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October 11–16, Shanghai, China

The Thirtieth (2020) International
**Ocean and Polar
Engineering Conference**
(Offshore and Polar Engineering Conference)

Including *additional* ISOPE symposia:

1st Advanced Ship Technology
3rd Environment Assisted Cracking
5th Underwater Technology
9th Tsunami & Safety
10th Asset Integrity
11th Arctic Science & Technology
11th Renewable Energy & Environment
12th Sloshing Dynamics & Design
LNG Membrane, Processing, Bunkering
15th Deep Ocean Mining & Gas Hydrates
18th High-Performance Materials

ISOPE-2020

Shanghai, China, October 11–16

*Updated
Technical Program*

Refereed papers from 45+ countries in 136 technical general
2 Plenary and 1 Keynote and multiple Focus sessions
Full Program with General Information, Advance Registration and Venue
Hotel. Paper List, Reservations, and Updates at

<http://www.isopec.org/conferences-symposia-and-workshops/>

ISOPE-2020 Conference proceedings

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All ISOPE Publications:

<http://www.isopec.org/proceedings/>

<http://www.isopec.org/ijope/>

Organized and Sponsored by: Technical Program Committee,
International Society of Ocean and Polar Engineers (ISOPE),
Shanghai Jiao Tong University with cooperating organizations
(listed inside)



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meetings@isopec.org; www.isopec.org



Opening session at ISOPE-2019



Shanghai at night, 2020

ISOPE-2020 Conference Co-chairs

Jim S Chung (USA); Ronald Knapp (USA); Demos Angelides (Greece);
Seok Won Hong (Korea), Hiroyasu Kawai (Japan); Hua Liu & Decheng
Wan (China)



Chung Knapp Angelides Hong Kawai Liu Wan

ISOPE-2020 Shanghai

The 30th Annual ISOPE-2020 Conference, Shanghai, China,
October 11–16 (originally June 16–21), 2020

Online Hotel Room Reservation Link:

Oriental Riverside Hotel Shanghai at Shanghai Intl Convention
Center (SHICC): <http://isope2020.shicc.net/en/index.aspx>

Expanded Session List and Full Program (digital)

with Paper List: Download from www.isope.org or

<http://www.isope.org/conferences-symposia-and-workshops/>

Full Program (Session and Paper List) and Update:

<http://www.isope.org/conferences-symposia-and-workshops/>;

Questions to meetings@isope.org

ISOPE Journal and Conference Proceedings and Order Form:

<http://www.isope.org/ijope/>

<http://www.isope.org/proceedings/>

*The 14th ISOPE Pacific Asia Offshore Mechanics Symposium
(PACOMS-2020), Dalian, China, November 22–25, 2020*

*The 31st Annual International Ocean and Polar (Arctic)
Engineering Conference, Rhodes, Greece, June 20–25, 2021*

Welcome to the ISOPE-2020 Conference

We greatly appreciate the excellent response, with **1250+** abstracts, and help we have received from colleagues around the world in the successful organization of the 30th International Ocean and Polar (Arctic) Engineering Conference (**ISOPE-2020**), Shanghai, China, October 11–16 (rescheduled from June 16–21), 2020. The Conference features **136** sessions of peer-reviewed papers and **3** plenary and keynote presentations from more than **45+** countries, including the ISOPE specialty symposia as a part of the ISOPE-2020 Conference.

The conference program is issued in 2 versions: Session time and rooms printed and full conference program online (www.isopec.org).

The purposes of the ISOPE conference are to:

- * Promote technological progress and activities, international technological transfer and cooperation, and opportunities for engineers to maintain and improve technical competence; and
- * Provide a timely international forum for technical activities, cooperation, opportunity and fellowship among researchers and engineers by developing focused session topics with high-quality papers (in both originality and significance) accepted through rigorous review, establishing high international standards for publication and worldwide distribution, and promoting interdisciplinary interaction between academia and industry.

The International Society of Ocean and Polar Engineers (ISOPE) has already held 60 successful international meetings with all peer-reviewed papers:

- 1st (1990) European Offshore Mechanics Symposium (**EUROMS-90**) Trondheim; **EUROMS-99** Moscow; **EUROMS-2012** Istanbul.
- 1st (1990) Pacific/Asia Offshore Mechanics Symposium (**PACOMS-90**) Seoul; Beijing; Pusan; Daejeon; Vladivostok; Dalian; Bangkok; Busan; Vladivostok; Shanghai; Gold Coast, Jeju Island, 2018.
- Annual **ISOPE** conferences, starting in Edinburgh, 1991, have been held in San Francisco, Singapore, Osaka, The Hague, Los Angeles, Honolulu, Montréal, Brest, Seattle, Stavanger, Kitakyushu, Honolulu, Toulon, Seoul, San Francisco, Lisbon, Vancouver, Osaka, Beijing, Maui Hawaii, Rhodes, Anchorage, Busan, Kona Hawaii, Rhodes, San Francisco, Sapporo, Honolulu. Since 1992, the annual ISOPE conference program has been the world's largest of its kind with peer-reviewed papers.
- 1st (1995) ISOPE (deep) Ocean Mining & Gas Hydrates Symposium (**OMS-95**; **OMGH**), Tsukuba, 1995; Seoul; Goa; Szczecin; Tsukuba; Changsha; Lisbon; Chennai, Szczecin; Kona Hawaii, Sapporo, Honolulu, 2019.
- 1st (1996) International Deep-Ocean Technology (**IDOT-96**) Symposium and Workshop, 1996 Los Angeles; Stavanger, 2001; Beijing 2009.
- ISOPE **HPM** (High-Performance Materials) Symposium: Started in Honolulu 2003 and expanded every year with emerging topics.
- A series of ISOPE specialty symposia: **ANGT**; **SBD**; ; Nanotechnology **NANOS**; Frontier Energy; Sloshing & Dynamics; Renewable Energy/Environment; Tsunami; Arctic Sci & Tech; Arctic Materials; Asset Integrity; High-Mn/Cryogenic Materials; Materials Reliability, EAC.

On behalf of the Technical Program Committee, it is our pleasure to welcome participants from all over the world to the ISOPE-2020 Conference in Shanghai, China.

Jin S Chung, USA	Ronald H Knapp USA	Demos Angelides Greece
Seok-Won Hong Korea	H Kawai Japan	H Liu & DC Wan China

Co-chairs of the ISOPE-2020 Conference

SUNDAY OCTOBER 11

09:00 ~~ISOPE Board of Directors Meeting~~ 3F, 3F
10:30 ~~ISOPE Executive Committee Meeting~~ 3F, 3F
 ~~EUROMS and PACOMS Executive Committees~~
15:00-18:00
~~CONFERENCE REGISTRATION~~ Mandarin Lobby, 1F
17:00-18:00
~~WELCOME RECEPTION~~ Grand Ballroom 1, 7F

~~Tour Information~~ Visit tour desk in Foyer or www.isopec.org

MONDAY OCTOBER 12

~~On-Site Registration~~ starts at 07:30 Mandarin Lobby, 1F
07:30 ~~Session Chair/Co-chair Briefing~~ Mandarin Lobby, 1F

19:00 Conference Opening Mandarin Hall, 1F
09:00 **The 30th ISOPE Anniversary slides**
1 OCEAN AND ARCTIC TECHNOLOGY Mandarin Hall, 1F
ZOOM presentation:
Plenary: Yousheng Wu, CSSRC, Wuxi, China (Vol 1) Room 1
Keynote 1: Hua Liu, SJTU, Tsunami South China Sea

10:30 **Video Presentations**
2. HYDRODYNAMICS I: Issue 1 Room 1
3. SLOSHING I: Wave Impact Room 2
4. RENEWABLE ENERGY I: Wave Energy 1 Room 3
5. DIGITALIZATION AND INTELLIGENCE Room 4
6. ENVIRONMENT I: Ocean Plastics/Debris Pollution Room 5
7. HYDRODYNAMICS YY1: Comparative Study 1 Room 6
8. OCEAN TECHNOLOGY I: Float-Over Installation 1 Room 7
9. ADVANCED SHIP TECH I: Added Resistance Room 8
10. UNDERWATER I: Sensing, Path Planning Control 1 Room 9

14:00
11. HYDRODYNAMICS II: Issue 2 Room 1
12. SLOSHING II: Sloshing Experiment Room 2
13. RENEWABLE ENERGY II: Wave Energy 2 Room 3
14. VORTEX-INDUCED VIBRATIONS I Room 4
15. ENVIRONMENT II: Water Quality, Oil Spill Room 5
16. HYDRODYNAMICS YY2: Comparative Study 2 Room 6
17. OCEAN TECHNOLOGY II: Float-Over Installation 2 Room 7
18. ADVANCED SHIP TECH II: Cavitation Room 8
19. UNDERWATER II: Sensing, Path Planning/Control 2 Room 9

16:20
20. HYDRODYNAMICS III: Issue 3 Room 1
21. SLOSHING III: LNG Sloshing Modeling Room 2
22. RENEWABLE ENERGY III: Tidal, Current Energy 1 Room 3
23. VORTEX-INDUCED VIBRATIONS II Room 4
24. HPM I: Advanced Metallurgy & Welding Room 5
25. HYDRODYNAMICS YY3: Comparative Study 3 Room 6
26. OCEAN TECHNOLOGY III: Floating Tunnel Room 7
27. ADVANCED SHIP TECH III: Design, Optimization Room 8
28. UNDERWATER III: Design, Application Room 9

18:30
ISOPE Technical Committee Meetings: Notice on bulletin board
New members are welcome.

TUESDAY OCTOBER 13

07:30 Session Chair/Co-chair Briefing	Mandarin Lobby, 1F
08:00	
29. HYDRODYNAMICS IV: Issue 4	Room 1
30. SJTU Hydrodynamics Symposium I	Room 2
31. RENEWABLE ENERGY IV: Tidal, Current Energy 2	Room 3
32. ADVANCED SHIP TECH XX: Dynamics, Vibration	Room 4
33. HPM II: EAC 1: Sour Service	Room 5
34. HYDRODYNAMICS YY4: Comparative Study 4	Room 6
35. OCEAN TECHNOLOGY IV: Floating Bridge, Tunnel	Room 7
36. ADVANCED SHIP TECH IV: Ship Hydrodynamics 1	Room 8
37. UNDERWATER IV: CFD	Room 9
10:30	
38. HYDRODYNAMICS V: FSI 1	Room 1
39. SJTU Hydrodynamics Symposium II	Room 2
40. RENEWABLE ENERGY V: Aquaculture System	Room 3
41. SUBSEA, PIPELINES, RISERS I: Pipeline 1	Room 4
42. HPM III: EAC 2: HE, Others	Room 5
43. COASTAL I: Wave, Current Modeling 1	Room 6
44. OCEAN TECHNOLOGY V: VLFS, Hydroelasticity	Room 7
45. ADVANCED SHIP TECH V: Ship Hydrodynamics 2	Room 8
46. UNDERWATER V: Thrusters, Steering	Room 9
13:10	
Prof. Jin S Chung Award and Lecture by Shigeru Naito	Room 1
14:00	
47. HYDRODYNAMICS VI: FSI 2	Room 1
48. SJTU Hydrodynamics Symposium III	Room 2
49. RENEWABLE ENERGY VI: Offshore Wind 1: Support	Room 3
50. SUBSEA, PIPELINES, RISERS II: Pipeline 2	Room 4
51. HPM IV: Asset Integrity 1	Room 5
52. COASTAL II: Wave, Current Modeling 2	Room 6
53. OCEAN TECHNOLOGY VI: Deepwater Installation	Room 7
54. ADVANCED SHIP TECH VI: Maneuvering 1	Room 8
55. UNDERWATER VI: ROV Launch, AUV Rescue	Room 9
16:20	
56. HYDRODYNAMICS VII: FSI 3	Room 1
57. SJTU-NTNU Joint Session	Room 2
58. RENEWABLE ENERGY VII: Panel	Room 3
59. SUBSEA, PIPELINES, RISERS III: Riser 1	Room 4
60. HPM V: Asset Integrity 2	Room 5
61. COASTAL III: Tide, Storm Surge	Room 6
62. OCEAN TECHNOLOGY VII: FPSO	Room 7
63. ADVANCED SHIP TECH VII: Propulsion 1	Room 8
64. ARCTIC I: Arctic Shipping, Logistics	Room 9
15:30 Awards Committee Meeting	3F, 3F
16:30 Journal Editors Meeting	3F, 3F
19:30 ISOPE-2020 Shanghai/ISOPE-2021 Rhodes TPC Meeting	TBA

Find Digital Conference Program Updates in
<http://www.isopec.org/index.php/conferences-symposia-and-workshops/>

WEDNESDAY OCTOBER 14

07:30 Session Chair/Co-chair Briefing	Mandarin Lobby, 1F
08:00	
65. HYDRODYNAMICS VIII: Offshore Mechanics	Room 1
66. HYDRODYNAMICS XV: Wave Mechanics 1	Room 2
67. RENEWABLE ENERGY VIII: Offshore Wind 2: Floating	Room 3
68. SUBSEA, PIPELINES, RISERS IV: Riser 2	Room 4
69. HPM VI: Advances in Materials 1	Room 5
70. COASTAL IV: Waves on Structures	Room 6
71. ADVANCED SHIP TECH XVI: Resistance Performance	Room 7
72. ADVANCED SHIP TECH VIII: Non-traditional Propulsors	Room 8
73. ARCTIC II: Ship Performance in Ice 1	Room 9
10:30	
74. HYDRODYNAMICS IX: Particle Methods	Room 1
75. HYDRODYNAMICS XVI: Wave Mechanics 2	Room 2
76. RENEWABLE ENERGY IX: Offshore Wind 3 - Floating	Room 3
77. SUBSEA, PIPELINES, RISERS V: Riser 3	Room 4
78. HPM VII: Advances in Materials 2	Room 5
79. COASTAL V: Behavior of Structures	Room 6
80. ADVANCED SHIP TECH XVII: Response in Waves	Room 7
81. ADVANCED SHIP TECH IX: Strength & Fatigue	Room 8
82. ARCTIC III: Ship Performance in Ice 2	Room 9
12:00 ISOPE Board of Directors Meeting III	3F, 3E
14:00	
83. HYDRODYNAMICS X: Naval Hydrodynamics 1	Room 1
84. HYDRODYNAMICS XVII: Extreme Waves, DP Control	Room 2
85. RENEWABLE ENERGY X: Offshore Wind 4: Floating	Room 3
86. SUBSEA, PIPELINES, RISERS VI: Riser 4	Room 4
87. MECHANICS, IMPACT, RISK I: Impact, Explosion 1	Room 5
88. COASTAL VI: Floating Breakwater	Room 6
89. ADVANCED SHIP TECH XVIII: Ship Routing Algorithm	Room 7
90. ADVANCED SHIP TECH X: Seakeeping	Room 8
91. ARCTIC IV: Icebreaker Design	Room 9
16:20	
92. HYDRODYNAMICS XI: Naval Hydrodynamics 2	Room 1
93. GEOTECH I: Offshore Foundation 1: Wind Turbines	Room 2
94. RENEWABLE ENERGY XI: Offshore Wind 5: Floating	Room 3
95. SUBSEA, PIPELINES, RISERS VII: Pipeline Analysis	Room 4
96. MECHANICS, IMPACT, RISK II: Impact, Explosion 2	Room 5
97. COASTAL VII: Sediment Transport	Room 6
98. OMGH I: Deep-Ocean Minerals: Exploration, Mining	Room 7
99. ADVANCED SHIP TECH XI: Navigation	Room 8
100. ARCTIC V: Ice Mechanics	Room 9



19:00 **Mandarin Hall, 1F**
The 30th Annual Conference Banquet (not in 2020)
Cultural Event, ISOPE Best Paper, Best Student Paper, Best Organizer(s)
and ISOPE Awards
Don't forget the banquet ticket.

THURSDAY OCTOBER 15

07:30 Session Chair/Co-chair Briefing **Mandarin Lobby, 1F**
08:00

- | | |
|--|--------|
| 101. ADVANCED SHIP TECH XIX: Structures | Room 1 |
| 102. GEOTECH II: Offshore Foundation 2 | Room 2 |
| 103. RENEWABLE ENERGY XII: Offshore Wind 6 | Room 3 |
| 104. SUBSEA, PIPELINES, RISERS VIII: Slurry | Room 4 |
| 105. MECHANICS, IMPACT, RISK III: Buckling, Strength | Room 5 |
| 106. COASTAL VIII: Beach Nourishment | Room 6 |
| 107. OMGH II: DEEP-OCEAN MINING 1: Collector, Lift | Room 7 |
| 108. ADVANCED SHIP TECH XII: Ship Production | Room 8 |
| 109. ARCTIC VI: Ice Loads | Room 9 |

10:30

- | | |
|--|--------|
| 110. HYDRODYNAMICS XXII: Ship Hydrodynamics 1 | Room 1 |
| 111. GEOTECH III: Offshore Foundation 3 | Room 2 |
| 112. RENEWABLE ENERGY XIII: Offshore Wind 7: General | Room 3 |
| 113. SUBSEA, PIPELINES, RISERS IX: Flow Assurance | Room 4 |
| 114. MECHANICS, IMPACT, RISK IV: Risk & Safety 1 | Room 5 |
| 115. COASTAL IX: Coastal Management | Room 6 |
| 116. OMGH III: Gas Hydrates | Room 7 |
| 117. ADVANCED SHIP TECH XIII: Merged to Session 63 | Room 8 |
| 118. ARCTIC VII: Ice Conditions 1 | Room 9 |

12:00 Student Forum: advance reservation required **TBA**

14:00

- | | |
|--|--------|
| 119. HYDRODYNAMICS XIII: Ship Hydrodynamics 2 | Room 1 |
| 120. GEOTECH IV: Offshore Foundation 4 | Room 2 |
| 121. RENEWABLE ENERGY XIV: Offshore Wind 8: | Room 3 |
| 122. SUBSEA, PIPELINES, RISERS X: Pipeline, Scouring | Room 4 |
| 123. MECHANICS, IMPACT, RISK V: Risk & Safety 2 | Room 5 |
| 124. COASTAL X: Coastal Hydrodynamics 1 | Room 6 |
| 125. OMGH IV: Ocean Drilling 1 | Room 7 |
| 126. ADVANCED SHIP TECH XIV: Propulsion 2 | Room 8 |
| 127. ARCTIC VIII: Ice Conditions 2 | Room 9 |

16:20

- | | |
|--|--------|
| 128. HYDRODYNAMICS XIV: Ship Hydrodynamics 3 | Room 1 |
| 129. GEOTECH V: Soil Property & Liquefaction | Room 2 |
| 130. OCEAN TECHNOLOGY VIII: Subsea, Drilling | Room 3 |
| 131. SUBSEA, PIPELINES, RISERS XI: Panel | Room 4 |
| 132. MECHANICS, IMPACT, RISK VI: Structure, Strength | Room 5 |
| 133. COASTAL XI: Coastal Hydrodynamics 2 | Room 6 |
| 134. OMGH V: Ocean Drilling 2 | Room 7 |
| 135. ADVANCED SHIP TECH XV: Propulsion 3; Hybrid | Room 8 |
| 136. ARCTIC IX: Floaters in Ice | Room 9 |

Sunday – Friday	
Author Practice	Individual Session rooms
On-site Registration	Mandarin Lobby, 1F
ISOPE Headquarters	3A, 3F
Proceedings Pickup	Registration Desk, Mandarin Lobby, 1F
Award, Editors Committee Meetings	3F, 3F

Tours: Click <http://www.isopec.org/conferences-symposia-and-workshops/>

FRIDAY OCTOBER 16

TECHNICAL PROGRAM

ISOPE-2020 Shanghai, China The Thirtieth (2020) International Ocean and Polar Engineering Conference Shanghai, China, October 11–16, 2020



This 30th annual conference features **136** technical and opening general sessions, **3** plenary presentation and keynote presentations from top experts from industry, academia and government. After peer review of the manuscripts selected from 1,250+ abstracts, **587** peer-reviewed-papers will be presented and discussed by researchers, engineers and managers from more than **45+** countries. In addition, there are 20+ presentations only w/o papers in the proceedings. The ISOPE-2020 Conference Proceedings with peer-reviewed papers in PDF files will be available in a set of 4 volumes on USB (4,023 pp.) — paginated — during the conference and later for worldwide post-conference order from ISOPE and agents: ISBN 978-1-880653-84-5; ISSN 1098-6189. The number at end of the session title indicates the tentative number of the proceedings volume. Only the changes in titles or authors the Technical Program Committee received in writing before May 30, 2020 are reflected in this program. Final updated data will be reflected in the Conference Proceedings of peer-reviewed papers and the Final Program.

All ISOPE publications are indexed by Engineering Index , EI Compendex, Google Scholar, Scopus, Scientific and Technical Proceedings (ISTP/ISI), Web of Science and others.

FULL CONFERENCE PROGRAM WITH SESSION / PAPER LIST:
Updated at

<http://www.isopec.org/conferences-symposia-and-workshops/>

2020 Jin S Chung Award and Lecture
Tuesday 13:10

1 Plenary and 3 keynote Presentations
Monday, Tuesday, Wednesday, Thursday

SUNDAY, October 11

Welcome Reception
17:00

Pearl Hall, 7F

MONDAY, October 12

Daily Session Chair Briefing
07:30

Mandarin Lobby, 1F

WEDNESDAY, October 14

The 30th Annual ISOPE Conference Banquet
19:00

Mandarin Hall, 1F

FRIDAY, October 16

TOURS and OTHERS.— See Updated Full Program on
<http://www.isopec.org/conferences-symposia-and-workshops/>

ISOPE-2020 Shanghai Conference Secretariat: ISOPE, USA
Local Secretariat : Benlong Wang, Shanghai Jiao Tong University

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**ISOPE-2020 Corporate Members and Sponsors (Janary 5)**  
Additional sponsors on the updated program and online.



#### **International Society of Ocean and Polar Engineers (ISOPE)**

**President** (2018–2020): Sa Young Hong, Korea

**Past President:** HyunWoo Jin, USA

**Executive Director:** Jin S Chung, USA

**Executive Committee:** Jin S Chung, Ronald H Knapp, Wan C Kan, USA,  
Demos Angelides, Greece, President Sa Young Hong, Korea, Past President  
Hyun Woo Jin, USA

*List of ISOPE Officers, Technical Program Committee members and  
Cooperating Organizations are listed on*  
<http://www.isopec.org/conferences-symposia-and-workshops/>.

#### **ISOPE Board of Directors (2018-2020)**

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(Greece), O M Akselsen (Norway), H G Sung (Korea), E J Wright (USA), M  
Wu (USA), I Kubat (Canada)

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(China)

#### **EUROMS Executive Committee**

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#### **ISOPE Cooperating Organizations and ISOPE-2020 Technical Program Committee**

Members are listed in digital version of the program on  
<http://www.isopec.org/conferences-symposia-and-workshops/>.

# ISOPE-2020 Shanghai Conference

## SESSION LIST BY TOPICS



### PLENARY PAPER KEYNOTE PAPERS

#### 15th OCEAN MINING AND GAS HYDRATES SYMPOSIUM (Vol. 1)

|                                   |        |
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| 98. OMGH I: Deep-Ocean Minerals   | Room 7 |
| 107. OMGH II: Deep-Ocean Mining 1 | Room 7 |
| 116. OMGH III: Gas Hydrates       | Room 7 |
| 125. OMGH IV: Ocean Drilling 1    | Room 7 |
| 134. OMGH V: Ocean Drilling 2     | Room 7 |

#### RENEWABLE ENERGY: OFFSHORE WIND AND OCEAN (Vol. 1)

|                                                   |        |
|---------------------------------------------------|--------|
| 4. RENEWABLE ENERGY I: Wave Energy 1              | Room 3 |
| 13. RENEWABLE ENERGY II: Wave Energy 2            | Room 3 |
| 22. RENEWABLE ENERGY III: Tidal, Current Energy 1 | Room 3 |
| 31. RENEWABLE ENERGY IV: Tidal, Current Energy 2  | Room 3 |
| 40. RENEWABLE ENERGY V: Aquaculture System        | Room 3 |
| 49. RENEWABLE ENERGY VI: Offshore Wind 1          | Room 3 |
| 67. RENEWABLE ENERGY VIII: Offshore Wind 2        | Room 3 |
| 76. RENEWABLE ENERGY IX: Offshore Wind 3          | Room 3 |
| 85. RENEWABLE ENERGY X: Offshore Wind 4           | Room 3 |
| 94. RENEWABLE ENERGY XI: Offshore Wind 5          | Room 3 |
| 103. RENEWABLE ENERGY XII: Offshore Wind 6        | Room 3 |
| 112. RENEWABLE ENERGY XIII: Offshore Wind 7       | Room 3 |
| 121. RENEWABLE ENERGY XIV: Offshore Wind 8        | Room 3 |

#### OCEAN, ARCTIC ENVIRONMENT & ECOSYSTEM (Vol. 1)

|                                                   |        |
|---------------------------------------------------|--------|
| 6. ENVIRONMENT I: Ocean Plastics/Debris Pollution | Room 5 |
| 15. ENVIRONMENT II: Water Quality, Oil Spill      | Room 5 |

#### ARTIFICIAL INTELLIGENCE, MACHINE LEARNING, DIGITALIZATION, NEURAL NETWORK (Vol. 1)

|                                    |        |
|------------------------------------|--------|
| 5. DIGITALIZATION AND INTELLIGENCE | Room 4 |
|------------------------------------|--------|

*Note: Many papers on these topics are included in various engineering applications topics in the proceedings.*

#### OFFSHORE MECHANICS, OCEAN TECHNOLOGY (Vol. 1)

PLENARY: Yousheng Wu, CSSRC, Wuxi, China

|                                                    |        |
|----------------------------------------------------|--------|
| 8. OCEAN TECHNOLOGY I: Float-Over Installation 1   | Room 7 |
| 17. OCEAN TECHNOLOGY II: Float-Over Installation 2 | Room 7 |
| 26. OCEAN TECHNOLOGY III: Floating Tunnel          | Room 7 |
| 35. OCEAN TECHNOLOGY IV: Floating Bridge, Tunnel   | Room 7 |

|                                                 |        |
|-------------------------------------------------|--------|
| 44. OCEAN TECHNOLOGY V: VLFS, Hydroelasticity   | Room 7 |
| 53. OCEAN TECHNOLOGY VI: Deepwater Installation | Room 7 |
| 62. OCEAN TECHNOLOGY VII: FPSO                  | Room 7 |
| 130. OCEAN TECHNOLOGY VIII: Subsea, Drilling    | Room 3 |

#### GEOTECHNICAL ENGINEERING (Vol. 2)

|                                              |        |
|----------------------------------------------|--------|
| 93. GEOTECH I: Offshore Foundation 1         | Room 2 |
| 102. GEOTECH II: Offshore Foundation 2       | Room 2 |
| 111. GEOTECH III: Offshore Foundation 3      | Room 2 |
| 120. GEOTECH IV: Offshore Foundation 4       | Room 2 |
| 129. GEOTECH V: Soil Property & Liquefaction | Room 2 |

#### SUBSEA, PIPELINES, RISERS AND UMBILICALS (Vol. 2)

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| 41. SUBSEA, PIPELINES, RISERS I: Pipeline 1          | Room 4 |
| 50. SUBSEA, PIPELINES, RISERS II: Pipeline 2         | Room 4 |
| 59. SUBSEA, PIPELINES, RISERS III: Riser 1           | Room 4 |
| 68. SUBSEA, PIPELINES, RISERS IV: Riser 2            | Room 4 |
| 77. SUBSEA, PIPELINES, RISERS V: Riser 3             | Room 4 |
| 86. SUBSEA, PIPELINES, RISERS VI: Riser 4            | Room 4 |
| 95. SUBSEA, PIPELINES, RISERS VII: Pipeline Analysis | Room 4 |
| 104. SUBSEA, PIPELINES, RISERS VIII: Slurry          | Room 4 |
| 113. SUBSEA, PIPELINES, RISERS IX: Flow Assurance    | Room 4 |
| 122. SUBSEA, PIPELINES, RISERS X: Pipeline, Scouring | Room 4 |
| 131. SUBSEA, PIPELINES, RISERS XI: Panel             | Room 4 |

#### UNDERWATER TECHNOLOGY (Vol. 2)

|                                                      |        |
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| 10. UNDERWATER I: Sensing, Path Planning, Control 1  | Room 9 |
| 19. UNDERWATER II: Sensing, Path Planning, Control 2 | Room 9 |
| 28. UNDERWATER III: Design, Application              | Room 9 |
| 37. UNDERWATER IV: CFD                               | Room 9 |
| 46. UNDERWATER V: Thrusters, Steering                | Room 9 |
| 55. UNDERWATER VI: ROV Launch, AUV Rescue            | Room 9 |

#### ARCTIC SCIENCE & TECHNOLOGY (Vol. 1)

|                                           |        |
|-------------------------------------------|--------|
| 64. ARCTIC I: Arctic Shipping, Logistics  | Room 9 |
| 73. ARCTIC II: Ship Performance in Ice 1  | Room 9 |
| 82. ARCTIC III: Ship Performance in Ice 2 | Room 9 |
| 91. ARCTIC IV: Icebreaker Design          | Room 9 |
| 100. ARCTIC V: Ice Mechanics              | Room 9 |
| 109. ARCTIC VI: Ice Loads                 | Room 9 |
| 118. ARCTIC VII: Ice Conditions 1         | Room 9 |
| 127. ARCTIC VIII: Ice Conditions 2        | Room 9 |
| 136. ARCTIC IX: Floaters in Ice           | Room 9 |

#### HYDRODYNAMICS (Vol. 3)

|                                |        |
|--------------------------------|--------|
| 2. HYDRODYNAMICS I: Issue 1    | Room 1 |
| 11. HYDRODYNAMICS II: Issue 2  | Room 1 |
| 20. HYDRODYNAMICS III: Issue 3 | Room 1 |
| 29. HYDRODYNAMICS IV: Issue 4  | Room 1 |
| 38. HYDRODYNAMICS V: FSI 1     | Room 1 |

|                                                   |        |
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# TECHNICAL PROGRAM

## ISOPE–2020 Conference

*The 30th Annual ISOPE–2020 Conference, Shanghai, China, October 11–16* (originally June 16–21)  
at Shanghai International Convention Center (SHICC)



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### Forthcoming ISOPE Meetings

14th ISOPE PACOMS-2020 (Pacific Asia Offshore Mechanics Symposium), Dalian, China, November 22-25, 2020

31st Annual ISOPE-2021 Conference, Rhodes (Rodos), Greece, June 20-25, 2021 *Online/Virtual Presentation*

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