



WORKSHOP PROGRAM

2026 IEEE INTERNATIONAL WORKSHOP ON

Metrology for the Sea

ŠIBENIK, CROATIA · OCTOBER 5-7, 2026



IEEE

MetroSea 10

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EDITION

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Dimitris Zissis, University of the Aegean, Greece
Ivana Zubak Čižmek, University of Zadar, Croatia
George Nicolaou Zodiatis, Oceanography Centre, University of Cyprus

IEEE MetroSea 2026 Keynote Speakers

Keynote Lecture - Monday October 5 - H 09:45



From Renaissance Trade to Modern Marine Science: The Adriatic Shipwreck as an Interdisciplinary Natural Laboratory

Vlado Cuculić

Ruđer Bošković Institute, Division for Marine and Environmental Research, Croatia

ABSTRACT

Founded in 1919, the International Commission for the Scientific Exploration of the Mediterranean Sea (CIESM) was established to promote scientific cooperation among Mediterranean countries and to advance understanding of one of the world's most complex marine regions. Since its inception, CIESM has embraced an interdisciplinary approach, bringing together oceanographers, chemists, biologists, geologists, archaeologists, engineers, and environmental scientists to address challenges that transcend traditional scientific boundaries. This collaborative philosophy remains essential for understanding the interactions between natural processes, human activities, and cultural heritage in the Mediterranean Sea.

A remarkable example of such interdisciplinary research is the Gnalić shipwreck, located in the Croatian Middle Adriatic near Biograd na Moru. The merchant ship Gagliana Grossa sank in 1583 at a depth of 25 m, carrying valuable cargo from Venice to Istanbul, including substantial quantities (500 - 1000 kg) of mercury and mercury-bearing materials. More than four centuries later, archaeological investigations of the wreck began in 1967, revealing a unique natural laboratory where underwater archaeology, marine chemistry, environmental monitoring, analytical science, and marine technology converge. For a decade, Croatian scientists from the Ruđer Bošković Institute have been investigating mercury contamination associated with the Gnalić shipwreck. Recent investigations have revealed elevated mercury concentrations in seawater, sediments, and marine organisms surrounding the site, demonstrating that historical contamination can remain environmentally relevant for centuries. The site offers a rare opportunity to study the long-term fate of mercury in a semi-enclosed coastal ecosystem, including its transport, transformation, bioaccumulation, and potential ecological impacts. At

the same time, ongoing archaeological excavations raise important questions regarding contaminant remobilization and environmental risk assessment.

This lecture will present recent findings from the Gnalić shipwreck and highlight how interdisciplinary collaboration between marine scientists, archaeologists, and engineers is advancing our understanding of both underwater cultural heritage and marine environmental processes. The lecture will also introduce CIESM as a unique and leading Mediterranean scientific organization that, for more than a century, has promoted interdisciplinary research and international cooperation across diverse fields of marine science, providing a framework for addressing complex environmental challenges.

SPEAKER BIOGRAPHY

Dr. **Vlado Cuculić** is a Senior Research Associate at the Ruđer Bošković Institute, Division for Marine and Environmental Research (Zagreb, Croatia). He is a marine and environmental chemist whose research focuses on the biogeochemistry of trace elements in coastal and marine ecosystems. His work investigates the distribution, speciation, and cycling of trace metals in seawater, sediments, and marine biota, including metal speciation in marine systems and mercury analysis and speciation. His research also addresses the interactions of trace metals with organic matter and emerging contaminants such as microplastics. He has extensive experience in environmental monitoring and the application of advanced analytical techniques for the study of complex marine systems. As principal investigator of several projects and a participant in numerous international research initiatives, he has contributed significantly to advancing knowledge of biogeochemical processes in coastal environments. Dr. Cuculić currently serves as Chair of the Marine Biogeochemistry Committee of the International Commission for the Scientific Exploration of the Mediterranean Sea (CIESM) and is a member of its Science Council. He is actively involved in European research networks, scientific evaluation panels, and interdisciplinary collaborations addressing marine pollution and ecosystem health.

Keynote Lecture - Tuesday October 6 - H 11:00



Maritime Informatics and Marine Robotics: From Research to Industry and Back Again

Dimitris Zissis

University of Aegean, Greece

ABSTRACT

This keynote traces the evolution from large-scale maritime data analytics to intelligent autonomous systems. It will address the challenges of processing noisy, heterogeneous real-world data from sources such as AIS, radar, satellite and onboard sensors, and show how spatio-temporal AI and sensor-fusion methods can reduce uncertainty and support maritime situational awareness. I will then discuss how this intelligence is transferred to Unmanned Surface Vessels (USVs), enabling capabilities such as COLREGs-compliant collision avoidance and autonomous coverage path planning.

Drawing on selected research projects, experimental deployments and sea trials, I will show how these topics have progressively connected over time, moving from academic research to operational systems and industrial products. I will also highlight the importance of hands-on experimentation and STEM engagement, including initiatives such as the annual Aegean Ro-Boat Race, in developing the skills and human capacity required for the future of marine robotics.

SPEAKER BIOGRAPHY

Dimitris Zissis is Professor and Head of the Department of Product and Systems Design Engineering at the School of Engineering of the University of the Aegean, where he also directs the Intelligent Transportation Systems Lab. His research lies at the intersection of information systems, data-intensive computing, maritime informatics and marine robotics, with particular interests in Big Data Analytics, Data Mining, Parallel and Distributed Systems, Cloud Computing, intelligent transportation, autonomous systems, maritime data analytics and robotic platforms for marine applications. He has authored more than 100 scientific publications, attracting over 5,000 citations internationally. He is also co-editor of the Guide to Maritime Informatics (Springer), which has been used as an academic textbook by universities in Greece and abroad. He has led research teams and served as Principal Investigator in numerous European and

national research projects, collaborating extensively with universities, research organisations, public authorities and industry. A significant part of his recent work has focused on maritime informatics and marine robotics, including vessel trajectory and AIS analytics, maritime situational awareness, multi-sensor fusion, autonomous navigation, collision avoidance and the development and testing of unmanned marine systems. His research combines data-driven methods with experimental deployments and sea trials, examining how intelligent and autonomous systems can operate reliably in complex real-world maritime environments. He has designed and coordinated large-scale experimental activities and field campaigns and has received a number of academic distinctions in Greece and internationally. According to a global citation-impact study, he is ranked among the world's top 2% most-cited researchers, while his article "Addressing Cloud Computing Security Issues" was recognised by Thomson Reuters as being among the top 0.1% of the most influential publications worldwide in its field during 2010–2014.

Keynote Lecture - Wednesday October 7 - H 11:00



Five thousand years of water level measurements: from carvings in black basalt stones to satellite missions

Jadranka Šepić

Faculty of Science, University of Split, Croatia

ABSTRACT

From the very beginning, the effort to measure water level has been driven both by our drive to understand the physical background of sea-level changes and by the practical need to support society: from facilitating port navigation and building coastal infrastructure, to protecting property and developing and implementing early warning systems for sea-level floodings.

This talk explores the history of sea-level measurement principles and techniques, starting with the black basalt stone records of Nile flood heights (2500 BCE), through the long centuries of nilometer and tidal pole measurements, followed by the first mechanical sea-level tide-gauge measurements (early 19th century), and the major advances in measuring instrumentation in the late 20th and early 21st centuries, culminating in the latest Copernicus Sentinel-6B satellite mission. A detour into the history of the Adriatic sea level measurements history is given as well.

The main processes governing sea-level changes are discussed, with special attention devoted to sea-level extremes such as tides, storm surges, tsunamis and climate change-induced sea-level rise. Sea-level measuring systems are then assessed in relation to their capability to capture these extremes. Several extreme events that motivated the development of new sea-level measuring instrumentation and the upgrading of sea-level measuring networks, as well as the changes that followed after these events, are discussed in more detail: the North Sea flood of 1953, the Chilean transoceanic tsunamis of 1966, the Boxing Day tsunami of 2004, and the Tohoku tsunami of 2011.

The talk concludes with an overview of global, Mediterranean and, in particular, Adriatic sea-level measuring networks. Persistent challenges and gaps are discussed.

SPEAKER BIOGRAPHY

Dr **Jadranka Šepić** is a professor of environmental physics at the Faculty of Science, University of Split. Her research focuses on the physics of extreme sea-level events, with particular emphasis on meteotsunamis, as well as storm surges, tsunamis, and other sea-level oscillations that can lead to hazardous coastal extremes. Jadranka Šepić has authored over 70 high-impact, peer-reviewed publications in leading journals, accumulating over 2,000 citations (h-index: 30) (WoS). She currently leads a team of six early career researchers (PhD candidates and postdoctoral researchers) dedicated to studying sea-level extremes. Jadranka is a double European Research Council (ERC) grantee and has also served as a PI on numerous national research projects. Her scientific excellence has been recognised through five prestigious Croatian scientific awards, as well as the 2019 EGU Natural Hazards Division Outstanding Early Career Scientist Award. She is strongly committed to teaching and science outreach, engaging students at all levels and the general public through lectures and hands-on oceanographic workshops.

IEEE MetroSea 2026 Venue



IEEE MetroSea 2026 will be held at **Amadria Park Convention Center** - Šibenik - Croatia.

The Convention Centre Šibenik, opened in May 2017 as part of the Amadria Park, is the largest and most modern convention centre in Croatia. Featuring an edgy, contemporary architectural design and an interior that allows plenty of natural light, this world-class facility has raised the benchmark for the meetings and conventions industry in Croatia and has positioned Šibenik as a leading business and MICE destination.

ADDRESS

Hoteli Solaris 86, Šibenik, Croatia



IEEE MetroSea 2026 Social Events

The social events of **IEEE MetroSea 2026** will be held at some exclusive venues within **Amadria Park**, all within walking distance of the Convention Center and the Hotel.

WELCOME RECEPTION

The Welcome Reception will be held at the **City Pub**, located within the Mediterranean City. The event will take place on Monday, 5 October, starting at 19:00.

GALA DINNER

The IEEE MetroSea Gala Dinner will be held at the **Dalmatian Ethno Village** on Tuesday, 6 October, starting at 20:00.

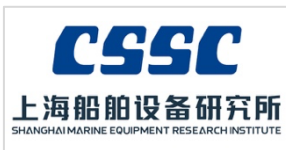
Located in the heart of a traditional Dalmatian village, the Dalmatian Ethno Village combines authentic architecture with contemporary high-end gastronomy. Stone houses, a historic mill, and carefully preserved details create an elegant and peaceful setting, perfect for relaxation and enjoyment. The restaurant offers dishes prepared with precision and creativity, combining local flavours with international culinary standards to provide an unforgettable dining experience.

MAP



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IEEE MetroSea 2026 Sponsors



Program Schedule - Monday, October 5

MONDAY - OCTOBER 5			
09:00 - 09:45	OPENING CEREMONY - WELCOME ADDRESSES		
09:45 - 10:30	Šibenik III - KEYNOTE LECTURE - Vlado Cuculic, Institute Ruđer Bošković From Renaissance Trade to Modern Marine Science: The Adriatic Shipwreck as an Interdisciplinary Natural Laboratory		
10:30 - 11:00	COFFEE BREAK		
	Šibenik III	Šibenik V	Šibenik VI
11:00 - 12:40	Special Session #01: Technologies, techniques and methodologies for coastal monitoring - PART I	Special Session #05: Artificial Intelligence for Marine Ecosystem Monitoring, Biodiversity Conservation, and Climate Change Impact Assessment - PART I	Special Session #03: New metrological approaches and devices for monitoring the status of aquatic habitats and its changes - PART I
12:40 - 14:00	LUNCH - Hotel Ivan - Restaurant Rustica		
14:00 - 14:45	Šibenik III - TECHNICAL PANEL Metrology for Underwater Acoustics: Standards, Instrumentation, and Emerging Applications		
	Šibenik III	Šibenik V	Šibenik VI
14:45 - 16:05	Special Session #01: Technologies, techniques and methodologies for coastal monitoring - PART II	Special Session #05: Artificial Intelligence for Marine Ecosystem Monitoring, Biodiversity Conservation, and Climate Change Impact Assessment - PART II	Special Session #03: New metrological approaches and devices for monitoring the status of aquatic habitats and its changes - PART II
16:05 - 16:25	COFFEE BREAK		
16:25 - 17:25	Live Demo - SubSeaPulse		
19:00	WELCOME RECEPTION - City Pub		

Program Schedule - Tuesday, October 6

TUESDAY - OCTOBER 6			
	Šibenik III	Šibenik V	Šibenik VI
09:00 - 10:40	Special Session #04: Monitoring, analysis and recovery of transitional and marine ecological systems affected by environmental and human pressures	Special Session #02: Towards Transparent Ocean using Underwater Robots and Internet of Things - PART I	Special Track - Special Track - Frontiers in Metrology and Data Technology for Intelligent Marine Systems - PART I
10:40 - 11:00	COFFEE BREAK		
11:00 - 11:45	Šibenik III - KEYNOTE LECTURE - Dimitris Zissis, University of the Aegean Maritime Informatics and Marine Robotics: From Research to Industry and Back Again		
11:50 - 13:10	Special Session #11: Exploiting in-situ measurements, modelling tools and remote sensing imagery to monitor coastal environments - PART I	Special Session #02: Towards Transparent Ocean using Underwater Robots and Internet of Things - PART II	Special Track - Frontiers in Metrology and Data Technology for Intelligent Marine Systems - PART II
13:10 - 14:20	LUNCH - Hotel Ivan - Restaurant Rustica		
14:20 - 15:10	Šibenik III - PANEL SESSION DTO: Toward standardization		
15:10 - 15:30	COFFEE BREAK		
	Šibenik III	Šibenik V	Šibenik VI
15:30 - 16:50	Special Session #11: Exploiting in-situ measurements, modelling tools and remote sensing imagery to monitor coastal environments - PART II	Special Session #09: Integrated approaches for the assessment of human and marine sentinel species interaction and development of co-existence strategies for their conservation	Special Session #06: Applied Marine Zoology as a Tool for Marine Species and Habitats Monitoring and Assessment - PART I
16:50 - 18:00	Live Demo - SubSeaPulse - Hydrocord - FER		
20:00	GALA DINNER - Dalmatian Ethno Village		

Program Schedule - Wednesday, October 7

WEDNESDAY - OCTOBER 7			
	Šibenik III	Šibenik V	Šibenik VI
09:00 - 10:40	Special Session #13: Object Detection, Tracking, and Sensor Fusion for Maritime Situational Awareness - PART I	Special Session #08: Marine Robotics for Environmental monitoring and preservation - PART I	Special Session #14: Smart Marine Infrastructures – Technologies, Systems, and Applications - PART I
10:40 - 11:00	COFFEE BREAK		
11:00 - 11:45	Šibenik III - KEYNOTE LECTURE - Jadranka Šepić, University of Split Five thousand years of water level measurements: from carvings in black basalt stones to satellite missions		
11:50 - 13:10	Special Session #13: Object Detection, Tracking, and Sensor Fusion for Maritime Situational Awareness - PART II	Special Session #08: Marine Robotics for Environmental monitoring and preservation - PART II	Special Session #14: Smart Marine Infrastructures – Technologies, Systems, and Applications - PART II
13:10 - 14:20	LUNCH - Hotel Ivan - Restaurant Rustica		
	Šibenik III	Šibenik V	
14:20 - 15:20	Special Session #12: Remote Sensing, In-Situ Surveys, and GIS Applications for Marine and Coastal Areas	Special Session #06: Applied Marine Zoology as a Tool for Marine Species and Habitats Monitoring and Assessment - PART II	
15:20 - 15:50	Šibenik III - Closing and Award Ceremony		
15:50 - 17:50	Visit to pilot sites - Live Demo by MARBLE		

Technical Program - Monday, October 5

08:30 - 17:00 *Amadria Park Convention Center - Floor -1*
REGISTRATIONS

09:00 - 09:45 *Hall Šibenik III*
OPENING CEREMONY - WELCOME ADDRESSES

09:45 - 10:30 *Hall Šibenik III*
KEYNOTE LECTURE
Chair: Neven Cukrov, *Ruđer Bošković Institute, Croatia*

From Renaissance Trade to Modern Marine Science: The Adriatic Shipwreck as an Interdisciplinary Natural Laboratory

*Vlado Cuculić, Ruđer Bošković Institute,
Division for Marine and Environmental Research, Croatia*

10:30 - 11:00 *Amadria Park Convention Center - Floor -1*
COFFEE BREAK

11:00 - 12:40 *Hall Šibenik III*
**S1.1 - Technologies, techniques and methodologies for coastal monitoring
- PART I**
Chair: Giacomo Peruzzi, *University of Padova, Italy*

11:00 A Relocatable Underwater Camera Observatory Using an ROV with Self-Leveling Landing Gear

Hallvard M Sjøstrand and Vahid Hassani (Oslo Metropolitan University, Norway)

11:20 Operational Factors Affecting Flash LiDAR Measurement Quality During USV-Based Surveys

Eleonoor Bosch, David Nguyen, Jannis Holzer, Christophe Meier, Stephane Humbert and Christophe Pache (CSEM, SA, Switzerland)

11:40 Seabed Platform Observatory Gulf of Naples (SPO_GoN): Long-Term Monitoring of the Deep-Sea Ecosystem Begins

Simona Saviano, Anastasia Angela Biancardi, Simonepietro Canese, Fabio Conversano, Augusto Passarelli and Daniela Cianelli (Stazione Zoologica Anton Dohrn, Italy)

12:00 Optical Characterization of Shallow Coastal Waters for Underwater Imaging Applications Using Synchronised Multi-Parameter Profiling

Barbara Džaja, Hrvoje Turic and Vladimir Plestina (University of Split, Croatia)

12:20 Experimental Validation of a Multi-Hop Underwater LoRa Network

Andrea Novero, Filippo Campagnaro, Alessandro Pozzebon, Lorenzo Vangelista and Michele Zorzi (University of Padova, Italy)

11:00 - 12:20 *Hall Šibenik V*

S1.2 - Artificial Intelligence for Marine Ecosystem Monitoring, Biodiversity Conservation, and Climate Change Impact Assessment - PART I

Chairs: Fabiana Di Ciaccio, *University of Florence, Italy*

Nikhil Muralikrishna, *Polytechnic University of Marche, Italy*

11:00 DART-INLA: Hybrid Spatio-Temporal Assessment of Tursiops Truncatus and Stenella Coeruleoalba Sightings Patterns and Drivers in the Gulf of Taranto

Maria Grazia Manco (University of Bari, Italy); Francesca Cornelia Santacesaria and Carmelo Fanizza (Jonian Dolphin Conservation, Italy); Alessio Pollice (University of Bari Aldo Moro, Italy); Rosalia Maglietta (STIIMA-CNR, Italy)

11:20 A Deep Learning Emulator for Wave-Vegetation Interaction: A Preliminary Study on the Rimini Coast

Serena Maria Lezzi (CMCC, Italy); Rosalia Maglietta (STIIMA-CNR, Italy); Ivan Federico, Salvatore Causio, Luca Giunti, Seimur Shirinov, Jacopo Alessandri and Giovanni Coppini (CMCC, Italy)

11:40 Climate-Driven Evolution of Salt-Wedge Intrusion in the Ofanto Estuary (Italy) Using a Physics-Informed Estuary Emulator

Alessandro De Lorenzis, Leonardo Saccotelli, Júlia Kaiser and Fabio Viola (CMCC, Italy); Rosalia Maglietta (STIIMA-CNR, Italy); Giorgia Verri (CMCC, Italy)

12:00 Statistical Downscaling of Sea Surface Temperature Projections over the Adriatic Sea

Leonardo Saccotelli, Alessandro De Lorenzis and Giorgia Verri (CMCC, Italy); Rosalia Maglietta (STIIMA-CNR, Italy)

11:00 - 12:42 *Hall Šibenik VI*

S1.3 - New metrological approaches and devices for monitoring the status of aquatic habitats and its changes - PART I

Chairs: Pietro Ferraro, *National Research Council, Italy*

Vittorio Bianco, *National Research Council, Italy*

11:00 Hyper-Crosslinked Polymeric Adsorbents for Efficient Removal of Organic Pollutants from Water

Antonia Cerbone, Federico Olivieri, Alfredo Sorrentino, Roberto Avolio, Mariacristina Cocca, Marino Lavorgna, Maria Emanuela Errico, Gennaro Gentile and Rachele Castaldo (National Research Council of Italy, Italy)

- 11:17 Dynamic Image Analysis for Grain-Size Characterization of Marine Sandy Sediments**
Elena Scacchia, Luisa Bergamin, Maria Grazia Finoia, Giancarlo Pierfranceschi, Elena Romano (Italian Institute for Environmental Protection and Research, Italy)
- 11:34 Optical Polarization Fingerprints for Environmental Monitoring of Pristine and UV-Aged Microplastics**
Maria Pia Pierro and Marika Valentino (National Research Council, Italy); Serena Ducoli (University of Brescia, Italy); Lisa Miccio (National Research Council, Italy); Stefania Federici (University of Brescia, Italy); Vittorio Bianco and Pietro Ferraro (National Research Council, Italy)
- 11:51 A Strategy for 3D Holographic Flow Cytometry of Microalgae with Complex Rotation**
Giusy Giugliano (National Research Council & University of Campania Luigi Vanvitelli, Italy); Lisa Miccio and Francesca Borrelli (National Research Council, Italy); Emilie Houliez (Stazione Zoologica Anton Dohrn, Italy); Daniele Pirone (National Research Council, Italy); Leonilde Roselli (Stazione Zoologica Anton Dohrn, Italy); Jaromir Behal (National Research Council, Italy); Angela Sardo (Stazione Zoologica Anton Dohrn, Italy); Pasquale Memmolo, Vittorio Bianco and Pietro Ferraro (National Research Council, Italy)
- 12:08 Sustainable Hierarchically Porous Adsorbents: Performance and Life Cycle Assessment**
Alfredo Sorrentino, Antonia Cerbone, Federico Olivieri, Roberto Avolio, Mariacristina Cocca and Maria Emanuela Errico (National Research Council, Italy); Marialucìa Curri and Pasquale Giungato (University of Bari, Italy); Elisabetta Fanizza (Università di Bari & CNR, Italy); Gennaro Gentile and Rachele Castaldo (National Research Council, Italy)
- 12:25 Evaluating Textile Ecodesign Strategies for the Reduction of Fibrous Microplastic Release**
Arianna Giovanna Zanolà, Elena Tortarolo and Giulia Dalla Fontana (National Research Council, Italy); Francesca Dotti and Ada Ferri (Politecnico di Torino, Italy); Raffaella Mossotti (National Research Council, Italy)

12:40 - 14:00 *Hotel Ivan - Restaurant Rustica*
LUNCH

14:00 - 14:45 *Hall Šibenik VI*
TECHNICAL PANEL - Metrology for Underwater Acoustics: Standards, Instrumentation, and Emerging Applications
Moderators: Alfonso Farina, *Leonardo SpA*
Salvatore Ponte, *University of Campania L. Vanvitelli, Italy*

14:45 - 16:05 *Hall Šibenik III*
S2.1 - Technologies, techniques and methodologies for coastal monitoring - PART II
Chair: Giacomo Peruzzi, *University of Padova, Italy*

- 14:45** **Combining Multifrequency Multistatic Radars and Smart Radar Buoys for Augmented Maritime Surveillance**
Alfonso Farina (Leonardo Company Consultant, Italy); Salvatore Ponte (University of Campania 'L. Vanvitelli', Italy)
- 15:05** **Recreational Sailing Fleets as a Coastal Observing System: A Citizen-Science Architecture and Metrological Methodology**
Zoran Kovačević (Stichting Project SeaSense, The Netherlands); Amey Nandkumar Vasulkar (The Hague University of Applied Sciences, The Netherlands); Hanno Hildmann (Netherlands Organization for Applied Scientific Research, The Netherlands)
- 15:25** **Design and Validation of a Virtual Salinity Sensor Based on Spectral Optical Reflectance**
Marco Migliorini (University of Siena, Italy); Giacomo Peruzzi and Matteo Bertocco (University of Padova, Italy); Ada Fort (University of Siena, Italy); Alessandro Pozzebon and Nicola Trivellin (University of Padova, Italy)
- 15:45** **GNSS - IMU Vessel Motion Measurements for Significant Wave Height Estimation**
Sabina Mammadova, Mohamad Khalil, Francesco Crenna, Giovanni Battista Rossi, Ilaria Ferrando and Domenico Sguerso (University of Genova, Italy)

14:45 - 15:55 *Hall Šibenik V*
S2.2 - Artificial Intelligence for Marine Ecosystem Monitoring, Biodiversity Conservation, and Climate Change Impact Assessment - PART II
Chairs: Fabiana Di Ciaccio, *University of Florence, Italy*
Serena Lezzi, *Euro-Mediterranean Center on Climate Change*

- 14:45** **Foundation Models for Marine Environment Monitoring: An Overview**
Paolo Russo (Roma Tre University, Italy); Fabiana Di Ciaccio (University of Florence, Italy)
- 15:05** **Training-Free Morphology-Aware Guidance for Long-Tail Diatom Classification**
Ilyes Benaissa, Vittorio Bianco, Pietro Ferraro, Cosimo Distanto (National Research Council, Italy)
- 15:25** **Multi-Modal Deep Learning for Marine Oil Spill Detection: A Multi-Encoder Approach Using SAR, Optical, and Synthetic Thermal Satellite Imagery**
Nikhil Muralikrishna, Marsia Sanità and Stefano Chiappini (Università Politecnica Delle Marche, Italy); Marina Paolanti (University of Macerata, Italy); Roberto Pierdicca (Università Politecnica delle Marche, Italy)

14:45 - 16:56 *Hall Šibenik VI*
S2.3 - New metrological approaches and devices for monitoring the status of aquatic habitats and its changes - PART II
Chairs: Pietro Ferraro, *National Research Council, Italy*
 Vittorio Bianco, *National Research Council, Italy*

- 14:45 INVITED - Optical Metrology Approaches for Microplastic Detection in Water: Raman Spectroscopy, Static Light Scattering and Polarimetric Holography**
Maria Lopera and Mehrdad Lotfi Choobbari (Vrije Universiteit Brussel, Belgium); Carlos Trujillo (Universidad EAFIT, Colombia); Heidi Ottevaeree (Vrije Universiteit Brussel, Belgium)
- 15:05 Design of a Compact Underwater Digital Holographic Microscope for in-Situ Marine Monitoring**
Giusy Giugliano (National Research Council, Italy & University of Campania Luigi Vanvitelli, Italy); Zhe Wang (University of Naples Federico II, Italy); Arturo Argentieri and Ilyes Benaissa, Paolo Spagnolo, Cosimo Distante, Vittorio Bianco and Pietro Ferraro (National Research Council, Italy)
- 15:22 Which Optical Wavelength Performs Best in Turbid UOWC Systems? An Experimental Characterization**
Giorgia Satta and Fabio Leccese (Roma Tre University, Italy)
- 15:40 Explainable Deep-Learning Characterization of Microplastic Fibers via Polarization Holography**
Jan Appel (Palacky University, Czech Republic); Marika Valentino, Lisa Miccio, Vittorio Bianco, Raffaella Mossotti, Giulia Dalla Fontana (National Research Council, Italy); Miroslav Ježek (Palacky University, Czech Republic); Pietro Ferraro (National Research Council); Jaromír Běhal (Palacky University, Czech Republic)

16:05 - 16:25 *Amadria Park Convention Center - Floor -1*
COFFEE BREAK

16:25 - 17:25 **LIVE DEMONSTRATION by SubSeaPulse**

The **live demonstration** will be conducted by SubSeaPulse. Please meet at the Registration Desk at 16:25, and we will go together to the location where the live demonstration will take place.

19:00 *City Pub*
WELCOME RECEPTION

Technical Program - Tuesday, October 6

08:30 - 18:00 *Amadria Park Convention Center - Floor -1*
REGISTRATIONS

09:00 - 10:40 *Hall Šibenik III*
S3.1 - Monitoring, analysis and recovery of transitional and marine ecological systems affected by environmental and human pressures
Chairs: Santina Giandomenico, *National Research Council, Italy*
Matilda Mali, *Politecnico di Bari, Italy*

09:00 The Seaweed Chaetomorpha Linum (O.F. Müller) in the Bioremediation of Aquaculture Waste: Laboratory-Scale Measurements

Loredana Stabili (Institute for Marine Biological Resources and Biotechnology (IRBIM), Italy & National Research Council (CNR), Italy); Francesca Letizia, Irma Del Piano, Chiara Anglana and Fabio Barozzi (University of Salento, Italy); Maria Immacolata Acquaviva (Institute for Marine Biological Resources and Biotechnology (IRBIM), Italy); Elisa Quarta and Gian Piero Di San Sebastiano (University of Salento, Italy)

09:20 Characterization of Benthic and Demersal Assemblages in a Trawling Fishing Area Through the IndVal-Based Approach

Pasquale Ricci, Giulia Cipriano and Carla Cherubini (University of Bari, Italy); Lorenza Ciarcia (Italy); Francesca P De Luca (CoNISMa, Italy); Angelica Catacchio (CoNISMa, Italy & University of Bari, Italy); Daniela Cascione (Polytechnic University of Bari, Italy); Gaia Madaghiele and Roberto Carlucci (University of Bari, Italy)

09:40 Effects of Tropicalisation on Fish Communities of the Eastern Aegean Sea, Greece

Silvia Giacomello (Archipelagos Institute of Marine Conservation, Greece); Laura Macrina (King Abdullah University of Science and Technology, Saudi Arabia); Maurice Calton Seal and Anastasia Miliou (Archipelagos Institute of Marine Conservation, Greece)

10:00 Microplastic Degradation in Marine Systems: Microscopy Driven Insights into Organic and Inorganic Fouling

Matilda Mali (Politecnico di Bari & DICATEch, Italy); Santina Giandomenico and Lucia Spada (National Research Council, Italy); Adriano Boghetich (Politecnico di Bari, Italy); Francesco Paolo Buonocunto (National Research Council, Italy); Piero Mastrorilli and Maria Michela Dell'Anna (Politecnico di Bari, Italy)

- 10:20 Comparative Analysis of Two Marine Food Webs in the Ionian Sea (Central Mediterranean Sea): A Standardization-Based Approach**
Camilla Mannarini, Pasquale Ricci and Roberto Carlucci (University of Bari, Italy); Giulia Lucia (Italy); Carla Cherubini (University of Bari, Italy); Francesca P De Luca (CoNISMa, Italy); Daniela Cascione (Politecnico di Bari, Italy)

09:00 - 10:40 *Hall Šibenik V*
S3.2 - Towards Transparent Ocean using Underwater Robots and Internet of Things - PART I
Chairs: Nazila Fough, *University of Glasgow, UK*
Filippo Campagnaro, *University of Padova, Italy*

- 09:00 Lightweight Detector Selection for Autonomous Subsea Monitoring Under Degraded Underwater Imaging**
Ayodeji Ologunmeta, Somasundar Kannan, Yafan Zhao (The Robert Gordon University, United Kingdom); Nazila Fough (University of Glasgow, United Kingdom)
- 09:20 Evaluating MOG2 Motion Filtering for YOLO-Based Underwater Object Detection**
Raghunandan Kalibhat (University of Glasgow, United Kingdom); Ayodeji Ologunmeta (The Robert Gordon University, United Kingdom); Hadi Heidari (University of Glasgow, United Kingdom); Khaliq Ur Rahman, Yafan Zhao, Somasundar Kannan (The Robert Gordon University, United Kingdom); Nazila Fough (University of Glasgow, United Kingdom)
- 09:40 Real-World Evaluation of the Underwater Geometry-Based Time Synchronization (UWGS) Using Ahoi Modems**
Matin Ghalkhani (University of Padova, Italy); Bernd-Christian Renner (Hamburg University of Technology, Germany); Filippo Campagnaro and Michele Zorzi (University of Padova, Italy)
- 10:00 Low-Cost Integrated Sensing and Communication Platform for AUV Deployment: Design and Sea Validation**
Davide Cosimo and Elena Franceschi (University of Pisa, Italy); Stefano Bianchi and Angelo Di Martino (Naval Support and Experimentation Centre, Italy); Lorenzo Bazzarello (Italian Navy, Italy); Filippo Campagnaro (University of Padova, Italy); Riccardo Costanzi (University of Pisa, Italy)
- 10:20 Development of a Custom Thermal Monitoring System for KM3Net ARCA WWRS Base Module Switches**
Giuseppina Larosa, Irene Sgura, Lucio Mirko Coppolino and Luca Platania (INFN, Italy)

09:00 - 10:40	<i>Hall Šibenik VI</i> S3.3 - Special Track - Frontiers in Metrology and Data Technology for Intelligent Marine Systems - PART I Chairs: Xianglong Ma, <i>Shanghai Marine Equipment Research Institute, China</i> Yunyue Chen, <i>Tianjin Research Institute for Water Transport Engineering - Ministry of Transport, China</i>
09:00	Data Governance and Middle Platform Architecture for Ship Power Sensors Towards Intelligent Metrology Zhiyuan Cai, <u>Yuhong Huang</u>, Zheng Mao, Hongli Qi and Shuoyuan Chang (China)
09:20	Different Methodologies to Detect Dominant Scatterers on Simulated Sea Surface SAR Data Antonio Sorrentino (Università di Cagliari, Italy); Emanuele Setale (University of Naples Parthenope, Italy); Alessandro Fanti and Matteo Bruno Lodi (University of Cagliari, Italy); <u>Maurizio Migliaccio</u> (University of Naples Parthenope, Italy)
09:40	Research on Ship Carbon Emission Measurement Methods Based on Fuel Monitoring Systems Yufen Cao (China); Chen Yunyue (Tianjin Research Institute for Water Transport Engineering, China); Jin Zhou Cao (China); JiaDongMei Yang (Tianjin University of Science and Technology & None, China); Huang Yuan (Tianjin Research Institute For Water Transport Engineering, China)
10:00	Development of a Cloud-Connected Autonomous Multiparametric Buoy for Real-Time Marine Environmental Monitoring <u>Mariella Sole</u>, Alberto Mancosu and Alessio Chirigu (Hedya S.r.l, Italy); Sara Pinna, Matteo Anedda and Daniel D Giusto (University of Cagliari, Italy)
10:20	Research Progress on Fuel Consumption Analysis Methods for Methanol Marine Engines Based on the Carbon Balance Method <u>Yuxin Sun</u> (Harbin Engineering University & Shanghai Marine Equipment Research Institute, China); Chong Yao (Harbin Engineering University, China); Xianglong Ma, Hu Ding and Hao Wu (Shanghai Marine Equipment Research Institute, China); Yuhong Huang (China)
10:40 - 11:00	<i>Amadria Park Convention Center - Floor -1</i> COFFEE BREAK / POSTER SESSION

PS01	Network-Based Architecture for Remote Environmental Monitoring Platform Using a VPN-Enabled Underwater Vehicle Mariagrazia Leccisi ("Roma Tre" University, Italy); Ruggero De Francesco (SeTeL, Italy); Eduardo De Francesco (SETEL, Italy); Fabio Verbosio and Georgia Cesarone (Start 4.0, Italy); Fabio Leccese ("Roma Tre" University, Italy)
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- PS02 Macroalgal Diversity and IndVal: First Results from a Mediterranean Transitional Water System**
Andrea Menegazzo (University of Padua, Italy); Giuseppe Denti (National Research Council, Italy); Ellen Pasqualin (University of Padua, Italy); Antonella Petrocelli (National Research Council, Italy); Pasquale Ricci (University of Bari, Italy); Fernando Rubino and Lucia Spada (National Research Council, Italy); Isabella Moro (University of Padua, Italy)
- PS03 Underwater Visual Census-Based Evaluation of Fish Assemblages on Artificial Reefs: A Baseline Assessment in the Mar Grande of Taranto (Southern Italy)**
Ellen Pasqualin (University of Padua, Italy); Giuseppe Denti and Giovanni Fanelli (National Research Council, Italy); Carlotta Mazzoldi and Andrea Menegazzo (University of Padova, Italy); Antonella Petrocelli (National Research Council, Italy); Francesca Cornelia Santacesaria and Cristiana De Leonardis (Jonian Dolphin Conservation, Italy); Fernando Rubino (National Research Council, Italy)
- PS04 Distribution and Transport of Polycyclic Aromatic Hydrocarbons (PAHs) at the Mouth of the Tonnarella Torrent (Gulf of Naples, Southern Italy) After a Major Rainfall Event**
Santina Giandomenico (National Research Council, Italy); Matilda Mali (Politecnico di Bari & DICATEch, Italy); Lucia Spada, Alfonsa Milia, Serena Gherardi and Francesco Paolo Buonocunto (National Research Council, Italy)
- PS05 Automated Disk Diffusion Antimicrobial Susceptibility Testing: A Comparative Framework Using Deep Learning, Image Processing, and OCR-Based Analysis**
Faranak Fough, Yafan Zhao, Somasundar Kannan and Pedram Salimi (The Robert Gordon University, United Kingdom); Nazila Fough (University of Glasgow, United Kingdom)
- PS06 Direct Sequence Spread Spectrum with 4-FSK for Reliable Underwater Acoustic Communication**
Khaliq Ur Rahman and Christopher D McDermott (The Robert Gordon University, United Kingdom); Raghunandan Kalibhat and Nazila Fough (University of Glasgow, United Kingdom)
- PS07 Common Dolphins (*Delphinus Delphis*, Linnaeus, 1758) as Social Brokers in a Mixed-Species Dolphin Community: Insights from Photo-Identification and Social Network Analysis in the Gulf of Corinth**
Marta Azzolin, Livio Favaro, and Sara Gianola (University of Torino, Italy); Giorgio Rosestolato (Gaia Research Institute, Italy); Andrea Antinolfi (University of Milan, Italy)
- PS08 Machine Learning-Based Sea State Estimation from Operational Ship Motion Data: From Integral Wave Parameters to Directional Wave Spectra**
José Miguel Lorenzo García (Technical University of Denmark, Denmark); Malte Mittendorf (A.P. Møller Maersk, Denmark); Ulrik Dam Nielsen and Raphaël E. G. Mounet (Technical University of Denmark, Denmark); Wengang Mao (Chalmers University of Technology, Sweden)

- PS09 A Vision-Based Coastal Early Warning System for Real-Time Wave Run-Up Monitoring**
Gaetano Sabato (University of Bari, Italy); Alok Kushabaha (University of Bari-IUSS School for Advanced Studies, Italy); Marco Luppichini (University of Pisa, Italy); Marco Chirivì (CETMA, Italy); Giovanni Scardino (INGV, Italy); Giovanni Scicchitano (University of Bari, Italy)
- PS10 Sandy Beaches Coastal Landscape Evolution in the Noto Hanto 2024 Earthquake Area (Japan)**
 Nicolò Parrino (Istituto Nazionale di Geofisica e Vulcanologia, Italy); Flavia Cianfanelli and Cristiano Pesaresi (Sapienza University of Rome, Italy); Salvatore Stramondo (Istituto Nazionale di Geofisica e Vulcanologia, Italy); Athanasios T. Vafeidis (Christian-Albrechts University Kiel, Germany); Pierfrancesco Burrato (Istituto Nazionale di Geofisica e Vulcanologia, Italy)
- PS11 Assessment of Shoreline Changes Along the Mediterranean Coast of Morocco Using Remote Sensing and DSAS**
Smail Souiri (Mohammed V University of Rabat, Morocco); Bruno Castelle (University of Bordeaux UMR CNRS, France); Anselme Muzirafuti (University of Messina, Italy); Mounir Hakkou (Mohammed V University of Rabat, Morocco)
- PS12 Metrological Evaluation of Hydrophone Array Noise for Ultra-Short Baseline Underwater Precision Positioning**
 Deng Zhang, Tao Zhang, Hua Zheng, Ruibin Ding, Kun Zhang and Binjie Wu (Second Institute of Oceanography, Ministry of Natural Resources, China)
- PS13 Design and Experimental Validation of a Flexible PCB Piezoresistive Sensing Matrix for Underwater Platforms**
Tiago Matos and Marcos Martins (INESC TEC, Portugal)
- PS14 Dynamic Thrust Calibration Method for Underwater Vehicle Propellers**
 Chen Yunyue (Tianjin Research Institute for Water Transport Engineering, China); Lin Qin (China); Huang Yuan (Tianjin Research Institute For Water Transport Engineering, China); JiaDongMei Yang (Tianjin University of Science and Technology & None, China); Jin Zhou Cao (China)
- PS15 Research on Pixel Measurement Method for Resolution Testing of Underwater Optical Imaging**
 Huang Yuan (Tianjin Research Institute For Water Transport Engineering, China); Chen Yunyue (Tianjin Research Institute for Water Transport Engineering, China); HaoChen Li and Jin Zhou Cao (China); JiaDongMei Yang (Tianjin University of Science and Technology & None, China)
- PS16 Overview of Dynamic Measurement Methods for Carbon Emission Intensity in Inland River Ship Operations: Current Status and Bottlenecks**
 JiaDongMei Yang (Tianjin University of Science and Technology & None, China); GuiCheng Zhang (China); Chen Yunyue (Tianjin Research Institute for Water Transport

Engineering, China); Huang Yuan (Tianjin Research Institute For Water Transport Engineering, China); Jin Zhou Cao (China)

PS17 On-Site Calibration Method for Shipborne Medium- and Deep-Water Multibeam Echosounder Systems

Song Wei, Liu Yi Cheng and Xinjie Zhou (China)

PS18 Marine Engine Energy-Efficiency Monitoring Based on Edge Computing and Large Language Models

Yuxin Sun (Harbin Engineering University & Shanghai Marine Equipment Research Institute, China); Wang Bo (Harbin Engineering University, China); Wei Liu (China); Hu Ding (Shanghai Marine Equipment Research Institute, China); Shuyi Zhao (China Academy of Transportation Sciences, China)

PS19 Research on Metrological Performance Requirements for Flowmeter Deployment in Marine Fuel Oil Consumption Metering

Xin Shi, Xuejian Tian and Xianguang Wang (China Academy of Transportation Sciences, China); Zhiyuan Cai (China)

PS20 Intelligent Monitoring Technology for Wear of Marine Engine Valve Train Based on Physics-Data Dual-Driven Approach

Zhiyuan Cai (China); Hao Wu (Shanghai Marine Equipment Research Institute, China); Guodong Li, Jiayuan Zhang, Heting Yin, Hongen Xue, Rui Li and Chong Yao (Harbin Engineering University, China)

PS21 Research on Technical Requirements for Marine Fuel Oil Tank Measurement Systems Based on Measurement Error Propagation

Xianguang Wang (China Academy of Transportation Sciences, China); Zicong Zhao, Yi Liu and Zheng Mao (China)

PS22 Strain Gauge Array-Based Thrust Measurement Method for Flettner Rotor

Jialin Lyu, Xianglong Ma, Jiejun Lin, Zhiyan Hu, Yang Zhang and Tao Li (Shanghai Marine Equipment Research Institute, China)

PS23 Covert Attacks on Naval Propulsion Control Systems Using Closed-Loop Identification

Victor Mattos (Federal University of Rio de Janeiro, Brazil); Amit Bhaya (Federal University of Rio de Janeiro & COPPE, Brazil); Daniel Menasché (Federal University of Rio de Janeiro, Brazil); Alan Oliveira (University of Lisbon, Portugal)

PS24 Blue-Green Adaptive Wavelength Hopping for anti-Jamming 4-PAM Underwater Wireless Optical Communication

Khaliq Ur Rahman (The Robert Gordon University, United Kingdom); Nazila Fough (University of Glasgow, United Kingdom); Christopher D McDermott (The Robert Gordon University, United Kingdom)

PS25 Multi-Temporal Shoreline Dynamics and Quantitative Uncertainty Assessment in North-Eastern Sicily Using Sentinel-2 Imagery

Fabiana Di Ciaccio (University of Florence, Italy); Francesco Giuseppe Figliomeni (Parthenope University of Naples, Italy); Emanuele Alcaras (Yamaguchi University, Japan); Masahiko Nagai (Yamaguchi University, Japan)

PS26 From Sensors to Seafloor Processes: Integrated Monitoring of Kolumbo Submarine Volcano

Anna Katsigera (University of Athens, Greece); Paraskevi Nomikou (National and Kapodistrian University of Athens, Greece); Christos Antoniou and Sotiris Spanos (National Technical University of Athens, Greece); Valsamis Ntouskos (Universitas Mercatorum, Italy); Angelos Mallios (PLOA Technology Consultants, Spain); Andrea Luca Rizzo (University of Milano-Bicocca, Italy); Gianluca Lazzaro, Manfredi Longo, Walter Dalessandro and Sergio Scirè Scappuzzo (Istituto Nazionale di Geofisica e Vulcanologia, Italy); Konstantinos Karantzas (National Technical University of Athens, Greece); Eirini Anagnostou (University of Bremen, Germany); Francesco Italiano (Istituto Nazionale di Oceanografia e di Geofisica Sperimentale, Italy)

11:00 - 11:45 *Hall Šibenik III*
KEYNOTE LECTURE
Chair: Maurizio Migliaccio, *Parthenope University of Naples, Italy*

**Maritime Informatics and Marine Robotics:
 From Research to Industry and Back Again**

Dimitris Zissis, University of Aegean, Greece

11:50 - 13:10 *Hall Šibenik III*
S4.1 - Exploiting in-situ measurements, modelling tools and remote sensing imagery to monitor coastal environments - PART I
Chairs: Andrea Buono, *University of Naples Parthenope, Italy*
 Giuseppe Grieco, *National Research Council, Italy*

11:50 A New Approach to the Estimation of Sea State Based on Shipboard Observations - Irregular Waves

Giovanni Battista Rossi, Francesco Crenna and Giuliano Vernengo (University of Genova, Italy)

12:10 Scale-Dependent Transition of Ocean SAR Normalized Radar Cross Section Distribution: From K-Distribution to Negative Exponential

Giuseppe Grieco (National Research Council, Italy); Yingying Liu (Nanjing University of Information Science and Technology, China); Maurizio Migliaccio (Università Napoli Parthenope, Italy); Yuanzhi Zhang (Nanjing University of Information Science and Technology, China)

- 12:30 Ping-Wise Semantic Segmentation of Side-Scan Sonar Data for Posidonia Oceanica Monitoring**
Gabriele Scarpelli, Francesco Ruscio, Simone Tani, Paolo Marinelli and Riccardo Costanzi (University of Pisa, Italy)
- 12:50 High-Resolution Antenna Array Diagnostics via Holographic Back-Projection Using a Low-Cost near-Field Scanning System**
 Marco Losso and Nicholas Sesto Gorella (PicoSaTs, European Union); Giulia Buttazzoni, Fulvio Babich, Massimiliano Comisso and Francesca Vatta (University of Trieste, Italy)

11:50 - 13:10 Hall Šibenik V
S4.2 - Towards Transparent Ocean using Underwater Robots and Internet of Things - PART II
Chairs: Nazila Fough, *University of Glasgow, UK*
 Filippo Campagnaro, *University of Padova, Italy*

- 11:50 Computationally Efficient LiDAR-Based SLAM for Autonomous Underwater Navigation**
Reynaud Lucie, David Barrett and Michael Triantafyllou (Massachusetts Institute of Technology, USA)
- 12:10 Reliability-Aware Structural-Textural Hybrid Perception for Subsea Defect Detection**
Ayodeji Ologunmeta, Yafan Zhao, and Somasundar Kannan (Robert Gordon University, United Kingdom); Nazila Fough (University of Glasgow, United Kingdom)
- 12:30 Received Signal Strength Ratio Localization in Optical Wireless Underwater Communication**
Ivar Bjørge Saksvik, Alexander B. Rambech and Vahid Hassani (Oslo Metropolitan University, Norway); Alex Alcocer (Kongsberg, Norway)
- 12:50 Propagation-Delay-Assisted Integrity Verification Against Data Falsification Attacks in Multi-Hop Underwater Acoustic Communication Networks**
 Khaliq Ur Rahman (Robert Gordon University, United Kingdom); Nazila Fough (University of Glasgow, United Kingdom); Rida Sundas and Christopher D McDermott (Robert Gordon University, United Kingdom)

11:50 - 13:10 Hall Šibenik VI
S4.3 - Special Track - Frontiers in Metrology and Data Technology for Intelligent Marine Systems - PART II
Chairs: Xianglong Ma, *Shanghai Marine Equipment Research Institute, China*
 Yunyue Chen, *Tianjin Research Institute for Water Transport Engineering - Ministry of Transport, China*

- 11:50 Methods and Applications of Metrological Traceability for Underwater Acoustic Positioning Equipment**
Liu Yi Cheng, Song Wei and Xinjie Zhou (China)
- 12:10 Mixed Layer Depth Estimation via Underwater Atmospheric Muon Flux Measurements**
Dođa Veske, M. Akif Korkmaz and Selman Diken (Middle East Technical University, Turkey); Bilge Demirköz (METU-IVMER, Turkey)
- 12:30 Standardization of Intelligent Risk Identification and Alerting Technologies for Ship Navigation and Watchkeeping: Progress and Prospects**
Shuyi Zhao, Xin Shi and Xianguang Wang (China Academy of Transportation Sciences, China)
- 12:50 Vulnerabilities in Naval Systems: CVE Analysis and Attack Triggering via AIS/ECDIS**
Miguel Bicudo, Giovanna M Lavouras and Bernardo Iwamoto Melo (UFRJ, Brazil); Victor Mattos (Federal University of Rio de Janeiro, Brazil); Alan Oliveira (University of Lisbon, Portugal); Raphael Machado (Inmetro and UFF, Brazil); Paulo Mann (UFRJ, Brazil); Amit Bhaya (Federal University of Rio de Janeiro & COPPE, Brazil); Daniel Menasché (Federal University of Rio de Janeiro, Brazil)

13:10 - 14:20 *Hotel Ivan - Restaurant Rustica*
LUNCH

14:20 - 15:10 *Hall Šibenik VI*
PANEL SESSION - Digital Twin of the Ocean: Toward standardization
Moderator: René Garelo, *IMT Atlantique, France*

PANELISTS

Antonio Vasilijevic, NTNU, Norway
Igor Kvasić, MARBLE, Croatia
Simona Aracri, CNR-INM, Italy
Sigmund Kluckner, IEEE France
Sun Yuxin, Shanghai Marine Equipment Research Institute, China

15:10 - 15:30 *Amadria Park Convention Center - Floor -1*
COFFEE BREAK / POSTER SESSION

The posters displayed during this session are the same as those presented during the morning coffee break.

15:30 - 16:50	<i>Hall Šibenik III</i> S5.1 - Exploiting in-situ measurements, modelling tools and remote sensing imagery to monitor coastal environments - PART II Chairs: Andrea Buono, <i>University of Naples Parthenope, Italy</i> Giuseppe Grieco, <i>National Research Council, Italy</i>
15:30	Directional Partitioning: A New Approach to Wave-Buoys Data Analysis <u>Giovanni Battista Rossi</u> (University of Genova, Italy); Gabriele Nardone, Marco Picone and Carlo Lo Re (ISPRA, Italy); Francesco Crenna (University of Genova, Italy)
15:50	A X-Band Scattering Analysis of Intertidal Mudflats Using Co-Polarised Model-Based Decomposition Adil Muhammad and Giovanna Inserra (National Research Council, Italy); <u>Andrea Buono</u> (University of Naples Parthenope, Italy); Giuseppe Grieco (National Research Council, Italy); Maurizio Migliaccio (University of Naples Parthenope, Italy)
16:10	Performance Assessment of a Deep Learning Approach for SAR Ship Detection Valeria Pezone, Andrea Buono and <u>Maurizio Migliaccio</u> (University of Naples Parthenope, Italy)
16:30	Sea State Estimation from Onboard Measurements: A First Attempt in the Ligurian Sea Mohamad Khalil, Francesco Crenna, Giovanni Battista Rossi and Giuliano Vernengo (University of Genova, Italy)
15:30 - 16:50	<i>Hall Šibenik V</i> S5.2 - Integrated approaches for the assessment of human and marine sentinel species interaction and development of co-existence strategies for their conservation Chairs: Giulia Cipriano, <i>University of Bari, Italy</i> Martina Đuras, <i>University of Zagreb, Croatia</i> Marta Anna Azzolin, <i>University of Turin, Italy</i>
15:30	Evidence of Possible Signature Whistle Occurrence in Mediterranean Striped Dolphin Carla Cherubini (CoNISMa, University of Bari, Italy); Elena Bianca Papale (National Research Council, Italy); Angelica Catacchio (CoNISMa, University of Bari, Italy); Pasquale Ricci (University of Padova, Italy); Giulia Lucia (CoNISMa, University of Bari, Italy); Francesca Cornelia Santacesaria and Carmelo Fanizza (Jonian Dolphin Conservation, Italy); Roberto Carlucci and <u>Giulia Cipriano</u> (University of Bari, Italy)
15:50	Effects of Cetacean Biological Characteristics on Dolphin-Human Interactions in the Adriatic Sea <u>Martina Đuras</u>, Magdalena Kolenc, Iva Matijević, Tomislav Gomerčić, Andrea Gudan Kurilj, Zoran Vrbnac, Ivan Alić, Tajana Trbojević Vukičević, Ana Galov and Kim Korpes (University of Zagreb, Croatia)

- 16:10 Clustering of the Whistle Repertoire of the Striped Dolphin (*Stenella Coeruleoalba*, Mayen 1833) in the Gulf of Corinth Using Dynamic Time Warping**
 Jakob Luxa (Van Hall Larenstein University of Applied Sciences, The Netherlands); Arianna Favara and Joseph Larkham (Milokopy Biodiversity Laboratory Gaia Research Institute, Greece); Marta Azzolin (University of Torino, Italy)
- 16:30 Spatio-Temporal Strandings Analysis of Tursiops Truncatus and Stenella Coeruleoalba Along the Adriatic-Ionian Region**
 Giulia Cipriano (University of Bari, Italy); Angelica Catacchio (CoNISMA & University of Bari, Italy); Guido Pietroluongo (CoNISMA & University of Padova, Italy); Luca Ceolotto (University of Padova, Italy); Giorgia Corazzola and Cinzia Centelleghes (CoNISMA & University of Padova, Italy); Kim Korpes and Magdalena Kolenc (University of Zagreb, Croatia); Aylin Akkaya (DMAD, Turkey); Tomislav Gomerčić (University of Zagreb, Croatia); Sandro Mazzariol (University of Padova, Italy); Roberto Carlucci (University of Bari, Italy); Martina Đuras (University of Zagreb, Croatia)
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- 15:30 - 16:50 Hall Šibenik VI*
S5.3 - Applied Marine Zoology as a Tool for Marine Species and Habitats Monitoring and Assessment - PART I
Chairs: Roberta Trani, *University of Bari Aldo Moro, Italy*
 Maria Chiara Cascarano, *University of Bari Aldo Moro, Italy*
 Isabella Coccia, *University of Bari Aldo Moro, Italy*
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- 15:30 Diel Differences in Invertebrate Communities of the Eastern Aegean Sea**
Arlet Escorihuela Pérez, Maurice Calton-Seal, and Anastasia Miliou (Archipelagos Institute of Marine Conservation, Greece); Laura Macrina (King Abdullah University of Science and Technology, Saudi Arabia)
- 15:50 Preliminary Observations on the Rapid Ex-Situ Growth of the Psammobiotic Sponge *Oceanapia Isodictyiformis* (Porifera, Spongidae)**
 Antonella Schiavo, Roberta Trani and Francesco Miscioscia (University of Bari Aldo Moro, Italy); Joseba Aguilo-Arce (Spanish Institute of Oceanography, Spain); Caterina Longo (University of Bari Aldo Moro, Italy)
- 16:10 Distribution, Density and Morphometric Features of *Corallium Rubrum* (Linnaeus, 1758) in the Apulian Region (Ionian Sea - South Italy)**
Isabella Coccia and Cataldo Pierri (University of Bari, Italy); Muriel Oddenino (CoNISMA, Italy); Giuseppe Corriero and Maria Mercurio (University of Bari, Italy)
- 16:30 Beyond Bioremediation: Mature IMTA Fouling Assemblages as Potential Habitat for the Mediterranean Sea Urchin *Paracentrotus Lividus* (Lamarck, 1816)**
Daniele Arduini, Silvia Fraissinet, Adriana Giangrande and Sergio Rossi (University of Salento, Italy)

16:50 - 18:00	LIVE DEMONSTRATIONS by SubSeaPulse - Hydrocord - FER
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The **live demonstrations** will be conducted by SubSeaPulse, Hydrocord and FER. Please meet at the Registration Desk at 16:50, and we will go together to the location where the live demonstrations will take place.

20:00	<i>Dalmatian Ethno Village</i> GALA DINNER
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Technical Program - Wednesday, October 7

08:30 - 15:00	<i>Amadria Park Convention Center - Floor -1</i> REGISTRATIONS
09:00 - 10:40	<i>Hall Šibenik III</i> S6.1 - Object Detection, Tracking, and Sensor Fusion for Maritime Situational Awareness - PART I Chair: Andrei Starodubov, <i>Cyprus Marine and Maritime Institute</i>
09:00	Historical Knowledge Graphs for Global Maritime Estimated Time of Arrival <u>Neofytos Dimitriou</u> (Cyprus Marine and Maritime Institute, Cyprus)
09:20	Interpretable CAM-Based Change Detection for Forward-Looking Sonar Imagery <u>Fausto Fedi</u> , Alessandro Bucci, Filippo Parati and Alberto Topini and Alessandro Ridolfi (University of Florence, Italy)
09:40	Validation of Automatic Vessel Detection in Sentinel-1 SAR Imagery over the Gulf of Gdańsk <u>Oktawia Specht</u> (Gdynia Maritime University, Poland)
10:00	Towards Measurement-Consistent Digital Twins: Force-Aware Visualization for Maritime Robotics <u>Natko Kraševac</u> (University of Zagreb FER, Croatia); Igor Kvasić (Centre of Excellence MARBLE, Croatia); Enio Krizman and Rabea P. Rogge (Norwegian University of Science and Technology, Norway); Dorian Možnik and Nikola Miskovic (University of Zagreb FER, Croatia); Asgeir Sørensen (Norwegian University of Science and Technology, Norway)
10:20	Robust Geometric-Semantic Data Association Under ATR Uncertainty in Forward-Looking Sonar <u>Filippo Parati</u> , Fausto Fedi, Alessandro Bucci, Alberto Topini and Alessandro Ridolfi (University of Florence, Italy)
09:00 - 10:40	<i>Hall Šibenik V</i> S6.2 - Marine Robotics for Environmental monitoring and preservation - PART I Chairs: Vidya Sudevan, <i>Khalifa University</i> Rim ElTobgui, <i>Khalifa University</i> Giulia De Masi, <i>Sorbonne University Abu Dhabi</i>

- 09:00 Robust Data Fusion and Spatial Hotspot Extraction for Anomaly Discovery in Geolocated Marine Environmental Sensing**
Angelo D'Amante, Alberto Topini and Alessandro Ridolfi (University of Florence, Italy); Vincenzo Calabrò, Lorenzo Marini and Lorenzo Sacco (MDM Team, Italy); Luca Ricci (RINA Consulting, Italy); Giorgos Katsouras, George Tsatsanifos and Anthi Yfanti (Athens Water and Sewerage Company EYDAP, Greece)
- 09:20 Benchmarking YOLO26 and RF-DETR Models for Floating Marine Litter Detection**
 Sattwik Kumar Sahu (Indian Institute of Science Education and Research Bhopal, India); Fausto Ferreira (University of Zagreb & CoE MARBLE, Croatia); Lucija Renić (University of Zagreb, Croatia); Pb Sujit (IISER Bhopal, India)
- 09:40 Design and Prototyping of an Underwater Sensing Pod for Marine Monitoring Applications**
Waseem Akram (University of Zagreb, Croatia); Darijo Matešić (Zagreb University of Applied Sciences, Croatia); Ewan Chapuzet (National Graduate School of Advanced Techniques ENSTA Brest, France); Ambre Vuillat (Polytech Montpellier, France); Dula Nad (University of Zagreb & CoE in Maritime Robotics and Technologies for Sustainable Blue Economy, Croatia); Marijan Vonić and Josip Lovrić (University of Zagreb, Croatia); Fausto Ferreira (University of Zagreb Faculty of Electrical Engineering and Computing & CoE MARBLE)
- 10:00 From Workstation to Edge: Vision-Language Models for Onboard Coral Reef Monitoring**
Rim ElTobgui, Vidya Sudevan and Federico Renda (Khalifa University, United Arab Emirates); Giulia De Masi (Sorbonne University-Abu Dhabi, United Arab Emirates); Jorge Dias (Khalifa University, United Arab Emirates)
- 10:20 Underwater Surgical Mask Detection with YOLO26: Evaluating Pool-to-Sea Transfer After Pretraining on Debris Datasets**
 Dario Perhat (University of Zagreb, Croatia); Matej Fabijanic (University of Zagreb, Croatia & Laboratory for Underwater Systems and Technologies, Croatia); Fausto Ferreira (University of Zagreb & CoE MARBLE, Croatia)

09:00 - 10:20 *Hall Šibenik VI*
S6.3 - Smart Marine Infrastructures – Technologies, Systems, and Applications - PART I
Chairs: Enrica Zereik, *National Research Council, Italy*
 Fabio Bonsignorio, *University of Zagreb and Heron Robots, Croatia*

- 09:00 Condition Monitoring of Maritime Pumps Based on Wavelet Anomaly Detection Using Real World Vibration Data**
 Florian Schlieker (German Aerospace Center (DLR), Germany); Andreas Schwung (South Westphalia University of Applied Science, Germany); Joao Paulo Javidi da Costa (Hamm-Lippstadt University of Applied Sciences, Germany); Gesa Ziemer (Institute of Maritime Technologies and Propulsion Systems, DLR, Germany); Sascha Wührl

(Hochschule Flensburg, Germany); Martin Bergström and Sören Ehlers (Institute of Maritime Technologies and Propulsion Systems, DLR, Germany); Sabah Badri-Höher (HAW Kiel, Germany)

- 09:20 One Cell After Another: An Explicit Multi-Objective Optimization Approach to Risk-Based Coverage Path Planning**
Marco Minarelli, Alberto Topini, Alessandro Bucci, Filippo Parati and Alessandro Ridolfi (University of Florence, Italy)
- 09:40 Frame-to-Panorama Localization and Context-Aware Sampling for Scene-Specific Ship Detection in a Smart Marina Testbed**
 Ignat Romanov (University of Nicosia, Cyprus); Andreas Hadjipieris and Neofytos Dimitriou (Cyprus Marine and Maritime Institute, Cyprus)
- 10:00 Smart Wearable Interface for Dexterous Underwater Teleoperation: Dry-Lab Proof of Concept**
Nina Bosak (University of Zagreb, Croatia); Dula Nad (University of Zagreb & CoE in Maritime Robotics and Technologies for Sustainable Blue Economy, Croatia); Nikola Miskovic (University of Zagreb, Croatia); Iain Anderson (University of Auckland, New Zealand)

10:40 - 11:00 *Amadria Park Convention Center - Floor -1*
COFFEE BREAK / POSTER SESSION

The posters displayed during this session are the same posters presented on October 6, during the coffee breaks.

11:00 - 11:45 *Hall Šibenik III*
KEYNOTE LECTURE
Chair: Fausto Ferreira, *University of Zagreb, Croatia*

Five thousand years of water level measurements: from carvings in black basalt stones to satellite missions

Jadranka Šepić, *Faculty of Science, University of Split, Croatia*

11:50 - 13:10 *Hall Šibenik III*
S7.1 - Object Detection, Tracking, and Sensor Fusion for Maritime Situational Awareness - PART II
Chair: Andrei Starodubov, *Cyprus Marine and Maritime Institute*

- 11:50 Critical Aspects of LiDAR-Based Detection of Floating Obstacles in Waves**
Carolina Riccardi, Filippo Scamardella, Flavio Balsamo, Paolo Marsilia, Aniello Mungiglio, Rosario Schiano Lo Moriello and Marco Altosole (University of Naples Federico II, Italy)

- 12:10 A Unity3D-Based Multi-Beam Forward-Looking Sonar Simulator for Synthetic Data Generation**
Francesca Gennai, Alessandro Gentili, Riccardo Costanzi and Lorenzo Pollini (University of Pisa, Italy)
- 12:30 Reinforcement Learning for Heterogeneous Sensor Selection in Maritime Surveillance**
Andrei Starodubov (Cyprus Marine and Maritime Institute, Cyprus); Yaqub Aris Prabowo (Technical University of Denmark, Denmark); Andreas Hadjipieris (Cyprus Marine and Maritime Institute, Cyprus); Roberto Galeazzi (Technical University of Denmark, Denmark); Ioannis Kyriakides (Cyprus Marine and Maritime Institute, Cyprus)
- 12:50 Comparing Supervised and Unsupervised Learning for Explainable Anomaly Detection in Offshore Inspections**
 Ibrahim Ibrahim (University of Zagreb, Croatia); Fausto Ferreira (University of Zagreb & CoE MARBLE, Croatia)

11:50 - 13:10 *Hall Šibenik V*

S7.2 - Marine Robotics for Environmental monitoring and preservation - PART II

Chairs: Vidya Sudevan, *Khalifa University*

Rim ElTobgui, *Khalifa University*

Giulia De Masi, *Sorbonne University Abu Dhabi*

- 11:50 Collaborative AI Agents for the Generation and Verification of Control Software for Marine Robotics**
Adrian Navarro Moya, Vahagn Grigoryan and Giulia De Masi (Sorbonne University-Abu Dhabi, United Arab Emirates)
- 12:10 Semantic 3D Underwater Scene Analysis for Ecological Monitoring**
Vidya Sudevan and Rim ElTobgui (Khalifa University, United Arab Emirates); Giulia De Masi (Sorbonne University-Abu Dhabi, United Arab Emirates); Jorge Dias (Khalifa University, United Arab Emirates)
- 12:30 From Language to Resilient Execution: Failure-Aware LLM-Driven Mission Planning for Heterogeneous Maritime Robot Teams**
 Shwetangshu Biswas (National Institute of Technology Silchar, India); Anubhav Kalita (NIT Silchar, India); Barbara Arbanas Ferreira (CoE MARBLE, Croatia)
- 12:50 Direct Dynamics Tool for the Simulation of a New Marine Measurements Amphibious Platform**
 Alessandro Muccichini, Fabio Botta and Niccolò Raco (Roma Tre University, Italy); Eduardo De Francesco (SETEL, Italy); Gianluca Fabbri (Link Campus University, Italy); Rosario Sinatra (University of Catania, Italy); Paolo Cicconi, Enrico Petritoli, Fabio Leccese and Andrea Scorza (Roma Tre University, Italy); Ruggero De Francesco (SeTeL, Italy); Nicola Pio Belfiore (Roma Tre University, Italy)

11:50 - 13:10	<i>Hall Šibenik VI</i> S7.3 - Smart Marine Infrastructures - Technologies, Systems, and Applications - PART II Chairs: Enrica Zereik, <i>National Research Council, Italy</i> Fabio Bonsignorio, <i>University of Zagreb and Heron Robots, Croatia</i>
11:50	An Acoustic Protocol Coupling USBL Positioning and Data Exchange Between an ASV and an AUV <u>Paolo Marinelli</u>, Alberto Regoli, Salvatore Fiorentino and Francesco Ruscio (University of Pisa, Italy); Alessandro Bucci and Alessandro Ridolfi (University of Florence, Italy); Riccardo Costanzi (University of Pisa, Italy)
12:10	Self-Assembling Marine Dams by Swarms of Bio-Inspired Compliant Semi-Autonomous Bricks Enrica Zereik (National Research Council of Italy, Italy); Fabio Bonsignorio (University of Zagreb, Croatia)
12:30	Bio-Mimetic Swarm Coordination by Visual Communication for Underwater Robot Swarms Fabio Bonsignorio (University of Zagreb, Croatia); Enrica Zereik (National Research Council of Italy, Italy)
12:50	Towards Autonomous Underwater Intervention Through LLM-Generated Behavior Trees for Adaptive Task-Priority Control <u>Thi Tran</u> (University of Zagreb, Croatia); Amir Vahidibejestani and Michele Grimaldi (Heriot-Watt University, United Kingdom); Fausto Ferreira (University of Zagreb & CoE MARBLE, Croatia); Ignacio Carlucho (Heriot-Watt University, United Kingdom)
13:10 - 14:20	<i>Hotel Ivan - Restaurant Rustica</i> LUNCH
14:20 - 15:20	<i>Hall Šibenik III</i> S8.1 - Remote Sensing, In-Situ Surveys, and GIS Applications for Marine and Coastal Areas Chairs: Oktawia Specht, <i>Gdynia Maritime University, Poland</i> Mariusz Specht, <i>Gdynia Maritime University, Poland</i>
14:20	Comparative Analysis of Height Determination Accuracy Using GNSS RTK/RTN Services in a Port Environment <u>Mariusz Specht</u> (Gdynia Maritime University, Poland)
14:40	Deep Learning for Anthropogenic Element Segmentation in Remote Sensing Coastal Images <u>Corrado Sasso</u> (University of Bari, Italy); Vincenzo Mariano Scarrica (University of Naples Parthenope, Italy); Angela Rizzo (University of Bari Aldo Moro, Italy); Antonino

Staiano (University of Parthenope, Italy); Giuseppe Mastronuzzi (University of Bari Aldo Moro, Italy)

15:00 Coastal Landscapes Retrieval from Sentinel-2 Images
Anselme Muzirafuti (University of Messina, Italy)

14:20 - 15:20 Hall Šibenik V
S8.2 - Applied Marine Zoology as a Tool for Marine Species and Habitats Monitoring and Assessment - PART II
Chairs: Roberta Trani, *University of Bari Aldo Moro, Italy*
Maria Chiara Cascarano, *University of Bari Aldo Moro, Italy*
Isabella Coccia, *University of Bari Aldo Moro, Italy*

14:20 Comparative Assessment of Macrofaunal Assemblages and Benthic Ecological Status in Cymodocea Nodosa Meadows and Rhodolith Beds in the Mar Piccolo of Taranto (Ionian Sea)
Luca Giannattasio (University of Palermo, Italy); Maria Flavia Gravina (University of Roma Tor Vergata Italy, Italy); Tamara Lazic and Giuseppe Corriero and Cataldo Pierri (University of Bari Aldo Moro, Italy)

14:40 Population Dynamics and Life-History Divergence in Sympatric Syngnathids: Integrating Habitat Heterogeneity and Phenotypic Strategies in the Mar Piccolo of Taranto
Tamara Lazic and Giuseppe Corriero (University of Bari Aldo Moro, Italy); Luca Giannattasio (University of Bari Aldo Moro & CoNISMa, Italy); Michele Gristina (National Research Council, Italy); Nuno Monteiro (CIBIO-InBIO, Portugal); Marco Spoto (University of Bologna, Italy & National Research Council, Italy); Miriam Ravisato and Cataldo Pierri (University of Bari Aldo Moro, Italy)

15:00 Sponges Farmed in Integrated Multi-Trophic Aquaculture During Marine Heat Waves: First Observations from the Northern Ionian Sea
Roberta Trani and Antonella Schiavo (University of Bari Aldo Moro, Italy); Daniele Arduini and Adriana Giangrande (University of Salento, Italy); Caterina Longo (University of Bari Aldo Moro, Italy)

15:20 - 15:50 Hall Šibenik III
CLOSING AND AWARD CEREMONY

15:50 - 17:50 VISIT TO PILOT SITES - LIVE DEMO by MARBLE

Please meet at the Registration Desk at 15:50, and we will go together to the location where the live demonstration and the visit will take place.