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June 10–15, Sapporo, Japan

The Twenty-eighth (2018) International  
**Ocean and Polar  
Engineering Conference**  
(Offshore and Polar Engineering Conference)

*Including additional ISOPE symposia:*

1st Environment-Assisted Cracking  
3rd Underwater Technology  
7th Tsunami & Safety  
8th Asset Integrity  
9th Arctic Science & Technology  
8th Arctic & Cryogenic Materials  
9th Renewable Energy & Environment  
10th Sloshing Dynamics & Design  
LNG Membrane, Processing, Bunkering  
13th Ocean Mining & Gas Hydrates Symposium  
16th High-Performance Materials

**ISOPE-2018**

Sapporo, Japan, June 10-15

(June 1)

*Updated  
Technical Program*

Peer-reviewed papers from 50+ countries in 151 technical sessions. 3 Plenary and 6 keynote and multiple focus sessions  
Full Program with General Information, Advance Registration and Venue Hotel. Paper List, Reservations, and Updates on

<http://www.isopec.org/conferences/conferences.htm>

ISOPE-2018 Conference proceedings

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<http://www.isopec.org/publications/publications.htm>

*Organized by:*

Technical Program Committee, ISOPE

*Sponsored by:*

International Society of Offshore and Polar Engineers (ISOPE)  
With cooperating organizations (listed inside)

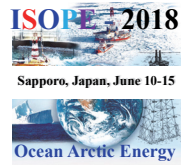


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## ISOPE-2018 Sapporo

The 28th Annual International Ocean and Polar Engineering Conference, Sapporo, Japan, June 10-15, 2018

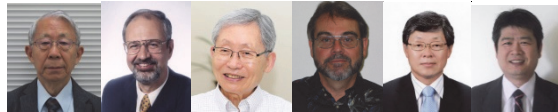


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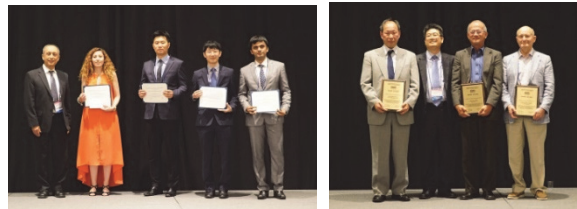


### ISOPE-2018 Conference Co-chair

Hiroimitsu Kitagawa, Demos Angelides, Greece; Jin S Chung, USA; Ronald Knapp, USA; Seok Won Hong, Korea; HW Jin (USA);



Kitagawa Angelides Chung Knapp Hong Jin



Presentations at ISOPE-2017 San Francisco Banquet  
**Awards:** Scholarships, ISOPE Board, Jin S Chung Award, Best Paper, Best Student Paper, 2016 Best Papers, 2017 Best Student Paper

## Welcome to the ISOPE-2018 Conference

We greatly appreciate the excellent response, with **1300+** abstracts, and help we have received from colleagues around the world in the successful organization of the 28th International Ocean and Polar Engineering Conference (**ISOPE-2018**), Sapporo, Japan, June 10–15, 2018. The Conference features **151** sessions of peer-reviewed papers and 9 plenary and keynote presentations from more than **50+** countries, including the ISOPE specialty symposia as a part of the ISOPE-2018 Conference.

The conference program is issued in 2 versions: Session time and rooms printed and full conference program online ([www.isopec.org](http://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 58 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, Australia, 2016 .
- **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, Rhodes, Anchorage, Busan and Hawaii Kona, Rhodes, San Francisco. Since 1992, the annual ISOPE conference program has been the world's largest of its kind with peer-reviewed papers.
- 1st (1995) ISOPE Ocean Mining & Gas Hydrates Symposium (**OMS-95; OMGH**), Tsukuba, 1995; Seoul; Goa; Szczecin; Tsukuba; Changsha; Lisbon; Chennai, Szczecin; Kona Hawaii, Sapporo, 2018.
- 1st (1996) International Deep-Ocean Technology (**IDOT-96**) Symposium and Workshop, 1996 Los Angeles 1996; Stavanger, 2001; Beijing 2009.
- **ISOPE HPM (High-Performance Materials) Symposium**: Started in Honolulu 2003 and expanded every year with emerging topics.
- **ISOPE Series of specialty symposia**: **ANGT**: Strain-Based Design SBD; Nanotechnology NANOS; Frontier Energy; Sloshing & Dynamics; Renewable Energy/Environment; Tsunami; Arctic Sci & Tech; Arctic Materials; Asset Integrity; High-Mn/Cryogenic Materials; Materials Reliability.

On behalf of the Technical Program Committee, it is our pleasure to welcome participants from all over the world to the ISOPE-2019 Conference in beautiful Honolulu, Hawaii, USA.

Hiroimitsu Kitagawa Japan	Demos Angelides Greece	Jin S Chung, USA
Ronald H Knapp USA	Seok-Won Hong Korea	Hyun Woo Jin USA

Co-chairs of the ISOPE-2018 Conference

**SUNDAY JUNE 10**

09:00 ISOPE Board of Directors Meeting	Crystal D, 2F
10:30 ISOPE Executive Committee Meeting EUROMS and PACOMS Executive Committees	Crystal D, 2F
15:00-18:00 <b>CONFERENCE REGISTRATION</b>	Foyer, 3F
17:00-18:00 <b>WELCOME RECEPTION</b>	Royton Hall, 3F

Tour Information **Visit tour desk in Foyer or [www.isopec.org](http://www.isopec.org)**

**MONDAY JUNE 11**

<b>On-Site Registration</b> starts at 07:30	Foyer, 3F
<b>07:30 Session Chair/Co-chair Briefing</b>	Foyer, 3F
<b>08:30 Conference Opening</b>	Royton Hall, 3F
<b>08:30</b> <b>1. OCEAN, ARCTIC, ENERGY: REVIEW (2018)</b>	Royton Hall, 3F
<b>10:30</b> <b>2. HYDRO I: Comparative Study</b>	Royton D, 3F
<b>3. SLOSHING I: Physics</b>	Empress, 2F
<b>4. RENEWABLE I: Support Structures</b>	Regent, 2F
<b>5. VORTEX-INDUCED VIBRATIONS I</b>	Highness, 2F
<b>6. ASSET INTEGRITY I: Fracture, Fatigue Mgmt</b>	Crystal A, 2F
<b>7. ENVIRONMENT I: Environ Monitorg, Red Tide</b>	Crystal B, 2F
<b>8. OCEAN TECH I: Floatover Installation 1</b>	Crystal C, 2F
<b>9. MECHANICS, IMPACT, SAFETY I: Mechanics 1</b>	Emerald A, 3F
<b>10. GEOTECH I: Suction Piles</b>	Emerald B, 3F
<b>11. UNDERWATER TECH I: Sensors, Observation</b>	Emerald C, 3F
<b>13:10</b> <b>Keynote Sea Ice Research .....(Ed Ross)</b>	Highness
<b>Keynote Wind Turbine Structure ..... (L B Kramer)</b>	Emerald C
<b>Keynote Hydrogen Trapping ..... (Kenichi Takai)</b>	Regent, 3F Crystal A
<b>14:00</b> <b>12. HYDRO II: Impact, Hydroelasticity 1</b>	Royton D
<b>13. SLOSHING II: Experiments</b>	Empress
<b>14. RENEWABLE II: Foundations</b>	Regent
<b>15. VORTEX-INDUCED VIBRATIONS II</b>	Highness
<b>16. ASSET INTEGRITY II: Corrosion Management</b>	Crystal A
<b>17. ENVIRONMENT II: CO<sub>2</sub> Emission, Water Quality</b>	Crystal B
<b>18. OCEAN TECH II: Floatover Installation 2</b>	Crystal C
<b>19. MECHANICS, IMPACT, SAFETY II: Mechanics 2</b>	Emerald A
<b>20. GEOTECH II: Foundation 1</b>	Emerald B
<b>21. UNDERWATER TECH II: Acoustics, Communication</b>	Emerald C
<b>16:20</b> <b>22. HYDRO III: Impact, Hydroelasticity 2</b>	Royton D
<b>23. SLOSHING III: Sloshing-Structure Interactions</b>	Empress
<b>24. RENEWABLE III: Floating, Substructures</b>	Regent
<b>25. VORTEX-INDUCED VIBRATIONS III</b>	Highness
<b>26. HPM I: Advanced Materials 1</b>	Crystal A
<b>27. COASTAL I: Wave Mechanics 1</b>	Crystal B
<b>28. OCEAN TECH III: Floatover Installation 3</b>	Crystal C
<b>29. MECHANICS, IMPACT, SAFETY III: Explosion</b>	Emerald A
<b>30. GEOTECH III: Foundation 2</b>	Emerald B
<b>31. UNDERWATER TECH III: ROV</b>	Emerald C
<b>18:30 ISOPE Technical Committee Meetings:</b>	<b>Notice on bulletin board</b>
<b>New members are welcome.</b>	

**TUESDAY JUNE 12**

<b>07:30 Session Chair/Co-chair Briefing</b>	Foyer, 3F
<b>08:00</b>	
<b>32. HYDRO IV: Ship Added Resistance</b>	Royton D, 3F
<b>33. SLOSHING IV: Assessment</b>	Empress, 2F
<b>34. RENEWABLE IV: Aerodynamics</b>	Regent, 2F
<b>35. VORTEX-INDUCED VIBRATIONS IV</b>	Highness, 2F
<b>36. HPM II: Advanced Materials 2</b>	Crystal A, 2F
<b>37. COASTAL II: Wave Mechanics 2</b>	Crystal B, 2F
<b>38. OCEAN TECH IV: Subsea Systems</b>	Crystal C, 2F
<b>39. MECHANICS, IMPACT, SAFETY IV: Safety</b>	Emerald A, 3F
<b>40. GEOTECH IV: Spudcan, Pipeline</b>	Emerald B, 3F
<b>41. UNDERWATER TECH IV: AUV Design</b>	Emerald C, 3F
<b>10:30</b>	
<b>42. HYDRO V: Ship Drag Reduction</b>	Royton D
<b>43. SLOSHING V: Sloshing Mitigation</b>	Empress
<b>44. RENEWABLE V: Offshore Wind Simulations</b>	Regent
<b>45. SUBSEA, PIPELINES, RISERS I: Flexibles, Umbilicals</b>	Highness
<b>46. HPM III: Composite Materials</b>	Crystal A
<b>47. COASTAL III: Storm Surge</b>	Crystal B
<b>48. OCEAN TECH V: LNG Process, Bunkering 1</b>	Crystal C
<b>49. MECHANICS, IMPACT, SAFETY V: Impact 1</b>	Emerald A
<b>50. GEOTECH V: Computational Modeling</b>	Emerald B
<b>51. UNDERWATER TECH V: AUV Control</b>	Emerald C
<b>13:10</b>	
<b>Prof. Jin S Chung Award and Lecture (O T Gudmestad)</b>	<b>Royton D</b>
<b>14:00</b>	
<b>52. HYDRO VI: Ship Seakeeping</b>	Royton D
<b>53. ARCTIC I: Ice Cover Mechanics</b>	Empress
<b>54. RENEWABLE VI: Wind Turbine 1</b>	Regent
<b>55. SUBSEA, PIPELINES, RISERS II: Riser Design 1</b>	Highness
<b>56. HPM IV: Fatigue, Fracture</b>	Crystal A
<b>57. COASTAL IV: Structures 1</b>	Crystal B
<b>58. OCEAN TECH VI: LNG Process, Bunkering 2</b>	Crystal C
<b>59. MECHANICS, IMPACT, SAFETY VI: Impact 2</b>	Emerald A
<b>60. GEOTECH VI: Geohazards, Liquefaction</b>	Emerald B
<b>61. UNDERWATER TECH VI: Robotics, Propulsion</b>	Emerald C
<b>16:20</b>	
<b>62. HYDRO VII: Loads, Responses 1</b>	Royton D
<b>63. TSUNAMI I</b>	Empress
<b>64. RENEWABLE VII: Wind Turbine 2</b>	Regent
<b>65. SUBSEA, PIPELINES, RISERS III: Riser Design 2</b>	Highness
<b>66. HPM V: Shipbuilding Steels</b>	Crystal A
<b>67. COASTAL V: Structures 2</b>	Crystal B
<b>68. OCEAN TECH VII: VLFS, TLP, TRUSS</b>	Crystal C
<b>69. ADVANCED SHIP TECH I: Ultimate Strength</b>	Emerald A
<b>70. GEOTECH VII: Soil Property, Mechanics 1</b>	Emerald B
<b>71. ARCTIC II: Arctic Ship Design</b>	Emerald C
<b>15:30 Awards Committee Meeting</b>	Crystal D, 2F
<b>16:30 Board of Editors Meeting</b>	Crystal D, 2F
<b>19:00 ISOPE-2018 Student Get-together</b>	<b>TBA</b>
<b>19:30 ISOPE-2018 Sapporo/2019 Honolulu TPC Meeting</b>	<b>TBA</b>

Find Digital Conference Program Updates in  
<http://www.isope.org/conferences/conferences.htm>

**WEDNESDAY JUNE 13**

<b>07:30</b>	<b>Session Chair/Co-chair Briefing</b>	Foyer, 3F
<b>08:00</b>		
72.	<b>HYDRO VIII: Loads, Responses 2</b>	Royton D, 3F
73.	<b>TSUNAMI II</b>	Empress, 2F
74.	<b>RENEWABLE VIII: Wind Installations</b>	Regent, 2F
75.	<b>SUBSEA, PIPELINES, RISERS IV: Flow Assuran</b>	Highness, 2F
76.	<b>HPM VI: Offshore Structures</b>	Crystal A, 2F
77.	<b>COASTAL VI: Structures 3</b>	Crystal B, 2F
78.	<b>OCEAN TECH VIII: Floating Dynamics</b>	Crystal C, 2F
79.	<b>ADVANCED SHIP TECH II: Hull Optimization</b>	Emerald A, 3F
80.	<b>IOR, Energy Storage</b>	Emerald B, 3F
81.	<b>ARCTIC III: Navigation in Ice</b>	Emerald C, 3F
<b>10:30</b>		
82.	<b>HYDRO IX: Rolling, Multi Body</b>	Royton D
83.	<b>TSUNAMI III</b>	Empress
84.	<b>RENEWABLE IX: Wave Energy 1</b>	Regent
85.	<b>SUBSEA, PIPELINES, RISERS V: Pipeline 1</b>	Highness
86.	<b>HPM VII: Advances in Welding</b>	Crystal A
87.	<b>COASTAL VII: Sediment Transport/Coastal Erosion 1</b>	Crystal B
88.	<b>OCEAN TECH IX: Mooring Dynamics</b>	Crystal C
89.	<b>ADVANCED SHIP TECH III: Navigation, Control 1</b>	Emerald A
90.	<b>OMGH I: DEEP OCEAN MINING 1:Mineral, Environ 1</b>	Emerald B
91.	<b>ARCTIC IV: Ice Structure Interaction</b>	Emerald C
<b>12:00</b>	<b>ISOPE Board of Directors Meeting III</b>	Crystal D, 3F
<b>13:10</b>		
	<b>Keynote: Large-Scale Plant in the Arctic... (S Abe)</b>	Emerald C
<b>14:00</b>		
92.	<b>TSUNAMI IV: Panel</b>	Royton D
93.	<b>HYDRO X: MetOcean 1</b>	Empress
94.	<b>RENEWABLE X: Wave Energy 2</b>	Regent
95.	<b>SUBSEA, PIPELINES, RISERS VI: Pipeline 2</b>	Highness
96.	<b>ENVIRON-ASSISTED CRACKING I: Sour Service</b>	Crystal A
97.	<b>COASTAL VIII: Sediment Transport/Coastal Erosi2</b>	Crystal B
98.	<b>OCEAN TECH X: FPSO</b>	Crystal C
99.	<b>ADVANCED SHIP TECH IV: Navigation, Control 2</b>	Emerald A
100.	<b>OMGH II: DEEP OCEAN MINING 2:Mineral, Env 2</b>	Emerald B
101.	<b>ARCTIC V: Arctic Environment</b>	Emerald C
<b>16:20</b>		
102.	<b>HYDRO XI: Comparative Study Panel</b>	Royton D
103.	<b>HYDRO XVI: Wave Mechanics 3</b>	Empress
104.	<b>RENEWABLE XI: Wave Energy 3</b>	Regent
105.	<b>SUBSEA, PIPELINES, RISERS VII: Pipeline 3</b>	Highness
106.	<b>ENVIRON-ASSISTED CRACKING II: Hydrogen...</b>	Crystal A
107.	<b>COASTAL IX: Sediment Transport/Coastal Erosi 3</b>	Crystal B
108.	<b>OCEAN TECH XI: Jackup &amp; Installation</b>	Crystal C
109.	<b>ADVANCED SHIP TECH V: Powering 1</b>	Emerald A
110.	<b>OMGH III: DEEP OCEAN MINING 3 – Systems 1</b>	Emerald B
111.	<b>ARCTIC VI: Ice Management, Station-keeping</b>	Emerald C



<b>19:00</b>	<b>The 28th Annual Conference Banquet</b>	<b>Royton Hall</b>
<b>Cultural Event, ISOPE Best Paper, Best Student Paper, Outstanding Student Scholarships, Best Organizer(s) and ISOPE Awards</b> <i>Don't forget the banquet ticket.</i>		

**THURSDAY JUNE 14**

<b>07:30</b>	Session Chair/Co-chair Briefing	Foyer, 3F
<b>08:00</b>		
112.	HYDRO XII: MetOcean 2	Royton D, 3F
113.	HYDRO XVII: CFD 1-Applications	Empress, 2F
114.	RENEWABLE XII: Wave Energy 4	Regent, 2F
115.	SUBSEA, PIPELINES, RISERS VIII: Pipeline 4	Highness, 2F
116.	ENVIRON-ASSISTED CRACKING III: Hydro	Crystal A, 2F
117.	COASTAL X: Reef Islands	Crystal B, 2F
118.	OCEAN TECH XII: Offshore, Aquaculture	Crystal C, 2F
119.	ADVANCED SHIP TECH VI: Powering 2	Emerald A, 3F
120.	OMGH IV: DEEP OCEAN MINING 4 – Syst 2	Emerald B, 3F
121.	ARCTIC VII: Safety in Operations	Emerald C, 3F
<b>10:30</b>		
122.	HYDRO XIII: Nonlinear Wave	Royton D
123.	HYDRO XVIII: CFD 2-FSI/WSI 1	Empress
124.	RENEWABLE XIII: Resources	Regent
125.	OMGH V: GAS HYDRATES 1: Fundamental	Highness
126.	HPM VIII: Arctic, Cryogenic Materials	Crystal A
127.	COASTAL XI: Ships & Harbors	Crystal B
128.	OCEAN TECH XIV: CCP-WSI Blind Tests 1	Crystal C
129.	ADVANCED SHIP TECH VII: Powering 3	Emerald A
130.	GEOTECH VIII: Soil Property, Mechanics 2	Emerald B
131.	ARCTIC VIII: Ice Loads on Ships	Emerald C
<b>12:00</b>	Student Forum: adv. reservation required.	Crystal D, 2F
<b>13:10</b>		
	Keynote: Methane Hydrates MH21 (Y Masuda)	Highness
	<del>Keynote: Renewable Energy – Russian Arctic (Cancelled)</del>	<del>Regent</del>
<b>14:00</b>		
132.	HYDRO XIV: Wave Mechanics 1	Royton D
133.	HYDRO XIX: CFD 3-FSI/WSI 2	Empress
134.	RENEWABLE XIV: Hybrid, Thermal Systems	Regent
135.	OMGH VI: GAS HYDRATES 2: Production Funda.	Highness
136.	HPM IX: Developments in Materials Panel	Crystal A
137.	COASTAL XII: Coastal Management 1	Crystal B
138.	OCEAN TECH XV: CCP-WSI Blind Tests 2	Crystal C
139.	OCEAN TECH XIII: Structural Health, Monitoring	Emerald A
140.	GEOTECH IX: Ground Improvement, Soft Soil	Emerald B
141.	ARCTIC IX: Arctic Monitoring	Emerald C
<b>16:20</b>		
142.	HYDRO XV: Wave Mechanics 2	Royton D
143.	HYDRO XX: CFD Panel	Empress
144.	RENEWABLE XV: Tidal, Current Energy	Regent
145.	OMGH VII: GAS HYDRATES 3 - CO <sub>2</sub> Storage	Highness
146.	UNDERWATER TECH VII: Panel	Crystal A
147.	COASTAL XIII: Coastal Management 2	Crystal B
148.	OCEAN TECH XVI: CCP-WSI Blind Tests 3	Crystal C
149.	ADVANCED SHIP TECH VIII: Ship Production	Emerald A
150.	GEOTECH X: Panel	Emerald B
151.	ARCTIC X: Panel	Emerald C



<b>Sunday – Friday</b>	
Author Practice On-site Registration ISOPE Headquarters Proceedings Pickup Award, Editors Committee Meetings	Individual session rooms Foyer, 3F Emerald, 2F Registration Desk, Foyer, 3F Crystal D, 3F

Tours: Click on General Information  
<http://www.isope.org/conferences/conferences.htm>

# TECHNICAL PROGRAM

## ISOPE-2018 Sapporo, Japan The Twenty-eighth (2018) International Ocean and Polar Engineering Conference Sapporo, Japan, June 10–15, 2018



This 28th annual conference features **151** technical and opening general sessions, **9** plenary presentation and keynote presentations from top experts from industry, academia and government. After peer review of the manuscripts selected from **1,450+** abstracts, **746** peer-reviewed-papers will be presented and discussed by researchers, engineers and managers from more than **50+** countries. The ISOPE-2018 Conference Proceedings with peer-reviewed papers in PDF files will be available in a set of 4 volumes on **USB** (5,094 pp.) – paginated– during the conference and later for worldwide post-conference order from ISOPE: ISBN 978-1-880653-87-6; 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 **April 26, 2018** are reflected in this program. Final corrections will be updated 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.isope.org/conferences/conferences.htm>

<http://www.isope.org/publications/publications.htm>

2018 Jin S Chung Award Lecture

Tuesday 13:10

**3 Plenary and 6 keynote Presentations**  
Monday, Tuesday, Wednesday, Thursday

### SATURDAY, June 9

**Board of Directors: Annual Meeting I**

16:00

BANRI

### SUNDAY, June 10

**Board of Directors: Annual Meeting II**

09:00

Crystal D, 3F

**Welcome Reception**

17:00

Royton Hall, 3F

### MONDAY, June 11

**Monday Session Chair Briefing**

07:30

Foyer, 3F

**Conference Opening Ceremony**

08:30

Royton Hall, 3F

**Opening Plenary Presentations**



**Plenary 1**  
**Global Energy Outlook and Its Implications**  
Jeffrey M. Grenda,, ExxonMobil Research & Engineering, USA

**Plenary 2**  
**Floatover Installation Technology in South China Sea**  
Xiaojian Jin, CNOOC-COOEC, China Offshore Oil Engineering, China

**13:10 Keynote**  
**Sea Ice Research: Recent Findings and Outstanding Issues in Relation to Arctic Development**  
David Fissel, Ed Ross, ASL Environmental Sciences, Inc, Canada

**13:10 Keynote**  
**Status & Outlook for Offshore Bottom Fixed Wind Turbine Support Structures**  
Laurent-Baudoin Kramer, OWEC Tower AS, Norway

**13:10...Keynote**  
**Hydrogen Trapping Sites and Hydrogen Embrittlement of Iron and Steels**  
{Oral presentation}  
Kenichi Takai, Sophia Univ, Japan

**Select Focus Sessions**  
Float-over Installation , South China Sea  
Hydrodynamics Comparative Study  
LNG, LNG Bunkering, LNG Storage and FLNG  
Sloshing in LNG, Aerospace and Hydrogen Car Industries,  
Vortex-Induced Vibrations

**ISOPE Technical Committee Meetings**  
18:30 Notice on bulletin board

## **TUESDAY, June 12**

**Tuesday Session Chair Briefing**  
07:30 Foyer, 3F

13:10 **Prof. Jin S. Chung Award and Lecture: 2018**  
**Technological Challenges Related to Sustainable Use of the Arctic Seas**  
Prof. Ove T Gudmestad, Univ of Stavanger, Norway

**Select Focus Sessions**  
LNG, LNG Bunkering and Storage  
DP Floatover Design, Floatover Installation  
AUV, Robotics

15:30 Crystal D, 3F  
**Awards Committee Meeting**  
16:30 Crystal D, 3F  
**Board of Editors: IJOPE**  
19:30 TBA  
**ISOPE-2018/2019 TPC Meeting**  
**18:30 tentative time** TBA  
**Student Get-together: Time**

## **WEDNESDAY, June 13**

**Wednesday Session Chair Briefing**  
07:30 Foyer, 3F

**13:10 Keynote**  
**A Large-Scale Plant Construction and Transportation in the Arctic Region**  
Shigeru Abe, JGC Corporation, Japan

**Select Focus Sessions**

FLNG Dynamics, Hydroelasticity, Added Resistance  
Environment Assisted Crack  
Deep Ocean Mining

**The 28th Annual ISOPE Conference Banquet**

19:00 Royton Hall, 3F

**THURSDAY, June 14**

**Thursday Session Chair Briefing**

07:30 Foyer, 3F

**12:00 Student Forum**

**13:10 Keynote**

**Recent Status of Methane Hydrate R&D Program in Japan**  
Yoshihiro Masuda, Univ of Tokyo, Japan

**13:10 Keynote (Cancelled)**

~~**The Prospects for Large scale Use of Resources Renewable Energy in the Russian Arctic**~~  
V I Pavlenko, S Yu Kutsenko, Russian Academy of Sciences, Russia

**Select Focus Sessions**

Gas Hydrates, CCP  
Floatover Installation, Lingshui 17-2 Deepwater Development  
CCP Blind Tests, Comparative Study  
13th ISOPE Student Forum 12:00 Requires advance reservation.

**FRIDAY, June 15**

**TOURS and OTHERS.** See Updated Full Program on  
<http://www.isopec.org/conferences/conferences.htm> : Advance  
reservation required.

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

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# TECHNICAL PROGRAM

## ISOPE-2018 Sapporo Conference

Venue: Royton Sapporo Hotel  
Sapporo, Japan ; June 10–15



### SESSION LIST BY TOPICS



**1. OCEAN, ARCTIC, ENERGY: REVIEW** Royton Hall, 3F  
(Oral Presentations Only)

#### IOR AND ENERGY STORAGE (Vol. 1)

**80. IOR, Energy Storage** Emerald B

#### 13th OCEAN MINING AND GAS HYDRATES SYMPOSIUM (Vol. 1)

**90. OMGH I: DEEP OCEAN MINING 1: Mineral, Envir 1** Emerald B, 3F  
**100. OMGH II: DEEP OCEAN MINING 2 - Mineral, Enviro 2** Emerald B  
**110. OMGH III: DEEP OCEAN MINING 3 – Systems, Tech 1** Emerald B  
**120. OMGH IV: DEEP OCEAN MINING 4 – Systems, Tech 2** Emerald B  
**125. OMGH V: GAS HYDRATES 1: Fundamental** Highness, 2F  
**135. OMGH VI: GAS HYDRATES 2: Production Fundame....** Highness  
**145. OMGH VII: GAS HYDRATES 3 - CO<sub>2</sub> Storage** Highness

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

**4. RENEWABLE I: Support Structures** Regent, 2F  
**14. RENEWABLE II: Foundations** Regent  
**24. RENEWABLE III: Floating, Substructures** Regent  
**34. RENEWABLE IV: Aerodynamics** Regent  
**44. RENEWABLE V: Offshore Wind Simulations** Regent  
**54. RENEWABLE VI: Wind Turbine 1** Regent  
**64. RENEWABLE VII: Wind Turbine 2** Regent  
**74. RENEWABLE VIII: Wind Installations** Regent  
**84. RENEWABLE IX: Wave Energy 2** Regent  
**94. RENEWABLE X: Wave Energy 2** Regent  
**104. RENEWABLE XI: Wave Energy 3** Regent  
**114. RENEWABLE XII: Wave Energy 4** Regent  
**124. RENEWABLE XIII: Resources** Regent  
**134. RENEWABLE XIV: Hybrid, Thermal Systems** Regent  
**144. RENEWABLE XV: Tidal, Current Energy** Regent

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

**7. ENVIRONMENT I: Environ Monitoring, Red Tide** Crystal B, 2F  
**17. ENVIRONMENT II: CO<sub>2</sub> Emission, Water Quality** Crystal B

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

**8. OCEAN TECH I: Floatover Installation 1** Crystal C, 2F  
**18. OCEAN TECH II: Floatover Installation 2** Crystal C  
**28. OCEAN TECH III: Floatover Installation 3** Crystal C  
**38. OCEAN TECH IV: Subsea Systems** Crystal C

48. OCEAN TECH V: LNG Process, Bunkering 1	Crystal C
58. OCEAN TECH VI: LNG Process, Bunkering 2	Crystal C
68. OCEAN TECH VII: VLFS, TLP, TRUSS	Crystal C
78. OCEAN TECH VIII: Floating Dynamics	Crystal C
88. OCEAN TECH IX: Mooring Dynamics	Crystal C
98. OCEAN TECH X: FPSO	Crystal C
108. OCEAN TECH XI: Jackup & Installation	Crystal C
118. OCEAN TECH XII: Offshore, Aquaculture	Crystal C
139. OCEAN TECH XIII: Structural Health, Monit	Emerald A, 3F
128. OCEAN TECH XIV: CCP-WSI Blind Tests 1	Crystal C
138. OCEAN TECH XV: CCP-WSI Blind Tests 2	Crystal C
148. OCEAN TECH XVI: CCP-WSI Blind Tests 3	Crystal C

#### UNDERWATER TECHNOLOGY (Vol 1)

11. UNDERWATER TECH I: Sensors, Observation	Emerald C, 3F
21. UNDERWATER TECH II: Acoustics, Communication	Emerald C
31. UNDERWATER TECH III: ROV	Emerald C
41. UNDERWATER TECH IV: AUV Design	Emerald C
51. UNDERWATER TECH V: AUV Control	Emerald C
61. UNDERWATER TECH VI: Robotics, Propulsion	Emerald C
146. UNDERWATER TECH VII: Panel	Crystal A, 2F

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

53. ARCTIC I: Ice Cover Mechanics	Empress, 2F
71. ARCTIC II: Arctic Ship Design	Emerald C, 3F
81. ARCTIC III: Navigation in Ice	Emerald C
91. ARCTIC IV: Ice Structure Interaction	Emerald C
101. ARCTIC V: Arctic Environment	Emerald C
111. ARCTIC VI: Ice Management, Stationkeeping	Emerald C
121. ARCTIC VII: Safety in Operations	Emerald C
131. ARCTIC VIII: Ice Loads on Ships	Emerald C
141. ARCTIC IX: Arctic Monitoring	Emerald C
151. ARCTIC X: Panel	Emerald C

#### GEOTECHNICAL ENGINEERING (VOL. 2)

10. GEOTECH I: Suction Piles	Emerald B, 3F
20. GEOTECH II: Foundation 1	Emerald B
30. GEOTECH III: Foundation 2	Emerald B
40. GEOTECH IV: Spudcan, Pipeline	Emerald B
50. GEOTECH V: Computational Modeling	Emerald B
60. GEOTECH VI: Geohazards, Liquefaction	Emerald B
70. GEOTECH VII: Soil Property, Mechanics 1	Emerald B
130. GEOTECH VIII: Soil Property, Mechanics 2	Emerald B
140. GEOTECH IX: Ground Improvement, Soft Soil	Emerald B
150. GEOTECH X: Panel	Emerald B

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

45. SUBSEA, PIPELINES, RISERS I: Flexibles, Umbilicals	Highness, 2F
55. SUBSEA, PIPELINES, RISERS II: Riser Design 1	Highness
65. SUBSEA, PIPELINES, RISERS III: Riser Design 2	Highness
75. SUBSEA, PIPELINES, RISERS IV: Flow Assurance	Highness
85. SUBSEA, PIPELINES, RISERS V: Pipeline 1	Highness
95. SUBSEA, PIPELINES, RISERS VI: Pipeline 2	Highness
105. SUBSEA, PIPELINES, RISERS VII: Pipeline 3	Highness
115. SUBSEA, PIPELINES, RISERS VIII: Pipeline 4	Highness

#### HYDRODYNAMICS (Vol. 3)

2. HYDRO I: Comparative Study	Royton D, 3F
12. HYDRO II: Impact, Hydroelasticity 1	Royton D
22. HYDRO III: Impact, Hydroelasticity 2	Royton D
32. HYDRO IV: Ship Added Resistance	Royton D

42. HYDRO V: Ship Drag Reduction	Royton D
52. HYDRO VI: Ship Seakeeping	Royton D
62. HYDRO VII: Loads, Responses 1	Royton D
72. HYDRO VIII: Loads, Responses 2	Royton D
82. HYDRO IX: Rolling, Multi Body	Royton D
93. HYDRO X: MetOcean 1	Empress, 2F
102. HYDRO XI: Comparative Study Panel	Royton D
112. HYDRO XII: MetOcean 2	Royton D
122. HYDRO XIII: Nonlinear Wave	Royton D
132. HYDRO XIV: Wave Mechanics 1	Royton D
142. HYDRO XV: Wave Mechanics 2	Royton D
103. HYDRO XVI: Wave Mechanics 3	Empress
113. HYDRO XVII: CFD 1-Applications	Empress
123. HYDRO XVIII: CFD 2-FSI/WSI 1	Empress
133. HYDRO XIX: CFD 3-FSI/WSI 2	Empress
143. HYDRO XVI: CFD Panel	Empress
128. OCEAN TECH XIV: CCP-WSI Blind Tests 1	Crystal C, 2F
138. OCEAN TECH XV: CCP-WSI Blind Tests 2	Crystal C
148. OCEAN TECH XVI: CCP-WSI Blind Tests 3	Crystal C

#### TSUNAMI AND SAFETY SYMPOSIUM (Vol. 3)

63. TSUNAMI I	Empress, 2F
73. TSUNAMI II	Empress
83. TSUNAMI III	Empress
92. TSUNAMI IV: Panel	Royton D, 3F

#### LNG SLOSHING DYNAMICS AND DESIGN (Vol. 3)

3. SLOSHING I: Physics	Empress, 2F
13. SLOSHING II: Experiments	Empress
23. SLOSHING III: Sloshing-Structure Interactions	Empress
33. SLOSHING IV: Assessment	Empress
43. SLOSHING V: Sloshing Mitigation	Empress

#### VORTEX-INDUCED VIBRATIONS: VIV (Vol. 3)

5. VORTEX-INDUCED VIBRATIONS I	Highness, 2F
15. VORTEX-INDUCED VIBRATIONS II	Highness
25. VORTEX-INDUCED VIBRATIONS III	Highness
35. VORTEX-INDUCED VIBRATIONS IV	Highness

#### COASTAL HYDRODYNAMICS (Vol. 3)

27. COASTAL I: Wave Mechanics 1	Crystal B, 2F
37. COASTAL II: Wave Mechanics 2	Crystal B
47. COASTAL III: Storm Surge	Crystal B
57. COASTAL IV: Structures 1	Crystal B
67. COASTAL V: Structures 2	Crystal B
77. COASTAL VI: Structures 3	Crystal B
87. COASTAL VII: Sediment Transport/Coastal Erosion 1	Crystal B
97. COASTAL VIII: Sediment Transport/Coastal Erosion 2	Crystal B
107. COASTAL IX: Sediment Transport/Coastal Erosion 3	Crystal B
117. COASTAL X: Reef Islands	Crystal B
127. COASTAL XI: Ships & Harbors	Crystal B
137. COASTAL XII: Coastal Management 1	Crystal B
147. COASTAL XIII: Coastal Management 2	Crystal B

#### HIGH-PERFORMANCE MATERIALS (HPM) (Vol. 4)

26. HPM I: Advanced Materials 1	Crystal A, 2F
36. HPM II: Advanced Materials 2	Crystal A
46. HPM III: Composite Materials	Crystal A
56. HPM IV: Fatigue, Fracture	Crystal A
66. HPM V: Shipbuilding Steels	Crystal A
76. HPM VI: Offshore Structures	Crystal A

- |   |           |
|---|-----------|
| <b>86. HPM VII: Advances in Welding</b>               | Crystal A |
| <b>126. HPM VIII: Arctic, Cryogenic Materials</b>     | Crystal A |
| <b>136. HPM IX: Developments in Materials - Panel</b> | Crystal A |

#### ENVIRONMENT-ASSISTED CRACKING

- |   |               |
|---|---------------|
| <b>96. ENVIRON-ASSISTED CRACKING I: Sour Service</b>  | Crystal A, 2F |
| <b>106. ENVIRON-ASSISTED CRACKING II: Hydrogen...</b> | Crystal A     |
| <b>116. ENVIRON-ASSISTED CRACKING III: Hydroge...</b> | Crystal A     |

#### ASSET INTEGRITY (Vol. 4)

- |   |               |
|---|---------------|
| <b>6. ASSET INTEGRITY I: Fracture, Fatigue Mgmt</b> | Crystal A, 2F |
| <b>16. ASSET INTEGRITY II: Corrosion Management</b> | Crystal A     |

#### MECHANICS AND HYDROELASTICITY (Vol. 4)

- |  |               |
|--|---------------|
| <b>9. MECHANICS, IMPACT, SAFETY I: Mechanics 1</b>   | Emerald A, 3F |
| <b>19. MECHANICS, IMPACT, SAFETY II: Mechanics 2</b> | Emerald A     |
| <b>29. MECHANICS, IMPACT, SAFETY III: Explosion</b>  | Emerald A     |
| <b>39. MECHANICS, IMPACT, SAFETY IV: Safety</b>      | Emerald A     |
| <b>49. MECHANICS, IMPACT, SAFETY V: Impact 1</b>     | Emerald A     |
| <b>59. MECHANICS, IMPACT, SAFETY VI: Impact 2</b>    | Emerald A     |

#### ADVANCED SHIP TECHNOLOGY (Vol. 4)

- |  |               |
|--|---------------|
| <b>69. ADVANCED SHIP TECH I: Ultimate Strength</b>       | Emerald A, 3F |
| <b>79. ADVANCED SHIP TECH II: Hull Optimization</b>      | Emerald A     |
| <b>89. ADVANCED SHIP TECH III: Navigation, Control 1</b> | Emerald A     |
| <b>99. ADVANCED SHIP TECH IV: Navigation, Control 2</b>  | Emerald A     |
| <b>109. ADVANCED SHIP TECH V: Powering 1</b>             | Emerald A     |
| <b>119. ADVANCED SHIP TECH VI: Powering 2</b>            | Emerald A     |
| <b>129. ADVANCED SHIP TECH VII: Powering 3</b>           | Emerald A     |
| <b>149. ADVANCED SHIP TECH VIII: Ship Production</b>     | Emerald A     |



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#### Forthcoming ISOPE Meetings

13th ISOPE PACOMS-2018 Symposium, Jeju Island, Korea, October 14-17, 2018

29th Annual ISOPE–2019 Conference, Honolulu, Hawaii, June 16–20, 2019

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