Prof. Claudio Lugni

Claudio Lugni is Research Director at CNR-INM and lecturer at University of Roma Tre for the course "Dynamics of floating structures for marine renewable energy". He is delegate of the Italian government for the Implementation Working Group "Offshore Wind" within the EU-SET-Plan (EU Strategic Energy Technology Plan). The IWG-OW provides the guidelines for the national and EU SET Plan actions on the Offshore Wind technology to achieve the low carbon economy goals of 2030 and 2050. He received the MSc degree in 1995 in Aeronautical Engineering at the University of Rome "Sapienza" and the PhD degree in "Theoretical and Applied Mechanics" in 1999. He was researcher at INSEAN since 2000, where he was Director of the Seakeeping and Maneuvering Dept from 2008 to 2011.

He is an expert in marine hydrodynamics, particularly gifted in working with people from different disciplines and with innovative research ideas. His research paradigm is characterised by a multi-directional integration of available approaches for an efficient and effective solution of a specific physical problem. This implies the capability to explore creative ways to answer novel research questions both from an interdisciplinary perspective (vertical integration) and by using different research tools, i.e., theoretical, numerical, and experimental, within a given discipline (horizontal integration).

Within important international collaborations with leading scientists, he investigated top-priority topics, many of them requiring multi- and inter-disciplinary research strategies: propagation of nonlinear sea states including statistical occurrence of extreme waves, e.g. freak waves (with Fedele, Georgia Tech,US); renewable energy from offshore wind turbine (with Manuel, Texas Univ.,US, Gao & Moan, NTNU, Marino, UniFi ,IT, Faltinsen & Greco, NTNU) and waves (with Vicinanza, Unica,IT]: violent wave-offshore structures interactions (with Faltinsen and Greco, NTNU); hydro-elasticity (with Faltinsen, NTNU); sloshing flows (with Faltinsen, NTNU, Lader & Kristiansen, NTNU/Sintef), fish hydrodynamics (with Graziani & Piva, UniRoma) and bio-inspired novel marine vehicles (with Faltinsen and Greco); wave impact (with Faltinsen, NTNU, and Brocchini, UnivPM); scaling during water-entry phenomenon (with Faltinsen, NTNU, Duan & Wang, Harbin Univ.); dynamic instability of ships (with Faltisnen & Greco, NTNU); turbulence (with Brocchini, UniPM), added resistance (with Okhusu, Osaka Univ.), remote sensing (with Nieto, Univ. Alcala', Soldovieri, CNR-IREA).

In 2010, within an interdisciplinary work with IREA-CNR colleagues (Soldovieri and Serafino) with a consolidated expertise in the electromagnetic field, he has been co-founder of the spin-off Remocean, developing the first Italian X-band wave-radar. This can measure in

real-time the sea spectrum, the surface current and the seabed bathymetry. A post-process algorithm can reconstruct the spatial-time evolution of the sea waves.

In the last 6 years, he has conceptualised the Floating Energy Archipelago (FEA), which integrates Marine Renewable Energy with the in-situ use of the energy generated. Recently, in cooperation with Prof. Vicinanza (Univ. of Campania), he has realised the first Laboratory at sea for the marine renewable energy of the Mediterranean Sea (MaRELab). At MaRELab, he has installed (in cooperation with Saipem) the first prototype existing in the Med Sea of a Floating Offshore Wind turbine (FOWT) and designed a new concept of flexible floating offshore solar island, characterised by a low cost, that will be installed in 2022.

C. Lugni has produced so far about 100 publications indexed in Scopus and coordinated about 20 Research Pojects. He has been visiting researcher at the Centre of Excellence (CoE) CeSOS and is presently Adjunct Professor at NTNU AMOS and at Harbin Engineering University of China. He is also High Level foreign expert for the Ministry of Science and Technology of China