

# DESIGN METHODS FOR MARINE ENGINEERING

## Motivation

We are pleased to invite contributions to the Special Session on “Design Methods for Marine Engineering” at the ADM 2025 Conference, organized by the Associazione Nazionale Disegno e Metodi dell’Ingegneria Industriale (ADM). This session aims to bring together researchers, academics, and industry professionals to discuss innovative design methods and emerging technologies applied to the marine, nautical, and naval industries. As the marine sector faces growing challenges related to efficiency, sustainability, and digital transformation, this session seeks to foster knowledge exchange on cutting-edge methodologies and tools that can enhance design, production, and operational processes in shipbuilding, naval, and nautical architecture.

## Background

The marine and naval industries are undergoing a significant transformation driven by digitalization, automation, and sustainability requirements. Advances in design methodologies, extended reality (XR), digital twins, and model-based systems engineering are shaping the way ships and nautical vehicles are conceived, tested, and optimized. The integration of these technologies enhances safety, efficiency, and cost-effectiveness, enabling innovative solutions for both commercial and military applications. Moreover, human-centered design principles and improved human-machine interaction are becoming crucial in ensuring usability and effectiveness in maritime operations. This session aims to highlight and discuss these developments, emphasizing their impact on the industry and the challenges associated with their implementation.

The Special Session seeks high-quality contributions addressing, but not limited to, the following topics:

- Human-Centred Design for the Marine Industry
- Human-Machine Interfaces for the Nautical and Naval Industry
- XR-based Methods for Design Review in Nautical Engineering
- XR-based Methods in Naval Engineering for Design Review, Quality Control of Assembly Plans, and Digital Mock-ups
- Integrated Ship Design
- Visualization and Interaction with Digital Twins in Nautical and Naval Engineering
- Virtual Prototyping in Nautical and Naval Vehicle Design
- Model-Based Systems Engineering Approach for Ship Design

This session seeks to provide a platform for researchers and practitioners to present their latest findings, case studies, and technological developments in marine engineering design. We encourage submissions that showcase novel computational approaches, experimental studies, and industrial applications that contribute to the advancement of the field.

The Special Session proposers include:

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- [Alfredo Liverani](mailto:alfredo.liverani@unibo.it) (alfredo.liverani@unibo.it)- University of Bologna, Italy;
- [Antonio Mancuso](mailto:antonio.mancuso@unipa.it) (antonio.mancuso@unipa.it)- University of Palermo, Italy;
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## Structure of the session

Invited speaker

Oral presentations