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Welcome from the Conference Chairs

Welcome to the 7th Offshore Energy and Storage Symposium, OSES 2023 being held in Malta, located in the centre of the Mediterranean Sea. OSES is back – after a 3-year pause caused by COVID. As we convene this year, we will do so in a world that feels much changed from how it was in the period 2014-2019. The same imperatives of averting disastrous climate change and focusing on sustainability motivate OSES2023 as they did for the previous six symposia. However, we are now knowledgeable of other key facts: (i) that the measures adopted to deal with COVID have taught us as a society that major global emergencies demand major global responses and we, humankind, can embrace those responses and (ii) that the volatility of oil and gas prices spurred by Russian aggression both enhance the already-obvious commercial sense of offshore renewable energy and confirm the political urgency for Western democracies to reduce dependence on hydrocarbon imports. The case for working at full speed to advance offshore energy and its storage has never been stronger.

OSES offers a great opportunity for sharing the latest developments of academic and industrial research in offshore renewables, energy storage as well as the integration of renewables in electricity supply networks. This year's programme includes more than 65 speakers. For the first time, OSES is also including the decarbonisation of maritime transport in its list of topics.

We hope that OSES 2023 will stimulate further networking and collaboration. We also hope that you will enjoy your stay in Malta and also find time to visit some of the many historical places and beaches on these islands.


Tonio Sant


Seamus Garvey


Rupp Carriveau


Jochen Bard


Claire De Marco


Robert N. Farrugia

OSES 2023
Offshore Energy & Storage Symposium

Programme at a Glance

Wednesday, 12th July 2023	Thursday, 13th July 2023	Friday, 14th July 2023
Registration: 08:00 - 17:15 The Foyer, Fortress Suite, Corinthia San Ġorġ Hotel, St George's Bay, St. Julian's		
Welcome Speeches 08:30 - 09:30 **OSES2023 Chair, Prof. Inġ. Tonio Sant** **OSES Founders, Prof. Seamus Garvey & Prof. Rupp Carriveau** **Prof. Alfred Vella, Rector University of Malta** **Hon. Miriam Dalli, Minister for Environment, Energy and Enterprise** Fortress 1	**Keynote 2:** 08:30 - 09:00 **Michael Borg** *The Tetra Concept: Industrialised Offshore Wind Foundations* Fortress 1	**Keynote 4:** 08:30 - 09:00 **Simone Borg** *Energy Out of the Blue: It takes Two to Tango* Fortress 1
Keynote 1: 09:30 - 10:00 **James F. Manwell** *Storage and the Energy Transition; The quest for a 100% Renewables-Based Future* Fortress 1	**Session 5:** 09:00 – 10:00 **Offshore Wind Energy I** Fortress 1	**Session 10:** 09:00 - 10:00 **Decarbonisation of Maritime Transport I** Fortress 1 **Green Hydrogen Production I** Fortress 2
Session 1: 10:30 - 11:30 **Compressed Gas and Pumped Thermal Energy Storage** Fortress 1	**Session 6:** 10:30 - 12:00 **Offshore Wind Energy II** Fortress 1 **Floating Offshore Solar** Fortress 2	**Session 11:** 10:30 - 11:50 **Decarbonisation of Maritime Transport II** Fortress 1 **Integration of RES & Storage of Electricity** Fortress 2
Session 2: 11:30 - 12:50 **New Concepts for Offshore Renewables** Fortress 1 **Compressed Air Energy Storage I** Fortress 2	**Session 7:** 12:00 - 13:00 **Offshore Wind Energy III** Fortress 1 **Other Novel Approaches for Storage** Fortress 2	**Session 12:** 13:00 - 14:00 **Hydrodynamics of Offshore Structures** Fortress 1 **Green Hydrogen Production II** Fortress 2

OSES 2023
Offshore Energy & Storage Symposium

Wednesday, 12th July	Thursday, 13th July	Friday, 14th July 2023
Session 3: 14:00 - 15:20	**Keynote 3:** 14:00 - 14:30 **Antonio Marco Pantaleo** *Research and Innovation Trends in Mid to Long Term Duration Energy Storage and the Role of the Program Manager at EIC* Fortress 1	**Closing Event**: 14:00 - 14:30 **Seamus Garvey & Rupp Carriveau** Fortress 1
Offshore Platforms Supporting Renewables & Storage Fortress 1 **Compressed Air Energy Storage II** Fortress 2	**Session 8:** 14:30 - 15:30 **Policy & Markets: Some Perspectives on the Size and Nature of the Problem** Fortress 1	
Session 4: 16:00 - 17:20 **Integration of Renewables with Storage** Fortress 1 **Offshore Pumped Hydro Storage** Fortress 2	**Session 9:** 16:00 - 18:00 **Policy & Markets: Possible Solutions** Fortress 1	
Welcome Reception: 18:00 - 19:00 Corinthia San Ġorġ Hotel Fra Martino Terrace	**18:30 onwards** **Cultural Visit** Mdina **Conference Banquet** The Xara Lodge, Rabat (offsite)	

Mdina

Xlendi Bay, Gozo

Blue Lagoon, Comino

PROGRAMME

Day 1 - Wednesday, 12th July 2023

Registration: 08:00 - 17:15
The Foyer, Fortress Suite, Corinthia San Ġorġ Hotel, St George's Bay

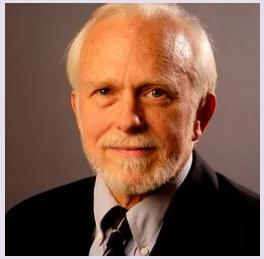
Welcome Speeches
08:30 - 09:30

OSES 2023 Chair, Prof. Inġ. Tonio Sant
OSES Founders, Prof. Seamus Garvey & Prof. Rupp Carriveau
Prof. Alfred Vella, Rector University of Malta
Hon. Miriam Dalli, Minister for Environment, Energy and Enterprise

Fortress 1

Keynote 1
09:30 – 10:00
Fortress 1

James F. Manwell
Storage and the Energy Transition; The quest for a 100% Renewables-Based Future



James F. Manwell is a Professor of Mechanical Engineering at the University of Massachusetts Amherst and the Founding Director of the University's Wind Energy Center. Prof. Manwell has been working in the field on wind energy for more than 35 years, both within the United States and internationally. His research interests have focused on assessment of the wind resource and wind turbine external design conditions, hybrid power system design, energy storage and offshore wind energy. He worked with the International Energy Agency's wind energy R&D activity and continues to be a member of the International Electrotechnical Commission's working groups developing design standards for offshore wind turbines since 2001. He is the lead author of the text book Wind Energy Explained: Theory, Design, and Application (Wiley, 2009) and the author of "Offshore Wind Energy: Technology Trends, Challenges, and Risks," (Springer, 2012) and "Hybrid Energy Systems," Encyclopaedia of Energy (Elsevier, 2004), as well as numerous other publications on various aspects of wind energy.

Refreshments: 10:00 - 10:30
The Foyer, Fortress Suite

Session 1: 10:30 - 11:30	
1. Compressed Gas and Pumped Thermal Energy Storage **Chair: Tonio Sant** Fortress 1	
Design and Modal Analysis of a Large-Scale Underwater Compressed Gas Energy Storage Accumulator H. Wang, W. Xiong, C. Liang, R. Carriveau, D. S-K Ting, Z. Wang Dalian Maritime University, China; University of Windsor, Canada	
Choice of Working Gas for a Pumped-Thermal System Integrating Energy Storage with Wind Turbines S.D. Garvey, L. Swinfen-Styles, J. Rouse, B. Cardenas, R. Ibanez University of Nottingham, UK	
Utility-Scale Subsea Energy Storage D. Buhagiar, E. Kloster, T. Sant, R.N. Farrugia FLASC B.V., The Netherlands; Subsea 7 S.A., Norway	
Session 2: 11:30 - 12:50	
2A. New Concepts for Offshore Renewables **Chair: Claire De Marco** Fortress 1	**2B. Compressed Air Energy Storage I** **Chair: Seamus Garvey** Fortress 2
Low Cost Locally Manufactured Concrete Anchors for Floating Ocean Energy Systems J. Cortell, G. Falzone, M. Bell, T. Marchment RCAM Technologies, USA	Identification of Slug Flow in Underwater Compressed Gas Energy Storage Pipeline Using Pressure Signal C. Liang, W. Xiong, H. Wang, R. Carriveau, D. S-K Ting, Z, Wang Dalian Maritime University, China; University of Windsor, Canada
Experimental Analysis of a Hydraulic Wind Turbine for Seawater Reverse Osmosis Desalination Prototype F. Greco, R. de la Garza Cuevas, A. Jarquin-Laguna Delft University of Technology, The Netherlands; DOT BV, The Netherlands	Adiabatic Compressed Air Energy Storage (ACAES) System Performance with an Application Oriented Designed Axial-Flow Compressor D.L. Pottie, P. Eames, E.R. Barbour Loughborough University, UK
Operational Assessment of a Flooded Linear C-Gen Generator for Wave Energy Conversion J. Burchell, I. Barajas-Solano, X. Xiang, M. Galbraith, M. Mueller University of Edinburgh, UK; Dana Incorporated, Germany; Tsinghua University, China; Fountain Design Ltd, County Durham, UK	Assessment of Compressed Air Energy Storage to Support UK Wind Generation through Colocation of Technologies M. King, W. He, J. Wang University of Warwick, UK; King's College London, UK
A Framework for the Assessment of the Maximum Convertible Power of Wave Energy Converters with an All-Electric Power Take-Off G. Moretti, E. Tedeschi University di Trento, Italy; Norwegian University of Science and Technology, Norway	

Lunch: 13:00 - 14:00 Fra Martino Restaurant	
Session 3: 14:00 - 15:20	
3A. Offshore Platforms Supporting Renewables & Storage **Chair: Lucio Mule` Stagno** Fortress 1	**3B. Compressed Air Energy Storage II** **Chair: Robert Ghirlando** Fortress 2
Evaluation of the Combination of Renewable Energy Sources in an Offshore Platform using TOPSIS Multicriteria Method I. K. Dagkinis, T.E. Lilas, P. M. Psomas, A. A. Stefanakou, E.E. Antoniou, N. V. Nikitakos, G. D. Pavlogeorgatos University of the Aegean, Greece	Isobaric Compressed Air Energy Storage in Salt Caverns: Operational Limitations and Structural Reliability J. Rouse, S. D. Garvey, B. Cardenas University of Nottingham, UK
Investigation into the Feasibility of a Modular Offshore Platform for Green Hydrogen Production as a Marine Fuel T.L. Gard, A. Hills, L. Johnston, C. Scott, H. Srirangeraj, O. Tawakol, S.R. Turnock, D.A. Hudson University of Southampton, UK	A Salt Based Integrated Thermal Store and Heat Exchanger for CAES Systems B. Cardenas, J.P. Rouse, R. Ibanez, S.D. Garvey University of Nottingham, UK
Technical Feasibility of an Offshore Semi-Submersible Platform Integrating an Advanced Adiabatic Compressed Air Energy Storage (AA-CAES) System P. Vella, T. Sant, R. N. Farrugia University of Malta, Malta	Exergy Analysis of Isochoric and Isobaric Adiabatic Compressed Air Energy Storage E. Barbour, D. Pottie Loughborough University, UK
	An Experimental Analysis for the Charging Cycle of a Hydro-Pneumatic Energy Storage System L. Aquilina, T. Sant, R. N. Farrugia University of Malta, Malta
Refreshments: 15:30 - 16:00 The Foyer, Fortress Suite	

Session 4: 16:00 - 17:20	
4A. Integration of Renewables with Storage **Chair: Luca Greco** Fortress 1	**4B. Offshore Pumped Hydro Storage** **Chair: Oliver Lodeho** Fortress 2
Application of the Cost of Valued Energy (COVE) to a RES-based Hybrid Energy System on a Mediterranean Island to Evaluate the Potential of Energy Storage Systems F. Superchi, A. Moustakis, G. Pechlivanoglou, A. Bianchini University of Florence, Italy; Eunice Energy Group, Greece	StEnSea: Stored Energy in the Sea B. Ernst, J. Bard, C. Dick Fraunhofer IEE, Germany
Using Machine Learning Techniques for Sizing Energy Storage Systems Coupled to Offshore Windfarms for the Maltese Islands M.D. Mifsud, T. Sant, R.N. Farrugia University of Malta, Malta	Low Cost Locally Manufactured Marine Pumped Hydro Energy Storage Systems J. Cortell, G. Falzone, M. Bell, T. Marchment RCAM Technologies, USA
Statistical Analysis for Evaluating the Energy Storage Requirements of Offshore Wind and Solar Plants in the Central Mediterranean Sea A. Borg, C. Cutajar, T. Sant, R. N. Farrugia, D. Buhagiar University of Malta, Malta; FLASC BV, The Netherlands	Optimal Design and Operation of Low Head Offshore Pumped Hydro Energy Storage for the Provision of Market-Based Grid Services E.B. Prasasti, M. Joseph, M. Zangeneh, K. Terheiden University of Stuttgart, Germany; Advanced Design Technology Ltd., UK
Isolated Microgrid Supply by Offshore Renewable Energy Improves Reliability with Inspection and Monitoring F. Dupriez-Robin, F. Roux France Énergies Marines, France	Experimental Setup and Methods for a Novel Low-Head Pumped Storage System J.P. Hoffstaedt, R. Ansorena Ruiz, D. Schurenkamp, A. Jarquin-Laguna, N. Goseberg Delft University of Technology, The Netherlands; Leichtweiß-Institute, Germany; Costal Research Center, Germany
Welcome Reception 18:00 - 19:00 Corinthia San Ġorġ Hotel Fra Martino Terrace	

Day 2 - Thursday, 13th July 2023

Registration
08:00 - 08:30
The Foyer, Fortress Suite, Corinthia San Ġorġ Hotel, St George's Bay

Keynote 2
08:30 – 09:00
Fortress 1

Michael Borg
The Tetra Concept: Industrialised Offshore Wind Foundations

Michael is Chief Engineer responsible for System Engineering at Stiedal Offshore, with over ten years' experience in academia and industry in floating offshore wind. A mechanical engineer by training, Michael obtained a PhD in offshore floating vertical axis turbine coupled dynamics from Cranfield University. Michael continued as a postdoc in the Department of Wind Energy at the Technical University of Denmark, focusing on industrial research in nonlinear hydrodynamics, numerical and experimental modelling of floating wind turbines. Michael then moved on to Stiesdal Offshore, where he was one of the lead engineers in the TetraSpar Demonstrator floating wind turbine prototype. In his current role, Michael leads the technical aspects of system engineering of the Tetra floating foundation concepts, covering global design, integrated load calculations, mooring, anchoring and cable.

Session 5: 09:00 - 10:00

5. Offshore Wind Energy I
Chair: Seamus Garvey
Fortress 1

NextFloat: Structural Benefit of Innovative Downwind Floating Wind Concept
M. Cahay, L. Milde
Technip Energies, France; X1-Wind, Spain

Towards the Development of Offshore Wind Farms in the Mediterranean Sea: a Techno-economic Analysis on an Italian Case Study
R. Travaglini, F. Superchi, F. Lanni, G. Manzini, L. Serri, A. Bianchini,
University of Florence, Italy; Ricerca sul Sistema Energetico - RSE S.p.A., Italy

Optimization of a Floating Offshore Wind Turbine Platform and Mooring Lines according to an Innovative Wind Farm Wake Control Technique
G. Lazzerini, D. Coiro, G. Troise
University of Naples Federico II, Italy; SEAPOWER Scrl., Italy

Refreshments: 10:00 - 10:30 The Foyer, Fortress Suite	
Session 6: 10:30 - 11:30	
6A. Offshore Wind Energy II **Chair: Alessandro Bianchini** Fortress 1	**6B. Floating Offshore Solar** **Chair: Antonio Laguna** Fortress 1
Substructure Optimization for a Semi-Submersible Floating Wind Turbine K. Fletcher, E. Tetteh, E. Loth, C. Qin, R, Damiani University of Virginia, USA; Washington State University, USA; The Floating Wind Technology Company, USA	Offshore Solar in High Seas - Assessment of Resource Complementarity for a Case in Malta J. Meit, J.C.S. Amato, B. Vlaswinkel Oceans of Energy, The Netherlands
Assessment of a Fast and Versatile Aeroelastic Platform for On/Off-Shore Wind Turbine Analysis N. Aryan, L. Greco, C. Testa University La Sapienza, Italy; Institute of Marine Engineering (CNR-INM), Italy	Development of Offshore Solar for Mediterranean Conditions L. Mule' Stagno, R. Bugeja, M. Grech, G. Poirier University of Malta, Malta
Investigation of Turbines Wakes and Wake-Rotor Interaction in a Floating Offshore Wind Farm A. Castorrini, V. Morici, F. De Girolamo, L. Tieghi, V.F. Barnabei, A. Corsini University La Sapienza, Italy	A Review on Conceptual Designs of Support Structures for Floating Solar Power Plants H. Pourgholami Markieh, A. Khaleghi Hendukhale, M. Khorasanchi, E. Oguz Sharif University of Technology, Iran; Middle East Technical University, Turkey
Session 7: 11:30 - 12:50	
7A. Offshore Wind Energy III **Chair: Daniel Micallef** Fortress 1	**7B. Other Novel Approaches for Storage** **Chair: Daniel Buhagiar** Fortress 2
Performance Analysis of a Hovering Multirotor UAV in Open Field Wind Conditions L. Scicluna, T. Sant, R.N. Farrugia University of Malta, Malta	Super-rated Wind Turbine for Energy Storage E. Loth, J. Simpson, C. Noyes University of Virginia, USA
Deriving Aerofoil Data for Very Large Offshore Wind Turbine Blades using CFD K.T. Borg, J.P. Mollicone, T. Sant University of Malta, Malta	Thermo-Chemical Storage of Electricity M. Saghafifar, S. A. Scott, A. J. White Cambridge University, UK
Resilience of Energy System with a High Share of Offshore Wind Energy Regarding Resource Availability D. Beljan, N. Duić University of Zagreb, Croatia	Subsea Buoyancy Gravity Energy Storage: An Innovative Modular Solution for Deepwater's Applications A.R. Novgorodcev Jr., A. Jarquín-Laguna Delft University of Technology, The Netherlands

Unsteady Aerodynamic Modelling of Floating Offshore Wind Turbine Rotor using A Free Wake Method İ. Öztürk, N. Sezer-Uzol Middle East Technical University & Center for Wind Energy Research (RÜZGEM), Turkey	Hybrid Flywheel (Hy-FLY) Energy Storage System (ESS) for Offshore Wind Application N.K. Mishra, D. Mukherjee, K. Kalita, S.D. Garvey, J.P. Rouse, P. Barooah Indian Institute of Technology Guwahati, India; University of Nottingham, UK

Lunch: 13:00 - 14:00
Fra Martino Restaurant

Keynote 3

14:00 – 14:30
Fortress 1

Antonio Marco Pantaleo

Research and Innovation Trends in Mid to Long Term Duration Energy Storage and the Role of the Program Manager at EIC

Antonio Marco is the European Innovation Commission Programme Manager for Energy Systems and Green Technologies. He has twenty years of experience in multidisciplinary research projects in renewable and clean energy technologies (solar, wind, biomass, and hybrid), energy systems integration, biosystems engineering, energy use in agricultural engineering and food processing. He holds a first degree in electric engineering from Politecnico of Bari and a PhD in process systems engineering from Imperial College London and is an associate professor of clean energy technologies at the department of agro-environmental sciences of the University of Bari. Before becoming professor, he co-founded an energy service company, worked for Edison Energie Speciali as wind and biomass energy engineer and for GSE (Gestore dei Servizi Energetici) in the strategic planning division. He also worked as scientific expert and consultant for public and private organisations, including the Italian Ministry of Research, and was vice-Rector for energy policy of University of Bari

Session 8: 14:30 - 15:30

Policy & Markets:
Some Perspectives on the Size and Nature of the Problem

Chair: John Loughhead
Fortress 1

John has over 30 years' experience in R&D, innovation and product development in the energy sector. He became the Chief Scientific Adviser to DECC (which subsequently became BEIS) in 2014 having previously been Executive Director of the UK Energy Centre. Before that he was Corporate Vice-President for the Alstom Group where he led R&D and technology assessments supporting M&A activity. John is a fellow of the Royal Academy of Engineering, Past-President (2008) of the Institution of Engineering & Technology and Honorary Professor of Engineering at Cardiff University.

Refreshments: 15:30 - 16:00 The Foyer, Fortress Suite
Session 9: 16:00 - 17:30
Policy & Markets: Possible Solutions: **Chair: John Loughhead** Fortress 1
18:00 onwards **Cultural Visit,** Mdina **Conference Banquet,** The Xara Lodge, Rabat (offsite)

Day 3 - Friday, 14th July 2023

Registration

08:00 - 08:30

The Foyer, Fortress Suite, Corinthia San Ġorġ Hotel, St George's Bay

Keynote 4

08:30 – 09:00

Fortress 1

Simone Borg

Energy Out of the Blue: It Takes Two to Tango

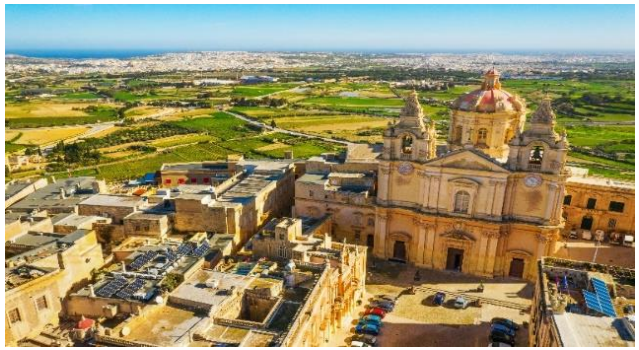
Professor Simone Borg LL.D, LL.M. (Int law), Ph.D (IMLI) is Malta's Ambassador for Climate Action and chairs the National Climate Action Board. Prof Borg is a resident academic at the University of Malta, a visiting lecturer at the IMO International Maritime Law Institute and has lectured at various Universities abroad. She is specialised in International law and policy relating to climate, ocean governance and biodiversity conservation. Prof Simone Borg recently chaired the Steering Committee for Malta's National Post COVID Strategy. She also occupied various other senior roles at governmental level. Professor Borg is a member of the IUCN Commission on Environmental Law, a member on its sub-committee on the oceans. She has authored various publications on both ocean governance and climate change. In 2017 she received the French National Order of Merit for her work as a diplomat on climate action in Malta and within the International community. She was recently awarded the Inspirational Leadership Award by the British High Commission in Malta for her work on climate action.

Session 10: 09:00 - 10:00

10A. Decarbonisation of Maritime Transport I **Chair: Kurt Mizzi** Fortress 1	10B. Green Hydrogen Production I **Chair: Jochen Bard** Fortress 2
Wind Assisted Ship Propulsion: A Code for Flettner Rotor Feasibility Studies M. Figari, V. Vigna Università di Genova, Italy; Fincantieri, Italy	Cost Optimization of Offshore Wind Farm Combination with Reversible Solid Oxide Cell System Producing Hydrogen using the PyPSA Power System Modelling Tool J. Guichard, R. Rawlinson-Smith, D. Greaves University of Plymouth, UK
Early Considerations for Offshore Fuelling of Zero Emission Transoceanic Marine Vessels R. Carriveau, L. Manuel University of Windsor, Canada; University of Texas at Austin, USA	Subsea Hydrogen Storage, a Versatile Innovative Technology Supporting the Development of the Renewable and Low-Carbon Hydrogen Economy C. Brice Subsea 7, France

The Full-Scale Performance Prediction of a General Cargo Ship with a Retrofitted Gate Rudder System using CFD Procedures M. Zammit Munro, K. Mizzi, K. Gutteridge, M. Atlar, N. Sasaki Naval Architectural Services, Malta; University of Strathclyde, UK	State of the Art of Methodologies for a Realistic Assessment of Offshore Renewable Energy Sources Deployment and Coupled Green-H2 Based Energy System Modelling A. Ferraresea, P. Marocco, R. Novo, G. Mattiazzo, M. Santarellia Politecnico di Torino, Italy
Refreshments: 10:00 - 10:30 The Foyer, Fortress Suite	
Session 11: 10:30 - 11:50	
11A. Decarbonisation of Maritime Transport II **Chair: Claire De Marco** Fortress 1	**11B. Integration of RES & Storage of Electricity** **Chair: Elisabetta Tedeschi** Fortress 2
Simulation of Operation and Control of LNG and Diesel Dual Fuel Engine for Marine Application A.T. Saliba, E. Agius, K. Scerri, M. Farrugia University of Malta, Malta	Modelling Energy Storage, Electric Vehicles and Power-to-X in a Large-Scale Hybrid Offshore Wind Power System J. F. Manwell, J. G. McGowan University of Massachusetts, USA
Numerical Modelling of a Kite-Assisted Vessel in Open Waters W. Formosa, T. Sant, C. De Marco Muscat-Fenech, M. Figari University of Malta, Malta; University of Genoa, Italy	Co-Location of Wave and Offshore Wind Energy for Electrification of North Sea Oil and Gas Assets W. Nassar, A. Aboushady, P. Robb, E. Osei, P. Slorach, M. Miller, G, Scarlett, A, Caio, I. Crossland Glasgow Caledonian University, UK; Net Zero Technology Centre, UK; Verlume Ltd, UK; Mocean Energy Ltd, UK
The Concept Design of Wind Assisted Emergency Escape Boat for Warships G.Tehlan, S. Babu Indian Navy, CUSAT, India	Modeling Analysis for Solar/Wind-Powered Microgrid on Tangier Island R. Sandherr, J. Miles Trier University of Applied Sciences, Germany; James Madison University, USA
	Renewable Offshore Energy System and Battery Energy Storage for the Island-Based Water-Energy Nexus Analysis G. Stunjek, G. Krajačić University of Zagreb, Croatia
Lunch: 12:00 - 13:00 Fra Martino Restaurant	

Session 12: 13:00 - 14:00	
12A. Hydrodynamics of Offshore Structures **Chair: Rupp Carriveau** Fortress 2	**12B. Green Hydrogen Production II** **Chair: Robert N. Farrugia** Fortress 2
Hydrodynamic Performance of an Array of Truncated Cylinders in front of a C-Type Vertical Wall T. P. Mazarakos University of West Attica, Greece	Coupling Offshore Wind Turbines with Hydro-Pneumatic Energy Storage for Green Hydrogen Production O. Pirotti, D. Scicluna, R.N. Farrugia; T. Sant, D. Buhagiar, J. Settino University of Malta, Malta; FLASC BV, The Netherlands
Numerical Modelling of the Wave Attenuation of Floating Breakwaters in Deep Waters C. Cutajar, A. Borg, T. Sant, R. N. Farrugia, D. Buhagiar University of Malta, Malta	Flexible Grid Hydrogen Production: Beyond the Colours Taxonomy F.B. Bozzolo Lueckel, C. Moran, A. Bopaiah, P. Deane, M. Lynch, R.F.D. Monagha University of Galway, Ireland; Ryan Institute, Ireland; Economic and Social Research Institute, Ireland; University College Cork, Ireland
Model Testing of Different Wave Attenuator Concepts for Supporting Offshore Renewables K. Spiteri, C, Cutajar, T. Sant University of Malta, Malta	Levelised Cost of Hydrogen from a Dedicated Offshore Wind Farm D. Pegler, R. Rawlinson-Smith, D. Greaves University of Plymouth, UK
Closing Event 14:00 – 14:30 **Chair: Seamus Garvey & Rupp Carriveau** Fortress 1	









OSES 2023
Offshore Energy & Storage Symposium

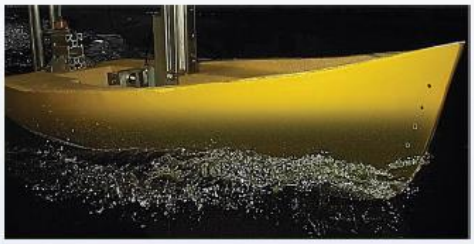
EU Horizon 2020 Project VENTuRE

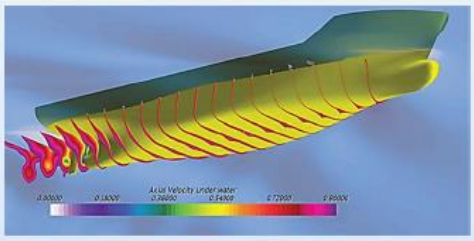
a **V**irtual and physical **E**xperime**N**tal **T**owing centre for the design of ene**R**gy **E**fficient sea-faring vessels

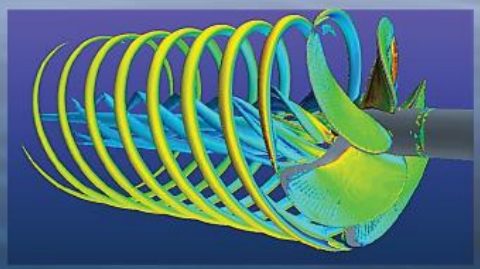
"Setting our sails through research, collaboration, and innovation"

Within a maritime vision, the European Commission, International Maritime Organization, and regulatory and industrial bodies have proposed preventative measures to establish a sustainable and cleaner environment, emphasising 'energy efficiency' to lower CO_2 emissions.

Malta's strategic location, infrastructure, and experience have resulted in a globally-respected Maltese flag registry (sixth globally, first ranking flag on the European level). To address the shortage of educational infrastructure, generate sufficient human skills, and encourage novel research, the VENTuRE twinning project between the Universities of Malta, Strathclyde, and Genoa, and the SME Naval Architecture Services Ltd. will work towards the creation of a virtual and experimental towing centre. The premise is to maximise the use of these facilities and secure the transfer of essential knowledge to increase HR capacity and expertise in Malta in the area of 'energy efficient' ship design.







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This project has received funding from the European Union's Horizon 2020 research and innovation programme. Project No. 856887.

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OSES 2023
Offshore Energy & Storage Symposium

OSES 2023
Offshore Energy & Storage Symposium

Venue of OSES2023

Corinthia San Ġorġ Hotel 5*
St, George's Bay, St Julian's, Malta
GPS: N35.929127, E14.49039

Conference Rooms

Welcome Speeches Fortress 1
Scientific Presentations

- Room: Fortress 1
- Room: Fortress 2

Welcome Reception

Date: Wednesday, 12 July 2023
Time: 18:00 - 19:00
Room: Corinthia San Ġorġ Hotel, Fra Martino Terrace

Walking Tour of Mdina & Conference Banquet, The Xara Lodge

Date: Thursday, 13 July 2023
Departure Time: conference bus @ 18:30
Departure Point: Reception Front Door, Corinthia San Ġorġ Hotel
Destination: Mdina (Offsite) for walking tour
Conference Banquet: The Xara Lodge, Sqaq Taċ-Ċawla, Triq It-Tiġrija, Ir-Rabat at 19:45, dress code is casual smart (no jackets required)

Important Notices:

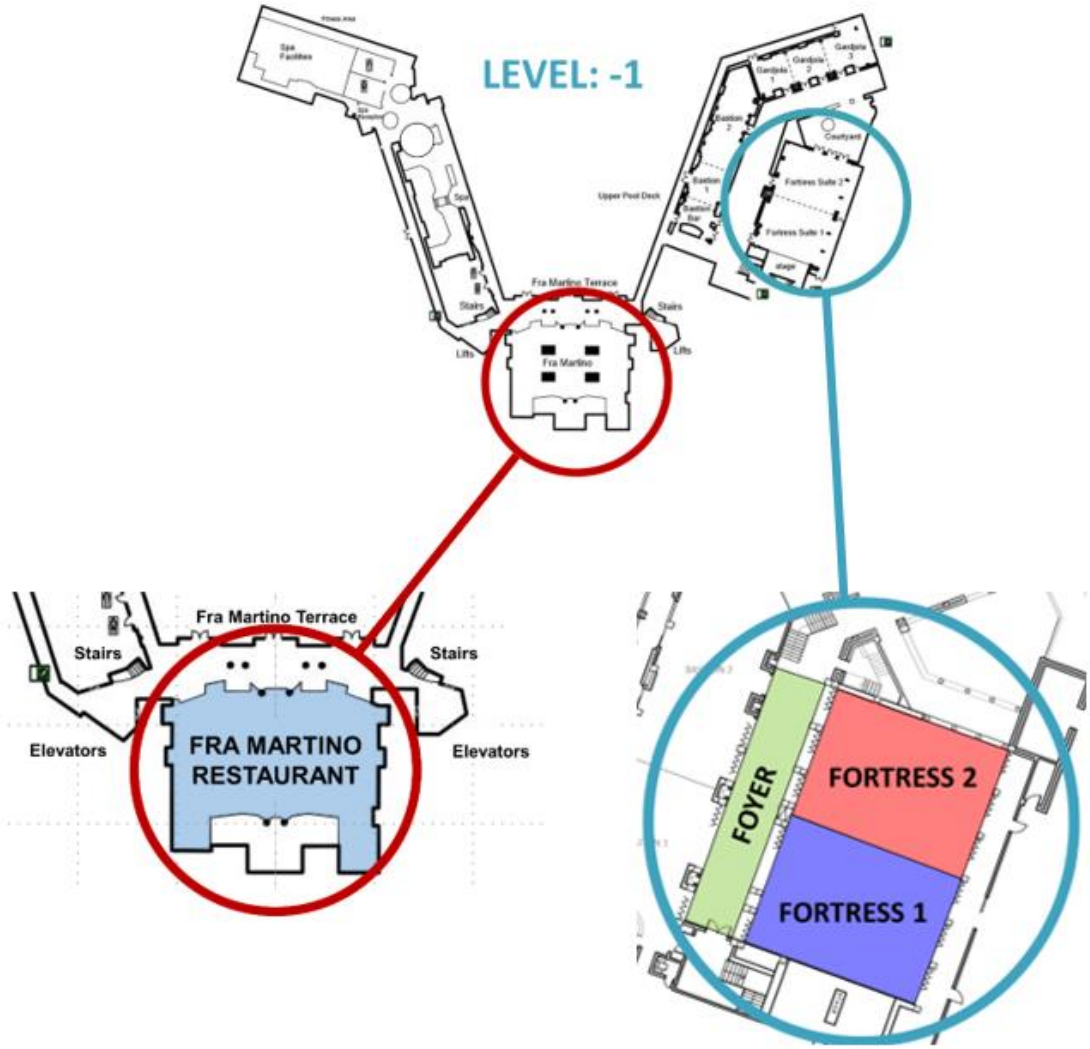
All registered participants of OSES2023 must wear their name badges when attending luncheons, coffee breaks, welcome reception, and conference banquet

Internet

username: corinthia
password: corinthia

Hotel Map

The Fortress Suites, Corinthia San Ġorġ Hotel, St. George's Bay, St Julian's



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