www.isope.org

June 16-21, Rhodes (Rodos), Greece

The Thirty-fourth (2024) International Ocean and Polar Engineering Conference
(Offshore and Polar Engineering Conference)

Including additional ISOPE symposia:

- Machine Learning, AI, Digital, CFD, …
- 2nd Marine Transport of H2, NH2 Carrier Symposium
- Energy LNG, LH2, LCO2
- Climate, Environment
- Hydrodynamics
- Advanced Ship Technology
- 7th Environment Assisted Cracking
- 9th Underwater Technology
- 13th Tsunami & Safety
- 15th Polar Sciences & Technology
- 11th Cryogenic/Arctic Materials
- 15th Renewable Energy & Environment
- 16th Sloshing Dynamics & Design
- 19th Deep Ocean Mining & Gas Hydrates
- 22nd High Performance Materials Symposium

ISOPE-2024
Rhodes (Rodos), Greece, June 16-21

Technical Program (April 29)

Referred papers from 40+ countries in 141 technical sessions,
1 Plenary and 3 Keynotes and Focus sessions

Full Program with General Information, Advance Registration & Venue
Hotel, Paper List, Reservations, and Updates on
https://www.isope.org/conferences-symposia-and-workshops/

ISOPE-2024 Conference proceedings
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All ISOPE Publications: https://www.isope.org/proceedings/
Individual papers are available from www.onepetro.org/isope

Organized and Sponsored by:
Technical Program Committee,
International Society of Offshore and Polar Engineers (ISOPE)
With cooperating organizations (listed inside)

ISOPE, P.O. Box 189
Cupertino, CA 95015-0189, USA
Fax: +1-650-254-2038
meetings@isope.org; www.isope.org
The 34th Annual ISOPE-2024 Conference, Rhodes, Greece

ISOPE-2024 Corporate Members and Sponsors. Additional sponsors/supporters in the updated program and online.

ISOPE-2024 Conference Co-chairs

Jin S Chung, USA
Sa Young Hong, Korea
Hua Liu, China
Ivana Kubat, Canada
Ove Gudmestad, Norway
Eva Loukogeorgaki, Greece
Hiroyasu Kawai, Japan
Decheng Wan, China
Ronald Knapp, USA
André Baeten, Germany

Presentations at ISOPE-2019 Honolulu Banquet
Awards: Scholarships, Best Session Organizer, Jin S Chung Award, C H Kim Award, 2019 Best Student Paper
Welcome to the ISOPE-2024 Conference

We greatly appreciate the excellent response, with 1,100+ abstracts, and help we have received from colleagues around the world in the successful organization of the 34th International Ocean and Polar (Arctic) Engineering Conference (ISOPE-2024), Rhodes, Greece, June 16–21, 2024. The Conference features 141 and 10 workshop sessions of peer-reviewed papers and 4 plenary and keynote presentations from more than 40+ countries, including the ISOPE specialty symposia as a part of the ISOPE-2024 Conference.

The conference program is issued in 2 versions: Session time and rooms printed and full conference program online (www.isope.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 peer-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 65 successful international meetings with all peer-reviewed papers:
* 1st (1990) Pacific/Asia Offshore Mechanics Symposium (PACOMS-90) Seoul; Beijing; Pusan; Daejeon; Vladivostok; Dalian; Bangkok; Busan; Vladivostok; Shanghai; Gold Coast, Jeju Island, Dalian.
* 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, Hawaii Kona, Rhodes, San Francisco, Sapporo, Hybrids, and Ottawa. 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; OMSGH), Tsukuba, 1995; Seoul; Goa; Szczecin; Tsukuba; Changsha; Lisbon; Chennai, Szczecin; Kona Hawaii, Sapporo, Honolulu, and three Hybrid.
* ISOPE HPM (High-Performance Materials) Symposium: Started in Honolulu 2003 and expanded every year with emerging topics.
* ISOPE Series of specialty symposia: ANGT; SBD; Nanotech; Frontier Energy; Sloshing Dynamics; Renewable Energy/Environment; Tsunami; Arctic; Asset Integrity; High-Mn/Cryogenic Materials; Material Reliability, EAC, LH2, Smart Ship, AI, NN, CFD,…..

On behalf of the Technical Program Committee, it is our pleasure to welcome participants from all over the world to the ISOPE-2024 Conference in Rhodes, Greece.

ISOPE-2024 Rhodes Conference Technical Program Committee (TPC), and Co-chairs of the ISOPE-2024 Conference

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<tr>
<td>Jin S Chung</td>
<td>Eva Loukogeorgaki</td>
<td>Sa Young Hong</td>
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<td>USA</td>
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<td>H Kawai</td>
<td>Hua Liu</td>
<td>Decheng Wan</td>
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<td>Japan</td>
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<td>Ivana Kubat</td>
<td>Ronald H Knapp</td>
<td>Ove T Gudmestad</td>
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<td>Canada</td>
<td>USA</td>
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André Baeten, Germany
**SUNDAY JUNE 16**

09:00 ISOPE Board of Directors Meeting  
Epsilon

10:30 ISOPE-2024 Executive Committee Meeting  
EUROMS and PACOMS Executive Committees  
Epsilon

15:00-18:00  
CONFERENCE REGISTRATION  
Lobby

17:00-18:00  
WELCOME RECEPTION  
Outdoor Pool Garden

Tour Information  
Visit tour desk in Lobby

**MONDAY JUNE 17**

On-Site Registration starts at 07:30  
Lobby

07:30 Session Chair/Co-chair Briefing  
Lobby

08:30 Conference Opening  
Emerging Trends in Marine Energy Transport  
112. Second MaTCH Symposium  
Jupiter

10:30  
2. HYDRODYNAMICS I: Big Data, Learning, PIN  
Athena

3. RENEWABLE ENERGY I: TALOS WEC I  
Salon A

4. SPRU I: Pipeline Soil  
Salon B

5. RENEWABLE ENERGY: Keynote 1: China Projects  
Nafsika A

6. COASTAL I: Wave Mechanics I  
Nafsika B

7. AST I: Autonomous Ship  
Nefeli A

8. POLAR TECH I: Ice Mechanics, Properties, Forces  
Nefeli A

9. HYDRODYNAMICS XV: Sloshing Dynamics I  
Exec. A

10. DEEP OCEAN MINING I: Surface System  
Exec. B

11. HYDRATES I: Gas Hydrates  
Exec. C

14:00  
12. HYDRODYNAMICS: Keynote 2: Machine Learning  
Athena

13. RENEWABLE ENERGY II: TALOS WEC 2  
Salon A

14. SPRU II: Riser—Top Tension  
Salon B

15. RENEWABLE ENERGY XVI: FOWT 10  
Nafsika A

16. COASTAL II: Wave Mechanics 2  
Nafsika A

17. AST II: Collision, Impact  
Nefeli B

18. POLAR TECH II: Ice Structure, Ice Breaking  
Nefeli A

19. HYDRODYNAMICS XVI: Sloshing Dynamics 2  
Exec. A

20. DEEP OCEAN MINING II: Seabed & Environment I  
Exec. B

21. HYDRATES II: Methane Hydrates  
Exec. C

16:20  
22. HYDRODYNAMICS II: Waves  
Athena

23. RENEWABLE ENERGY III: WEC 1  
Salon B

24. SPRU III: Riser—Catenary  
Salon B

25. OFFSHORE MECHANICS I: Install, Bridge, Tunnel 1  
Nafsika A

26. COASTAL III: Structures  
Nafsika B

27. AST III: Drag, EEDI  
Nefeli B

28. POLAR TECH III: Ice Management, Forecast, Towing  
Nefeli A

29. HYDRODYNAMICS XVII: Sloshing Dynamics 3  
Exec. A

30. DEEP OCEAN MINING III: Seabed and Environment 2  
Exec. B

31. DRILLING & COMPLETION I: Wellhead/ Cementing 1  
Exec. C

18:30 ISOPE Technical Committee Meetings  
Notice on bulletin board
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<td>Session Chair/Co-chair Briefing</td>
<td>Lobby</td>
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<td>08:00</td>
<td><strong>32. HYDRODYNAMICS III:</strong> Waves &amp; Forces 1</td>
<td>Athena</td>
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<td><strong>33. RENEWABLE ENERGY IV:</strong> WEC 2</td>
<td>Salon A</td>
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<td><strong>34. SPRU IV:</strong> Subsea—Infrastructure</td>
<td>Salon A</td>
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<td><strong>35. OFFSHORE MECHANICS II:</strong> Install, Bridge, Tunnel</td>
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<td><strong>36. COASTAL IV:</strong> AI, Big Data, Remote Sensing</td>
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<td><strong>37. AST IV:</strong> Ultimate Strength</td>
<td>Nefeli B</td>
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<td><strong>38. POLAR TECH IV:</strong> Arctic Transport, Propulsion 1</td>
<td>Nefeli A</td>
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<td><strong>39. HYDRODYNAMICS XVIII:</strong> VIV 1</td>
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<td><strong>40. DEEP OCEAN MINING IV:</strong> Hydraulic Lift and Pipe</td>
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<td><strong>41. DRILLING &amp; COMPLETION II:</strong> Wellhead/Cementing 2</td>
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<td>10:30</td>
<td><strong>42. HYDRODYNAMICS IV:</strong> Waves &amp; Forces 2</td>
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<td><strong>43. RENEWABLE ENERGY V:</strong> WEC 3</td>
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<td><strong>44. SPRU V:</strong> Subsea, Installation</td>
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<td><strong>45. OFFSHORE MECHANICS III:</strong> Jackup, Fixed Struct 1</td>
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<td><strong>46. COASTAL V:</strong> Coastal Processes</td>
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<td><strong>47. AST V:</strong> ACV</td>
<td>Nefeli B</td>
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<td><strong>48. POLAR TECH V:</strong> Arctic Transport, Propulsion 2</td>
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<td><strong>49. HYDRODYNAMICS XIX:</strong> VIV 2</td>
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<td><strong>50. MECHANICS I:</strong> Risk and Reliability 1</td>
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<td><strong>51. DRILLING &amp; COMPLETION III:</strong> Ocean and Polar</td>
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<td>14:00</td>
<td><strong>52. HYDRODYNAMICS XI:</strong> Wave Suite Mini Symposium</td>
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<td><strong>53. RENEWABLE ENERGY VI:</strong> Tidal Power</td>
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<td><strong>54. SPRU VI:</strong> Cable/Flex Pipe 1</td>
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<td> </td>
<td><strong>60. MECHANICS II:</strong> Risk and Reliability 2</td>
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<td><strong>61. GEOTECH I:</strong> Soil Liquefaction 1</td>
<td>Exec. C</td>
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<td>16:20</td>
<td><strong>62. HYDRODYNAMICS V:</strong> Floating Dynamics 1</td>
<td>Athena</td>
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<td><strong>63. RENEWABLE ENERGY VII:</strong> FOWT 1</td>
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<td><strong>64. SPRU VII:</strong> Cable/Flex Pipe 2</td>
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<td><strong>65. OFFSHORE MECHANICS V:</strong> VLFS, Hydroelastic 1</td>
<td>Nafsika A</td>
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<td><strong>66. HPM VI:</strong> EAC 1</td>
<td>Nafsika B</td>
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<td><strong>67. AST VII:</strong> ASV, USV 2</td>
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<td><strong>68. UNDERWATER I:</strong> Sensors and Detection</td>
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<td><strong>69. AST XVI:</strong> Propulsion 2</td>
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<td><strong>70. MECHANICS III:</strong> Collision and Impact 1</td>
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<td><strong>71. GEOTECH II:</strong> Soil Liquefaction 2</td>
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<td>15:30</td>
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<td>16:30</td>
<td>Board of Editors Meeting</td>
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<td>19:30</td>
<td>ISOPE-2024/2025 TPC Meeting</td>
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**TUESDAY JUNE 18**
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<td>08:00</td>
<td>72. HYDRODYNAMICS VI: Floating Dynamics 2</td>
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<td>73. RENEWABLE ENERGY VIII: FOWT 2</td>
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<td>75. OFFSHORE MECHANICS VI: VLFS, Hydroelastic 2</td>
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<td>77. AST VIII: Ship Maneuvering 1</td>
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<td>78. UNDERWATER II: Cables</td>
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<td>79. AST XVII: Propulsion 3</td>
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<td>80. MECHANICS IV: Collision and Impact 2</td>
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<td>81. GEOTECH III: Pile, Anchor</td>
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<td>10:30</td>
<td>82. HYDRODYNAMICS VII: Internal/Solitary Waves</td>
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<td>84. SPRU IX: Pipeline Mechanics 1</td>
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<td>85. OFFSHORE MECHANICS VII: FPSO, Compliant</td>
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<td>86. HPM VIII: EAC 3</td>
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<td>87. AST IX: Ship Maneuvering 2</td>
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<td>88. UNDERWATER III: Acoustics</td>
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<td>89. AST XVIII: Propulsion 4</td>
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<td>90. MECHANICS V: Collision and Impact 3</td>
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<td>91. GEOTECH IV: Foundation</td>
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<td>12:00</td>
<td>ISOPE Board of Directors Meeting III</td>
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<td>14:00 Keynote 3: Japan’s Cryogenic Mats R&amp;D for LH2</td>
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<td>14:00</td>
<td>92. HYDRODYNAMICS VIII: Tsunami and Hazard</td>
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<td>95. OFFSHORE MECHANICS VIII: Offshore Syst, General 1</td>
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<td>96. HPM: Keynote 3: Japan’s Cryogenic Mats R&amp;D for LH2</td>
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<td>97. AST X: Ship Maneuvering 3</td>
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<td>98. UNDERWATER IV: Design</td>
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<td>101. GEOTECH V: Soil Properties</td>
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<td>16:20</td>
<td>102. HYDRODYNAMICS IX: Metocean</td>
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<td>103. RENEWABLE ENERGY XI: FOWT 5</td>
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<td>104. SPRU XI: Pipeline Mechanics 3</td>
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<td>105. OFFSHORE MECHANICS IX: Offshore System, General 2</td>
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<td>106. HPM I: Adv Materials &amp; Structures 1</td>
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<td>109. AST XX: Nuclear and Photovoltaic Platform</td>
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<td>19:00</td>
<td>Annual Conference Banquet</td>
<td>Super Dome Pool</td>
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<td>34th ISOPE Cultural Event, Best Paper, Best Student Paper, Outstanding</td>
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<td>Student Scholarships, Best Organizer(s) and ISOPE Awards</td>
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<td>Don’t forget the banquet ticket.</td>
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07:30 Session Chair/Co-chair Briefing Lobby

08:00
110. HYDRODYNAMICS X: Instruments, Measurement Athena
111. RENEWABLE ENERGY XII: FOWT 6 Salon A
112. AST XXIII: MaTCH Symposium-Moved to Opening Jupiter
113. OFFSHORE MECHANICS X: Environ, Climate 1 Salon B
114. HPM II: Adv Materials & Structures 2 Nafsika A
115. AST XII: Optimization 2 Nafsika B
116. UNDERWATER VI: Path Tracking Nefeli B
117. AST XXI: Ship AI Nefeli A
118. MECHANICS VII: Materials, Structures Exec. A

10:30
119. HYDRODYNAMICS XII: CFD 1 Athena
120. RENEWABLE ENERGY XIII: FOWT 7 Salon A
121. UNDERWATER IX: Tsinghua (SZ) Focus Exec. C
122. OFFSHORE MECHANICS XI: Environment, Climate 2 Salon B
123. HPM III: Fatigue & Fracture 1 Nafsika A
124. AST XIII: Drag/Resistance 1 Nafsika B
125. UNDERWATER VII: Vehicles in Internal Waves Nefeli B
126. AST XXII Clean Fuel: Hydrogen, Ammonia Nefeli A
127. MECHANICS VIII: Explosion Exec. A

13:00 Student Forum: Adv. reservation req’d. Exec. C

14:00
128. HYDRODYNAMICS XIII: CFD 2 Athena
129. RENEWABLE ENERGY XIV: FOWT 8 Salon A
130. HPM IV: Fatigue & Fracture 2 Salon B
131. AST XIV: Drag/Resistance 2 Nafsika A
132. UNDERWATER VIII: Robotics Nafsika B
133. MECHANICS IX: Buckling Nefeli A
138. AST XXIV: CAD/Design Nefeli B

16:20
134. HYDRODYNAMICS XIV: Model Test Athena
135. RENEWABLE ENERGY XV: FOWT 9 Salon A
136. HPM V: Corrosion Salon B
137. AST XV: Propulsion 1 Nafsika A

FRIDAY JUNE 21

138. AST XXIV: CAD/Design Nefeli B

Tours: Click on General Information
ISOPE-2024 Rhodes, Greece
The Thirty-fourth (2024) International
Ocean and Polar Engineering Conference in person
Rodos (Rhodes), Greece, June 16–21, 2024

This 34th annual conference features 141 technical and opening general sessions, 1 plenary and 3 keynote presentations from top experts from industry, academia and government. After peer review of the manuscripts selected from 1,300+ abstracts, some 650+ peer-reviewed papers will be presented and discussed by researchers, engineers, and managers from more than 40+ countries. The ISOPE-2024 Conference Proceedings with peer-reviewed papers in PDF files will be available in a set of 4 volumes on USB (4,300 pp. est.) — paginated during the conference and later for worldwide post-conference mail order from ISOPE: ISBN 978-1-880653-78-4; ISSN 1098-6189. Only the changes in titles or authors the Technical Program Committee received in writing before April 18, 2024 are reflected in this program. Final corrections will be updated in the Conference Proceedings of peer-reviewed papers and the Final Program.

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SESSION LIST BY TOPICS

ISOPE

1. Conference Opening, Monday Morning

Opening /Plenary Session Monday 08:30

Navigating the Future: Emerging Trends in Marine Energy Transport [Oral presentation]
YoungBum Lee, Vice President, Hanwha Ocean, Korea

The Second MaTCH Symposium
H W Jin, ExxonMobil Technology & Engineering, USA

Keynote 1

Floating Offshore Wind Farm Projects in China: Part I Coupled Aero-Hydro-Elastic Behaviors
Decheng Wan, Weiwen Zhao, Shun Xu, Yingjie Xue, Maokun Ye,
Shanghai Jiao Tong University; Youwan Mi, Liangming Fu, Jinguang Wang,
Zhongnan Engineering Corporation; Xiaolong Yang, Junji Li,
Offshore Oil Engineering Co; Shengxiao Zhao, Yan Zhao, Nina Wang,
Hudong Engineering Corporation, China

Ongoing Floating Offshore Wind Farm Projects in China: Part II Safety Examination and Optimization
Decheng Wan, Weiwen Zhao, Shun Xu, Yingjie Xue, Maokun Ye,
Shanghai Jiao Tong University; Youwan Mi, Liangming Fu, Jinguang Wang,
Zhongnan Engineering Corporation; Xiaolong Yang, Junji Li,
Offshore Oil Engineering Co; Shengxiao Zhao, Yan Zhao, Nina Wang,
Hudong Engineering Corporation, China

Keynote 2

Japan's Cryogenic Materials R&D for Liquefied Hydrogen Storage (Oral Presentation Only)
Tomoya Kawabata, University of Tokyo, Japan

Keynote 3

Exploring Applications of Machine Learning to Numerical Modelling of Nonlinear WSI (Oral Presentation Only)
Qingwei Ma, Ningbo Zhang, Shiqiang Yan, City, University of London, UK

SESSION LIST BY TOPICS

OFFSHORE MECHANICS AND OCEAN TECHNOLOGY

25. OFFSHORE MECHANICS I: Install, Floating Bridge, Tunnel 1
35. OFFSHORE MECHANICS II: Install, Floating Bridge, Tunnel 2
45. OFFSHORE MECHANICS III: Jackup, Fixed Structure 1
55. OFFSHORE MECHANICS IV: Jackup, Fixed Structure 2
65. OFFSHORE MECHANICS V: VLFS, Hydroelastic 1
75. OFFSHORE MECHANICS VI: VLFS, Hydroelastic 2
HIGH-PERFORMANCE MATERIALS (HPM)

96. HPM: Keynote 3
106. HPM I: Adv Materials & Structures 1
114. HPM II: Adv Materials & Structures 2
123. HPM III: Fatigue & Fracture 1
130. HPM IV: Fatigue & Fracture 2
136. HPM V: Corrosion
66. HPM VI: EAC 1
76. HPM VII: EAC 2
86. HPM VIII: EAC 3

MECHANICS, COLLISION, RELIABILITY

50. MECHANICS I: Risk and Reliability 1
60. MECHANICS II: Risk and Reliability 2
70. MECHANICS III: Collision and Impact 1
80. MECHANICS IV: Collision and Impact 2
90. MECHANICS V: Collision and Impact 3
100. MECHANICS VI: Additive Manufacturing
118. MECHANICS VII: Materials, Structures
127. MECHANICS VIII: Explosion
133. MECHANICS IX: Buckling

ADVANCED SHIP TECH (AST)

7. AST I: Autonomous Ship
17. AST II: Collision, Impact
27. AST III: Drag, EEDI
37. AST IV: Ultimate Strength
47. AST V: ACV
57. AST VI: ASV, USV 1
67. AST VII: ASV, USV 2
77. AST VIII: Ship Maneuvering 1
87. AST IX: Ship Maneuvering 2
97. AST X: Ship Maneuvering 3
107. AST XI: Optimization 1
112. AST XII: Second MaTCH Symposium
115. AST XIII: Optimization 2
124. AST XIII: Drag/Resistance 1
131. AST XIV: Drag/Resistance 2
137. AST XV: Propulsion 1
69. AST XVI: Propulsion 2
79. AST XVII: Propulsion 3
89. AST XVIII: Propulsion 4
99. AST XIX: Cavitation
109. AST XX: Nuclear and Photovoltaic Platform
117. AST XXI: Ship AI
126. AST XXII: Clean Fuel: Hydrogen, Ammonia
138. AST XXIV: CAD/Design

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First Call For Papers

Abstract Deadline: October 20, 2024
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Main fields of interest are:


The abstract should stress the originality and the significance of the results, and include the complete names, postal and e-mail addresses and fax numbers of all authors.

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