



H. Ronald Riggs  
Co-chair

 **2010**  
Shanghai, China



Gang Chen  
Chair



Jianmin Yang  
Co-chair

 **2011**  
Rotterdam,  
Netherlands



Bas Buchner  
Chair

 **2012**  
Rio de Janeiro, Brazil



Segen F. Estefen  
Chair



Antonio C. Fernandes  
Co-chair

 **2013**  
Nantes,  
France



Pierre Ferrant  
Chair


 **2014**  
San Francisco, USA



Ronald W. Yeung  
Chair



Dominique Roddier  
Co-chair

 **2015**  
St. John's, Canada



Wei Qiu  
Chair



Charles Smith  
Co-chair

 **2016**  
Busan,  
South Korea



Jeom Kee Paik  
Chair

 **2017**  
Trondheim, Norway



Bernt J. Leira  
Chair



Atle Minsaas  
Co-chair

 **2018**  
Madrid, Spain



Antonio Souto-Iglesias  
Chair



Raúl Guanche  
Chair




Francisco Huera-Huarte  
Chair

 **2019**  
Glasgow,  
U.K.



Atilla Incecik  
Chair

 **2020**  
Ft. Lauderdale, USA  
(Virtual)



Manhar Dhanak  
Chair



Ronald W. Yeung  
Co-Chair

**2021**  
(Virtual)



Dr. Franz von Bock und Polach  
Chair



Denby Morrison  
Co-Chair

## FUTURE CONFERENCES

 **2022**  
Hamburg, Germany



Soren Ehlers  
Chair



Walter Kuehnlein  
Co-Chair

 **2024**  
Singapore



Allan Magee  
Chair



Michael Si  
Co-Chair

# Author Index

## A

Aadnøy, Bernt .....	OMAE2023-108000 (11-03-02)
Aanensen, Marie .....	OMAE2023-104670 (07-03-03)
Abad, Farhad .....	OMAE2023-100523 (03-05-01), OMAE2023-101302 (09-02-03)
Abaei, Mohammad Mahdi .....	OMAE2023-104628 (13-05-01)
Abbassi, Rouzbeh .....	OMAE2023-104522 (09-05-01), OMAE2023-104609 (13-06-02), OMAE2023-104627 (09-04-02), OMAE2023-104628 (13-05-01), OMAE2023-105112 (13-06-01)
Abdel-Salam, Tarek .....	OMAE2023-104013 (09-04-01)
Abdussamie, Nagi .....	OMAE2023-101806 (13-06-01), OMAE2023-101836 (13-06-01), OMAE2023-104590 (09-02-02), OMAE2023-104624 (06-05-03), OMAE2023-105112 (13-06-01)
Abe, Shungo .....	OMAE2023-101928 (11-03-02)
Abreu, Danilo Taverna M. Pereira .....	OMAE2023-104971 (02-13-02)
Abritta Aguiar Santos, Ramon .....	OMAE2023-105003 (09-05-01)
Abugarara, Abdelsalam .....	OMAE2023-105090 (11-01-01), OMAE2023-105113 (11-01-02), OMAE2023-105315 (11-01-02), OMAE2023-108187 (11-02-03)
Achete, Fernanda .....	OMAE2023-108536 (06-11-03)
Adami, Nasim .....	OMAE2023-108186 (09-02-01)
Adcock, Thomas A. A. ....	OMAE2023-102682 (06-03-01)
Aertsens, Tim .....	OMAE2023-100850 (06-16-01)
Aggarwal, Pratham .....	OMAE2023-108232 (09-04-04)
Ahmad, Suhail .....	OMAE2023-102765 (09-01-02), OMAE2023-104526 (02-05-02), OMAE2023-104820 (02-08-01), OMAE2023-108232 (09-04-04)
Ahmadi, Hamid .....	OMAE2023-100940 (02-11-01)
Ahmadli, Mehman .....	OMAE2023-102907 (04-04-01)
Ahmed, Salim .....	OMAE2023-104936 (01-02-01)
Ahn, Yangjun .....	OMAE2023-104632 (06-05-03)
Aida, Yasuhiro .....	OMAE2023-104612 (05-06-01), OMAE2023-104669 (05-05-02)
Aiming, Wang .....	OMAE2023-102742 (07-02-02)
Aiswaria, K. ....	OMAE2023-102107 (09-02-02)
Akbari, Soheil .....	OMAE2023-101070 (11-04-01), OMAE2023-101472 (11-04-01)
Akindele, Oluwatimilehin Mary .....	OMAE2023-108187 (11-02-03)
Akinturk, Ayhan .....	OMAE2023-101645 (06-03-01)
Al Dhuhoori, Mohammed .....	OMAE2023-108021 (11-10-02)
Al Hameli, Fatima .....	OMAE2023-108021 (11-10-02)
Al-Abdrabalnabi, Ridha .....	OMAE2023-104389 (11-10-01)
Al-Qahtani, Hussam .....	OMAE2023-105029 (11-02-04)
Al-Saiedy, Ali .....	OMAE2023-106209 (09-05-01)
Al-Yami, Abdullah S. ....	OMAE2023-104959 (11-02-01), OMAE2023-105029 (11-02-04), OMAE2023-105051 (11-02-01)
Aland, Per Arild .....	OMAE2023-101782 (13-05-01)
Alanqari, Khawlah .....	OMAE2023-104959 (11-02-01)
Alberello, Alberto .....	OMAE2023-104435 (02-04-02)
Alencar Bisinotto, Gustavo .....	OMAE2023-101967 (01-08-03)
Alkhalaf, Sara .....	OMAE2023-104418 (11-02-02)
Almeida, Lucas Ribeiro de .....	OMAE2023-105039 (02-13-02)
Altomare, Corrado .....	OMAE2023-105023 (08-04-02), OMAE2023-105049 (08-02-02)
Alvarenga, Marco Antonio Bayout .....	OMAE2023-105027 (02-13-02)
Alves, Jose-Henrique .....	OMAE2023-103260 (12-03-01)
Alyaev, Sergey .....	OMAE2023-102300 (11-03-02)
Alyami, Abdullah .....	OMAE2023-104418 (11-02-02), OMAE2023-104986 (11-04-02), OMAE2023-104992 (11-04-02)
Amato, Nicholas .....	OMAE2023-103594 (06-03-02)
Amaya, Ichiro .....	OMAE2023-100664 (05-05-01)
Ambika Harikumar, Akshay Krishna .....	OMAE2023-104611 (03-05-01)
Ambrus, Adrian .....	OMAE2023-102300 (11-03-02), OMAE2023-104704 (11-02-04)
Amdahl, Jørgen .....	OMAE2023-100743 (02-02-01), OMAE2023-104771 (07-05-01), OMAE2023-105048 (02-02-02)
Amdal, Lars Wist .....	OMAE2023-105427 (04-01-01)

# AUTHOR INDEX

Amlashi, Hadi	OMAE2023-106479 (02-08-01)
An, Gyubaek	OMAE2023-102208 (02-11-02)
An, Hongwei	OMAE2023-104334 (08-04-01), OMAE2023-104379 (04-03-03), OMAE2023-104579 (08-01-02), OMAE2023-106777 (04-01-04)
Anai, Yosuke	OMAE2023-101139 (03-02-01)
Andersen, Steiner	OMAE2023-104670 (07-03-03)
Ando, Takahiro	OMAE2023-101139 (03-02-01)
Ånesbug, Geir Olav	OMAE2023-104756 (11-02-01)
Ang, Joo Hock	OMAE2023-100911 (06-04-01)
Anne, Florentin	OMAE2023-103312 (06-14-03)
Antoun Netto, Theodoro	OMAE2023-105095 (04-01-06)
Anwar, Ali	OMAE2023-104455 (06-11-03)
Anwar, Taha	OMAE2023-104638 (07-04-01)
Aoun Tannuri, Eduardo	OMAE2023-101967 (01-08-03), OMAE2023-103265 (06-07-01), OMAE2023-104603 (06-07-02), OMAE2023-104950 (08-09-01)
Araujo Das Virgens, Edmo	OMAE2023-100993 (01-04-01)
Arena, Felice	OMAE2023-102239 (02-06-01), OMAE2023-105242 (09-02-01)
Arima, Masakazu	OMAE2023-101043 (06-11-01)
Arora, Prince	OMAE2023-104820 (02-08-01), OMAE2023-108232 (09-04-04)
Aryai, Vahid	OMAE2023-105112 (13-06-01)
Arzaghi, Ehsan	OMAE2023-104522 (09-05-01), OMAE2023-104609 (13-06-02), OMAE2023-104627 (09-04-02), OMAE2023-104628 (13-05-01)
Asgari, Peyman	OMAE2023-103189 (04-02-01)
Ashar, Areeb	OMAE2023-106209 (09-05-01)
Ashok, Kumar	OMAE2023-100975 (06-05-01)
Atkinson, Michael	OMAE2023-100971 (09-02-04)
Augusto Vaz, Murilo	OMAE2023-104870 (04-01-04)
Ayala Cruz, Franklin Farid	OMAE2023-103377 (02-06-01)
Aydemir, Onur	OMAE2023-101705 (05-02-01)
Aye, Yan Naung	OMAE2023-101301 (09-04-03)
Azuma, Shungo	OMAE2023-104545 (02-10-01)

## B

Balisampang, Til	OMAE2023-104522 (09-05-01), OMAE2023-104627 (09-04-02)
Babanin, Alexander	OMAE2023-102095 (02-04-02), OMAE2023-103377 (02-06-01), OMAE2023-104355 (02-04-02), OMAE2023-104594 (08-03-02), OMAE2023-104739 (02-05-02)
Babu, Nitin	OMAE2023-107719 (08-04-02)
Baca, Elena	OMAE2023-105102 (09-02-01)
Bacelli, Giorgio	OMAE2023-103899 (09-02-05)
Bachimanchi, Praniitha	OMAE2023-105144 (02-11-01)
Bachmann Mehammer, Eirill	OMAE2023-102113 (06-04-02)
Bachynski-Polić, Erin E.	OMAE2023-101930 (09-01-10), OMAE2023-104699 (09-01-06)
Badhurshah, Rameez	OMAE2023-105249 (08-01-02)
Bae, Junsik	OMAE2023-101044 (10-03-01)
Bae, Yoon Hyeok	OMAE2023-107853 (09-01-08)
Bahootoroody, Ahmad	OMAE2023-102504 (07-03-01), OMAE2023-104628 (13-05-01)
Bai, Baojun	OMAE2023-104172 (11-10-01)
Bai, Wei	OMAE2023-103590 (08-04-01)
Bai, Yingli	OMAE2023-104436 (08-01-02)
Bailey, Jonathan	OMAE2023-105101 (01-08-01)
Bailey, Trevor	OMAE2023-104781 (04-01-05)
Bakti, Farid Putra	OMAE2023-104432 (09-04-03)
Balachandran, Balakumar	OMAE2023-103020 (02-04-01)
Baldock, Tom	OMAE2023-102097 (13-01-02)
Ballard, Jean-Christophe	OMAE2023-104434 (04-03-05)
Bamford, Richard J	OMAE2023-105101 (01-08-01)
Baquet, Aldric	OMAE2023-108155 (01-01-01)
Barata, Anderson	OMAE2023-103764 (04-01-05)

# AUTHOR INDEX

Barbosa, Nicholas	OMAE2023-108536 (06-11-03)
Barker, Robert J.	OMAE2023-105101 (01-08-01)
Barreira, Rodrigo A.	OMAE2023-102044 (01-08-02), OMAE2023-104351 (01-08-02)
Barrington, Matthew	OMAE2023-105021 (09-03-02)
Barros, Leonardo de Oliveira	OMAE2023-103603 (02-12-01)
Basak, Souvik	OMAE2023-104337 (09-01-09)
Basnayake, Asanka	OMAE2023-104611 (03-05-01)
Batista Soares, Rodrigo	OMAE2023-100990 (04-04-01)
Battle Martin, Marc	OMAE2023-107740 (02-05-02)
Bauer, Peter	OMAE2023-103244 (04-01-07)
Bayati, Ilmas	OMAE2023-103266 (09-01-02)
Baynabaj, Mohsen	OMAE2023-101694 (11-02-03)
Bedrossian, Arek	OMAE2023-104359 (04-03-04)
Begovic, Ermina	OMAE2023-104777 (08-02-02)
Béguin, Cédric	OMAE2023-103312 (06-14-03)
Bekker, Anriëtte	OMAE2023-102785 (07-01-01), OMAE2023-104878 (07-01-01)
Belayneh, Mesfin	OMAE2023-108000 (11-03-02)
Belhaj, Hadi	OMAE2023-108021 (11-10-02)
Belibassakis, Kostas	OMAE2023-103192 (06-04-03)
Bergman Fonte, Clarissa	OMAE2023-102271 (09-01-03)
Bergström, Martin	OMAE2023-102401 (06-04-02)
Bergua, Roger	OMAE2023-101853 (09-01-04)
Berthelsen, Petter Andreas	OMAE2023-104699 (09-01-06)
Bertoni, Fabiano	OMAE2023-101201 (04-01-03)
Bharath, Aidan	OMAE2023-101076 (09-03-02)
Bhaskar, Prashant	OMAE2023-101836 (13-06-01)
Bian, Jiayi	OMAE2023-104398 (07-02-02)
Bianchini, Alessandro	OMAE2023-101926 (01-04-02), OMAE2023-104864 (09-01-03)
Binns, Jonathan	OMAE2023-101473 (06-08-01), OMAE2023-101836 (13-06-01)
Bisinotto, Gustavo A.	OMAE2023-102044 (01-08-02)
Bjarkason, Elvar Karl	OMAE2023-104712 (11-02-03), OMAE2023-104713 (11-02-02)
Blomgren, Atle	OMAE2023-102822 (07-06-02)
Boamah, Samuel	OMAE2023-103027 (05-01-01)
Boerner, Thomas	OMAE2023-105016 (09-02-03)
Bohan, Paul	OMAE2023-100993 (01-04-01)
Böhm, Angelo	OMAE2023-103425 (07-03-02)
Böhm, Manuela	OMAE2023-103701 (01-04-01)
Bokhove, Onno	OMAE2023-108097 (08-03-02), OMAE2023-108105 (08-06-01)
Bonanni, Michele	OMAE2023-104781 (04-01-05)
Bond, James	OMAE2023-104860 (07-03-03)
Bonnefoy, Félicien	OMAE2023-104676 (06-03-03)
Boral, Susam	OMAE2023-104336 (06-03-02)
Bordalo, Sergio Nascimento	OMAE2023-104375 (11-07-01)
Borg, Michael	OMAE2023-100980 (09-01-07)
Børresen, Børre T.	OMAE2023-105003 (09-05-01)
Borsutkar, Visharad	OMAE2023-103432 (06-05-01)
Borthwick, Alistair	OMAE2023-105249 (08-01-02)
Bosman, Rene	OMAE2023-103266 (09-01-02)
Bouchard, Philippe	OMAE2023-103160 (01-02-01)
Bourgoyne Jr., Adam T.	OMAE2023-104531 (11-10-02)
Bouscasse, Benjamin	OMAE2023-104676 (06-03-03)
Bouwer Utne, Ingrid	OMAE2023-102113 (06-04-02)
Bouy, Ludovic	OMAE2023-104633 (04-01-01)
Bransby, Fraser	OMAE2023-101816 (04-03-05), OMAE2023-104434 (04-03-05)
Breakey, Hugh	OMAE2023-104524 (13-06-03)
Brennan, Feargal	OMAE2023-100523 (03-05-01), OMAE2023-101302 (09-02-03)
Breunung, Thomas	OMAE2023-103020 (02-04-01)
Brizzolara, Stefano	OMAE2023-108022 (06-05-04)



# AUTHOR INDEX

Brodtkorb, Astrid H.....	OMAE2023-107733 (06-05-04)
Brower, David.....	OMAE2023-103309 (02-07-02)
Brown, Jeffrey.....	OMAE2023-101554 (07-03-01)
Browne, Thomas.....	OMAE2023-101455 (07-02-01), OMAE2023-101554 (07-03-01)
Brühl, Markus.....	OMAE2023-104326 (06-16-01)
Brun Coser, Tiago.....	OMAE2023-106952 (04-01-02)
Bruschi, Niccolò.....	OMAE2023-104864 (09-01-03)
Bruun Mortensen, Karina.....	OMAE2023-104682 (04-01-02)
Bryson, Edward.....	OMAE2023-104854 (07-03-03)
Bubbar, Kush.....	OMAE2023-103996 (09-02-05)
Bubel, Julian.....	OMAE2023-102040 (10-05-01)
Buchner, Bas.....	OMAE2023-103850 (05-01-01)
Bunnik, Tim.....	OMAE2023-108105 (08-06-01)
Buschmann, Philip Erik.....	OMAE2023-108101 (11-05-02)
Büsken, Wiebke.....	OMAE2023-101872 (06-08-01)
Butt, Stephen.....	OMAE2023-103836 (11-01-01), OMAE2023-105090 (11-01-01), OMAE2023-105113 (11-01-02), OMAE2023-105315 (11-01-02), OMAE2023-108187 (11-02-03)
Byrne, Michaela.....	OMAE2023-105020 (09-02-05)

## C

Cahay, Marc.....	OMAE2023-102974 (09-04-01)
Cai, Jinyan.....	OMAE2023-102938 (07-01-01), OMAE2023-104398 (07-02-02)
Cai, Wei.....	OMAE2023-101414 (08-02-01), OMAE2023-101935 (02-13-01)
Cai, Yuanzhen.....	OMAE2023-105262 (13-02-01)
Caire, Marcelo.....	OMAE2023-104870 (04-01-04)
Callaghan, David.....	OMAE2023-102097 (13-01-02)
Camilleri, Florent.....	OMAE2023-102990 (04-03-04)
Campari, Alessandro.....	OMAE2023-100914 (03-02-01)
Cannard, Patrick.....	OMAE2023-104119 (09-02-01)
Cao, Deping.....	OMAE2023-104586 (08-03-01), OMAE2023-104596 (05-01-02)
Cao, Jie.....	OMAE2023-104639 (01-08-03)
Cao, Renjing.....	OMAE2023-103551 (09-03-02)
Cao, Yingzhi.....	OMAE2023-104647 (13-06-02)
Capasso, Salvatore.....	OMAE2023-105023 (08-04-02), OMAE2023-105049 (08-02-02)
Capper, Benjamin.....	OMAE2023-104119 (09-02-01)
Caprace, Jean-David.....	OMAE2023-108204 (13-06-03)
Caracol, Rui.....	OMAE2023-102019 (04-01-01)
Cardozo de Mello, Pedro.....	OMAE2023-101967 (01-08-03), OMAE2023-104950 (08-09-01)
Carmo, Bruno.....	OMAE2023-104427 (06-01-01), OMAE2023-105084 (09-01-08)
Carneiro Campello, George.....	OMAE2023-106952 (04-01-02)
Carra, Chris.....	OMAE2023-104519 (02-09-01)
Carter, Chris G.....	OMAE2023-100870 (13-01-01)
Caruso, Mário.....	OMAE2023-103464 (04-03-05)
Casanovas Revilla, Clara.....	OMAE2023-103676 (04-01-01)
Cascão Ferreira de Almeida, Maria.....	OMAE2023-103227 (10-04-01)
Cascelli, Luis Antonio Matile.....	OMAE2023-104963 (06-01-01)
Cassidy, Mark.....	OMAE2023-104437 (10-02-01), OMAE2023-107918 (02-01-02)
Cayeux, Eric.....	OMAE2023-104443 (11-02-04), OMAE2023-104704 (11-02-04)
Cazzolato, Benjamin.....	OMAE2023-104119 (09-02-01), OMAE2023-104330 (09-04-02), OMAE2023-104333 (09-01-05), OMAE2023-105348 (09-04-01)
Chabchoub, Amin.....	OMAE2023-104594 (08-03-02), OMAE2023-104739 (02-05-02)
Chads, Carlos Eduardo Holmes.....	OMAE2023-105085 (06-01-02)
Chai, Wei.....	OMAE2023-104415 (07-02-02), OMAE2023-104751 (07-01-01)
Chandler, Bruce.....	OMAE2023-101113 (04-03-01)
Chang-Zhe, Chen.....	OMAE2023-100531 (06-02-01)
Chang, Kuntan.....	OMAE2023-104680 (10-03-01)
Chao, Zen.....	OMAE2023-101588 (06-12-03)
Chaplin, John.....	OMAE2023-105249 (08-01-02)

# AUTHOR INDEX

Charabin, Scott.....	OMAE2023-104587 (11-04-02)
Chatzimanolis, Nikolaos .....	OMAE2023-104359 (04-03-04)
Chauhan, Kapil .....	OMAE2023-104739 (02-05-02)
Chen, Bo-Chen.....	OMAE2023-105123 (09-02-03)
Chen, Changzhe.....	OMAE2023-102079 (06-11-01)
Chen, Cheng.....	OMAE2023-106039 (06-04-05)
Chen, Chi-Ang.....	OMAE2023-104394 (06-11-02)
Chen, Diyi .....	OMAE2023-101844 (07-06-01)
Chen, Donghui.....	OMAE2023-104394 (06-11-02)
Chen, Gang .....	OMAE2023-102830 (01-01-01)
Chen, Hao.....	OMAE2023-104586 (08-03-01), OMAE2023-104596 (05-01-02)
Chen, Hongbo.....	OMAE2023-100573 (11-02-01)
Chen, Jialun.....	OMAE2023-102780 (01-08-03)
Chen, Jiaming.....	OMAE2023-102855 (07-05-01), OMAE2023-104251 (07-06-02)
Chen, Jiaxing.....	OMAE2023-102355 (01-02-01)
Chen, Jinbo .....	OMAE2023-104013 (09-04-01)
Chen, Kai-Hung.....	OMAE2023-104394 (06-11-02)
Chen, Ming.....	OMAE2023-108186 (09-02-01)
Chen, Ming-Lu.....	OMAE2023-101218 (09-01-04)
Chen, Nian-Zhong.....	OMAE2023-103331 (02-07-01), OMAE2023-104210 (02-11-01), OMAE2023-104301 (08-01-01), OMAE2023-104383 (06-16-01)
Chen, Peng.....	OMAE2023-101805 (06-04-05), OMAE2023-101929 (09-01-04)
Chen, Qishi.....	OMAE2023-101113 (04-03-01)
Chen, Qiyang.....	OMAE2023-104794 (07-05-01)
Chen, Shengjun.....	OMAE2023-104656 (02-02-01)
Chen, Siqi.....	OMAE2023-108147 (06-04-05)
Chen, Wang.....	OMAE2023-108010 (11-01-02)
Chen, Weilin.....	OMAE2023-104810 (09-04-03)
Chen, Xi.....	OMAE2023-104224 (02-06-01)
Chen, Xi.....	OMAE2023-102682 (06-03-01)
Chen, Xu.....	OMAE2023-108192 (03-01-01)
Chen, Yanfei.....	OMAE2023-104656 (02-02-01)
Chen, Yongbo.....	OMAE2023-105070 (06-04-05)
Chen, Yue.....	OMAE2023-104430 (09-01-03)
Chen, Zhanjie.....	OMAE2023-104379 (04-03-03)
Chen, Zhaoting.....	OMAE2023-104619 (06-04-04)
Chen, Zhuoheng.....	OMAE2023-107753 (11-10-02)
Chen, Zuogang.....	OMAE2023-103443 (09-04-04)
Cheng, Ankang.....	OMAE2023-101700 (02-09-01), OMAE2023-102807 (02-09-01)
Cheng, Hui.....	OMAE2023-101705 (05-02-01)
Cheng, Liang.....	OMAE2023-102341 (09-01-06), OMAE2023-104579 (08-01-02)
Cheng, Liang.....	OMAE2023-101340 (04-02-01), OMAE2023-103310 (04-03-03), OMAE2023-104297 (06-02-01), OMAE2023-104334 (08-04-01), OMAE2023-104379 (04-03-03)
Cheng, Xin.....	OMAE2023-104379 (04-03-03)
Cheng, Zhengshun.....	OMAE2023-101805 (06-04-05), OMAE2023-101929 (09-01-04)
Chin, Christopher.....	OMAE2023-101836 (13-06-01), OMAE2023-104590 (09-02-02)
Chiu, Forng-Chen.....	OMAE2023-104742 (09-01-07)
Chizfahm, Amir.....	OMAE2023-101030 (08-05-01)
Cho, Dong Pil.....	OMAE2023-104718 (03-01-01)
Cho, Joung Hyung.....	OMAE2023-102747 (02-01-02)
Choi, Seonghwan.....	OMAE2023-107939 (03-01-01)
Choi, Sukjoo.....	OMAE2023-105074 (09-01-10)
Chou, Shean-Kwang.....	OMAE2023-104742 (09-01-07)
Christakos, Konstantinos.....	OMAE2023-104492 (02-07-02), OMAE2023-104877 (06-07-02)
Chu, Yun Il.....	OMAE2023-101407 (13-01-02)
Chuang, Wei-Liang.....	OMAE2023-102066 (06-03-04)
Chuang, Zhenju.....	OMAE2023-101844 (07-06-01)
Chujo, Toshiki.....	OMAE2023-100973 (09-01-01)

# AUTHOR INDEX

Chung, Cheng-Hsien .....	OMAE2023-104742 (09-01-07)
Ciecko, Edward .....	OMAE2023-107635 (04-03-03)
Cifuentes, Cristian .....	OMAE2023-101308 (13-01-01)
Cilkaya, Emre .....	OMAE2023-105053 (06-12-03)
Cleggett, James .....	OMAE2023-104119 (09-02-01)
Clements, Richard .....	OMAE2023-102019 (04-01-01)
Cleavelario, Judimar de Assis .....	OMAE2023-101201 (04-01-03)
Coe, Ryan G. ....	OMAE2023-103899 (09-02-05)
Collberg, Leif .....	OMAE2023-105427 (04-01-01)
Collu, Maurizio .....	OMAE2023-100822 (09-01-04)
Colombo, Danilo .....	OMAE2023-105150 (02-13-01)
Conde, Alejandro Garcia .....	OMAE2023-102873 (06-11-01)
Cooke, Nathan .....	OMAE2023-101167 (04-01-02)
Costa Nogueira Junior, Alberto .....	OMAE2023-104950 (08-09-01)
Costa, Anna Helena Reali .....	OMAE2023-102044 (01-08-02), OMAE2023-104351 (01-08-02)
Cotrim, Lucas P. ....	OMAE2023-102044 (01-08-02)
Court, Jean-Philippe .....	OMAE2023-102256 (03-05-01)
Cousin, Alexis .....	OMAE2023-101961 (02-04-02)
Crawford, Jack .....	OMAE2023-105353 (09-04-02)
Crespo, Alejandro J.C. ....	OMAE2023-105023 (08-04-02), OMAE2023-105049 (08-02-02)
Cui, Boyu .....	OMAE2023-104639 (01-08-03)
Cui, Jinju .....	OMAE2023-107994 (02-02-02)
Cui, Lin .....	OMAE2023-104822 (10-02-01)
Cui, Minghao .....	OMAE2023-101805 (06-04-05)
Cui, Yongdong .....	OMAE2023-101352 (01-08-02), OMAE2023-102369 (01-06-01)
Cunha, Rodrigo Da Silva .....	OMAE2023-102044 (01-08-02), OMAE2023-104351 (01-08-02)

## D

D, Vignesh .....	OMAE2023-108006 (06-14-02)
da Silva, Leandro S. P. ....	OMAE2023-104427 (06-01-01)
Da Silva, Vinicius Ribeiro Machado .....	OMAE2023-105040 (04-01-03)
Dae Joong Kim, Bruce .....	OMAE2023-108186 (09-02-01)
Dai, Saishuai .....	OMAE2023-100523 (03-05-01), OMAE2023-101302 (09-02-03), OMAE2023-102682 (06-03-01)
Dai, Shaoshi .....	OMAE2023-104736 (04-03-03)
Daley, Claude .....	OMAE2023-104854 (07-03-03), OMAE2023-104860 (07-03-03)
Dalton, Eunice .....	OMAE2023-105556 (14-01-01)
Damgaard Christensen, Erik .....	OMAE2023-107186 (08-03-02)
Dao, My Ha .....	OMAE2023-101331 (08-04-01), OMAE2023-101352 (01-08-02), OMAE2023-101859 (08-08-01), OMAE2023-102369 (01-06-01), OMAE2023-102743 (09-01-10), OMAE2023-104406 (09-01-03), OMAE2023-107794 (01-04-02)
Das, Suvabrata .....	OMAE2023-105101 (01-08-01)
Dash, Sambit Supriya .....	OMAE2023-104750 (02-11-01)
Datla, Raju .....	OMAE2023-104777 (08-02-02)
Datta, Nabanita .....	OMAE2023-104337 (09-01-09)
Davis, Jacob .....	OMAE2023-106657 (09-02-02)
De Luca, Fabio .....	OMAE2023-105049 (08-02-02)
de Oliveira Trigo, Caio Cesar .....	OMAE2023-104375 (11-07-01)
de Oliveira, Marielle .....	OMAE2023-104330 (09-04-02), OMAE2023-104427 (06-01-01), OMAE2023-105084 (09-01-08)
de Ridder, Erik-Jan .....	OMAE2023-103266 (09-01-02)
De Sousa, Jose Renato Mendes .....	OMAE2023-105040 (04-01-03)
de Souza Soares de Almeida, Márcio .....	OMAE2023-103227 (10-04-01)
Deberaldini Netto, Caio Fabricio .....	OMAE2023-104950 (08-09-01)
Defensor Filho, Wagner A. ....	OMAE2023-105119 (08-06-01)
DeGeer, Duane .....	OMAE2023-101113 (04-03-01)
Deguchi, Mitsuyasu .....	OMAE2023-106749 (05-01-01)
Deheeger, Antoine .....	OMAE2023-105422 (04-01-03)
Delvosal, Pierre .....	OMAE2023-104434 (04-03-05)
Delwing Rosa, Carolina .....	OMAE2023-106952 (04-01-02)

# AUTHOR INDEX

Deng, Pengqian	OMAE2023-104396 (08-01-01)
Deng, Weihua	OMAE2023-104552 (08-03-02)
Deng, Yanfei	OMAE2023-106568 (06-05-04)
Deng, Yue	OMAE2023-104647 (13-06-02), OMAE2023-104649 (13-06-02)
Deng, Yulin	OMAE2023-102185 (01-03-01)
Denis, Raphael	OMAE2023-104434 (04-03-05)
Deo, Indu Kant	OMAE2023-101031 (08-07-01)
Deogaonkar, Vallabh Vinod	OMAE2023-104644 (06-05-03)
Depken, Jorgen	OMAE2023-102401 (06-04-02)
Devergez, Mélanie	OMAE2023-101111 (02-12-01)
Devin, Michael C.	OMAE2023-103899 (09-02-05)
Devolder, Brecht	OMAE2023-102845 (08-02-01)
Deydier, Maxime	OMAE2023-102256 (03-05-01)
Di Nardo, Emanuel	OMAE2023-103731 (02-02-01)
Dias, Helena	OMAE2023-107626 (10-01-01)
Dickerson, Dan	OMAE2023-101202 (06-08-01)
Dickerson, Joseph	OMAE2023-101202 (06-08-01)
Diez, Anja	OMAE2023-108101 (11-05-02)
Dillenburg, Simon	OMAE2023-104576 (09-01-08)
Dillon-Gibbons, Craig	OMAE2023-103244 (04-01-07)
Dimitrov, Nikolay	OMAE2023-101961 (02-04-02)
Dimopoulos, Simon	OMAE2023-104519 (02-09-01)
Ding, Boyin	OMAE2023-104330 (09-04-02), OMAE2023-104333 (09-01-05), OMAE2023-104377 (06-11-02), OMAE2023-105348 (09-04-01), OMAE2023-107971 (13-02-01)
Ding, Haoyu	OMAE2023-102682 (06-03-01)
Ding, Jianliang	OMAE2023-102755 (02-02-01)
Ding, Shifeng	OMAE2023-102381 (07-03-01), OMAE2023-102855 (07-05-01), OMAE2023-102938 (07-01-01), OMAE2023-104251 (07-06-02), OMAE2023-104289 (07-02-02), OMAE2023-104305 (07-03-02), OMAE2023-104308 (07-03-02), OMAE2023-104315 (07-03-03), OMAE2023-104398 (07-02-02)
Ding, Yi	OMAE2023-104251 (07-06-02)
Ding, Yue	OMAE2023-104281 (06-07-01)
Dirdal, Johann A.	OMAE2023-104492 (02-07-02)
Do Nascimento Carvalhal, Rodrigo	OMAE2023-103189 (04-02-01)
Dobson, Alan	OMAE2023-107668 (04-01-07), OMAE2023-108686 (04-01-06)
Doherty, James	OMAE2023-106589 (10-04-01)
Dolinsky, Mauro Cresta de Barros	OMAE2023-105085 (06-01-02)
Domínguez, José Manuel	OMAE2023-105023 (08-04-02), OMAE2023-105049 (08-02-02)
Dong, Guohua	OMAE2023-102184 (08-03-01), OMAE2023-102195 (08-05-01), OMAE2023-102722 (08-03-01), OMAE2023-104807 (06-12-02)
Dong, Qianqian	OMAE2023-104736 (04-03-03), OMAE2023-104794 (07-05-01)
Dong, Shuchuang	OMAE2023-104637 (05-02-01), OMAE2023-104700 (05-01-02), OMAE2023-105129 (05-02-01)
Dory, Jean-Noel	OMAE2023-104281 (06-07-01)
dos Reis Tagliari, Mariana	OMAE2023-106952 (04-01-02)
Dos Santos Cordeiro, Alexandre	OMAE2023-103764 (04-01-05)
dos Santos, Joaquim Rocha	OMAE2023-105150 (02-13-01)
Dottori, Marcelo	OMAE2023-103265 (06-07-01), OMAE2023-104603 (06-07-02), OMAE2023-104950 (08-09-01)
Doynov, Krassimir	OMAE2023-101167 (04-01-02)
Draper, Scott	OMAE2023-102341 (09-01-06), OMAE2023-104379 (04-03-03), OMAE2023-104579 (08-01-02), OMAE2023-106777 (04-01-04), OMAE2023-108062 (10-04-01)
Drumond, Geovana	OMAE2023-103764 (04-01-05)
Du, Jun-Feng	OMAE2023-102530 (09-04-04)
Du, Zhengxue	OMAE2023-108061 (11-01-01)
Duan, Fei	OMAE2023-103611 (06-12-02)
Duan, Jianwen	OMAE2023-102410 (06-12-01)
Duan, Xiaofeng	OMAE2023-104649 (13-06-02)
Duarte Radke, Erik	OMAE2023-106952 (04-01-02)
Duba, Kurabachew	OMAE2023-104013 (09-04-01)
Ducrozet, Guillaume	OMAE2023-100850 (06-16-01), OMAE2023-104676 (06-03-03), OMAE2023-104857 (06-16-02)
Duplenskiy, Stanislav	OMAE2023-103654 (04-03-02)
Dyson, Ashley	OMAE2023-103287 (13-01-02), OMAE2023-104397 (10-02-01)

## E

e Silva, Daniel Fonseca de Carvalho .....	OMAE2023-105066 (06-01-02)
Ean, Lee Woen .....	OMAE2023-103329 (09-03-01)
Eassom, Adrian .....	OMAE2023-104708 (01-08-02)
Echevarría, Alonso .....	OMAE2023-101308 (13-01-01)
Eggermont, Coen .....	OMAE2023-101382 (02-10-01)
Ehlers, Sören .....	OMAE2023-101505 (08-07-01), OMAE2023-102401 (06-04-02), OMAE2023-102581 (06-01-01), OMAE2023-103425 (07-03-02)
El Moctar, Ould .....	OMAE2023-105235 (08-02-01)
Elahifar, Behzad .....	OMAE2023-103528 (11-03-01), OMAE2023-104309 (11-05-01)
Ellwanger, Gilberto Bruno .....	OMAE2023-105040 (04-01-03)
Elrick, Peter .....	OMAE2023-100890 (08-01-01)
Emad, Gholam Reza .....	OMAE2023-101806 (13-06-01)
Engström, Jens .....	OMAE2023-102422 (09-02-04)
Enshaei, Hossein .....	OMAE2023-101836 (13-06-01), OMAE2023-104286 (06-11-02), OMAE2023-104624 (06-05-03)
Eoima, Vagi .....	OMAE2023-105556 (14-01-01)
Eriksen, Morten .....	OMAE2023-102019 (04-01-01)
Eriksson, Kjell .....	OMAE2023-105285 (01-08-01)
Ertekin, R. Cengiz .....	OMAE2023-105070 (06-04-05)
Ertugrul, Nesimi .....	OMAE2023-107971 (13-02-01)
Esber, Ghaith .....	OMAE2023-104705 (09-01-09)
Estefen, Segen F. ....	OMAE2023-102271 (09-01-03), OMAE2023-103289 (11-07-01)
Estrier, Pascal .....	OMAE2023-104633 (04-01-01)
Étienne, Stéphane .....	OMAE2023-103312 (06-14-03)
Euskirchen, Frederik .....	OMAE2023-102401 (06-04-02)
Ewans, Kevin .....	OMAE2023-104360 (12-01-01)
Ewans, Kevin C. ....	OMAE2023-101196 (06-07-01)
Eyni, Leila .....	OMAE2023-102454 (11-07-01)

## F

Faanes, Audun .....	OMAE2023-104399 (01-04-01)
Fabricio Deberaldini Netto, Caio .....	OMAE2023-103265 (06-07-01), OMAE2023-104603 (06-07-02)
Fan, Shida .....	OMAE2023-103327 (01-01-01), OMAE2023-104660 (01-03-02)
Fang, Wei .....	OMAE2023-104540 (02-11-02)
Fard, Hamid .....	OMAE2023-100940 (02-11-01)
Fathi Kazerooni, Reza .....	OMAE2023-103261 (06-12-01)
Fatima, Zeest .....	OMAE2023-101605 (10-01-01)
Favaro Borges, Marcelo .....	OMAE2023-106952 (04-01-02)
Fei, Jianxiong .....	OMAE2023-102938 (07-01-01)
Feixu, Li .....	OMAE2023-102742 (07-02-02)
Fekhari, Elias .....	OMAE2023-101961 (02-04-02)
Feneuil, Blandine .....	OMAE2023-104758 (11-05-01), OMAE2023-104790 (11-05-01), OMAE2023-107301 (11-05-02)
Feng, Dakui .....	OMAE2023-102184 (08-03-01), OMAE2023-104552 (08-03-02), OMAE2023-104807 (06-12-02)
Feng, Feng .....	OMAE2023-106039 (06-04-05)
Feng, Guoqing .....	OMAE2023-104753 (02-07-02)
Fernandes, Antonio Carlos .....	OMAE2023-100990 (04-04-01), OMAE2023-100991 (09-03-02), OMAE2023-104192 (06-03-02)
Fernandez-Vega, Jens .....	OMAE2023-105350 (01-04-01)
Ferraz Netto, Carolina .....	OMAE2023-105095 (04-01-06)
Ferreira, Marcos Donato Auler da Silva .....	OMAE2023-105085 (06-01-02)
Ferri, Giulio .....	OMAE2023-104864 (09-01-03)
Festa, Oscar .....	OMAE2023-100845 (09-01-05)
Fialho Coelho, Jefferson .....	OMAE2023-103265 (06-07-01), OMAE2023-104603 (06-07-02), OMAE2023-104950 (08-09-01)
Fievez, Joanthan .....	OMAE2023-100742 (13-04-01)
Filho, Faete .....	OMAE2023-104013 (09-04-01)
Filipot, Jean-François .....	OMAE2023-107740 (02-05-02)
Fiore, Fabrizio .....	OMAE2023-104634 (01-03-01)
Firdaus, Ahmad .....	OMAE2023-108028 (09-03-01)

# AUTHOR INDEX

Fitz, Annika	OMAE2023-102401 (06-04-02)
Fitzpatrick, Thomas	OMAE2023-107769 (07-04-01)
Fjeldstad, Arne	OMAE2023-104674 (03-02-01), OMAE2023-104800 (02-12-01), OMAE2023-104845 (02-11-02)
Fletcher-Woods, Jamie	OMAE2023-108686 (04-01-06)
Fonseca De Souza, Derek	OMAE2023-106952 (04-01-02)
Forbush, Dominic	OMAE2023-105030 (09-02-04)
Føre, Heidi Moe	OMAE2023-104444 (05-02-01)
Foster, Tegan S.	OMAE2023-100980 (09-01-07)
Franzini, Guilherme R.	OMAE2023-105119 (08-06-01)
Freitas, Inês S. G.	OMAE2023-104679 (04-01-03)
Frigaard, Ian	OMAE2023-104587 (11-04-02), OMAE2023-104944 (11-04-02), OMAE2023-107063 (11-05-02)
Frigeri, Phellip	OMAE2023-104633 (04-01-01)
Frigon, Ethan	OMAE2023-102308 (04-03-02)
Frutuoso e Melo, Paulo Fernando	OMAE2023-103603 (02-12-01), OMAE2023-105027 (02-13-02)
Fu, Shan Shan	OMAE2023-105765 (07-04-01)
Fu, Shanshan	OMAE2023-101081 (07-02-01)
Fu, Shixiao	OMAE2023-104396 (08-01-01), OMAE2023-104436 (08-01-02)
Fueki, Ryutaro	OMAE2023-101139 (03-02-01)
Fuglsang, Alex	OMAE2023-103244 (04-01-07)
Fujikubo, Masahiko	OMAE2023-102688 (02-02-02)
Fujimoto, Wataru	OMAE2023-101876 (02-05-01), OMAE2023-104733 (02-05-01)
Fujiwara, Toshifumi	OMAE2023-100973 (09-01-01), OMAE2023-103370 (06-14-02)
Fujiwara, Yasushi	OMAE2023-104435 (02-04-02)

## G

Gaebele, Daniel T.	OMAE2023-103899 (09-02-05)
Gagliardi Cozman, Fabio	OMAE2023-101967 (01-08-03), OMAE2023-103265 (06-07-01), OMAE2023-104603 (06-07-02), OMAE2023-104950 (08-09-01)
Gallina, Alessandro	OMAE2023-101201 (04-01-03)
Gamaleldin, Muhannad W.	OMAE2023-104594 (08-03-02), OMAE2023-104739 (02-05-02)
Gan, Jianqiang	OMAE2023-103776 (02-03-01)
Ganz, Avshalom	OMAE2023-104497 (10-02-01)
Gao, Bin	OMAE2023-105425 (10-05-01)
Gao, Chao	OMAE2023-102540 (02-07-01)
Gao, Ming Hui	OMAE2023-108062 (10-04-01)
Gao, Pan	OMAE2023-105338 (04-01-04)
Gao, Qiang	OMAE2023-107971 (13-02-01)
Gao, Qiang	OMAE2023-105338 (04-01-04)
Gao, Shan	OMAE2023-101844 (07-06-01)
Gao, Yanling	OMAE2023-105338 (04-01-04)
Gao, Zhe	OMAE2023-102624 (06-16-01)
Gao, Zhen	OMAE2023-104492 (02-07-02), OMAE2023-104877 (06-07-02)
Gao, Zhenguo	OMAE2023-102125 (04-02-01)
Garaniya, Vikram	OMAE2023-104522 (09-05-01), OMAE2023-104609 (13-06-02), OMAE2023-104627 (09-04-02), OMAE2023-104628 (13-05-01), OMAE2023-105112 (13-06-01)
Gash, Robert	OMAE2023-104936 (01-02-01)
Gaudin, Christophe	OMAE2023-105185 (13-04-01)
Gauthier, David	OMAE2023-101058 (13-01-01), OMAE2023-104966 (08-04-02)
Gavouyere, Thierry	OMAE2023-102019 (04-01-01)
Gayen, R.	OMAE2023-100794 (06-01-02)
Ge, Yuhui	OMAE2023-104305 (07-03-02)
Geng, Jiahui	OMAE2023-104639 (01-08-03)
Genzani, Rachel C.	OMAE2023-102990 (04-03-04)
George, Judith	OMAE2023-103836 (11-01-01), OMAE2023-108187 (11-02-03)
Georgiadis, Mikaela	OMAE2023-104119 (09-02-01)
Geusti, Lucas Alban	OMAE2023-101201 (04-01-03)
Ghadirian, Amin	OMAE2023-100980 (09-01-07)
Ghanavati, Mandana	OMAE2023-109008 (12-03-01)

# AUTHOR INDEX

Ghazal, Abdallah M.....	OMAE2023-102009 (11-04-01)
Ghorbani, Mahdi.....	OMAE2023-100940 (02-11-01)
Ghoshal, Ritwik.....	OMAE2023-105214 (08-08-01)
Giannini, Leonardo.....	OMAE2023-100914 (03-02-01)
Gibson, David.....	OMAE2023-104729 (04-03-04)
Giering, Jan-Erik.....	OMAE2023-101505 (08-07-01)
Gil, Cyprian.....	OMAE2023-102864 (02-01-01)
Gilges, Markus.....	OMAE2023-102785 (07-01-01)
Giljarhus, Knut Erik Teigen.....	OMAE2023-102788 (09-01-09)
Gindis, Miriam.....	OMAE2023-104497 (10-02-01)
Gjerstad, Kristian.....	OMAE2023-105303 (11-02-02)
Gjersvik, Tor Berge.....	OMAE2023-102907 (04-04-01)
Glosson, Gabriel.....	OMAE2023-104013 (09-04-01)
Godø, John Martin Kleven.....	OMAE2023-104731 (06-04-04)
Golestani, Nima.....	OMAE2023-104609 (13-06-02)
Gomar, Mostafa.....	OMAE2023-103528 (11-03-01)
Gomi, Edson Satoshi.....	OMAE2023-102044 (01-08-02), OMAE2023-104351 (01-08-02)
Goncalves, Rodolfo T.....	OMAE2023-102704 (01-03-02), OMAE2023-104333 (09-01-05), OMAE2023-104427 (06-01-01), OMAE2023-104664 (06-03-03)
Gong, Chenxing.....	OMAE2023-103302 (11-01-02)
Gonzalez Angarita, Juan Camilo.....	OMAE2023-108000 (11-03-02)
González-Ávalos, Raúl.....	OMAE2023-105023 (08-04-02)
Gonzalez, Martin.....	OMAE2023-103055 (08-07-01)
Gopinath, Sathiyamoorthy.....	OMAE2023-100975 (06-05-01)
Görmüş, Doğukan.....	OMAE2023-102329 (09-01-06)
Gosala, Vaidehi.....	OMAE2023-101505 (08-07-01), OMAE2023-102401 (06-04-02)
Gosse, Joshua.....	OMAE2023-104860 (07-03-03)
Gosselin, Frédéric.....	OMAE2023-103312 (06-14-03)
Göteman, Malin.....	OMAE2023-102422 (09-02-04)
Goucher-Lambert, Kosa.....	OMAE2023-100580 (08-04-02)
Gourvenec, Susan.....	OMAE2023-100845 (09-01-05)
Grabe, Jürgen.....	OMAE2023-101605 (10-01-01)
Graham, Peter.....	OMAE2023-108091 (02-05-01)
Grasberger, Jeff T.....	OMAE2023-103899 (09-02-05), OMAE2023-105030 (09-02-04)
Gray, Evan.....	OMAE2023-102112 (13-04-01)
Griffiths, Terry.....	OMAE2023-102329 (09-01-06), OMAE2023-102341 (09-01-06), OMAE2023-103310 (04-03-03), OMAE2023-104379 (04-03-03)
Grimaldo, Eduardo.....	OMAE2023-104444 (05-02-01)
Grossmann-Matheson, Guisela.....	OMAE2023-103260 (12-03-01)
Grytøyr, Guttorm.....	OMAE2023-105583 (08-08-01)
Gu, Haoyuan.....	OMAE2023-102355 (01-02-01)
Gu, Si Yuan.....	OMAE2023-105765 (07-04-01)
Gu, Xiechong.....	OMAE2023-102410 (06-12-01), OMAE2023-103611 (06-12-02)
Gu, Yingjie.....	OMAE2023-102822 (07-06-02)
Gu, Yongan.....	OMAE2023-107753 (11-10-02)
Guarda Brauning, Luis Felipe.....	OMAE2023-101753 (02-08-01)
Gubesch, Eric.....	OMAE2023-104590 (09-02-02), OMAE2023-105348 (09-04-01), OMAE2023-105352 (09-04-02), OMAE2023-105353 (09-04-02)
Gueydon, Sebastien.....	OMAE2023-103266 (09-01-02)
Guihen, Damien.....	OMAE2023-105124 (13-05-01)
Guiton, Martin.....	OMAE2023-101961 (02-04-02)
Gullaksen, Joannes.....	OMAE2023-101799 (06-11-01)
Gumley, Jon.....	OMAE2023-104715 (09-01-02)
Gunawan, David.....	OMAE2023-102780 (01-08-03)
Gunawardane, Kosala.....	OMAE2023-103054 (13-04-01)
Gunn, David.....	OMAE2023-104519 (02-09-01)
Guo, Jianing.....	OMAE2023-101748 (04-03-01)
Guo, Jianqun.....	OMAE2023-104716 (06-02-01)

# AUTHOR INDEX

Guo, Ruinan.....	OMAE2023-106517 (06-14-02)
Guo, Xiaoxian.....	OMAE2023-102927 (08-06-01)
Guo, Yongjin.....	OMAE2023-102540 (02-07-01)
Guo, Yue.....	OMAE2023-104649 (13-06-02)

## H

Ha, Yoon-Jin.....	OMAE2023-107853 (09-01-08)
Hachmeister, Ludger.....	OMAE2023-101505 (08-07-01)
Haghighi, Hooman.....	OMAE2023-105428 (04-04-01)
Haider, Ali Shahbaz.....	OMAE2023-103996 (09-02-05)
Hals Todalshaug, Jørgen.....	OMAE2023-104749 (06-03-03)
Halse, Karl Henning.....	OMAE2023-101206 (09-01-01)
Hamada, Eigai.....	OMAE2023-101764 (05-06-01)
Han, Bing.....	OMAE2023-101081 (07-02-01), OMAE2023-102540 (02-07-01)
Han, Duanfeng.....	OMAE2023-106517 (06-14-02)
Han, Jialin.....	OMAE2023-103284 (08-02-02)
Han, Liang.....	OMAE2023-103412 (11-03-01)
Hanaoka, Daishin.....	OMAE2023-104545 (02-10-01)
Hands, Graydon.....	OMAE2023-106209 (09-05-01)
Haneda, Ken.....	OMAE2023-100973 (09-01-01)
Hao, Zhailiu.....	OMAE2023-104322 (08-05-01)
Harkin, Alex.....	OMAE2023-103261 (06-12-01)
Harris, Andrew.....	OMAE2023-101836 (13-06-01)
Harris, Jeffrey C.....	OMAE2023-107740 (02-05-02)
Hasan Yousef, Hassan.....	OMAE2023-101027 (06-14-01)
Hassan, Ibrahim.....	OMAE2023-108094 (11-08-01)
Hassanzadeh, Hossein.....	OMAE2023-101070 (11-04-01), OMAE2023-101472 (11-04-01)
Hasumi, Tomohiro.....	OMAE2023-100973 (09-01-01)
Hatlebrekke, Hanne Hjelle.....	OMAE2023-104444 (05-02-01)
Hayakawa, Ginga.....	OMAE2023-104224 (02-06-01)
Hayashi, Ryota.....	OMAE2023-104700 (05-01-02)
Hayashibara, Hitoshi.....	OMAE2023-101139 (03-02-01)
Hayatdavoodi, Masoud.....	OMAE2023-105065 (06-03-04), OMAE2023-105070 (06-04-05), OMAE2023-105333 (06-05-03)
He, Guolian.....	OMAE2023-102195 (08-05-01)
He, Yangye.....	OMAE2023-104870 (04-01-04)
He, Yuchen.....	OMAE2023-104739 (02-05-02)
He, Yupei.....	OMAE2023-104797 (06-03-04)
Hedengren, John D.....	OMAE2023-103309 (02-07-02)
Hegseth, John Marius.....	OMAE2023-101930 (09-01-10)
Heinrich, Dariya.....	OMAE2023-103701 (01-04-01)
Heitzmann, Michael Tobias.....	OMAE2023-104611 (03-05-01), OMAE2023-105262 (13-02-01)
Hejazi, Rasoul.....	OMAE2023-103433 (02-09-01)
Helder, Joop.....	OMAE2023-104288 (02-05-01)
Helena Reali Costa, Anna.....	OMAE2023-103265 (06-07-01), OMAE2023-104603 (06-07-02)
Hellinckx, Peter.....	OMAE2023-104455 (06-11-03)
Helmersson, Bjorn.....	OMAE2023-100628 (03-06-01)
Heng, Zi.....	OMAE2023-105399 (06-12-03)
Heo, J. K.....	OMAE2023-101405 (01-02-01)
Heo, Jaekyung.....	OMAE2023-103793 (06-05-02)
Herremans, Siemen.....	OMAE2023-104455 (06-11-03)
Herrnring, Hauke.....	OMAE2023-102584 (07-05-01), OMAE2023-103425 (07-03-02)
Hertel, Melissa.....	OMAE2023-107819 (09-01-01), OMAE2023-107904 (09-01-01)
Hewins, Shelby.....	OMAE2023-105352 (09-04-02)
Hillman, Zachary.....	OMAE2023-103309 (02-07-02)
Hirabayashi, Shinichiro.....	OMAE2023-102704 (01-03-02), OMAE2023-104664 (06-03-03)
Hirdaris, Spyros.....	OMAE2023-101896 (07-03-01), OMAE2023-104304 (06-03-02)
Hironaka, Masato.....	OMAE2023-104302 (05-05-01)
Hisamatsu, Ryoya.....	OMAE2023-103375 (05-05-01)



# AUTHOR INDEX

Hlophe, Thobani	OMAE2023-104672 (06-16-02)
Hmadeh, Lewaa	OMAE2023-104309 (11-05-01)
Hogg, Brendan Francis	OMAE2023-105583 (08-08-01)
Hong, Cheng	OMAE2023-103289 (11-07-01)
Hong, Sunghun	OMAE2023-101206 (09-01-01)
Hoo, Eric	OMAE2023-104675 (02-11-02)
Hooper, Christopher	OMAE2023-107819 (09-01-01), OMAE2023-107904 (09-01-01)
Hoppmann, Mario	OMAE2023-104207 (02-04-01)
Horn, Agnes Marie	OMAE2023-104674 (03-02-01)
Hørte, Torfinn	OMAE2023-104800 (02-12-01), OMAE2023-104891 (04-02-03)
Hossain, Muhammad Shazzad	OMAE2023-101044 (10-03-01), OMAE2023-104680 (10-03-01), OMAE2023-108062 (10-04-01)
Hou, Fuheng	OMAE2023-104656 (02-02-01)
Hou, Jing	OMAE2023-104291 (04-02-03)
Hou, Senhan	OMAE2023-104485 (11-10-01)
Hou, Yucheng	OMAE2023-104905 (04-01-02)
Hou, Zhechen	OMAE2023-104434 (04-03-05)
Houtani, Hidetaka	OMAE2023-101876 (02-05-01), OMAE2023-104733 (02-05-01)
Hovda, Sigve	OMAE2023-104720 (11-03-01)
Howe, Damon	OMAE2023-104286 (06-11-02), OMAE2023-105346 (13-02-01)
Høyland, Knut V.	OMAE2023-104751 (07-01-01)
Høyli, Randulf	OMAE2023-101707 (06-04-01)
Hsu, Hao-Teng	OMAE2023-104742 (09-01-07)
Hsu, I Jen	OMAE2023-101503 (09-01-09)
Hu, Jingru	OMAE2023-104619 (06-04-04)
Hu, Lei	OMAE2023-104270 (06-04-03)
Hu, Min	OMAE2023-101935 (02-13-01)
Hu, Xiaoyuan	OMAE2023-104297 (06-02-01), OMAE2023-104379 (04-03-03)
Hu, Xuefeng	OMAE2023-101748 (04-03-01)
Hu, Yuxia	OMAE2023-108062 (10-04-01)
Hu, Zhijian	OMAE2023-101084 (11-03-02)
Huang, Alex S.	OMAE2023-102044 (01-08-02)
Huang, Fuxiang	OMAE2023-106517 (06-14-02)
Huang, Shihao	OMAE2023-109014 (06-14-03), OMAE2023-109449 (06-14-03)
Huang, Shuo	OMAE2023-109156 (09-02-04)
Huang, Weiquan	OMAE2023-109014 (06-14-03), OMAE2023-109449 (06-14-03)
Huang, Xueqin	OMAE2023-108061 (11-01-01)
Huang, Yang	OMAE2023-100523 (03-05-01), OMAE2023-101302 (09-02-03)
Huang, Yuexiang	OMAE2023-104415 (07-02-02)
Huang, Zheng-Zhang	OMAE2023-104742 (09-01-07)
Huang, Zhongwei	OMAE2023-104619 (06-04-04)
Hughes, Nick	OMAE2023-101757 (07-02-01)
Hulin, Florian	OMAE2023-107740 (02-05-02)
Hüllein, Anna Sophia	OMAE2023-102113 (06-04-02)
Hurtado, Carlos	OMAE2023-101308 (13-01-01)
Husain, Salman	OMAE2023-105030 (09-02-04), OMAE2023-106657 (09-02-02)
Hyldahl, Per C.	OMAE2023-100980 (09-01-07)

Idarraga, Guillermo	OMAE2023-100523 (03-05-01), OMAE2023-101302 (09-02-03)
Igarashi, Yuki	OMAE2023-104394 (06-11-02)
Igor Lourenço, Marcelo	OMAE2023-103764 (04-01-05)
Ikoma, Tomoki	OMAE2023-104612 (05-06-01), OMAE2023-104669 (05-05-02)
Imtiaz, Syed	OMAE2023-104936 (01-02-01)
Inaba, Shogo	OMAE2023-103370 (06-14-02)
Indrajith, Bawantha	OMAE2023-103054 (13-04-01)
Inkinen, Tommi	OMAE2023-104628 (13-05-01)
Inoue, Tomoya	OMAE2023-101928 (11-03-02), OMAE2023-102439 (11-01-01)
Ishibashi, Kinya	OMAE2023-101136 (02-01-01), OMAE2023-101139 (03-02-01), OMAE2023-102688 (02-02-02)

# AUTHOR INDEX

Islam, Mohammad	OMAE2023-104936 (01-02-01)
Islam, Rabiul	OMAE2023-101836 (13-06-01)
Islam, T. M. Rabiul	OMAE2023-101806 (13-06-01)
Islam, Tanjil	OMAE2023-104936 (01-02-01)
Ivanov, Glib	OMAE2023-101503 (09-01-09)
Iwata, Toshiaki	OMAE2023-101139 (03-02-01)
Izadi, Mahdi	OMAE2023-104944 (11-04-02)

## J

J, Suneela	OMAE2023-100778 (08-02-01)
Jaber, Nizar	OMAE2023-105029 (11-02-04)
Jacobs, Georg	OMAE2023-102785 (07-01-01)
Jacques, Nicolas	OMAE2023-107740 (02-05-02)
Jadhav, Aditya Kailas	OMAE2023-104644 (06-05-03)
Jadhav, Pramod Suresh	OMAE2023-108006 (06-14-02)
Jafarzadeh, Sepideh	OMAE2023-100914 (03-02-01), OMAE2023-101707 (06-04-01)
Jaiman, Rajeev	OMAE2023-101030 (08-05-01), OMAE2023-101031 (08-07-01)
Jain, Arvind Kumar	OMAE2023-108232 (09-04-04)
Jain, Mohit	OMAE2023-102785 (07-01-01)
Jalali, Hossein	OMAE2023-104359 (04-03-04)
Janbazi, Hossein	OMAE2023-104471 (04-02-03)
Jang, Hakun	OMAE2023-104384 (09-01-07), OMAE2023-105074 (09-01-10)
Jang, Hyunchul	OMAE2023-104384 (09-01-07)
Jangir, Pramod Kumar	OMAE2023-101196 (06-07-01)
Janocha, Marek Jan	OMAE2023-102822 (07-06-02)
Jaques Honorato, Henrique	OMAE2023-105095 (04-01-06)
Javanmardi, Mohammadreza	OMAE2023-105399 (06-12-03)
Jay, Brighid	OMAE2023-100742 (13-04-01)
Jayasinghe, Hasith	OMAE2023-103054 (13-04-01)
Jayasinghe, Kanishka	OMAE2023-104708 (01-08-02), OMAE2023-104715 (09-01-02)
Jebali, Adel	OMAE2023-102939 (04-03-04), OMAE2023-102990 (04-03-04)
Jeng, Dong-Sheng	OMAE2023-101571 (10-01-01), OMAE2023-103600 (10-01-01), OMAE2023-104425 (13-01-02), OMAE2023-104822 (10-02-01)
Jensen, Bjarne	OMAE2023-102429 (08-08-01), OMAE2023-103261 (06-12-01)
Jeon, Jaehyeuk	OMAE2023-101969 (04-02-02)
Jeong, Seyong	OMAE2023-102348 (06-04-02)
Jeong, Young Cheon	OMAE2023-104718 (03-01-01)
Jepsen, Michael Sandholm	OMAE2023-101045 (01-08-03)
Jettestuen, Espen	OMAE2023-104704 (11-02-04)
Ji, Guomin	OMAE2023-104823 (04-01-06)
Ji, Shengchen	OMAE2023-104322 (08-05-01)
Jia, L. S.	OMAE2023-102624 (06-16-01)
Jia, Lusheng	OMAE2023-104291 (04-02-03)
Jia, Xu	OMAE2023-102624 (06-16-01), OMAE2023-104291 (04-02-03)
Jiang, Fan	OMAE2023-104764 (06-12-02)
Jiang, Fengjian	OMAE2023-105583 (08-08-01)
Jiang, Hongyi	OMAE2023-104297 (06-02-01), OMAE2023-104334 (08-04-01), OMAE2023-104579 (08-01-02)
Jiang, Liwu	OMAE2023-104485 (11-10-01)
Jiang, Liwu	OMAE2023-107874 (11-09-01)
Jiang, Shengchao	OMAE2023-104423 (06-03-03)
Jiang, Xiaoli	OMAE2023-100612 (13-05-01)
Jiang, Ze	OMAE2023-102376 (02-01-02)
Jiang, Zhonglian	OMAE2023-104716 (06-02-01)
Jiang, Zongyu	OMAE2023-101896 (07-03-01)
Jin, Jingzhe	OMAE2023-101055 (05-01-01)
Jin, Pengfei	OMAE2023-108192 (03-01-01)
Jin, Shanqin	OMAE2023-104885 (06-12-02)
Jin, Yee-Chung	OMAE2023-107874 (11-09-01)

# AUTHOR INDEX

Jinyan, Cai	OMAE2023-102742 (07-02-02)
Joe Joe, C S	OMAE2023-108232 (09-04-04)
Johanning, Lars	OMAE2023-100980 (09-01-07), OMAE2023-105249 (08-01-02)
Johansen, Tonni Franke	OMAE2023-108101 (11-05-02)
Johansson, Elisabeth	OMAE2023-100628 (03-06-01)
Johnsen, Øyvind	OMAE2023-102788 (09-01-09)
Johnson, Tyler	OMAE2023-102308 (04-03-02)
Jonathan, Philip	OMAE2023-104360 (12-01-01)
Jorgensen, Jack	OMAE2023-102329 (09-01-06), OMAE2023-102341 (09-01-06)
Jors, Charles	OMAE2023-107819 (09-01-01), OMAE2023-107904 (09-01-01)
Joshi, Saptarshi	OMAE2023-101472 (11-04-01)
Joshi, Vaibhav	OMAE2023-105214 (08-08-01)
Jung, Dongho	OMAE2023-102747 (02-01-02)
Jung, Doojin	OMAE2023-102771 (06-14-01)

## K

Kaasen, Karl E.	OMAE2023-104492 (02-07-02)
Kaeding, Patrick	OMAE2023-103731 (02-02-01)
Kageyama, Kazuro	OMAE2023-104545 (02-10-01)
Kaji, Aline	OMAE2023-108536 (06-11-03)
Kaklis, Panagiotis	OMAE2023-100580 (08-04-02)
Kamal, Muhammad Shahzad	OMAE2023-104389 (11-10-01)
Kaminski, Pauline	OMAE2023-101605 (10-01-01)
Kamizawa, Ken	OMAE2023-100664 (05-05-01)
Kanehira, Taiga	OMAE2023-104739 (02-05-02)
Kaneko, Tatsuya	OMAE2023-101928 (11-03-02), OMAE2023-102439 (11-01-01)
Kang, Ga Hyeong	OMAE2023-104652 (02-13-01)
Kang, Hooi Siang	OMAE2023-103329 (09-03-01)
Kang, Soo-Chang	OMAE2023-107939 (03-01-01)
Karampour, Hassan	OMAE2023-100940 (02-11-01)
Karatvuo, Helena	OMAE2023-103261 (06-12-01)
Karimfazli, Ida	OMAE2023-102009 (11-04-01)
Karlsen, Jon Erik	OMAE2023-104921 (03-06-01), OMAE2023-104972 (03-06-01)
Kashima, Hiroaki	OMAE2023-100910 (06-07-02)
Kasparian, Jérôme	OMAE2023-107884 (02-04-01)
Kaspary, Tiago	OMAE2023-100628 (03-06-01)
Katayama, Toru	OMAE2023-104685 (05-05-02), OMAE2023-108083 (05-05-02)
Katsioloudis, Petros	OMAE2023-101202 (06-08-01)
Katsui, Tokihiro	OMAE2023-102439 (11-01-01)
Katsuno, Eduardo Tadashi	OMAE2023-105235 (08-02-01)
Katsuno, Tomotaka	OMAE2023-104207 (02-04-01)
Kawamura, Yasumi	OMAE2023-104224 (02-06-01)
Kazunori, Abe	OMAE2023-102188 (11-08-01)
Kees, Christopher E.	OMAE2023-104544 (06-02-01)
Keester, Adam	OMAE2023-105030 (09-02-04)
Kefayati, Gholamreza	OMAE2023-103287 (13-01-02), OMAE2023-104397 (10-02-01)
Kejriwal, Vikas	OMAE2023-104675 (02-11-02)
Kelly, Mark	OMAE2023-101961 (02-04-02)
Kelmanson, Mark	OMAE2023-108097 (08-03-02), OMAE2023-108105 (08-06-01)
Kendrick, Andrew	OMAE2023-104860 (07-03-03)
Khait, Anatoliy	OMAE2023-103590 (08-04-01)
Khakbaz, Hadis	OMAE2023-104611 (03-05-01)
Khan, Majad	OMAE2023-105029 (11-02-04), OMAE2023-105051 (11-02-01)
Khan, Sarmad Zafar	OMAE2023-104389 (11-10-01)
Khan, Shahroz	OMAE2023-100580 (08-04-02)
Khoo, Boo Cheong	OMAE2023-101352 (01-08-02), OMAE2023-102369 (01-06-01)
Khwaja Naweed, SEDDIQI	OMAE2023-102188 (11-08-01)
Kida, Yukihiro	OMAE2023-106749 (05-01-01)

# AUTHOR INDEX

Kidder, Kody .....	OMAE2023-103309 (02-07-02)
Kim, Bohee .....	OMAE2023-104939 (01-03-02)
Kim, Daegyoum .....	OMAE2023-104626 (02-07-02)
Kim, Dongeun .....	OMAE2023-107853 (09-01-08)
Kim, Ekaterina .....	OMAE2023-101757 (07-02-01), OMAE2023-104771 (07-05-01)
Kim, Eungsoo .....	OMAE2023-107853 (09-01-08)
Kim, H. J. ....	OMAE2023-101405 (01-02-01)
Kim, Hyoungchul .....	OMAE2023-105073 (09-01-05)
Kim, Hyungtaek .....	OMAE2023-102348 (06-04-02)
Kim, Hyunjo .....	OMAE2023-104939 (01-03-02)
Kim, Hyunpyo .....	OMAE2023-104652 (02-13-01)
Kim, In-Chul .....	OMAE2023-104857 (06-16-02)
Kim, Jang Whan .....	OMAE2023-108155 (01-01-01)
Kim, Jeongbin .....	OMAE2023-107853 (09-01-08)
Kim, Ji Hoon .....	OMAE2023-104718 (03-01-01)
Kim, Jongoh .....	OMAE2023-108155 (01-01-01)
Kim, Joo-Sung .....	OMAE2023-104939 (01-03-02)
Kim, Joongyu .....	OMAE2023-108155 (01-01-01)
Kim, Kangsoo .....	OMAE2023-103370 (06-14-02)
Kim, Ki Jong .....	OMAE2023-104626 (02-07-02)
Kim, KwangSik .....	OMAE2023-108475 (02-05-02)
Kim, Min Joo .....	OMAE2023-104652 (02-13-01)
Kim, Mun Sung .....	OMAE2023-101405 (01-02-01)
Kim, Myung Hyun .....	OMAE2023-104718 (03-01-01)
Kim, Sang Jin .....	OMAE2023-102747 (02-01-02)
Kim, Sanghyun .....	OMAE2023-102771 (06-14-01)
Kim, Sunghee .....	OMAE2023-104652 (02-13-01)
Kim, Tae-Wan .....	OMAE2023-102348 (06-04-02)
Kim, Taeyoung .....	OMAE2023-103793 (06-05-02)
Kim, Youngho .....	OMAE2023-101044 (10-03-01), OMAE2023-104680 (10-03-01)
Kinugasa, Mizuki .....	OMAE2023-104685 (05-05-02), OMAE2023-108083 (05-05-02)
Kioka, Shinji .....	OMAE2023-101599 (07-06-01), OMAE2023-101702 (07-06-01)
Kirezci, Ebru .....	OMAE2023-109008 (12-03-01)
Kitago, Ryuta .....	OMAE2023-104712 (11-02-03)
Kitazawa, Daisuke .....	OMAE2023-103284 (08-02-02), OMAE2023-104637 (05-02-01), OMAE2023-104700 (05-01-02), OMAE2023-105129 (05-02-01)
Kiu, Kwong .....	OMAE2023-104333 (09-01-05)
Kiyomatsu, Keiji .....	OMAE2023-104431 (14-01-01)
Klamo, Joseph T. ....	OMAE2023-104393 (06-14-02)
Klim Gomes, Rodrigo .....	OMAE2023-103189 (04-02-01)
Knoph, Magnus .....	OMAE2023-101111 (02-12-01)
Kobatake, Kanako .....	OMAE2023-101043 (06-11-01)
Kobayashi, Shunichi .....	OMAE2023-102308 (04-03-02)
Kodaira, Tsubasa .....	OMAE2023-104207 (02-04-01)
Koh, Kaixiang .....	OMAE2023-104680 (10-03-01)
Kohei, Ajima .....	OMAE2023-104713 (11-02-02)
Koldenhof, Yvonne .....	OMAE2023-103850 (05-01-01)
Kolle Kleivane, Siri .....	OMAE2023-104648 (02-10-01)
Kondo, Satoshi .....	OMAE2023-103370 (06-14-02)
Kondo, Satoshi .....	OMAE2023-106749 (05-01-01)
Kondo, Shuto .....	OMAE2023-102321 (05-05-01)
Konno, Akihisa .....	OMAE2023-104700 (05-01-02)
Konovessis, Dimitrios .....	OMAE2023-100911 (06-04-01)
Kontis, Paraskevas .....	OMAE2023-103843 (11-05-01)
Koo, Bonjun .....	OMAE2023-105073 (09-01-05), OMAE2023-105074 (09-01-10)
Koraira, Tsubasa .....	OMAE2023-104435 (02-04-02)
Korra, Naveen .....	OMAE2023-100778 (08-02-01)
Kosleck, Sascha .....	OMAE2023-104705 (09-01-09)

# AUTHOR INDEX

Kostas, Konstantinos	OMAE2023-100580 (08-04-02)
Koul, Parul	OMAE2023-107635 (04-03-03)
Koyama, Takayoshi	OMAE2023-104215 (11-10-01)
Krisdani, Henry	OMAE2023-107626 (10-01-01)
Krishnankutty, Parameswaran	OMAE2023-108006 (06-14-02)
Kristian Boe, Johan	OMAE2023-102019 (04-01-01)
Kronemberger Lopes, Guilherme	OMAE2023-103227 (10-04-01)
Krüger, Stefan	OMAE2023-101675 (06-12-01), OMAE2023-101872 (06-08-01)
Kubo, Hiromi	OMAE2023-104224 (02-06-01)
Kujala, Pentti	OMAE2023-101896 (07-03-01), OMAE2023-103403 (07-03-02)
Kumar, Arun	OMAE2023-105333 (06-05-03)
Kumar, Deepak	OMAE2023-108068 (02-01-01)
Kumar, Ram	OMAE2023-108068 (02-01-01)
Kumar, Sumit	OMAE2023-104627 (09-04-02)
Kume, Kenichi	OMAE2023-101078 (06-04-01)
Kurniawan, Adi	OMAE2023-104672 (06-16-02), OMAE2023-104749 (06-03-03), OMAE2023-105185 (13-04-01)
Kurokawa, Kazuki	OMAE2023-104302 (05-05-01)
Kuru, Ergun	OMAE2023-100573 (11-02-01)
Kusangaya, Anesu J.	OMAE2023-103244 (04-01-07)
Kuthe, Nikesh	OMAE2023-102765 (09-01-02)
Kuwata, Airi	OMAE2023-104669 (05-05-02)
Kvittem, Marit I.	OMAE2023-102645 (09-01-05)
Kyoung, Johyun	OMAE2023-108155 (01-01-01)
Kyriakides, Stelios	OMAE2023-101793 (04-03-01)

## L

La Ferlita, Alessandro	OMAE2023-103731 (02-02-01)
Laas, Jaco	OMAE2023-104878 (07-01-01)
Ladstein, Jarle	OMAE2023-101707 (06-04-01)
Laface, Valentina	OMAE2023-102239 (02-06-01)
Laham, Sabih	OMAE2023-102440 (01-08-01)
Lai, Zhao-Yu	OMAE2023-104394 (06-11-02)
Laihomäki, Tapio	OMAE2023-105073 (09-01-05)
Lal, Mayank	OMAE2023-101969 (04-02-02), OMAE2023-103743 (04-02-02)
Lambert, William	OMAE2023-108022 (06-05-04)
Lamei, Azin	OMAE2023-105065 (06-03-04)
Lampe, Tobias	OMAE2023-102581 (06-01-01)
Langer, Doug	OMAE2023-102308 (04-03-02)
Larsen, Anders A.	OMAE2023-102019 (04-01-01)
Larsen, Idar	OMAE2023-104758 (11-05-01)
Law, Yun Zhi	OMAE2023-104748 (08-05-01)
Lawson, Michael	OMAE2023-105021 (09-03-02)
Le, Quang Tuyen	OMAE2023-101331 (08-04-01), OMAE2023-101859 (08-08-01), OMAE2023-102743 (09-01-10), OMAE2023-104406 (09-01-03), OMAE2023-107794 (01-04-02)
Ledoux, Bart	OMAE2023-102329 (09-01-06)
Ledoux, Thomas	OMAE2023-103312 (06-14-03)
Lee, Byung-Hyuk	OMAE2023-104833 (08-02-02)
Lee, DaSol	OMAE2023-108475 (02-05-02)
Lee, Heejung	OMAE2023-108155 (01-01-01)
Lee, Hyungtae	OMAE2023-108155 (01-01-01)
Lee, Hyunho	OMAE2023-104306 (02-13-01)
Lee, JangHyun	OMAE2023-108475 (02-05-02)
Lee, Myoung-Gyu	OMAE2023-107939 (03-01-01)
Lee, Sang-Eui	OMAE2023-104833 (08-02-02)
Lee, Yu-Chen	OMAE2023-104326 (06-16-01)
Lehmann, Benjamin	OMAE2023-102785 (07-01-01)
Leira, Bernt J.	OMAE2023-104492 (02-07-02), OMAE2023-104648 (02-10-01), OMAE2023-104751 (07-01-01), OMAE2023-104877 (06-07-02)

# AUTHOR INDEX

Lemmer, Frank	OMAE2023-104715 (09-01-02)
Lemonnier, Gilles	OMAE2023-104633 (04-01-01)
Lenchine, Valeri V.	OMAE2023-104358 (14-01-01)
Leon, Jorge	OMAE2023-105030 (09-02-04)
Leong, Zhi	OMAE2023-101473 (06-08-01)
Leroy, Vincent	OMAE2023-104676 (06-03-03)
Lewis, Mark	OMAE2023-104359 (04-03-04)
Li, Baozhong	OMAE2023-106517 (06-14-02)
Li, Chuangchuang	OMAE2023-105338 (04-01-04)
Li, Chunhui	OMAE2023-103327 (01-01-01)
Li, Chuntong	OMAE2023-102376 (02-01-02)
Li, Evan	OMAE2023-101202 (06-08-01)
Li, Fang	OMAE2023-101896 (07-03-01), OMAE2023-103403 (07-03-02)
Li, Feixu	OMAE2023-104315 (07-03-03)
Li, Fengxia	OMAE2023-104546 (11-09-01), OMAE2023-104573 (11-09-01)
Li, Gensheng	OMAE2023-103302 (11-01-02)
Li, He	OMAE2023-106568 (06-05-04)
Li, Huazhou	OMAE2023-108222 (11-10-02)
Li, Jiarui	OMAE2023-104647 (13-06-02)
Li, Jichao	OMAE2023-107794 (01-04-02)
Li, Jingbin	OMAE2023-104619 (06-04-04)
Li, Jun	OMAE2023-108010 (11-01-02)
Li, Li	OMAE2023-102218 (11-08-01)
Li, Liang	OMAE2023-105875 (09-01-08)
Li, Lin	OMAE2023-100707 (06-14-01), OMAE2023-101055 (05-01-01)
Li, Miao	OMAE2023-104737 (11-08-01)
Li, Na	OMAE2023-101847 (02-03-01)
Li, Qiao	OMAE2023-104637 (05-02-01), OMAE2023-104700 (05-01-02), OMAE2023-105129 (05-02-01)
Li, Ruoxin	OMAE2023-102766 (06-05-04)
Li, Shengzhong	OMAE2023-104322 (08-05-01)
Li, Shuijin	OMAE2023-105065 (06-03-04)
Li, Wentuo	OMAE2023-108010 (11-01-02)
Li, Xiaobin	OMAE2023-103776 (02-03-01)
Li, Xin	OMAE2023-101346 (11-07-01)
Li, Xin	OMAE2023-102999 (08-04-01)
Li, Xin	OMAE2023-104655 (06-16-02), OMAE2023-104881 (06-11-03)
Li, Yan	OMAE2023-104655 (06-16-02)
Li, Yaning	OMAE2023-104647 (13-06-02)
Li, Ye	OMAE2023-105348 (09-04-01)
Li, Yong	OMAE2023-101346 (11-07-01), OMAE2023-107230 (11-09-01)
Li, Youan	OMAE2023-105338 (04-01-04)
Li, Yulong	OMAE2023-104748 (08-05-01)
Li, Yuzhu	OMAE2023-104810 (09-04-03)
Li, Zhengxu	OMAE2023-103600 (10-01-01)
Li, Zhenquan	OMAE2023-104737 (11-08-01)
Li, Zijian	OMAE2023-103836 (11-01-01)
Lian, Wenkang	OMAE2023-108134 (13-06-03)
Lian, Yushun	OMAE2023-103027 (05-01-01)
Lian, Zhengchen	OMAE2023-104450 (01-04-02)
Liang, Denis Alvin	OMAE2023-105085 (06-01-02)
Liang, Wei Li	OMAE2023-101845 (01-04-02)
Liang, Xiaofeng	OMAE2023-102431 (06-12-01), OMAE2023-102540 (02-07-01)
Liang, Xu	OMAE2023-104430 (09-01-03)
Lie, Halvor	OMAE2023-105583 (08-08-01)
Lim, Ho-Joon	OMAE2023-105073 (09-01-05), OMAE2023-105074 (09-01-10)
Lim, J. H.	OMAE2023-101405 (01-02-01)
Lim, Soon Heng	OMAE2023-100725 (13-06-01)
Lin, Chun Cheng	OMAE2023-101845 (01-04-02)

# AUTHOR INDEX

Lin, Jianfeng	OMAE2023-101335 (09-02-03)
Lin, Ting-Chieh	OMAE2023-102066 (06-03-04)
Lin, Wei	O
MAE2023-107918 (02-01-02)	
Lin, Yu-Hsien	OMAE2023-101588 (06-12-03)
Lin, Zaibin	OMAE2023-103590 (08-04-01), OMAE2023-104596 (05-01-02)
Lindemann, Thomas	OMAE2023-103731 (02-02-01)
Liu, Chao	OMAE2023-104308 (07-03-02)
Liu, Haixiao	OMAE2023-104475 (04-04-01), OMAE2023-104477 (10-03-01)
Liu, Hao	OMAE2023-104289 (07-02-02)
Liu, Huaxing	OMAE2023-101408 (01-03-02)
Liu, Jian	OMAE2023-102019 (04-01-01), OMAE2023-103676 (04-01-01), OMAE2023-104926 (04-01-05)
Liu, Kun	OMAE2023-102125 (04-02-01)
Liu, Lei	OMAE2023-101058 (13-01-01), OMAE2023-104966 (08-04-02)
Liu, Lei	OMAE2023-104924 (05-03-01)
Liu, Lingqiao	OMAE2023-104377 (06-11-02)
Liu, Luping	OMAE2023-104881 (06-11-03)
Liu, Ping	OMAE2023-101113 (04-03-01)
Liu, Qingxiang	OMAE2023-103377 (02-06-01)
Liu, Renwei	OMAE2023-102381 (07-03-01), OMAE2023-102855 (07-05-01), OMAE2023-102938 (07-01-01), OMAE2023-104251 (07-06-02), OMAE2023-104289 (07-02-02), OMAE2023-104305 (07-03-02), OMAE2023-104308 (07-03-02), OMAE2023-104315 (07-03-03), OMAE2023-104398 (07-02-02)
Liu, Ruihao	OMAE2023-104656 (02-02-01)
Liu, Shengnan	OMAE2023-104634 (01-03-01)
Liu, Siyuan	OMAE2023-102426 (02-07-01)
Liu, Tongjing	OMAE2023-107874 (11-09-01)
Liu, Weiqi	OMAE2023-109156 (09-02-04)
Liu, Wenlong	OMAE2023-104437 (10-02-01)
Liu, Wuyang	OMAE2023-102184 (08-03-01), OMAE2023-102722 (08-03-01)
Liu, Ye	OMAE2023-104639 (01-08-03)
Liu, Yi	OMAE2023-102624 (06-16-01), OMAE2023-104291 (04-02-03)
Liu, Yu	OMAE2023-104656 (02-02-01)
Liu, Yuanchuan	OMAE2023-105875 (09-01-08)
Liu, Yujie	OMAE2023-104753 (02-07-02)
Liu, Zhe	OMAE2023-104540 (02-11-02)
Liu, Zheng	OMAE2023-108192 (03-01-01)
Liu, Zhenhui	OMAE2023-101910 (04-03-02)
Liu, Zinan	OMAE2023-103310 (04-03-03)
Loh, SaiKeong	OMAE2023-108084 (05-01-02)
Long, Yang	OMAE2023-102218 (11-08-01)
Long, Zhenyu	OMAE2023-108010 (11-01-02)
Longva, Vegard	OMAE2023-104935 (04-01-07)
Lopes de Castro, Mario Augusto	OMAE2023-103676 (04-01-01)
Lopez-Pavon, Carlos	OMAE2023-102788 (09-01-09)
Lotfian, Saeid	OMAE2023-100523 (03-05-01), OMAE2023-101302 (09-02-03)
Lotsberg, Inge	OMAE2023-104845 (02-11-02)
Lou, Jing	OMAE2023-101352 (01-08-02), OMAE2023-102369 (01-06-01)
Lourenço De Souza, Marcelo Igor	OMAE2023-105095 (04-01-06), OMAE2023-108204 (13-06-03)
Lourenço, Marcelo Igor	OMAE2023-101121 (04-01-06)
Low, Han Eng	OMAE2023-104434 (04-03-05)
Low, Ying Min	OMAE2023-101700 (02-09-01), OMAE2023-101868 (09-04-04), OMAE2023-102807 (02-09-01)
Lu, Haining	OMAE2023-104924 (05-03-01)
Lu, Hengyang	OMAE2023-104540 (02-11-02)
Lu, Lin	OMAE2023-100668 (06-03-01)
Lu, Wenyue	OMAE2023-102999 (08-04-01)
Lu, Xin	OMAE2023-101331 (08-04-01)
Luís Condino Fajarra, André	OMAE2023-105138 (06-03-04)
Luna Araújo Oliveira, Pedro	OMAE2023-104870 (04-01-04)

# AUTHOR INDEX

Lund, Björnar .....	OMAE2023-101294 (11-02-02), OMAE2023-101611 (11-04-01), OMAE2023-101628 (11-02-03), OMAE2023-104720 (11-03-01), OMAE2023-104756 (11-02-01), OMAE2023-104790 (11-05-01)
Luo, Liang .....	OMAE2023-104322 (08-05-01)
Luo, Ming .....	OMAE2023-108010 (11-01-02)
Luo, Shihui .....	OMAE2023-107987 (13-06-03)
Luo, Xiaomeng .....	OMAE2023-102376 (02-01-02)
Luu, Trung Pham Duong .....	OMAE2023-102743 (09-01-10)
Lv, Huizi .....	OMAE2023-102431 (06-12-01)
Lv, Zehao .....	OMAE2023-103302 (11-01-02), OMAE2023-103412 (11-03-01)

## M

Ma, Jingyao .....	OMAE2023-101571 (10-01-01)
Ma, Kai-Tung .....	OMAE2023-101503 (09-01-09), OMAE2023-104394 (06-11-02)
Ma, Mingyuan .....	OMAE2023-104425 (13-01-02)
Ma, Ning .....	OMAE2023-102410 (06-12-01), OMAE2023-103611 (06-12-02), OMAE2023-104299 (06-12-03)
Ma, Yu .....	OMAE2023-101055 (05-01-01)
Ma, Yucong .....	OMAE2023-100707 (06-14-01), OMAE2023-101027 (06-14-01)
Ma, Zihua .....	OMAE2023-103590 (08-04-01)
Maali Amiri, Mojtaba .....	OMAE2023-102271 (09-01-03)
Machado, João Paulo .....	OMAE2023-104192 (06-03-02)
Machado, Kamille Vieira .....	OMAE2023-102501 (06-04-02)
Macke, Michael .....	OMAE2023-104891 (04-02-03)
Maeda, Nobuo .....	OMAE2023-108222 (11-10-02)
Mafazy, Salum .....	OMAE2023-105113 (11-01-02)
Mahajan, Puneet .....	OMAE2023-102765 (09-01-02)
Mahmoudi, Hedy .....	OMAE2023-102974 (09-04-01)
Mainçon, Philippe .....	OMAE2023-104935 (04-01-07)
Majed, Arya .....	OMAE2023-101167 (04-01-02)
Majidiyan, Hamed .....	OMAE2023-104286 (06-11-02)
Maldar, Nauman Riyaz .....	OMAE2023-103329 (09-03-01)
Mali, Vijaykumar .....	OMAE2023-102440 (01-08-01)
Malineni, Vamsi Sai Krishna .....	OMAE2023-105343 (08-09-01)
Manasseh, Richard .....	OMAE2023-104774 (09-02-05)
Manataki, Andriani .....	OMAE2023-103843 (11-05-01)
Manawasekara, Chathura .....	OMAE2023-100910 (06-07-02)
Mancini, Simone .....	OMAE2023-105049 (08-02-02)
Mandviwalla, Xerxes .....	OMAE2023-102429 (08-08-01)
Mangalathu Raj, Samuel .....	OMAE2023-104624 (06-05-03)
Mansour, Ghiath (Guy) .....	OMAE2023-105131 (04-02-02)
Marcollo, Hayden .....	OMAE2023-101473 (06-08-01), OMAE2023-103244 (04-01-07)
Marin, Jose R. ....	OMAE2023-104777 (08-02-02)
Marino Moreno, Felipe .....	OMAE2023-103265 (06-07-01), OMAE2023-104603 (06-07-02), OMAE2023-104950 (08-09-01)
Marino, Enzo .....	OMAE2023-104864 (09-01-03)
Marks, Johnathan D. ....	OMAE2023-104393 (06-14-02)
Markussen, Christian .....	OMAE2023-105285 (01-08-01)
Maraju, Soma S .....	OMAE2023-105101 (01-08-01)
Marques, Crístofer Hood .....	OMAE2023-102501 (06-04-02), OMAE2023-104963 (06-01-01)
Marques, Matheus .....	OMAE2023-102704 (01-03-02)
Martin, Darren .....	OMAE2023-104611 (03-05-01)
Martínez-Estévez, Iván .....	OMAE2023-105023 (08-04-02), OMAE2023-105049 (08-02-02)
Martins de Andrade, Emerson .....	OMAE2023-100990 (04-04-01), OMAE2023-104192 (06-03-02)
Martins, Marcelo Ramos .....	OMAE2023-104971 (02-13-02), OMAE2023-105027 (02-13-02), OMAE2023-105039 (02-13-02)
Masanobu, Sotaro .....	OMAE2023-100624 (05-03-01), OMAE2023-100939 (05-03-01), OMAE2023-101679 (05-03-01)
Masuda, Koichi .....	OMAE2023-104612 (05-06-01), OMAE2023-104669 (05-05-02)
Masuda, Mitsuhiro .....	OMAE2023-100844 (05-06-01), OMAE2023-104768 (05-06-01), OMAE2023-107202 (05-05-02)
Matala, Riikka .....	OMAE2023-102474 (07-04-01)
Matos Carnier, Rodrigo .....	OMAE2023-105138 (06-03-04)
Matsui, Sadaoki .....	OMAE2023-101876 (02-05-01), OMAE2023-104733 (02-05-01)



# AUTHOR INDEX

Matsumoto, Hiroshi	OMAE2023-103370 (06-14-02)
Matsuo, Ryo	OMAE2023-102715 (02-01-01)
Maturana, Marcos C.	OMAE2023-103603 (02-12-01), OMAE2023-104971 (02-13-02), OMAE2023-105027 (02-13-02)
Mazaheri, Sam	OMAE2023-107731 (02-12-01)
Mccormick, Andrew	OMAE2023-104781 (04-01-05)
McDonald, Alasdair	OMAE2023-100822 (09-01-04)
McGrath, Nicholas	OMAE2023-102329 (09-01-06), OMAE2023-102341 (09-01-06)
Mckay, Craig	OMAE2023-105428 (04-04-01)
Mcneill, Scot	OMAE2023-104900 (08-01-02)
Meguro, Koji	OMAE2023-106749 (05-01-01)
Mehr, Javad	OMAE2023-105399 (06-12-03)
Mehta, Nikhil	OMAE2023-101202 (06-08-01)
Mei, Hongtao	OMAE2023-104540 (02-11-02)
Melchers, Robert E.	OMAE2023-104513 (04-03-02)
Mello, Pedro Cardozo de	OMAE2023-105066 (06-01-02)
Mencarelli, Guy	OMAE2023-104729 (04-03-04)
Mendes de Sousa, José Renato	OMAE2023-103227 (10-04-01)
Mendes, Saulo	OMAE2023-107884 (02-04-01)
Menezes, Fabio Gouveia Telles de	OMAE2023-105066 (06-01-02)
Meng, Fanliang	OMAE2023-102722 (08-03-01)
Meng, Fantai	OMAE2023-104330 (09-04-02)
Meng, Shawn	OMAE2023-104576 (09-01-08)
Meng, Shuai	OMAE2023-103416 (08-06-01)
Menges, Daniel	OMAE2023-100626 (06-04-01)
Menon, Ajay	OMAE2023-103996 (09-02-05)
Menon, Nirmal Vineeth	OMAE2023-100911 (06-04-01)
Mercelis, Siegfried	OMAE2023-104455 (06-11-03)
Meucci, Alberto	OMAE2023-101809 (12-03-01), OMAE2023-102094 (12-01-01), OMAE2023-103260 (12-03-01)
Miao, Qingqing	OMAE2023-101700 (02-09-01)
Michel, Xavier	OMAE2023-104729 (04-03-04)
Michelen Strofer, Carlos A.	OMAE2023-103899 (09-02-05)
Miller, Logan P.	OMAE2023-101443 (07-02-01)
Milne, Ian A.	OMAE2023-102780 (01-08-03)
Minami, Kiyokazu	OMAE2023-100844 (05-06-01), OMAE2023-104768 (05-06-01)
Minga, Eleni	OMAE2023-101651 (02-08-01)
Minier, Yves	OMAE2023-104729 (04-03-04)
Minnebo, Joerik	OMAE2023-102355 (01-02-01)
Mishnaevsky Jr, Leon	OMAE2023-102765 (09-01-02)
Mitsuyuki, Taiga	OMAE2023-104224 (02-06-01)
Miyanawala, Tharindu Pradeeptha	OMAE2023-104748 (08-05-01)
Miyazaki, Hitoshi	OMAE2023-101599 (07-06-01)
Miyazaki, Marcelo Noboro Ralim	OMAE2023-105040 (04-01-03)
Miyazato, Shinichi	OMAE2023-104545 (02-10-01)
Miyoshi, Keisuke	OMAE2023-101928 (11-03-02)
Moan, Torgeir	OMAE2023-101805 (06-04-05), OMAE2023-108172 (09-01-02)
Moen, Petter	OMAE2023-104634 (01-03-01)
Mohajernasab, Saeed	OMAE2023-101836 (13-06-01)
Mohamed Roslan, Sharul Baggio	OMAE2023-100911 (06-04-01)
Mohammadpour, Javad	OMAE2023-104522 (09-05-01)
Mohammed, Mohammed	OMAE2023-102864 (02-01-01)
Mohiuddin, Mohammad Arif	OMAE2023-104680 (10-03-01)
Mohr, Henning	OMAE2023-104379 (04-03-03)
Mohtat, Ali	OMAE2023-107819 (09-01-01), OMAE2023-107904 (09-01-01)
Mokhtari, Mojtaba	OMAE2023-104771 (07-05-01), OMAE2023-105048 (02-02-02)
Molyneux, David	OMAE2023-101554 (07-03-01)
Monahan, Michael	OMAE2023-101076 (09-03-02)
Monbaliu, Jaak	OMAE2023-100850 (06-16-01)
Montoya Ramirez, Rubén Darío	OMAE2023-103377 (02-06-01)

# AUTHOR INDEX

Moore, Shawn	OMAE2023-101202 (06-08-01)
Moorlag, Lucas	OMAE2023-100612 (13-05-01)
Mori, Nobuhito	OMAE2023-104739 (02-05-02)
Morooka, Celso Kazuyuki	OMAE2023-104375 (11-07-01)
Morota, Hiroki	OMAE2023-104685 (05-05-02)
Mortimer, Alan	OMAE2023-100822 (09-01-04)
Mounet, Raphaël E. G.	OMAE2023-107733 (06-05-04)
Mudiyanselage, Chandima Ratnayake	OMAE2023-104921 (03-06-01), OMAE2023-104972 (03-06-01)
Muff, Anthony. D.	OMAE2023-104674 (03-02-01), OMAE2023-104891 (04-02-03)
Müller, Franciska	OMAE2023-102584 (07-05-01), OMAE2023-103425 (07-03-02)
Muñoz Ortiz, Miguel	OMAE2023-101707 (06-04-01)
Murai, Motohiko	OMAE2023-102321 (05-05-01), OMAE2023-103284 (08-02-02)
Murai, Yuichi	OMAE2023-100939 (05-03-01)
Murakami, Chikahisa	OMAE2023-101139 (03-02-01)
Murashima, Takashi	OMAE2023-103370 (06-14-02)
Murayama, Hideaki	OMAE2023-104545 (02-10-01)
Murphy, Mark	OMAE2023-101076 (09-03-02)
Murray, Sean	OMAE2023-103676 (04-01-01)
Mussel Dias Soares da Silva, Thiago	OMAE2023-100993 (01-04-01)
Mustiere, Olivier	OMAE2023-102990 (04-03-04)
Mustiere, Olivier	OMAE2023-102939 (04-03-04)

## N

N'gouamba, Elie	OMAE2023-104758 (11-05-01)
Nabelek, Patrik	OMAE2023-108051 (06-16-02)
Nader, Jean-Roch	OMAE2023-105346 (13-02-01), OMAE2023-105348 (09-04-01), OMAE2023-105352 (09-04-02), OMAE2023-105353 (09-04-02)
Naess, Arvid	OMAE2023-104751 (07-01-01)
Naganawa, Shigemi	OMAE2023-104712 (11-02-03), OMAE2023-104713 (11-02-02)
Naito, Yuki	OMAE2023-104664 (06-03-03)
Najjaran, Samieh	OMAE2023-104731 (06-04-04)
Nakagawa, Yujin	OMAE2023-101928 (11-03-02)
Nakazawa, Hibiki	OMAE2023-104612 (05-06-01)
Nallayarasu, Seeninaidu	OMAE2023-104486 (02-10-01), OMAE2023-104750 (02-11-01)
Nam, Hyunjoon	OMAE2023-104652 (02-13-01)
Namazi, Hosna	OMAE2023-104863 (06-04-04)
Nasyrlyayev, Nazhmiddin	OMAE2023-103287 (13-01-02)
Negi, Pawan	OMAE2023-104336 (06-03-02)
Ng, Cheng Yee	OMAE2023-103329 (09-03-01)
Nguyen, H. P.	OMAE2023-100857 (13-01-01)
Nguyen, Nhu	OMAE2023-106657 (09-02-02)
Nichols, Casey	OMAE2023-101076 (09-03-02)
Nickerson, Brendon	OMAE2023-104878 (07-01-01)
Nie, Zhen	OMAE2023-101346 (11-07-01), OMAE2023-107230 (11-09-01), OMAE2023-108061 (11-01-01)
Nielsen, Ulrik D.	OMAE2023-107733 (06-05-04)
Nikoo, Hamid	OMAE2023-104675 (02-11-02)
Nishimura, Shunsuke	OMAE2023-100664 (05-05-01)
Nivlet, Philippe	OMAE2023-108151 (11-03-01)
Niwa, Toshio	OMAE2023-101139 (03-02-01)
Nogueira Soares, Luisa	OMAE2023-101121 (04-01-06), OMAE2023-103764 (04-01-05)
Nose, Takehiko	OMAE2023-104207 (02-04-01), OMAE2023-104435 (02-04-02)
Nott, Phil	OMAE2023-104781 (04-01-05)
Nounou, Hazem	OMAE2023-108094 (11-08-01)
Nounou, Mohamed	OMAE2023-108094 (11-08-01)
Novel, Matthieu	OMAE2023-102939 (04-03-04), OMAE2023-102990 (04-03-04)
Nubli, Haris	OMAE2023-102747 (02-01-02)
Nuernberg, Martin	OMAE2023-102185 (01-03-01)
Nybø, Roar	OMAE2023-108151 (11-03-01)

## O

O' Brien, Dermot.....	OMAE2023-106777 (04-01-04)
O' Neill, Michael.....	OMAE2023-101816 (04-03-05)
O'byrne, Patrick.....	OMAE2023-101076 (09-03-02)
Ødegård, Anders.....	OMAE2023-101707 (06-04-01)
Oettle, Johannes.....	OMAE2023-101675 (06-12-01)
Ogden, David.....	OMAE2023-105020 (09-02-05), OMAE2023-105030 (09-02-04)
Okada, Tetsuo.....	OMAE2023-104224 (02-06-01)
Okamoto, Akihiro.....	OMAE2023-103370 (06-14-02)
Okpeke, Bright Ebikemefa.....	OMAE2023-102581 (06-01-01)
Oladele, Omotayo.....	OMAE2023-108022 (06-05-04)
Oliveira Ribeiro, Felipe.....	OMAE2023-103189 (04-02-01)
Oliveira, Allan Carre de.....	OMAE2023-105085 (06-01-02)
Ollgaard Larsen, Henrik.....	OMAE2023-102019 (04-01-01)
Ong, Muk Chen.....	OMAE2023-101055 (05-01-01), OMAE2023-101126 (02-03-01), OMAE2023-101705 (05-02-01), OMAE2023-102822 (07-06-02), OMAE2023-102873 (06-11-01), OMAE2023-102996 (06-11-02), OMAE2023-104495 (06-05-02)
Onizuka, Hiroyuki.....	OMAE2023-102715 (02-01-01)
Ooi, Chin Chun.....	OMAE2023-102743 (09-01-10)
Opoku, Frimpong.....	OMAE2023-100971 (09-02-04)
Ordóñez, Juan.....	OMAE2023-102501 (06-04-02), OMAE2023-104963 (06-01-01)
Orlowski, Rene Thiago Capelari.....	OMAE2023-103603 (02-12-01)
Orsino, Renato M. M.....	OMAE2023-105119 (08-06-01)
Orszaghova, Jana.....	OMAE2023-104672 (06-16-02), OMAE2023-104749 (06-03-03)
Osawa, Hiroyuki.....	OMAE2023-103370 (06-14-02)
Osborne, Alfred R.....	OMAE2023-101978 (02-04-01), OMAE2023-105072 (12-01-01)
Osen, Per.....	OMAE2023-104891 (04-02-03)
Osmar de Almeida, Jeferson.....	OMAE2023-102271 (09-01-03)
Osorio Arias, Andrés Fernando.....	OMAE2023-103377 (02-06-01)
Ota, Makoto.....	OMAE2023-102321 (05-05-01)
Otaka, Isami.....	OMAE2023-102321 (05-05-01)
Otto, William.....	OMAE2023-103850 (05-01-01)
Owen, leuan.....	OMAE2023-101602 (01-06-01)

## P

Paboeuf, Stéphane.....	OMAE2023-102256 (03-05-01)
Pacis, Felix James.....	OMAE2023-102300 (11-03-02)
Pahos, Spiro J.....	OMAE2023-104576 (09-01-08)
Pailusseau, Christophe.....	OMAE2023-102256 (03-05-01)
Palaniyandi, Kurinjivelan.....	OMAE2023-102440 (01-08-01)
Pallin, Jan Egil.....	OMAE2023-104756 (11-02-01)
Palmiro de Freitas, Lucas.....	OMAE2023-103265 (06-07-01), OMAE2023-104603 (06-07-02), OMAE2023-104950 (08-09-01)
Paltrinieri, Nicola.....	OMAE2023-100914 (03-02-01)
Pan, Jin.....	OMAE2023-101847 (02-03-01), OMAE2023-103776 (02-03-01)
Pan, Jun.....	OMAE2023-100531 (06-02-01)
Pan, Tao.....	OMAE2023-101084 (11-03-02)
Pan, Xing-Yu.....	OMAE2023-102066 (06-03-04)
Pan, Zhiyuan.....	OMAE2023-103793 (06-05-02)
Panchi, Nabil.....	OMAE2023-101757 (07-02-01)
Pandey, Vibhuti Bhushan.....	OMAE2023-102765 (09-01-02)
Pang, Dan.....	OMAE2023-104334 (08-04-01)
Pang, Tak Yin.....	OMAE2023-104377 (06-11-02)
Pani, Soumyashree.....	OMAE2023-102792 (06-05-01)
Papageorgiou, Dimitrios.....	OMAE2023-102570 (06-04-03)
Papageorgopoulos, George.....	OMAE2023-104675 (02-11-02)
Papavasileiou, Vasileios.....	OMAE2023-101816 (04-03-05)
Papi, Francesco.....	OMAE2023-101926 (01-04-02), OMAE2023-104864 (09-01-03)

# AUTHOR INDEX

Paranhos Pasqualino, Ilson	OMAE2023-101121 (04-01-06)
Paredes, Rubén J.	OMAE2023-104777 (08-02-02)
Paris, Mario	OMAE2023-101058 (13-01-01), OMAE2023-104966 (08-04-02)
Park, Hyun Jin	OMAE2023-100939 (05-03-01)
Park, Jeongung	OMAE2023-102208 (02-11-02)
Park, Ji Yong	OMAE2023-107853 (09-01-08)
Park, Joonghoo	OMAE2023-102348 (06-04-02)
Park, Jungki	OMAE2023-104939 (01-03-02)
Park, Sung-In	OMAE2023-104652 (02-13-01)
Parmeshwar Atkale, Prashant	OMAE2023-104820 (02-08-01)
Párraga Quispe, José Luis	OMAE2023-103764 (04-01-05)
Pasala, Dharma	OMAE2023-101167 (04-01-02)
Paso, Kristofer	OMAE2023-101694 (11-02-03)
Passano, Elizabeth	OMAE2023-104763 (09-01-07), OMAE2023-105583 (08-08-01)
Patel, Karan Sandipkumar	OMAE2023-100707 (06-14-01)
Patel, Murlidhar	OMAE2023-104526 (02-05-02)
Patel, Parth	OMAE2023-104522 (09-05-01)
Patel, Shivdayal	OMAE2023-104526 (02-05-02)
Patel, Vikas	OMAE2023-101969 (04-02-02)
Pathirana, Sachini	OMAE2023-101809 (12-03-01)
Patil, Palash	OMAE2023-107635 (04-03-03)
Patrocínio, Juliana	OMAE2023-103676 (04-01-01)
Pavlov, Alexey	OMAE2023-105003 (09-05-01), OMAE2023-108149 (11-05-02)
Pedersen, Tommy	OMAE2023-102019 (04-01-01), OMAE2023-104730 (04-01-05)
Pedrosa, Camilo	OMAE2023-101694 (11-02-03)
Pei, Zhijun	OMAE2023-101084 (11-03-02)
Pei, Zhiyong	OMAE2023-102426 (02-07-01), OMAE2023-102755 (02-02-01)
Penesis, Irene	OMAE2023-104590 (09-02-02), OMAE2023-105112 (13-06-01), OMAE2023-105348 (09-04-01)
Peng, Hao	OMAE2023-103776 (02-03-01)
Peng, Heather	OMAE2023-104885 (06-12-02), OMAE2023-105053 (06-12-03)
Peng, Peng	OMAE2023-102125 (04-02-01)
Peng, Tao	OMAE2023-102927 (08-06-01)
Peng, Xiaolong	OMAE2023-107753 (11-10-02)
Peng, Yan	OMAE2023-104467 (06-05-02)
Pensa, Claudio	OMAE2023-105049 (08-02-02)
Perera, Lokukaluge Prasad	OMAE2023-103192 (06-04-03), OMAE2023-103249 (06-04-03), OMAE2023-104863 (06-04-04)
Peres Leal, Aline	OMAE2023-105138 (06-03-04)
Perignon, Yves	OMAE2023-104857 (06-16-02)
Periyal, Arun	OMAE2023-105214 (08-08-01)
Pesce, Celso P.	OMAE2023-105119 (08-06-01)
Pestana, Marco Aurélio	OMAE2023-105039 (02-13-02)
Peters, Andreas	OMAE2023-105235 (08-02-01)
Pettersen, Sune	OMAE2023-104817 (09-01-06), OMAE2023-105427 (04-01-01)
Pichard, Alexandre	OMAE2023-100742 (13-04-01)
Pipal, Harsh	OMAE2023-105214 (08-08-01)
Pires, Roberta	OMAE2023-102019 (04-01-01)
Pistani, Fabrizio	OMAE2023-102329 (09-01-06), OMAE2023-102341 (09-01-06)
Plaza, David	OMAE2023-104777 (08-02-02)
Poguluri, Sunny Kumar	OMAE2023-107853 (09-01-08)
Posterari, Jessica	OMAE2023-104431 (14-01-01)
Potts, Douglas	OMAE2023-101473 (06-08-01)
Pradeilles, Camille	OMAE2023-104729 (04-03-04)
Prasad Patel, Badri	OMAE2023-104820 (02-08-01), OMAE2023-108232 (09-04-04)
Prasad Perera, Lokukaluage	OMAE2023-104508 (06-04-04)
Primo, Bruno	OMAE2023-108536 (06-11-03)
Prior, Mark	OMAE2023-101602 (01-06-01)
Pu, Dan	OMAE2023-104737 (11-08-01)
Puraca, Rodolfo	OMAE2023-105084 (09-01-08)

# AUTHOR INDEX

Purwandari, Sartika Dwi..... OMAE2023-104720 (11-03-01)  
Pyatina, Tatiana ..... OMAE2023-107301 (11-05-02)



Qi, Xiang..... OMAE2023-104736 (04-03-03)  
Qian, Ling..... OMAE2023-103590 (08-04-01), OMAE2023-104586 (08-03-01)  
Qin, Yan..... OMAE2023-104807 (06-12-02)  
Qiu, Wei..... OMAE2023-104885 (06-12-02), OMAE2023-105053 (06-12-03)  
Qu, Dong..... OMAE2023-104467 (06-05-02)  
Qu, Yan..... OMAE2023-101844 (07-06-01), OMAE2023-104297 (06-02-01)  
Quayle, Alexander..... OMAE2023-100822 (09-01-04)  
Quéméré, Marie-Odette..... OMAE2023-102256 (03-05-01)  
Quinton, Bruce..... OMAE2023-101443 (07-02-01), OMAE2023-104854 (07-03-03), OMAE2023-104860 (07-03-03)  
Qwist, Jesper Roland Kjærgaard..... OMAE2023-107186 (08-03-02)

## R

Raach, Steffen..... OMAE2023-104715 (09-01-02)  
Rabault, Jean..... OMAE2023-104207 (02-04-01)  
Radhakrishnan, Gowtham..... OMAE2023-104492 (02-07-02), OMAE2023-104751 (07-01-01), OMAE2023-104877 (06-07-02)  
Raghavan, Nagarajan..... OMAE2023-102743 (09-01-10)  
Rahman, Mohammad..... OMAE2023-108094 (11-08-01)  
Rai, Ranjodh S..... OMAE2023-103590 (08-04-01)  
Rajagopalan, Vijayakumar..... OMAE2023-100975 (06-05-01)  
Rajendran, Suresh..... OMAE2023-105343 (08-09-01), OMAE2023-107680 (09-03-01), OMAE2023-107719 (08-04-02)  
Raji, Hauwa..... OMAE2023-108686 (04-01-06)  
Rakotonirina, Andriarimina Daniel..... OMAE2023-103055 (08-07-01), OMAE2023-103594 (06-03-02),  
..... OMAE2023-103606 (08-03-01)  
Ramachandran, Krishnavelu..... OMAE2023-103432 (06-05-01), OMAE2023-104644 (06-05-03)  
Ramakrishnan, Balaji..... OMAE2023-102107 (09-02-02)  
Ramalho Dos Santos Ferreira, Lucas..... OMAE2023-103764 (04-01-05)  
Ramiro Amorim, Andre..... OMAE2023-103189 (04-02-01)  
Ramiro, Andre..... OMAE2023-108536 (06-11-03)  
Ramos Martins, Marcelo..... OMAE2023-101753 (02-08-01), OMAE2023-103603 (02-12-01), OMAE2023-105150 (02-13-01)  
Ramos, Juan Pablo..... OMAE2023-103701 (01-04-01)  
Ramos, Pedro..... OMAE2023-102845 (08-02-01)  
Randolph, Mark..... OMAE2023-106589 (10-04-01)  
Rao, Venu..... OMAE2023-105350 (01-04-01)  
Rasheed, Adil..... OMAE2023-100626 (06-04-01), OMAE2023-103112 (09-01-10),  
..... OMAE2023-103740 (01-08-01), OMAE2023-108151 (11-03-01)  
Ravijts, Ian..... OMAE2023-104455 (06-11-03)  
Raye, Robert..... OMAE2023-101076 (09-03-02)  
Reali Costa, Anna Helena..... OMAE2023-104950 (08-09-01)  
Reddy, Namireddy Praveen..... OMAE2023-102570 (06-04-03)  
Rehman, Wajiha..... OMAE2023-108097 (08-03-02), OMAE2023-108105 (08-06-01)  
Reinås, Lorents..... OMAE2023-104891 (04-02-03)  
Reindl, Thomas..... OMAE2023-101868 (09-04-04)  
Ren, Chengjiao..... OMAE2023-101340 (04-02-01), OMAE2023-103310 (04-03-03), OMAE2023-104736 (04-03-03)  
Ren, Haojie..... OMAE2023-104396 (08-01-01), OMAE2023-104436 (08-01-02)  
Ren, Huilong..... OMAE2023-102830 (01-01-01), OMAE2023-104702 (02-07-01),  
..... OMAE2023-104753 (02-07-02), OMAE2023-104764 (06-12-02)  
Ren, Xiudi..... OMAE2023-102185 (01-03-01)  
Renaud, Paul..... OMAE2023-107740 (02-05-02)  
Renck, Tiago Samuel..... OMAE2023-106952 (04-01-02)  
Renugadevi, A..... OMAE2023-104486 (02-10-01)  
Renwei, Liu..... OMAE2023-102742 (07-02-02)  
Repalle, Nitin..... OMAE2023-108084 (05-01-02)  
Resvanis, Themistocles..... OMAE2023-104900 (08-01-02), OMAE2023-105583 (08-08-01)

# AUTHOR INDEX

Rezende Diezel, Alexandre	OMAE2023-103189 (04-02-01)
Ribeiro Nicolosi, Eduardo	OMAE2023-101121 (04-01-06), OMAE2023-108204 (13-06-03)
Ribeiro, Rodrigo	OMAE2023-103764 (04-01-05)
Riggs, H. Ronald	OMAE2023-105065 (06-03-04)
Rigon, Henrique Chiaradia	OMAE2023-101201 (04-01-03)
Ringsberg, Jonas W.	OMAE2023-101335 (09-02-03)
Ritchie, Felix	OMAE2023-108469 (01-01-01)
Roberts, Andrew	OMAE2023-103676 (04-01-01), OMAE2023-104781 (04-01-05), OMAE2023-104926 (04-01-05)
Roberts, Sophie	OMAE2023-105346 (13-02-01)
Robertson, Amy	OMAE2023-101853 (09-01-04)
Robinson, Haakon	OMAE2023-103740 (01-08-01)
Rodrigues de Barros, Marcel	OMAE2023-103265 (06-07-01), OMAE2023-104603 (06-07-02), OMAE2023-104950 (08-09-01)
Rodriguez Gallegos, Carlos David	OMAE2023-101868 (09-04-04)
Rohrer, Peter J.	OMAE2023-101930 (09-01-10)
Rokseth, Børge	OMAE2023-102113 (06-04-02)
Romolo, Alessandra	OMAE2023-105242 (09-02-01)
Røneid, Sigbjørn	OMAE2023-105427 (04-01-01)
Rong, Chunming	OMAE2023-104639 (01-08-03)
Røsberg, Knut Marius	OMAE2023-108101 (11-05-02)
Ross, Hannah	OMAE2023-101076 (09-03-02)
Roß, Lukas	OMAE2023-102581 (06-01-01)
Ruehl, Kelley	OMAE2023-105030 (09-02-04)
Rui, Shengjie	OMAE2023-104420 (10-03-01), OMAE2023-104430 (09-01-03)
Russell, Andrew J.	OMAE2023-100822 (09-01-04)

## S

S, Karthikeyan	OMAE2023-103724 (08-01-01)
S, Nallayarasu	OMAE2023-103724 (08-01-01)
Sa'ad, Amir Muhammed	OMAE2023-104351 (01-08-02)
Saar, Kalju	OMAE2023-104670 (07-03-03)
Saasen, Arild	OMAE2023-101294 (11-02-02), OMAE2023-101611 (11-04-01), OMAE2023-101628 (11-02-03), OMAE2023-101694 (11-02-03), OMAE2023-104756 (11-02-01)
Sablok, Anil	OMAE2023-105073 (09-01-05), OMAE2023-105074 (09-01-10)
Sætre, Simon Mork	OMAE2023-100626 (06-04-01)
Sætre, Stian	OMAE2023-104800 (02-12-01), OMAE2023-104891 (04-02-03)
Sævik, Svein	OMAE2023-104823 (04-01-06)
Sævik, Svein	OMAE2023-104492 (02-07-02), OMAE2023-104877 (06-07-02), OMAE2023-105583 (08-08-01)
Safran, Ali	OMAE2023-104418 (11-02-02)
Saha, Nilanjan	OMAE2023-102792 (06-05-01), OMAE2023-105144 (02-11-01)
Sahoo, Trilochan	OMAE2023-104336 (06-03-02)
Sainte-Rose, Bruno	OMAE2023-103055 (08-07-01), OMAE2023-103594 (06-03-02), OMAE2023-103606 (08-03-01)
Sakamoto, Nobuaki	OMAE2023-101237 (08-07-01)
Saleh, Ahmed	OMAE2023-102785 (07-01-01)
Salehi, Fatemeh	OMAE2023-104522 (09-05-01)
Sales, Leonardo	OMAE2023-102864 (02-01-01), OMAE2023-104399 (01-04-01)
Saltara, Fabio	OMAE2023-104427 (06-01-01)
Salvador Lopes, Filipe	OMAE2023-104192 (06-03-02)
Salvio, Filipe	OMAE2023-108536 (06-11-03)
Samad, Abdus	OMAE2023-107680 (09-03-01)
Samaria, Sagar	OMAE2023-105074 (09-01-10)
Sampford, Charles	OMAE2023-104524 (13-06-03)
Sangesland, Sigbjørn	OMAE2023-102907 (04-04-01), OMAE2023-103843 (11-05-01), OMAE2023-104309 (11-05-01), OMAE2023-108149 (11-05-02)
Sannasiraj, Sannasi Annamalaisamy	OMAE2023-100687 (06-05-01), OMAE2023-102095 (02-04-02)
Santo, Harrif	OMAE2023-101183 (01-03-01), OMAE2023-104748 (08-05-01)
Santos, Joaquim Rocha dos	OMAE2023-105039 (02-13-02)
Saraswat, Rajil	OMAE2023-107635 (04-03-03)
Sarnaglia Do Amaral, Acácio	OMAE2023-100993 (01-04-01)

# AUTHOR INDEX

Sasahara, Yutaro	OMAE2023-107202 (05-05-02)
Sasaki, Ami	OMAE2023-104612 (05-06-01)
Sasano, Masahiko	OMAE2023-103370 (06-14-02)
Sato, Norikazu	OMAE2023-100664 (05-05-01)
Sato, Takumi	OMAE2023-103370 (06-14-02)
Sato, Toru	OMAE2023-104215 (11-10-01)
Satoshi Gomi, Edson	OMAE2023-103265 (06-07-01), OMAE2023-104603 (06-07-02), OMAE2023-104950 (08-09-01)
Saunders, Brad	OMAE2023-105185 (13-04-01)
Sautreuil, Dorine	OMAE2023-105422 (04-01-03)
Savage, Leigh	OMAE2023-101407 (13-01-02)
Scharnke, Jule	OMAE2023-104288 (02-05-01)
Schira, Bepo	OMAE2023-104910 (06-07-02)
Schleder, Adriana M.	OMAE2023-103603 (02-12-01)
Schmidt, Dilnei	OMAE2023-105066 (06-01-02)
Schmidt, Henrik Blicher	OMAE2023-104730 (04-01-05)
Schnepf, Anja	OMAE2023-102788 (09-01-09)
Scholcz, Thomas	OMAE2023-100954 (01-03-01)
Schultz, Jesse	OMAE2023-104119 (09-02-01)
Schümann, Heiner	OMAE2023-102454 (11-07-01)
Schurr, Rebecca	OMAE2023-104544 (06-02-01)
Schwenck Franco Maciel, Vitor	OMAE2023-105119 (08-06-01)
Scolan, Yves-Marie	OMAE2023-107740 (02-05-02)
Scultori, Marcio	OMAE2023-102939 (04-03-04), OMAE2023-102990 (04-03-04)
Sebastian, Abhilash A.	OMAE2023-101969 (04-02-02), OMAE2023-103743 (04-02-02)
Sellar, Brian	OMAE2023-104347 (09-03-01)
Semwogerere, David	OMAE2023-108149 (11-05-02)
Sena Sales Junior, Joel	OMAE2023-100990 (04-04-01), OMAE2023-100991 (09-03-02), OMAE2023-104192 (06-03-02)
Seo, Jungkwan	OMAE2023-104306 (02-13-01)
Seo, Jungwon	OMAE2023-104639 (01-08-03)
Sergiienko, Nataliia	OMAE2023-104119 (09-02-01), OMAE2023-104330 (09-04-02), OMAE2023-104333 (09-01-05), OMAE2023-104377 (06-11-02), OMAE2023-105348 (09-04-01), OMAE2023-105352 (09-04-02)
Severs, Glenn	OMAE2023-102329 (09-01-06)
Seyffert, Harleigh	OMAE2023-100954 (01-03-01)
Sgarioto, Daniel	OMAE2023-108091 (02-05-01)
Sha, Yanyan	OMAE2023-101126 (02-03-01), OMAE2023-101910 (04-03-02)
Shadman, Milad	OMAE2023-102271 (09-01-03)
Shahbakhsh, Mehrangiz	OMAE2023-101806 (13-06-01)
Shahroozi, Zahra	OMAE2023-102422 (09-02-04)
Shanks, Andrew	OMAE2023-102019 (04-01-01)
Shao, Xinyuan	OMAE2023-101335 (09-02-03)
Sharma, Lupamudra	OMAE2023-102040 (10-05-01)
Shearer, Chris	OMAE2023-101836 (13-06-01), OMAE2023-105185 (13-04-01)
Shen, Cong	OMAE2023-104301 (08-01-01), OMAE2023-104383 (06-16-01)
Shen, Linfang	OMAE2023-104737 (11-08-01)
Shen, Shutian	OMAE2023-103027 (05-01-01)
Shen, Xingzhi	OMAE2023-104702 (02-07-01)
Shen, Zhirong	OMAE2023-108155 (01-01-01)
Shengxia, Sun	OMAE2023-102820 (06-14-01)
Sheriff, M. Ziyen	OMAE2023-108094 (11-08-01)
Shi, Guijie	OMAE2023-101632 (02-06-01)
Shi, Hongda	OMAE2023-104446 (09-04-01)
Shi, Qiqi	OMAE2023-102410 (06-12-01), OMAE2023-103611 (06-12-02), OMAE2023-104299 (06-12-03)
Shi, Shuzhe	OMAE2023-104573 (11-09-01)
Shi, Shuzhe	OMAE2023-101346 (11-07-01), OMAE2023-104546 (11-09-01), OMAE2023-107230 (11-09-01), OMAE2023-108061 (11-01-01)
Shi, Wei	OMAE2023-104385 (13-02-01)
Shi, Wei-Chao	OMAE2023-101527 (09-05-01)

# AUTHOR INDEX

Shi, Yongkang	OMAE2023-103443 (09-04-04)
Shifeng, Ding	OMAE2023-102742 (07-02-02)
Shimura, Takuya	OMAE2023-106749 (05-01-01)
Shin, Dongkyu	OMAE2023-104652 (02-13-01)
Shiomitsu, Daisuke	OMAE2023-102688 (02-02-02)
Shiri, Hodjat	OMAE2023-104471 (04-02-03)
Shor, Roman	OMAE2023-106209 (09-05-01)
Shoukat, Gohar	OMAE2023-104910 (06-07-02)
Sidarta, Djoni E.	OMAE2023-103160 (01-02-01)
Signorelli, Rodrigo	OMAE2023-100628 (03-06-01)
Sigurdsson, Gudfinnur	OMAE2023-101111 (02-12-01), OMAE2023-104800 (02-12-01)
Silcock, Donald	OMAE2023-104729 (04-03-04)
Silva, Daniel Fonseca de Carvalho e	OMAE2023-105085 (06-01-02)
Silva, Leandro	OMAE2023-105084 (09-01-08)
Silva, Leandro	OMAE2023-102704 (01-03-02)
Simms, Andrew	OMAE2023-101076 (09-03-02)
Singh, Mansi	OMAE2023-100794 (06-01-02)
Sinsabvarodom, Chana	OMAE2023-104751 (07-01-01)
Skeie, Geir	OMAE2023-104817 (09-01-06), OMAE2023-105427 (04-01-01)
Skjerve, Håvard	OMAE2023-104682 (04-01-02)
Skjetne, Roger	OMAE2023-101757 (07-02-01), OMAE2023-102570 (06-04-03), OMAE2023-104731 (06-04-04)
Skjöldhammer, Jan	OMAE2023-101335 (09-02-03)
Skogestad, Jan Ole	OMAE2023-108151 (11-03-01)
Skorpa, Ragnhild	OMAE2023-104758 (11-05-01), OMAE2023-104790 (11-05-01), OMAE2023-107301 (11-05-02)
Skvortsov, Alex	OMAE2023-101473 (06-08-01)
Smith, Carl	OMAE2023-104935 (04-01-07)
Smith, Jennifer	OMAE2023-101455 (07-02-01)
Soares, Carlos Guedes	OMAE2023-104526 (02-05-02)
Soares, Rodrigo	OMAE2023-100991 (09-03-02)
Sobey, Adam	OMAE2023-100845 (09-01-05)
Socrates S, Sandana	OMAE2023-108074 (09-02-02)
Sødahl, Nils	OMAE2023-104817 (09-01-06)
Sogihara, Naoto	OMAE2023-101078 (06-04-01)
Sohn, Jung Min	OMAE2023-102747 (02-01-02)
Solano, Rafael F.	OMAE2023-102939 (04-03-04), OMAE2023-102990 (04-03-04)
Solfeldt, Thomas Iversen	OMAE2023-104730 (04-01-05)
Somayajula, Abhilash Sharma	OMAE2023-103432 (06-05-01), OMAE2023-104644 (06-05-03)
Son, Hyejong	OMAE2023-104939 (01-03-02)
Song, Bin	OMAE2023-104436 (08-01-02)
Song, Gisu	OMAE2023-104939 (01-03-02)
Song, Rui	OMAE2023-104467 (06-05-02)
Song, Weiling	OMAE2023-104649 (13-06-02)
Song, Xianzhi	OMAE2023-101084 (11-03-02), OMAE2023-103302 (11-01-02), OMAE2023-103412 (11-03-01)
Song, Zhiwei	OMAE2023-100668 (06-03-01)
Soper, Jonathan	OMAE2023-101443 (07-02-01), OMAE2023-101455 (07-02-01)
Sørum, Stian H.	OMAE2023-102645 (09-01-05)
Souquet, Benjamin	OMAE2023-107819 (09-01-01), OMAE2023-107904 (09-01-01)
Sourisseau, Quentin	OMAE2023-102256 (03-05-01)
Sousa, José Renato M. de	OMAE2023-104679 (04-01-03)
Souza Pinheiro da Silva, Leandro	OMAE2023-104330 (09-04-02), OMAE2023-104333 (09-01-05)
Souza, Jeferson Avila	OMAE2023-102501 (06-04-02), OMAE2023-104963 (06-01-01)
Sproesser Mathias, Marlon	OMAE2023-103265 (06-07-01), OMAE2023-104603 (06-07-02), OMAE2023-104950 (08-09-01)
Sridhar, K.	OMAE2023-100687 (06-05-01)
Srinil, Narakorn	OMAE2023-101301 (09-04-03), OMAE2023-105249 (08-01-02)
Stadtmann, Florian	OMAE2023-103112 (09-01-10)
Stanko, Milan	OMAE2023-102454 (11-07-01), OMAE2023-104399 (01-04-01)
Stansby, Peter	OMAE2023-105185 (13-04-01)
Steen, Sverre	OMAE2023-104648 (02-10-01)



# AUTHOR INDEX

Stempinski, Florian	OMAE2023-102845 (08-02-01)
Stokes, Stephen	OMAE2023-105428 (04-04-01)
Stolpnes, Thomas	OMAE2023-104399 (01-04-01)
Stutz, Sophie	OMAE2023-101505 (08-07-01)
Su, Biao	OMAE2023-101055 (05-01-01)
Sugama, Toshi	OMAE2023-107301 (11-05-02)
Sugimoto, Tomohiro	OMAE2023-101139 (03-02-01)
Sukri, Hilmi	OMAE2023-101408 (01-03-02)
Sulaiman, Zana	OMAE2023-101096 (06-01-01)
Sulino de Negreiros, Luiz Antonio	OMAE2023-106952 (04-01-02)
Sun, Chao	OMAE2023-107626 (10-01-01)
Sun, Cong	OMAE2023-106039 (06-04-05)
Sun, Deping	OMAE2023-104475 (04-04-01)
Sun, Qianyang	OMAE2023-102855 (07-05-01)
Sun, Shuyue	OMAE2023-102927 (08-06-01)
Sun, Tongxiao	OMAE2023-104396 (08-01-01)
Sun, Xiaoshuai	OMAE2023-102195 (08-05-01)
Sun, Yanli	OMAE2023-104647 (13-06-02)
Sundaravadelu, R.	OMAE2023-100687 (06-05-01), OMAE2023-102792 (06-05-01)
Sundseth, Kyrre	OMAE2023-101707 (06-04-01)
Suominen, Mikko	OMAE2023-101896 (07-03-01), OMAE2023-102474 (07-04-01), OMAE2023-102504 (07-03-01)
Sutherland, James	OMAE2023-103464 (04-03-05)
Suzuki, Hideyuki	OMAE2023-102704 (01-03-02), OMAE2023-104664 (06-03-03), OMAE2023-105138 (06-03-04)
Suzuki, Hiroyoshi	OMAE2023-102439 (11-01-01)
Swanek, Doug	OMAE2023-101113 (04-03-01)

## T

Tabib, Mandar	OMAE2023-108151 (11-03-01)
Tabri, Kristjan	OMAE2023-104670 (07-03-03)
Taghavi, Mahmood	OMAE2023-103249 (06-04-03)
Taghavi, Seyed Mohammad	OMAE2023-101070 (11-04-01), OMAE2023-101472 (11-04-01), OMAE2023-104944 (11-04-02)
Taghavifar, Hadi	OMAE2023-104508 (06-04-04)
Taghipour, Ali	OMAE2023-101611 (11-04-01), OMAE2023-101628 (11-02-03), OMAE2023-104756 (11-02-01)
Tagliafierro, Bonaventura	OMAE2023-105023 (08-04-02), OMAE2023-105049 (08-02-02)
Tahir, Muhammad	OMAE2023-105051 (11-02-01)
Tahir, Uzair Bin	OMAE2023-104774 (09-02-05)
Takami, Tomoki	OMAE2023-101876 (02-05-01)
Takano, Satoru	OMAE2023-100624 (05-03-01), OMAE2023-100939 (05-03-01)
Takekawa, Mebae	OMAE2023-104612 (05-06-01)
Takeuchi, Takaaki	OMAE2023-104302 (05-05-01)
Takeuchi, Takahiro	OMAE2023-101599 (07-06-01), OMAE2023-101702 (07-06-01)
Talimi, Vandaad	OMAE2023-101058 (13-01-01), OMAE2023-104966 (08-04-02)
Tampier, Gonzalo	OMAE2023-101308 (13-01-01)
Tan, Bryan	OMAE2023-104749 (06-03-03)
Tan, Tian	OMAE2023-104347 (09-03-01)
Tan, Wei Siang	OMAE2023-101352 (01-08-02), OMAE2023-102369 (01-06-01)
Tan, Zhimin	OMAE2023-102019 (04-01-01), OMAE2023-103676 (04-01-01), OMAE2023-104905 (04-01-02), OMAE2023-104926 (04-01-05)
Tanaka, Yasushi	OMAE2023-104545 (02-10-01)
Tanaka, Yoji	OMAE2023-100910 (06-07-02)
Taneli, Marvin Ananda	OMAE2023-104432 (09-04-03)
Tang, Guoqiang	OMAE2023-100668 (06-03-01)
Tang, Tianning	OMAE2023-102682 (06-03-01)
Tang, Xiang-Jie	OMAE2023-102378 (07-06-01)
Tannuri, Eduardo Aoun	OMAE2023-102044 (01-08-02), OMAE2023-104351 (01-08-02)
Tao, Longbin	OMAE2023-100980 (09-01-07), OMAE2023-101527 (09-05-01), OMAE2023-102185 (01-03-01)
Tasaka, Yuji	OMAE2023-100939 (05-03-01)
Tassin, Alan	OMAE2023-107740 (02-05-02)

# AUTHOR INDEX

Tavakoli, Sasan.....	OMAE2023-101896 (07-03-01), OMAE2023-104304 (06-03-02)
Taverna Martins Pereira de Abreu, Danilo.....	OMAE2023-105150 (02-13-01)
Tay, Zhi Yung.....	OMAE2023-100911 (06-04-01), OMAE2023-102732 (09-04-03), OMAE2023-104385 (13-02-01)
Taylor, Paul H.....	OMAE2023-102682 (06-03-01), OMAE2023-102780 (01-08-03), OMAE2023-104281 (06-07-01), OMAE2023-104672 (06-16-02)
Taylor, Rocky.....	OMAE2023-104638 (07-04-01), OMAE2023-107769 (07-04-01)
Tcherniguin, Nicolas.....	OMAE2023-103160 (01-02-01)
Teng, Yanjun.....	OMAE2023-104660 (01-03-02)
Teng, YihJeng.....	OMAE2023-104384 (09-01-07)
Teng, Yunfei.....	OMAE2023-102624 (06-16-01), OMAE2023-104297 (06-02-01), OMAE2023-104379 (04-03-03)
Tengesdal, Trym.....	OMAE2023-103740 (01-08-01)
Terada, Daisuke.....	OMAE2023-108083 (05-05-02)
Terra, Leonardo.....	OMAE2023-101753 (02-08-01)
Thiagarajan, Krish.....	OMAE2023-106657 (09-02-02)
Thiagarajan, Vijaya Lakshmi.....	OMAE2023-107680 (09-03-01)
Thies, Philipp.....	OMAE2023-100822 (09-01-04), OMAE2023-105249 (08-01-02)
Thijssen, Jan.....	OMAE2023-101058 (13-01-01), OMAE2023-107769 (07-04-01)
Thodi, Premkumar.....	OMAE2023-101058 (13-01-01), OMAE2023-104966 (08-04-02)
Thomas, Clare.....	OMAE2023-104708 (01-08-02), OMAE2023-104715 (09-01-02)
Thondiyath, Asokan.....	OMAE2023-108006 (06-14-02)
Thurstan, Bryan.....	OMAE2023-102329 (09-01-06)
Thusyanthan, Indrasenan.....	OMAE2023-104910 (06-07-02)
Thys, Maxime.....	OMAE2023-104699 (09-01-06)
Tian, Xinliang.....	OMAE2023-102927 (08-06-01), OMAE2023-102999 (08-04-01), OMAE2023-104924 (05-03-01)
Tian, Yinghui.....	OMAE2023-104437 (10-02-01), OMAE2023-105425 (10-05-01), OMAE2023-107918 (02-01-02)
Tighe, Nick.....	OMAE2023-101836 (13-06-01)
Timms, Chris.....	OMAE2023-101113 (04-03-01), OMAE2023-102308 (04-03-02)
Toffoli, Alessandro.....	OMAE2023-100850 (06-16-01)
Toftekær, Johan F.....	OMAE2023-101045 (01-08-03)
Tolooiyan, Ali.....	OMAE2023-103287 (13-01-02), OMAE2023-104397 (10-02-01)
Tom, Nathan.....	OMAE2023-105020 (09-02-05), OMAE2023-105030 (09-02-04), OMAE2023-106657 (09-02-02)
Tomaselli, Pietro D.....	OMAE2023-102429 (08-08-01)
Tong, Feifei.....	OMAE2023-101340 (04-02-01), OMAE2023-103310 (04-03-03), OMAE2023-104297 (06-02-01), OMAE2023-104334 (08-04-01)
Topper, Mathew.....	OMAE2023-105030 (09-02-04)
Torres Rios, Omar Zain.....	OMAE2023-102095 (02-04-02)
Toyota, Takenobu.....	OMAE2023-104435 (02-04-02)
Tran, Thanh Toan.....	OMAE2023-105016 (09-02-03), OMAE2023-105021 (09-03-02)
Trapper, Pavel A.....	OMAE2023-104497 (10-02-01)
Trentin Gonçalves, Rodolfo.....	OMAE2023-105138 (06-03-04)
Troch, Arne.....	OMAE2023-104455 (06-11-03)
Trousdale, Euan.....	OMAE2023-103676 (04-01-01)
Trudel, Elizabeth.....	OMAE2023-107063 (11-05-02)
Truong, Kevin.....	OMAE2023-106209 (09-05-01)
Tsao, Wen-Huai.....	OMAE2023-104544 (06-02-01)
Tsumura, Shuichi.....	OMAE2023-101139 (03-02-01)
Tsuru, Eiji.....	OMAE2023-102308 (04-03-02)
Tsutsui, Chiaki.....	OMAE2023-100844 (05-06-01)
Tuck, William.....	OMAE2023-104119 (09-02-01)
Tullberg, R.....	OMAE2023-100857 (13-01-01)
Tytler, Oluwafemi.....	OMAE2023-103836 (11-01-01)

## U

Uddin, Mohammad Nasim.....	OMAE2023-100971 (09-02-04)
Unico, Yvan.....	OMAE2023-106209 (09-05-01)
Ushio, Shuki.....	OMAE2023-104207 (02-04-01)
Ustolin, Federico.....	OMAE2023-100914 (03-02-01)
Utsunomiya, Tomoaki.....	OMAE2023-103375 (05-05-01)

# AUTHOR INDEX

## V

V, Sundar	OMAE2023-108074 (09-02-02)
Vaaler, Aksel	OMAE2023-103740 (01-08-01)
Valdez Banda, Osiris	OMAE2023-102504 (07-03-01)
Valer, Carlos	OMAE2023-102939 (04-03-04), OMAE2023-102990 (04-03-04)
van den Bremer, Ton	OMAE2023-103606 (08-03-01)
van Deyzen, Alex	OMAE2023-101382 (02-10-01)
Van Essen, Sanne	OMAE2023-100954 (01-03-01)
Van Gundy, Coulston	OMAE2023-107819 (09-01-01), OMAE2023-107904 (09-01-01)
Van Kampen, Wouter	OMAE2023-103266 (09-01-02)
van Walree, Frans	OMAE2023-108091 (02-05-01)
Vandiver, J. Kim	OMAE2023-104900 (08-01-02)
Vandiver, Kim	OMAE2023-105583 (08-08-01)
Vanem, Erik	OMAE2023-101961 (02-04-02)
Vangeneugden, Maarten	OMAE2023-104455 (06-11-03)
Varagnolo, Damiano	OMAE2023-105003 (09-05-01)
Vartak, Viren	OMAE2023-108084 (05-01-02)
Vaz, Murilo Augusto	OMAE2023-101748 (04-03-01)
Veber, Joshua	OMAE2023-101554 (07-03-01)
Veen, Daniel	OMAE2023-104576 (09-01-08)
Veitch, Brian	OMAE2023-101443 (07-02-01), OMAE2023-101455 (07-02-01), OMAE2023-101554 (07-03-01)
Venero, Germain	OMAE2023-100993 (01-04-01)
Venkatachalam, Sriram	OMAE2023-108074 (09-02-02)
Venturini Rodrigues, Luiz Francisco	OMAE2023-106952 (04-01-02)
Venugopal, Vengatesan	OMAE2023-100890 (08-01-01), OMAE2023-100980 (09-01-07), OMAE2023-104347 (09-03-01), OMAE2023-105249 (08-01-02)
Verde, Lars Helge	OMAE2023-104817 (09-01-06)
Vernizzi, Guilherme J.	OMAE2023-105119 (08-06-01)
Vestermark, Jonas T.	OMAE2023-101045 (01-08-03)
Viccione, Giacomo	OMAE2023-105023 (08-04-02), OMAE2023-105049 (08-02-02)
Viggen, Erlend Magnus	OMAE2023-108101 (11-05-02)
Vijayakumar, Rajagopalan	OMAE2023-108006 (06-14-02)
Vinicius Da Cruz, Marcus	OMAE2023-104870 (04-01-04)
Violante Ferreira, Claudio	OMAE2023-101121 (04-01-06), OMAE2023-108204 (13-06-03)
Viuff, Thomas	OMAE2023-102645 (09-01-05)
Voermans, Joey	OMAE2023-104355 (02-04-02)
Volpi, Lucas P.	OMAE2023-104443 (11-02-04)
von Bock und Polach, Franz	OMAE2023-102584 (07-05-01)
von Bock Und Polach, Rüdiger U. Franz	OMAE2023-103425 (07-03-02)
von Herzen, B.	OMAE2023-100857 (13-01-01)

## W

Wada, Ryota	OMAE2023-101928 (11-03-02), OMAE2023-102439 (11-01-01)
Wagle, Vikrant	OMAE2023-104418 (11-02-02), OMAE2023-104959 (11-02-01), OMAE2023-104986 (11-04-02), OMAE2023-104992 (11-04-02), OMAE2023-105029 (11-02-04), OMAE2023-105051 (11-02-01)
Wahls, Sander	OMAE2023-104326 (06-16-01)
Wallauer, Frederico	OMAE2023-101201 (04-01-03)
Wan, Ling	OMAE2023-102732 (09-04-03), OMAE2023-104385 (13-02-01)
Wan, Xiao	OMAE2023-106589 (10-04-01)
Wan, Zhipeng	OMAE2023-104822 (10-02-01)
Wang, Aimin	OMAE2023-102381 (07-03-01), OMAE2023-102855 (07-05-01), OMAE2023-102938 (07-01-01), OMAE2023-104289 (07-02-02), OMAE2023-104305 (07-03-02), OMAE2023-104308 (07-03-02), OMAE2023-104315 (07-03-03), OMAE2023-104398 (07-02-02)
Wang, Baoxuan	OMAE2023-104420 (10-03-01), OMAE2023-104430 (09-01-03)
Wang, Bin	OMAE2023-101844 (07-06-01)
Wang, Brydon T.	OMAE2023-104421 (13-06-02)
Wang, Chao	OMAE2023-102830 (01-01-01), OMAE2023-104660 (01-03-02)

# AUTHOR INDEX

Wang, Chien Ming	OMAE2023-100857 (13-01-01), OMAE2023-101407 (13-01-02), OMAE2023-102097 (13-01-02), OMAE2023-104425 (13-01-02), OMAE2023-105112 (13-06-01)
Wang, Chunpeng	OMAE2023-108061 (11-01-01)
Wang, Chunsha	OMAE2023-104656 (02-02-01)
Wang, Dejun	OMAE2023-102624 (06-16-01), OMAE2023-104291 (04-02-03)
Wang, Deyu	OMAE2023-101312 (02-02-02), OMAE2023-101632 (02-06-01), OMAE2023-102376 (02-01-02), OMAE2023-107994 (02-02-02)
Wang, Enhao	OMAE2023-103551 (09-03-02)
Wang, Haibo	OMAE2023-104546 (11-09-01), OMAE2023-104573 (11-09-01)
Wang, Hao	OMAE2023-104322 (08-05-01)
Wang, Hongdong	OMAE2023-102540 (02-07-01)
Wang, Hongjian	OMAE2023-109014 (06-14-03), OMAE2023-109449 (06-14-03)
Wang, Hongyu	OMAE2023-104420 (10-03-01)
Wang, Howard	OMAE2023-105422 (04-01-03)
Wang, Jiaxia	OMAE2023-102125 (04-02-01)
Wang, Jing	OMAE2023-104436 (08-01-02)
Wang, Jingyao	OMAE2023-107230 (11-09-01)
Wang, Jungyong	OMAE2023-101554 (07-03-01), OMAE2023-104638 (07-04-01)
Wang, Kai	OMAE2023-108147 (06-04-05), OMAE2023-109156 (09-02-04)
Wang, Lizheng	OMAE2023-104450 (01-04-02)
Wang, Lu	OMAE2023-101853 (09-01-04), OMAE2023-105016 (09-02-03)
Wang, Pengfei	OMAE2023-102766 (06-05-04)
Wang, Pengyu	OMAE2023-104737 (11-08-01)
Wang, Qiang	OMAE2023-102705 (02-03-01)
Wang, Qing	OMAE2023-104807 (06-12-02)
Wang, Qinghu	OMAE2023-101312 (02-02-02)
Wang, Shaoyang	OMAE2023-104430 (09-01-03)
Wang, Shuaishuai	OMAE2023-108172 (09-01-02)
Wang, Tong	OMAE2023-104446 (09-04-01)
Wang, Xin	OMAE2023-108192 (03-01-01)
Wang, Xintong	OMAE2023-100743 (02-02-01), OMAE2023-105048 (02-02-02)
Wang, Xueliang	OMAE2023-104540 (02-11-02)
Wang, Xunming	OMAE2023-104552 (08-03-02)
Wang, Yao	OMAE2023-101312 (02-02-02)
Wang, Yucheng	OMAE2023-104540 (02-11-02)
Wang, Yuhan	OMAE2023-104660 (01-03-02)
Wang, Yunhe	OMAE2023-104423 (06-03-03)
Wang, Yuxi	OMAE2023-103289 (11-07-01)
Wang, Zhiliang	OMAE2023-104737 (11-08-01)
Wang, Zi-Hao	OMAE2023-104303 (06-05-02), OMAE2023-104467 (06-05-02)
Wang, Zihao	OMAE2023-101126 (02-03-01)
Wang, Zixuan	OMAE2023-106568 (06-05-04)
Wang, Ziyu	OMAE2023-101935 (02-13-01)
Warringa, Sjoerd	OMAE2023-104935 (04-01-07)
Waseda, Takuji	OMAE2023-104207 (02-04-01), OMAE2023-104431 (14-01-01), OMAE2023-104435 (02-04-02)
Wassertheurer, Henrik Andreas Gusdal	OMAE2023-103112 (09-01-10)
Watanabe, Yoshitaka	OMAE2023-106749 (05-01-01)
Watson, Neale A.	OMAE2023-101602 (01-06-01)
Watson, Phil	OMAE2023-101816 (04-03-05), OMAE2023-104434 (04-03-05)
Wei, Chengzhu	OMAE2023-102431 (06-12-01)
Wei, Handi	OMAE2023-104924 (05-03-01)
Wei, Mingzhen	OMAE2023-104172 (11-10-01)
Wei, Naikun	OMAE2023-102376 (02-01-02)
Wei, Pengyu	OMAE2023-102376 (02-01-02)
Wei, Rongzhi	OMAE2023-101748 (04-03-01)
Wei, Yanji	OMAE2023-103443 (09-04-04)
Wen, Chang-Qing	OMAE2023-104566 (06-11-03)
Wen, Xueliang	OMAE2023-102873 (06-11-01), OMAE2023-102996 (06-11-02)

# AUTHOR INDEX

Wen, Yan	OMAE2023-103327 (01-01-01)
Wen, Yiyan	OMAE2023-104299 (06-12-03)
Wenbo, Dong	OMAE2023-102742 (07-02-02)
Wernø, Tore Geir	OMAE2023-104674 (03-02-01)
Westerkamp, Diederik	OMAE2023-103606 (08-03-01)
Weston, Collin	OMAE2023-105016 (09-02-03)
White, David	OMAE2023-104434 (04-03-05)
White, Mark D.	OMAE2023-101602 (01-06-01)
Widerspan, Viktor	OMAE2023-103701 (01-04-01)
Wiegerink, Johannes	OMAE2023-102097 (13-01-02)
Wiggo Time, Rune	OMAE2023-104443 (11-02-04)
Wiktorski, Tomasz	OMAE2023-102300 (11-03-02)
Wiley, Will	OMAE2023-105016 (09-02-03), OMAE2023-105021 (09-03-02)
Wilson, Eric	OMAE2023-104905 (04-01-02)
Wojtanowicz, Andrew K.	OMAE2023-104531 (11-10-02)
Wolgamot, Hugh	OMAE2023-104672 (06-16-02), OMAE2023-104749 (06-03-03), OMAE2023-105185 (13-04-01)
Womersley, Timothy	OMAE2023-103261 (06-12-01)
Wong, Bak Shiiun	OMAE2023-103329 (09-03-01)
Wosnik, Martin	OMAE2023-101076 (09-03-02)
Wu, Bin	OMAE2023-102830 (01-01-01)
Wu, Bohong	OMAE2023-101346 (11-07-01), OMAE2023-107230 (11-09-01), OMAE2023-108061 (11-01-01)
Wu, Guoqing	OMAE2023-104540 (02-11-02)
Wu, Hao	OMAE2023-103551 (09-03-02)
Wu, Hua-Tung	OMAE2023-104742 (09-01-07)
Wu, Jie	OMAE2023-105583 (08-08-01)
Wu, Jing-Ping	OMAE2023-100531 (06-02-01), OMAE2023-102079 (06-11-01), OMAE2023-104566 (06-11-03)
Wu, Mingyan	OMAE2023-101081 (07-02-01)
Wu, Weiguo	OMAE2023-102426 (02-07-01), OMAE2023-102755 (02-02-01)
Wu, Xiaodi	OMAE2023-108147 (06-04-05)
Wu, Yan-Wen	OMAE2023-104742 (09-01-07)
Wu, Yu-Shu	OMAE2023-104389 (11-10-01)
Wu, Zhongdai	OMAE2023-101081 (07-02-01)
Xia, Jinzhu	OMAE2023-101408 (01-03-02)

## X

Xiang, Han	OMAE2023-104552 (08-03-02)
Xiao, Fei	OMAE2023-108141 (10-05-01)
Xiao, Longfei	OMAE2023-101929 (09-01-04)
Xiao, Qing	OMAE2023-100523 (03-05-01), OMAE2023-101302 (09-02-03)
Xiao, Zhong	OMAE2023-104477 (10-03-01)
Xie, Chang	OMAE2023-102381 (07-03-01)
Xie, Min	OMAE2023-104359 (04-03-04)
Xin, Zirui	OMAE2023-104655 (06-16-02)
Xing, Xiuqing	OMAE2023-101352 (01-08-02), OMAE2023-102369 (01-06-01)
Xing, Yihan	OMAE2023-100707 (06-14-01), OMAE2023-101027 (06-14-01)
Xiong, Chengwang	OMAE2023-104736 (04-03-03), OMAE2023-104794 (07-05-01)
Xu, Chaozuo	OMAE2023-104764 (06-12-02)
Xu, Chen	OMAE2023-104764 (06-12-02)
Xu, Cong	OMAE2023-104446 (09-04-01)
Xu, Mingcai	OMAE2023-101847 (02-03-01)
Xu, Wenhao	OMAE2023-104924 (05-03-01)
Xu, Xiaosen	OMAE2023-101027 (06-14-01)
Xu, Xingkun	OMAE2023-104355 (02-04-02)
Xu, Yishi	OMAE2023-104702 (02-07-01)
Xu, Yuwang	OMAE2023-104396 (08-01-01), OMAE2023-104436 (08-01-02)
Xue, Qianling	OMAE2023-102218 (11-08-01)

## Y

Yamaguchi, Alan Junji	OMAE2023-104215 (11-10-01)
Yamamoto, Joji	OMAE2023-101679 (05-03-01)
Yamamoto, Marcio	OMAE2023-100939 (05-03-01), OMAE2023-101679 (05-03-01)
Yamamoto, Norio	OMAE2023-101139 (03-02-01)
Yamamoto, Yusuke	OMAE2023-104685 (05-05-02), OMAE2023-108083 (05-05-02)
Yamatoki, Shuichi	OMAE2023-102715 (02-01-01)
Yan, Bin	OMAE2023-105425 (10-05-01)
Yan, Yongsu	OMAE2023-103327 (01-01-01)
Yanagimoto, Fuminori	OMAE2023-101136 (02-01-01), OMAE2023-102688 (02-02-02)
Yang, Bin	OMAE2023-102426 (02-07-01)
Yang, Can	OMAE2023-101929 (09-01-04)
Yang, Daoyong (Tony)	OMAE2023-104485 (11-10-01), OMAE2023-107874 (11-09-01)
Yang, Hankun	OMAE2023-103327 (01-01-01)
Yang, Hongwei	OMAE2023-108010 (11-01-02)
Yang, Jianguo	OMAE2023-104270 (06-04-03)
Yang, Jianmin	OMAE2023-104924 (05-03-01)
Yang, Jin	OMAE2023-102218 (11-08-01)
Yang, Kun	OMAE2023-101910 (04-03-02)
Yang, Liu	OMAE2023-100523 (03-05-01), OMAE2023-101302 (09-02-03)
Yang, Shikai	OMAE2023-104485 (11-10-01)
Yang, Yu	OMAE2023-104753 (02-07-02)
Yao, Chaobang	OMAE2023-102184 (08-03-01), OMAE2023-102195 (08-05-01), OMAE2023-102722 (08-03-01), OMAE2023-104807 (06-12-02)
Yao, Hua-Dong	OMAE2023-101335 (09-02-03)
Yao, Jiangyuan	OMAE2023-107753 (11-10-02)
Yao, Xuezhe	OMAE2023-103412 (11-03-01)
Ye, Guanlin	OMAE2023-105425 (10-05-01)
Ye, Naiquan	OMAE2023-104495 (06-05-02), OMAE2023-104823 (04-01-06)
Yenduri, Anurag	OMAE2023-103743 (04-02-02)
Yi, Hong	OMAE2023-102431 (06-12-01), OMAE2023-102540 (02-07-01)
Yi, Xi	OMAE2023-102079 (06-11-01)
Yim, Solomon	OMAE2023-108051 (06-16-02), OMAE2023-108186 (09-02-01)
Yim, Solomon C.	OMAE2023-103027 (05-01-01)
Yin, Decao	OMAE2023-104763 (09-01-07), OMAE2023-104935 (04-01-07), OMAE2023-105583 (08-08-01)
Yin, Guang	OMAE2023-104495 (06-05-02)
Yin, Haoyang	OMAE2023-101844 (07-06-01)
Yin, Qishuai	OMAE2023-102218 (11-08-01)
Yin, Yan	OMAE2023-102830 (01-01-01), OMAE2023-104660 (01-03-02)
Ying, Jianglong	OMAE2023-104716 (06-02-01)
Yokoi, Takeshi	OMAE2023-100973 (09-01-01)
Yoneyama, Haruo	OMAE2023-100910 (06-07-02)
Yoon, Sungwon	OMAE2023-102584 (07-05-01)
Yoshimoto, Haruki	OMAE2023-100664 (05-05-01)
Young, Ian R.	OMAE2023-101196 (06-07-01), OMAE2023-101592 (06-07-01), OMAE2023-101809 (12-03-01), OMAE2023-102094 (12-01-01), OMAE2023-102095 (02-04-02), OMAE2023-103260 (12-03-01), OMAE2023-109008 (12-03-01)
Ytrehus, Jan David	OMAE2023-101294 (11-02-02), OMAE2023-101611 (11-04-01), OMAE2023-101628 (11-02-03), OMAE2023-104756 (11-02-01)
Yu, Dan	OMAE2023-109449 (06-14-03)
Yu, Jiawei	OMAE2023-102722 (08-03-01)
Yu, Kai	OMAE2023-102766 (06-05-04)
Yu, Pengyao	OMAE2023-102705 (02-03-01)
Yu, Shuang-Rui	OMAE2023-101218 (09-01-04)
Yu, Wei	OMAE2023-104389 (11-10-01)
Yu, Yao-Hui	OMAE2023-104467 (06-05-02)
Yu, Yi	OMAE2023-103654 (04-03-02)
Yu, Yi-Hsiang	OMAE2023-105030 (09-02-04), OMAE2023-105123 (09-02-03)

# AUTHOR INDEX

Yu, Yonghua	OMAE2023-104270 (06-04-03)
Yu, Zhen	OMAE2023-104716 (06-02-01)
Yu, Zhiyan	OMAE2023-101935 (02-13-01)
Yuan, Hongtao	OMAE2023-102830 (01-01-01)
Yuan, Jiabei	OMAE2023-104905 (04-01-02)
Yuan, Shuai	OMAE2023-101206 (09-01-01)
Yuan, Wanju	OMAE2023-107753 (11-10-02)
Yuan, Zhi-Ming	OMAE2023-101218 (09-01-04), OMAE2023-101527 (09-05-01), OMAE2023-102530 (09-04-04)
Yuck, R. H.	OMAE2023-101405 (01-02-01)

## Z

Zaman, Hasanat	OMAE2023-104936 (01-02-01)
Zaman, M Hasanat	OMAE2023-101645 (06-03-01)
Zan, Yingfei	OMAE2023-106517 (06-14-02)
Zang, Jun	OMAE2023-102682 (06-03-01)
Zarraonandia Simeon, Gaizka	OMAE2023-101651 (02-08-01)
Zeng, Dinghan	OMAE2023-104398 (07-02-02)
Zeng, Jiayan	OMAE2023-104415 (07-02-02)
Zeng, Qingsong	OMAE2023-101414 (08-02-01)
Zenith, Federico	OMAE2023-101707 (06-04-01)
Zha, Ruosi	OMAE2023-108147 (06-04-05)
Zha, Xing	OMAE2023-104430 (09-01-03)
Zhan, Peng	OMAE2023-102079 (06-11-01)
Zhang, O	OMAE2023-104639 (01-08-03)
Zhang, Baili	OMAE2023-101352 (01-08-02), OMAE2023-102369 (01-06-01)
Zhang, Bingchang	OMAE2023-104579 (08-01-02)
Zhang, Boran	OMAE2023-102705 (02-03-01)
Zhang, Cheng	OMAE2023-104291 (04-02-03)
Zhang, Chengkai	OMAE2023-103302 (11-01-02)
Zhang, Chengyang	OMAE2023-104477 (10-03-01)
Zhang, Chengyu	OMAE2023-102705 (02-03-01)
Zhang, De-Qing	OMAE2023-102530 (09-04-04)
Zhang, Fan	OMAE2023-104881 (06-11-03)
Zhang, Haojie	OMAE2023-104420 (10-03-01)
Zhang, Haolin	OMAE2023-103412 (11-03-01)
Zhang, Hong	OMAE2023-101407 (13-01-02), OMAE2023-104425 (13-01-02)
Zhang, Hongwei	OMAE2023-104270 (06-04-03)
Zhang, Houxiang	OMAE2023-101206 (09-01-01)
Zhang, Huan	OMAE2023-104660 (01-03-02)
Zhang, Huanyu	OMAE2023-102927 (08-06-01), OMAE2023-102999 (08-04-01)
Zhang, Huidong	OMAE2023-104446 (09-04-01)
Zhang, Jianan	OMAE2023-102873 (06-11-01), OMAE2023-102996 (06-11-02)
Zhang, Jianwei	OMAE2023-104430 (09-01-03)
Zhang, Jiayu	OMAE2023-104301 (08-01-01)
Zhang, Jingxin	OMAE2023-104774 (09-02-05)
Zhang, Kai	OMAE2023-109014 (06-14-03)
Zhang, Lufeng	OMAE2023-101346 (11-07-01), OMAE2023-104546 (11-09-01), OMAE2023-104573 (11-09-01)
Zhang, Mengmeng	OMAE2023-104396 (08-01-01), OMAE2023-104436 (08-01-02)
Zhang, Ming	OMAE2023-101218 (09-01-04), OMAE2023-101527 (09-05-01), OMAE2023-102530 (09-04-04)
Zhang, Mingyang	OMAE2023-101081 (07-02-01)
Zhang, Pei	OMAE2023-106039 (06-04-05)
Zhang, Renjie	OMAE2023-105875 (09-01-08)
Zhang, Rui	OMAE2023-103302 (11-01-02), OMAE2023-103412 (11-03-01)
Zhang, Tianjun	OMAE2023-104545 (02-10-01)
Zhang, Wei	OMAE2023-104477 (10-03-01)
Zhang, Weihan	OMAE2023-101793 (04-03-01)
Zhang, Weilong	OMAE2023-107994 (02-02-02)
Zhang, Wenzhe	OMAE2023-101847 (02-03-01), OMAE2023-103776 (02-03-01)

# AUTHOR INDEX

Zhang, X.	OMAE2023-100857 (13-01-01)
Zhang, Xiangrui	OMAE2023-106039 (06-04-05)
Zhang, Xiantao	OMAE2023-104881 (06-11-03)
Zhang, Xinshu	OMAE2023-102378 (07-06-01)
Zhang, Xinyu	OMAE2023-101407 (13-01-02)
Zhang, Xinyun	OMAE2023-101935 (02-13-01)
Zhang, Xiuyuan	OMAE2023-106039 (06-04-05)
Zhang, Yali	OMAE2023-101183 (01-03-01)
Zhang, Yanfei	OMAE2023-104299 (06-12-03)
Zhang, Yanna	OMAE2023-107230 (11-09-01), OMAE2023-108061 (11-01-01)
Zhang, Yaru	OMAE2023-104420 (10-03-01)
Zhang, Yue	OMAE2023-105765 (07-04-01)
Zhang, Yunhao	OMAE2023-107874 (11-09-01)
Zhang, Ziwen	OMAE2023-104299 (06-12-03)
Zhao, Binbin	OMAE2023-105070 (06-04-05)
Zhao, Guixin	OMAE2023-103416 (08-06-01)
Zhao, Huaizhi	OMAE2023-105129 (05-02-01)
Zhao, Jingli	OMAE2023-104647 (13-06-02), OMAE2023-104649 (13-06-02)
Zhao, Mengshang	OMAE2023-108147 (06-04-05)
Zhao, Min	OMAE2023-102820 (06-14-01), OMAE2023-104797 (06-03-04)
Zhao, Shengnan	OMAE2023-101868 (09-04-04)
Zhao, Wenhua	OMAE2023-102780 (01-08-03), OMAE2023-104281 (06-07-01)
Zhao, Xiang	OMAE2023-101859 (08-08-01), OMAE2023-102743 (09-01-10), OMAE2023-104406 (09-01-03)
Zhao, Yakun	OMAE2023-102927 (08-06-01), OMAE2023-102999 (08-04-01)
Zhao, Zhimin	OMAE2023-103331 (02-07-01)
Zheng, Jiancai	OMAE2023-104797 (06-03-04)
Zheng, Jinhai	OMAE2023-103027 (05-01-01)
Zheng, Sijie	OMAE2023-102381 (07-03-01), OMAE2023-102938 (07-01-01)
Zheng, Tingsen	OMAE2023-104210 (02-11-01)
Zheng, Yonglai	OMAE2023-108141 (10-05-01)
Zhong, Yu-Xuan	OMAE2023-104303 (06-05-02)
Zhou, Bo	OMAE2023-103327 (01-01-01)
Zhou, Detao	OMAE2023-103412 (11-03-01)
Zhou, Hongjie	OMAE2023-107626 (10-01-01)
Zhou, Ji	OMAE2023-102755 (02-02-01)
Zhou, Jinxin	OMAE2023-104637 (05-02-01), OMAE2023-104700 (05-01-02), OMAE2023-105129 (05-02-01)
Zhou, Li	OMAE2023-102855 (07-05-01), OMAE2023-104251 (07-06-02), OMAE2023-104289 (07-02-02), OMAE2023-104308 (07-03-02)
Zhou, Libin	OMAE2023-104540 (02-11-02)
Zhou, Tongming	OMAE2023-104423 (06-03-03)
Zhou, Xianmin	OMAE2023-104389 (11-10-01)
Zhou, Xueqian	OMAE2023-104702 (02-07-01), OMAE2023-104753 (02-07-02), OMAE2023-104764 (06-12-02)
Zhou, Yaohua	OMAE2023-103611 (06-12-02)
Zhou, Ying	OMAE2023-108222 (11-10-02)
Zhou, Yong	OMAE2023-107987 (13-06-03), OMAE2023-108134 (13-06-03)
Zhou, Zefeng	OMAE2023-104420 (10-03-01)
Zhu, Feng-Shen	OMAE2023-102530 (09-04-04)
Zhu, Linfa	OMAE2023-102019 (04-01-01), OMAE2023-103676 (04-01-01), OMAE2023-104905 (04-01-02), OMAE2023-104926 (04-01-05)
Zhu, Wenxuan	OMAE2023-105425 (10-05-01)
Zhu, Zhaopeng	OMAE2023-103302 (11-01-02), OMAE2023-103412 (11-03-01)
Zou, Lu	OMAE2023-102378 (07-06-01)
Zou, Ming	OMAE2023-102378 (07-06-01)
Zou, Runbei	OMAE2023-102705 (02-03-01)
Zou, Yanlin	OMAE2023-104552 (08-03-02)
Zou, Zao-Jian	OMAE2023-100531 (06-02-01), OMAE2023-102079 (06-11-01), OMAE2023-102378 (07-06-01), OMAE2023-104303 (06-05-02)



# Session Index

## 01 Offshore Technology

01-01-01	Offshore Platforms	Monday June 12 (15:30)	205
01-02-01	Station Keeping	Monday June 12 (13:30)	205
01-03-01	Computational Offshore Hydrodynamics	Tuesday June 13 (13:30)	205
01-03-02	Hydrodynamic Industrial Applications	Tuesday June 13 (15:30)	205
01-04-01	Design & Analysis I	Tuesday June 13 (8:30)	205
01-04-02	Design & Analysis II	Tuesday June 13 (10:30)	205
01-06-01	CFD Modeling Practice & Verification	Wednesday June 14 (15:30)	205
01-08-01	Digital Twin Applications to Offshore Systems	Wednesday June 14 (8:30)	205
01-08-02	AI/ML Applications to FPSO and Mooring Systems	Wednesday June 14 (10:30)	205
01-08-03	AI/ML Applications to Offshore Systems and Subsurface	Wednesday June 14 (13:30)	205

## 02 Structures, Safety and Reliability

02-01-01	Structural Analysis and Optimisation I	Monday June 12 (13:30)	212
02-01-02	Structural Analysis and Optimisation II	Monday June 12 (15:30)	212
02-02-01	Ultimate Strength I	Monday June 12 (13:30)	213
02-02-02	Ultimate Strength II	Monday June 12 (15:30)	213
02-03-01	Collision and Crashworthiness	Tuesday June 13 (8:30)	212
02-04-01	Extreme and Freak Waves	Thursday June 15 (10:30)	212
02-04-02	Probabilistic and Spectral Wave Modelling	Thursday June 15 (13:30)	212
02-05-01	Extreme Loads and Responses I	Tuesday June 13 (8:30)	213
02-05-02	Extreme Loads and Responses II	Tuesday June 13 (10:30)	213
02-06-01	Probabilistic Models of Forces and Motions	Tuesday June 13 (10:30)	212
02-07-01	Data-driven Models for Marine Structures I	Tuesday June 13 (13:30)	212
02-07-02	Data-driven Models for Marine Structures II	Tuesday June 13 (15:30)	212
02-08-01	Risk and Reliability of Renewable Energy Devices	Tuesday June 13 (13:30)	213
02-09-01	Reliability of Mooring and Riser Systems	Wednesday June 14 (8:30)	212
02-10-01	Reliability of Marine Structures	Wednesday June 14 (10:30)	212
02-11-01	Fatigue and Fracture Reliability I	Wednesday June 14 (13:30)	212
02-11-02	Fatigue and Fracture Reliability II	Wednesday June 14 (15:30)	212
02-12-01	Reliability Based Maintenance and Inspection Planning; Life Cycle Cost Optimization	Wednesday June 14 (15:30)	214
02-13-01	Risk Analysis and Safety Management I	Thursday June 15 (10:30)	208
02-13-02	Risk Analysis and Safety Management II	Thursday June 15 (13:30)	213

## 03 Materials Technology

03-01-01	Fracture Assessment and Control	Tuesday June 13 (15:30)	206
03-02-01	Fatigue Performance & Inspection Planning	Wednesday June 14 (8:30)	206
03-05-01	Modeling and Performance of Non-metallics	Wednesday June 14 (10:30)	206
03-06-01	Materials Selection	Wednesday June 14 (13:30)	206

## 04 Pipeline, Risers, and Subsea Systems

04-01-01	Flexible Pipes and Umbilicals I	Monday June 12 (13:30)	210
04-01-02	Flexible Pipes and Umbilicals II	Monday June 12 (15:30)	210
04-01-03	Flexible Pipes and Umbilicals III	Tuesday June 13 (13:30)	210
04-01-04	Flexible Pipes and Umbilicals IV	Tuesday June 13 (15:30)	210
04-01-05	Flexible Pipes and Umbilicals V	Wednesday June 14 (13:30)	210
04-01-06	Flexible Pipes and Umbilicals VI	Wednesday June 14 (15:30)	210

# SESSION INDEX

04-01-07	Flexible Pipes and Umbilicals VII	Thursday June 15 (10:30)	214
04-02-01	Rigid Risers I	Tuesday June 13 (8:30)	210
04-02-02	Rigid Risers II	Tuesday June 13 (10:30)	210
04-02-03	Rigid Risers III	Tuesday June 13 (15:30)	213
04-03-01	Mechanics I	Wednesday June 14 (8:30)	210
04-03-02	Mechanics II	Wednesday June 14 (10:30)	210
04-03-03	Hydrodynamics	Wednesday June 14 (15:30)	213
04-03-04	Thermo-Mechanical	Thursday June 15 (10:30)	210
04-03-05	Pipe-Soil Interaction	Thursday June 15 (13:30)	210
04-04-01	Subsea Systems and Flow Assurance	Thursday June 15 (13:30)	208

## 05 Ocean Space Utilization

05-01-01	New Concepts for Ocean Space Utilization I	Monday June 12 (13:30)	207
05-01-02	New Concepts for Ocean Space Utilization II	Tuesday June 13 (10:30)	207
05-02-01	Aquaculture and Related Technology I	Tuesday June 13 (15:30)	207
05-03-01	Deepsea Mining and Ocean Resources	Monday June 12 (15:30)	207
05-05-01	Floating Systems for Renewable Energy	Tuesday June 13 (8:30)	207
05-05-02	Aquaculture and Related Technology II	Wednesday June 14 (8:30)	207
05-06-01	High Tide and Tsunamis	Tuesday June 13 (13:30)	207

## 06 Ocean Engineering

06-01-01	Computational Mechanics and Design Applications I	Wednesday June 14 (8:30)	218
06-01-02	Computational Mechanics and Design Applications II	Wednesday June 14 (13:30)	218
06-02-01	Coastal Engineering	Thursday June 15 (10:30)	203
06-03-01	Fluid-Structure, Multi-body and Wave-body Interaction I	Monday June 12 (13:30)	204
06-03-02	Fluid-Structure, Multi-body and Wave-body Interaction II	Tuesday June 13 (8:30)	204
06-03-03	Fluid-Structure, Multi-body and Wave-body Interaction III	Tuesday June 13 (10:30)	204
06-03-04	Fluid-Structure, Multi-body and Wave-body Interaction IV	Tuesday June 13 (13:30)	204
06-04-01	Marine Engineering and Technology I	Monday June 12 (13:30)	203
06-04-02	Marine Engineering and Technology II	Tuesday June 13 (8:30)	203
06-04-03	Marine Engineering and Technology III	Tuesday June 13 (10:30)	203
06-04-04	Marine Engineering and Technology IV	Tuesday June 13 (13:30)	203
06-04-05	Marine Engineering and Technology V	Wednesday June 14 (8:30)	203
06-05-01	Marine Hydrodynamics I	Monday June 12 (13:30)	218
06-05-02	Marine Hydrodynamics II	Tuesday June 13 (10:30)	218
06-05-03	Marine Hydrodynamics III	Tuesday June 13 (13:30)	218
06-05-04	Marine Hydrodynamics IV	Tuesday June 13 (15:30)	218
06-07-01	Metocean, Measurement and Data Interpretation I	Thursday June 15 (10:30)	205
06-07-02	Metocean, Measurement and Data Interpretation II	Thursday June 15 (13:30)	205
06-08-01	Model Tests	Thursday June 15 (10:30)	204
06-11-01	Ocean Engineering Technology I	Wednesday June 14 (8:30)	204
06-11-02	Ocean Engineering Technology II	Wednesday June 14 (10:30)	204
06-11-03	Ocean Engineering Technology III	Wednesday June 14 (13:30)	204
06-12-01	Ship Hydromechanics I	Wednesday June 14 (8:30)	217
06-12-02	Ship Hydromechanics II	Wednesday June 14 (10:30)	217
06-12-03	Ship Hydromechanics III	Wednesday June 14 (13:30)	217
06-14-01	Underwater Vehicles and Design Technology I	Wednesday June 14 (15:30)	217
06-14-02	Underwater Vehicles and Design Technology II	Thursday June 15 (10:30)	217
06-14-03	Underwater Vehicles and Design Technology III	Thursday June 15 (13:30)	217
06-16-01	Wave Mechanics, Modeling and Wave Effects I	Wednesday June 14 (10:30)	203
06-16-02	Wave Mechanics, Modeling and Wave Effects II	Wednesday June 14 (13:30)	203

# SESSION INDEX

## 07 Polar and Arctic Sciences and Technology

07-01-01	Arctic Frontier Regions and Propulsion in Ice	Monday June 12 (13:30)	208
07-02-01	Arctic Sea Transportation I	Monday June 12 (15:30)	208
07-02-02	Arctic Sea Transportation II	Tuesday June 13 (8:30)	208
07-03-01	Vessels in Ice I	Tuesday June 13 (10:30)	208
07-03-02	Vessels in Ice II	Tuesday June 13 (13:30)	208
07-03-03	Vessels in Ice III	Tuesday June 13 (15:30)	208
07-04-01	Vessels in Ice and Model Test	Wednesday June 14 (8:30)	208
07-05-01	Numerical Ice Modeling	Wednesday June 14 (10:30)	208
07-06-01	Structures in Ice I	Wednesday June 14 (13:30)	208
07-06-02	Structures in Ice II	Wednesday June 14 (15:30)	208

## 08 CFD, VIV and FSI

08-01-01	Risers, Pipelines & VIV I	Monday June 12 (13:30)	209
08-01-02	Risers, Pipelines & VIV II	Monday June 12 (15:30)	209
08-02-01	Ship & Floating Systems I	Tuesday June 13 (8:30)	209
08-02-02	Ship & Floating Systems II	Tuesday June 13 (10:30)	209
08-03-01	Free Surface Flows I	Tuesday June 13 (13:30)	209
08-03-02	Free Surface Flows II	Tuesday June 13 (15:30)	209
08-04-01	CFD Development I	Wednesday June 14 (8:30)	209
08-04-02	CFD Development II	Wednesday June 14 (10:30)	209
08-05-01	Model Reduction and Machine Learning	Wednesday June 14 (13:30)	209
08-06-01	Internal Flows & FIV	Wednesday June 14 (13:30)	214
08-07-01	Data-Driven Models and Digital Twins	Wednesday June 14 (15:30)	209
08-08-01	VIV & Offshore Wind Turbines	Thursday June 15 (10:30)	209
08-09-01	Neural Network for Waves & Cylinders, Symposium Summary	Thursday June 15 (13:30)	209

## 09 Ocean Renewable Energy

09-01-01	Offshore Wind Energy - Installation	Monday June 12 (13:30)	216
09-01-02	Offshore Wind Energy - Structural Dynamics	Monday June 12 (15:30)	216
09-01-03	Offshore Wind Energy - Aerodynamics	Tuesday June 13 (8:30)	216
09-01-04	Offshore Wind Energy - Aerodynamic Control	Tuesday June 13 (10:30)	216
09-01-05	Offshore Wind Energy - Moorings and Cables I	Tuesday June 13 (13:30)	216
09-01-06	Offshore Wind Energy - Moorings and Cables II	Tuesday June 13 (15:30)	216
09-01-07	Offshore Wind Energy - Hydrodynamics I	Wednesday June 14 (8:30)	216
09-01-08	Offshore Wind Energy - Hydrodynamics II	Wednesday June 14 (10:30)	216
09-01-09	Offshore Wind Energy - Design Optimization	Wednesday June 14 (13:30)	216
09-01-10	Offshore Wind Energy - Data Science and Digital Twins	Wednesday June 14 (15:30)	216
09-02-01	Wave Energy - Environment	Monday June 12 (13:30)	217
09-02-02	Wave Energy - Design and Performance Analysis I	Monday June 12 (15:30)	217
09-02-03	Wave Energy - Design and Performance Analysis II	Tuesday June 13 (8:30)	217
09-02-04	Wave Energy - Design and Performance Analysis III	Tuesday June 13 (10:30)	217
09-02-05	Wave Energy Control and Power Take Off	Tuesday June 13 (13:30)	217
09-03-01	Current and Tidal Energy - Design Considerations	Thursday June 15 (10:30)	216
09-03-02	Current and Tidal Energy: Hydrodynamic Analysis	Thursday June 15 (13:30)	216
09-04-01	Hybrid and Novel Renewable Energy Systems I	Wednesday June 14 (10:30)	218
09-04-02	Hybrid and Novel Renewable Energy Systems II	Wednesday June 14 (15:30)	218
09-04-03	Hybrid and Novel Renewable Energy Systems III	Thursday June 15 (10:30)	218
09-04-04	Floating Solar Energy	Thursday June 15 (13:30)	218
09-05-01	Hydrogen and Energy Storage	Tuesday June 13 (15:30)	217

# SESSION INDEX

## 10 Offshore Geotechnics

10-01-01	Seabed Properties and Processes and Fluid-Soil-Structure Interaction	Monday June 12 (13:30)	206
10-02-01	Fluid-Soil-Structure Interaction	Monday June 12 (15:30)	206
10-03-01	Anchors	Tuesday June 13 (8:30)	206
10-04-01	Pile Foundations	Tuesday June 13 (10:30)	206
10-05-01	Bucket Foundations, Suction Caissons and Spudcans	Tuesday June 13 (13:30)	206

## 11 Petroleum Technology

11-01-01	Well Drilling Technology I	Thursday June 15 (10:30)	211
11-01-02	Well Drilling Technology II	Thursday June 15 (13:30)	211
11-02-01	Well Drilling Fluids and Hydraulics I	Tuesday June 13 (13:30)	211
11-02-02	Well Drilling Fluids and Hydraulics II	Tuesday June 13 (15:30)	211
11-02-03	Well Drilling Fluids and Hydraulics III	Wednesday June 14 (13:30)	211
11-02-04	Well Drilling Hydraulics and Cementing	Wednesday June 14 (15:30)	211
11-03-01	Data Science Applications in Drilling Engineering I	Monday June 12 (13:30)	211
11-03-02	Data Science Applications in Drilling Engineering II	Monday June 12 (15:30)	211
11-04-01	Well Cementing Theory & Practice I	Tuesday June 13 (8:30)	211
11-04-02	Well Cementing Theory & Practice II	Tuesday June 13 (10:30)	211
11-05-01	Integrity of Well Barriers I	Wednesday June 14 (8:30)	211
11-05-02	Integrity of Well Barriers II	Wednesday June 14 (10:30)	211
11-07-01	Production Systems and Subsea Operations	Thursday June 15 (10:30)	213
11-08-01	Multiphase Flow & Flow Assurance	Wednesday June 14 (8:30)	213
11-09-01	Development of Unconventional Reservoirs	Thursday June 15 (13:30)	214
11-10-01	Advances in Carbon Capture Utilization and Storage (CCUS) I	Wednesday June 14 (10:30)	213
11-10-02	Advances in Carbon Capture Utilization and Storage (CCUS) II	Wednesday June 14 (13:30)	213

## 12 Professor Ian Young Honouring Symposium on Global Ocean Wind and Wave Climate

12-01-01	Wave/Ocean/Atmosphere Coupling and Climate Change Impacts on Ocean Waves	Wednesday June 14 (10:30)	207
12-03-01	Global Ocean Wave Climate	Wednesday June 14 (13:30)	207

## 13 Blue Economy Symposium

13-01-01	Blue Economy I	Monday June 12 (13:30)	214
13-01-02	Blue Economy II	Monday June 12 (15:30)	214
13-02-01	Blue Economy III	Tuesday June 13 (8:30)	214
13-04-01	Blue Economy IV	Tuesday June 13 (10:30)	214
13-05-01	Blue Economy V	Tuesday June 13 (13:30)	214
13-06-01	Blue Economy VI	Tuesday June 13 (15:30)	214
13-06-02	Blue Economy VII	Wednesday June 14 (8:30)	214
13-06-03	Blue Economy VIII	Wednesday June 14 (10:30)	214

## 14 Small Maritime Nations Symposium

14-01-01	Small Maritime Nations	Monday June 12 (15:30)	218
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