



Faculty of Naval Architecture
Naval Architecture Research Center
“Dunarea de Jos” University of Galati



EDUCATION RESEARCH DEVELOPMENT INNOVATION

NAVAL ARCHITECTURE RESEARCH CENTER - NARC

Assoc. prof. Sandita Pacuraru

● NAVAL ARCHITECTURE RESEARCH CENTER - NARC

- Full members
- Associated members
- PhD coordinators
- Students of: Bachelor, Master and Doctorate degrees
- Students of European Master, EMship



NAVAL ARCHITECTURE
RESEARCH CENTER

“Dunarea de Jos” University of Galati

● NAVAL ARCHITECTURE RESEARCH CENTER - NARC



[Program](#)

[Finances](#)

[Who we are](#)

[How to apply](#)

[Contact](#)

Applications for September 2024 are open.

[How to apply](#)



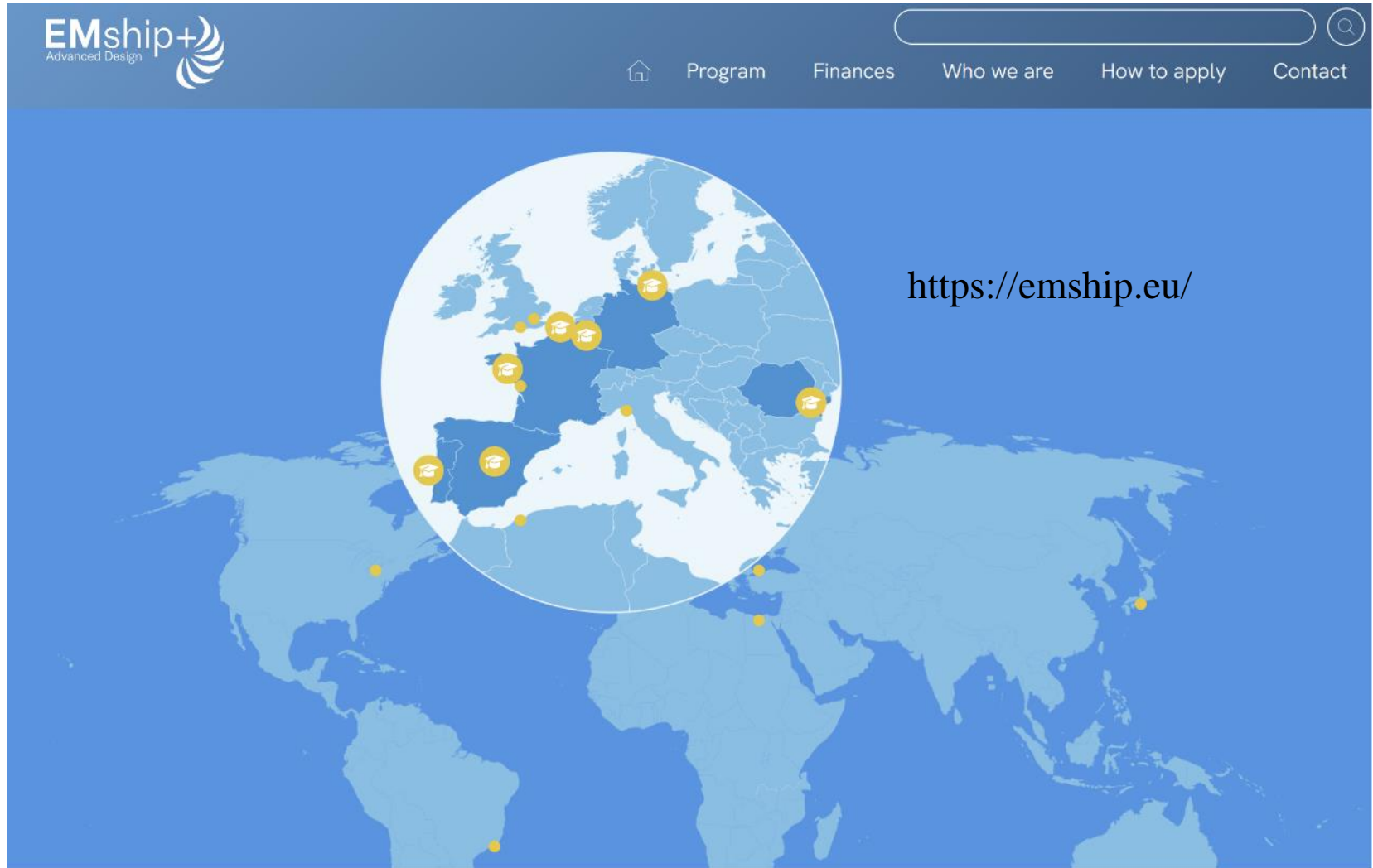
Universität
Rostock



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The image shows a screenshot of the EMship+ website. At the top left is the logo for EMship+ Advanced Design. To the right of the logo is a search bar and a navigation menu with the following items: Home, Program, Finances, Who we are, How to apply, and Contact. Below the navigation menu is a large blue background featuring a world map. A circular inset map of Europe is centered on the map, with several yellow location markers and icons of a graduation cap placed over various European countries. To the right of the circular inset, the URL <https://emship.eu/> is displayed.



NAVAL ARCHITECTURE
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● RDI CONCERNS

- Hydrodynamic optimization of ship hull forms;
- Numerical modeling of free surface flow around ships;
- Numerical analysis of ship resistance, propulsion, maneuverability and seakeeping performance;
- Hydrodynamic and structural response of offshore structures;
- Numerical and experimental analysis of static and dynamic behavior of hull structures;
- Noise and vibration analysis;
- Structural optimization of ships and marine structures;
- Experimental analysis on model scale regarding hydro-aerodynamic performances of ships;
- Towing Tank, Cavitation Tunnel, Aerodynamic Tunnel, Structures Laboratory.



● REXDAN - A SUCCES STORY AT DUNAREA DE JOS UNIVERSITY OF GALATI, ROMANIA



UNIUNEA EUROPEANĂ



Instrumente Structurale
2014-2020

REXDAN

- A co-financed project from the European Regional Development Fund through the Operational Competitiveness Program 2014-2020 (POC)
- **RESEARCH CENTER**
- **RESEARCH VESSEL** with 9 laboratories on board
- **Mobile Campus** (students & researchers)



<https://rexdan.ugal.ro/>



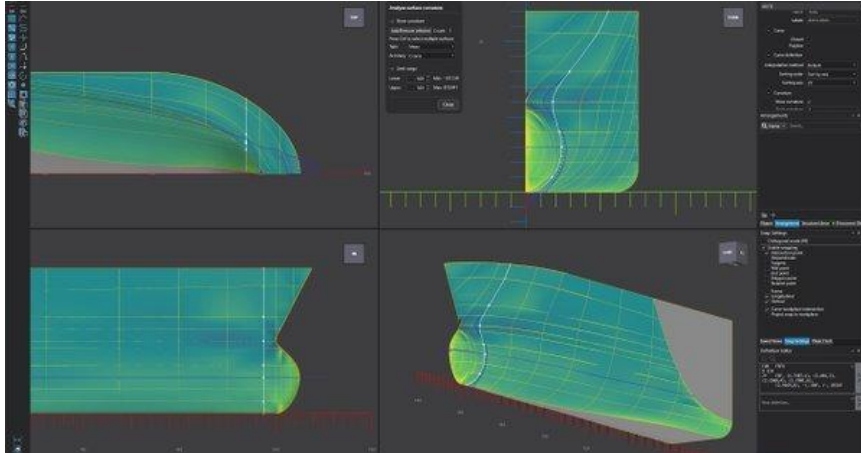
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● NARC LABORATORIES

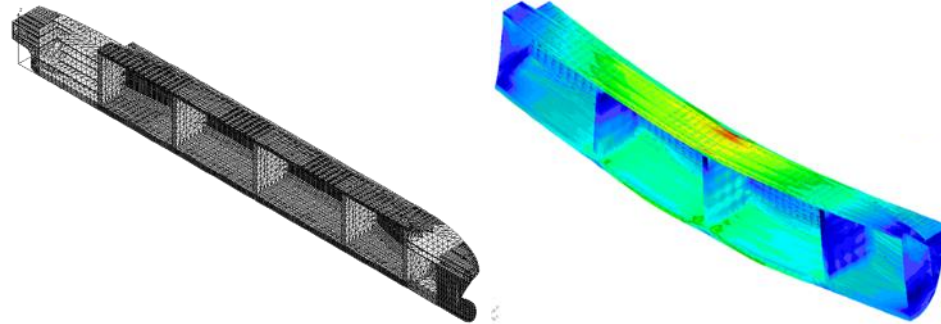
INTEGRATED DESIGN

AVEVA; NUPAS-CADMATIC; NAPA; BENTLEY;
MAXSURF; MOSES; MULTISURF



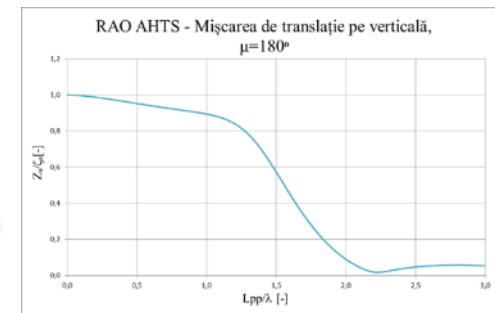
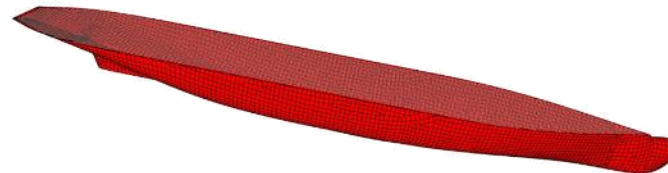
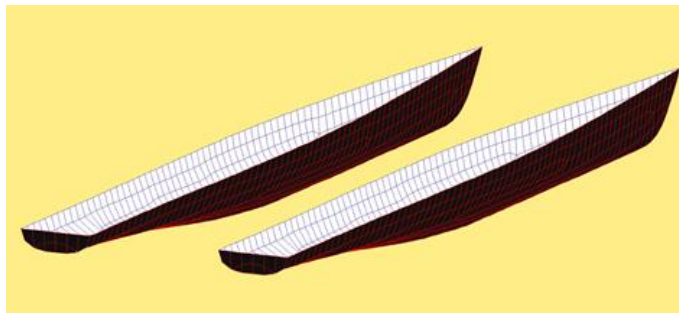
NUMERICAL STRUCTURAL ANALYSIS

FEMAP; ANSYS; IN-HOUSE CODES



HYDRODYNAMIC AND STRUCTURAL RESPONSE OF SHIPS AND MARINE STRUCTURES

BUREAU VERITAS: HYDROSTAR; ARIANE; HOMER;



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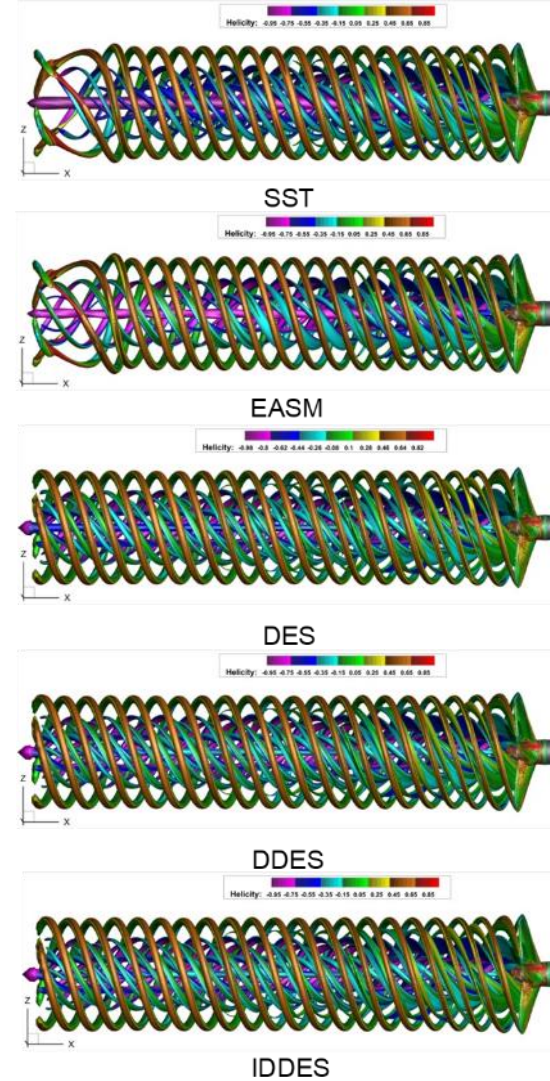
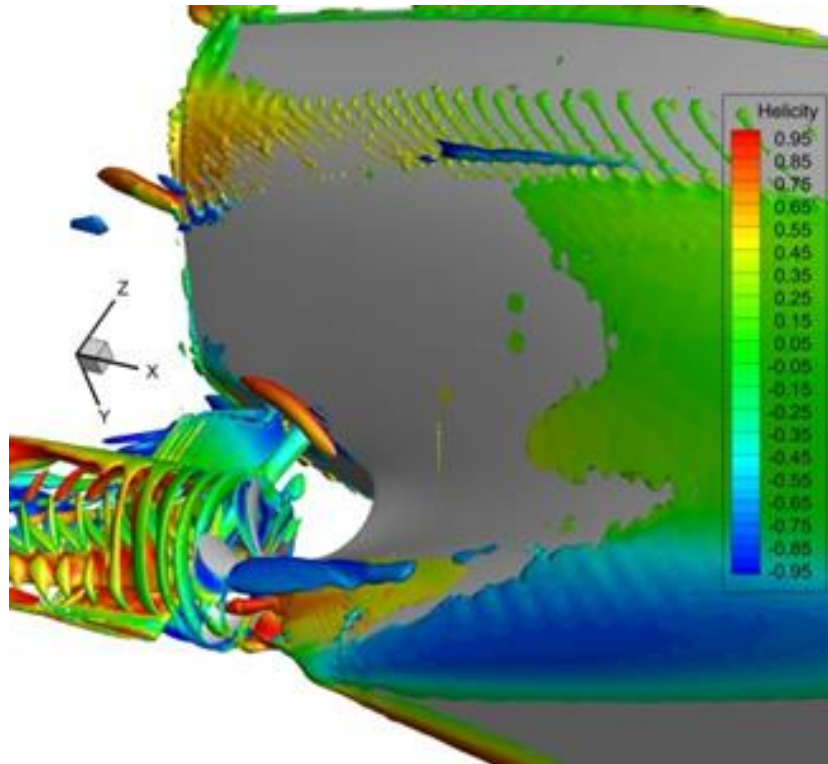
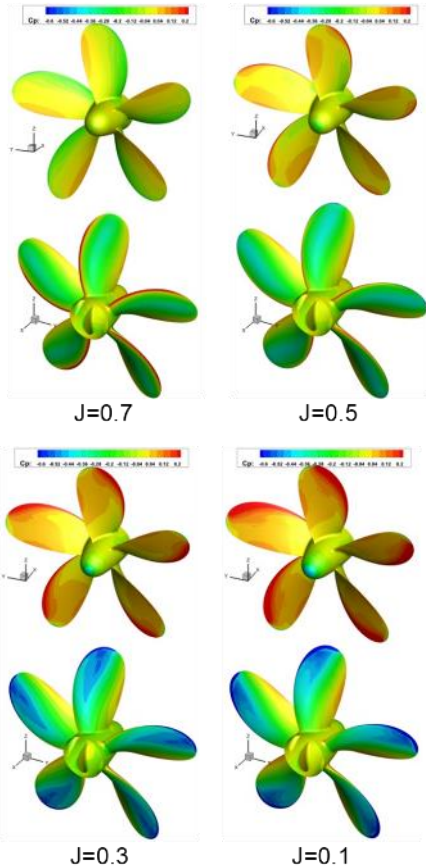
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● NARC LABORATORIES

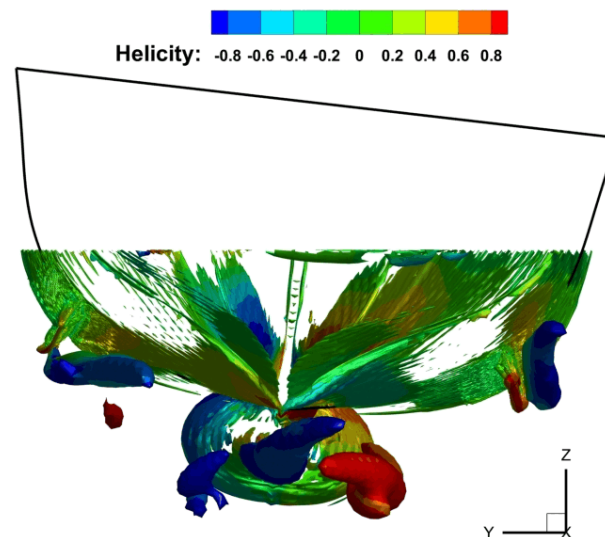
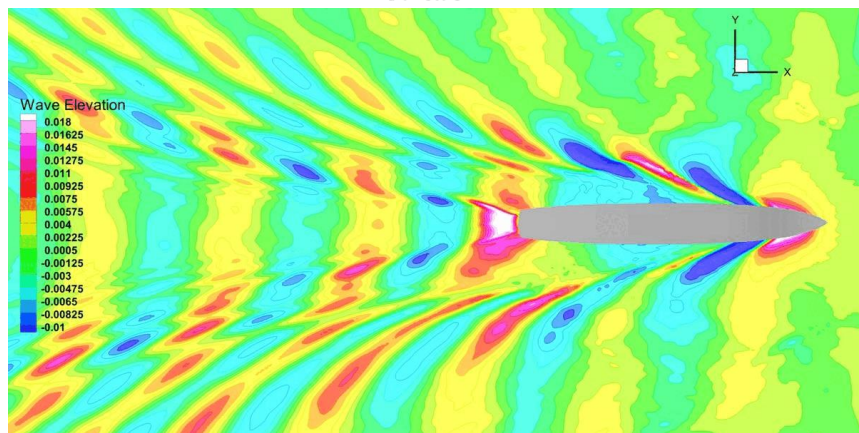
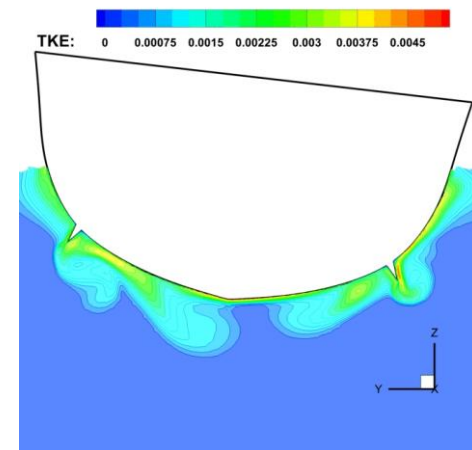
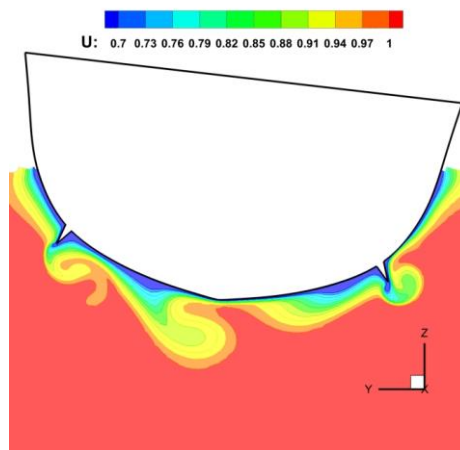
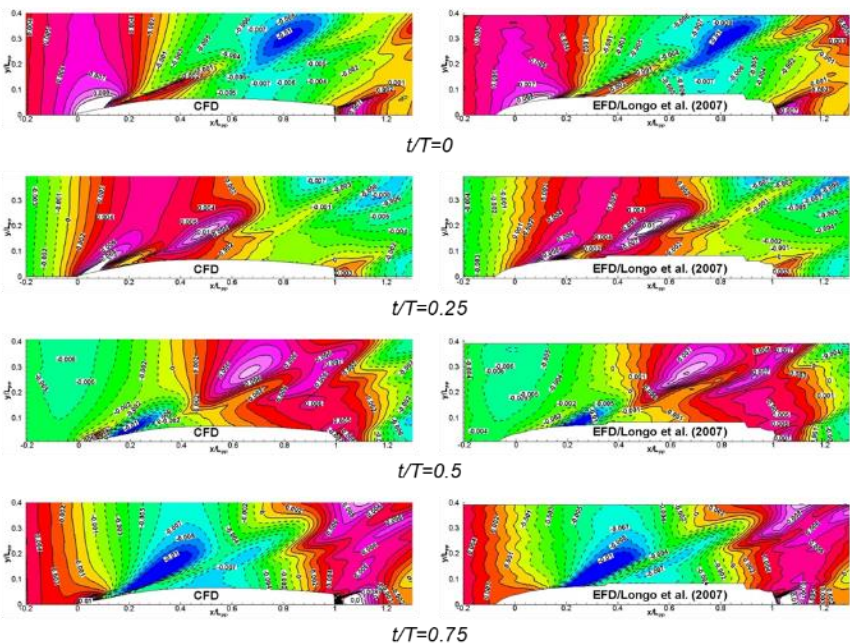
HYDRODYNAMIC NUMERICAL SIMULATION

SHIPFLOW; NUMECA FINE MARINE; OpenFOAM

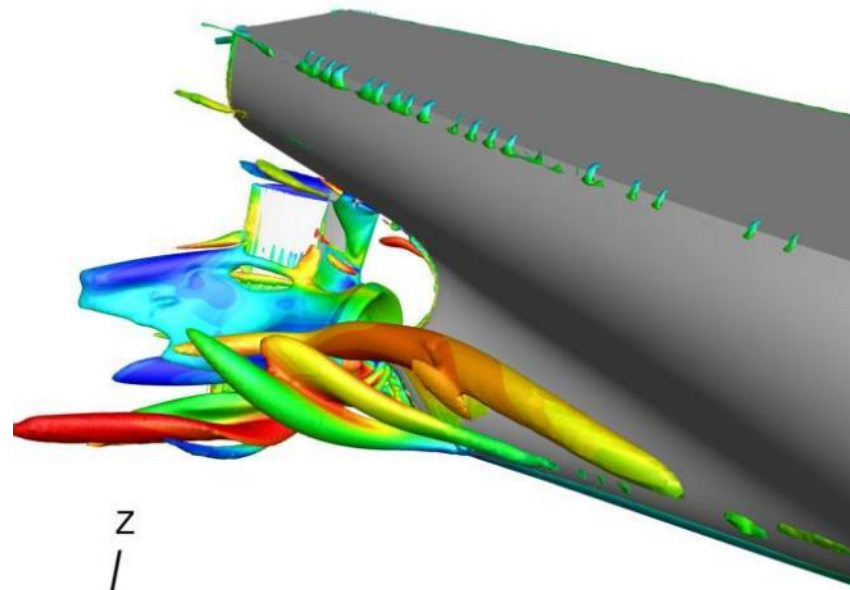
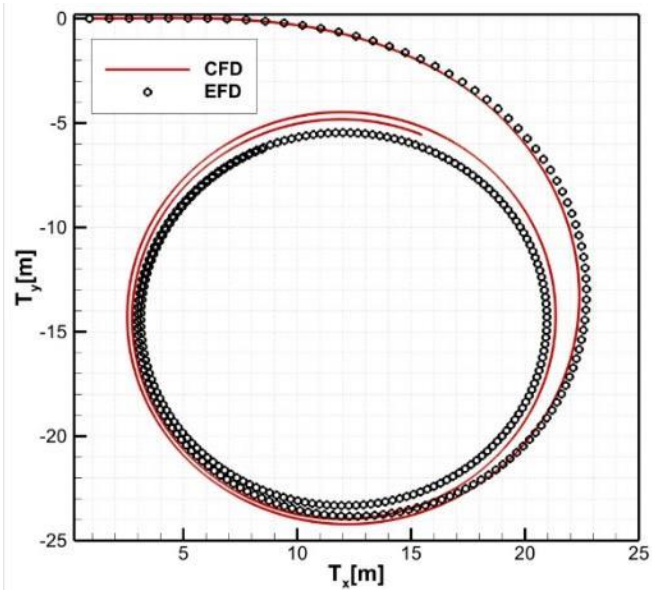
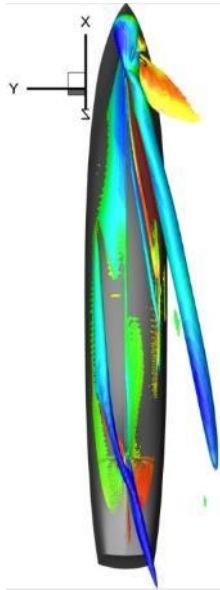
High Performance Computer (HPC-UGAL) - NUMECA for 448 processors



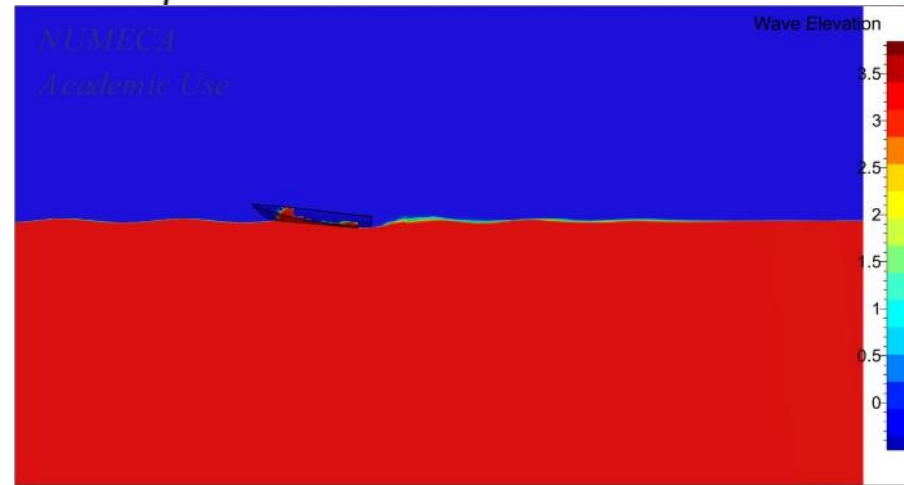
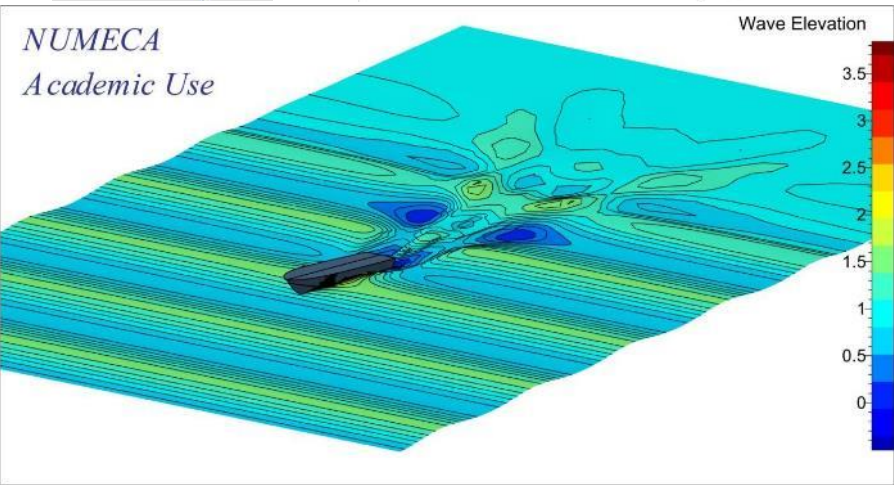
● NARC LABORATORIES



● NARC LABORATORIES



NUMECA
Academic Use



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● PROFESSIONAL AND EDUCATIONAL ASSOCIATION



The experimental hydro-aerodynamic laboratories are represented at the international organization INTERNATIONAL TOWING TANK CONFERENCE - ITTC. NARC is member of ITTC (<https://ittc.info>), the world's leading association of research organizations in the field of experimental hydrodynamic tests.



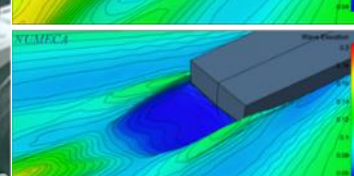
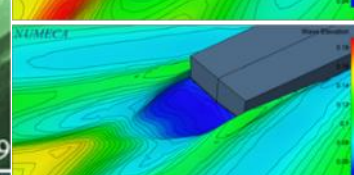
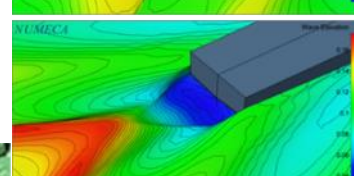
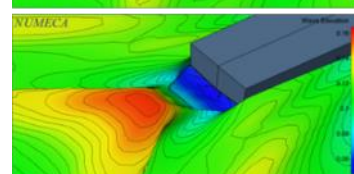
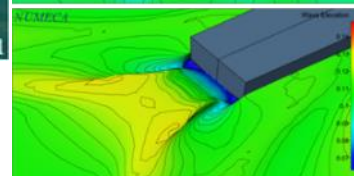
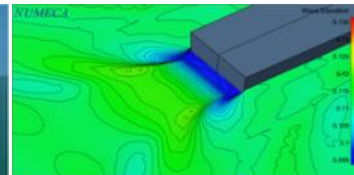
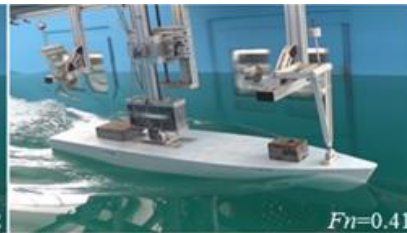
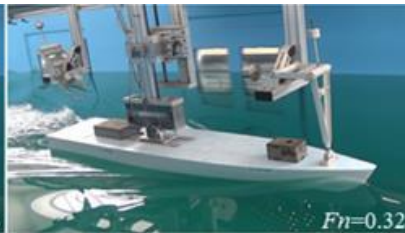
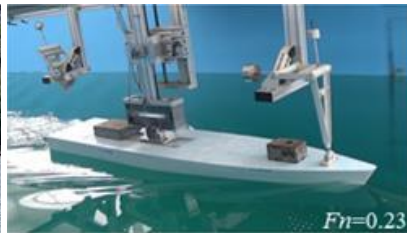
Dunarea de Jos University of Galați, through NARC, is member of Executive Committee of WEGEMT (European Association of Universities in Marine Technology <http://www.wegemt.com/>), the European association of universities with studies in the naval field.



NARC, through WEGEMT, is a member of WATERBORNE - a technological platform that brings together classification societies, shipbuilders, shipowners, manufacturers of marine equipment, providers of infrastructure and services, universities or research institutes in the EU.

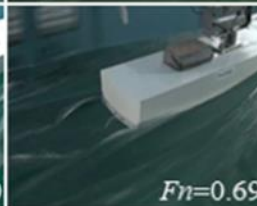
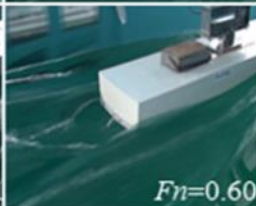
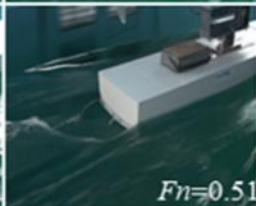
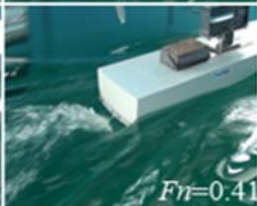
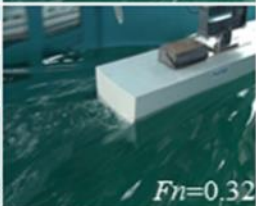
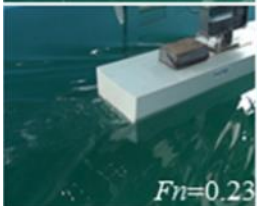
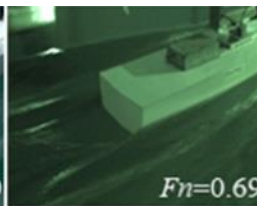
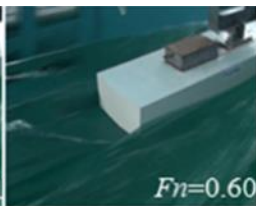
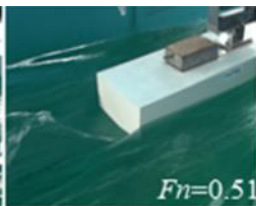
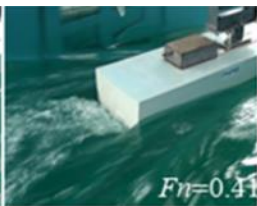
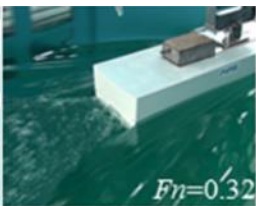
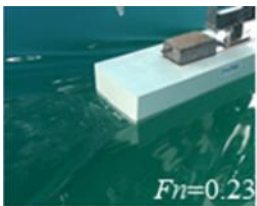


● RESEARCH PROJECTS



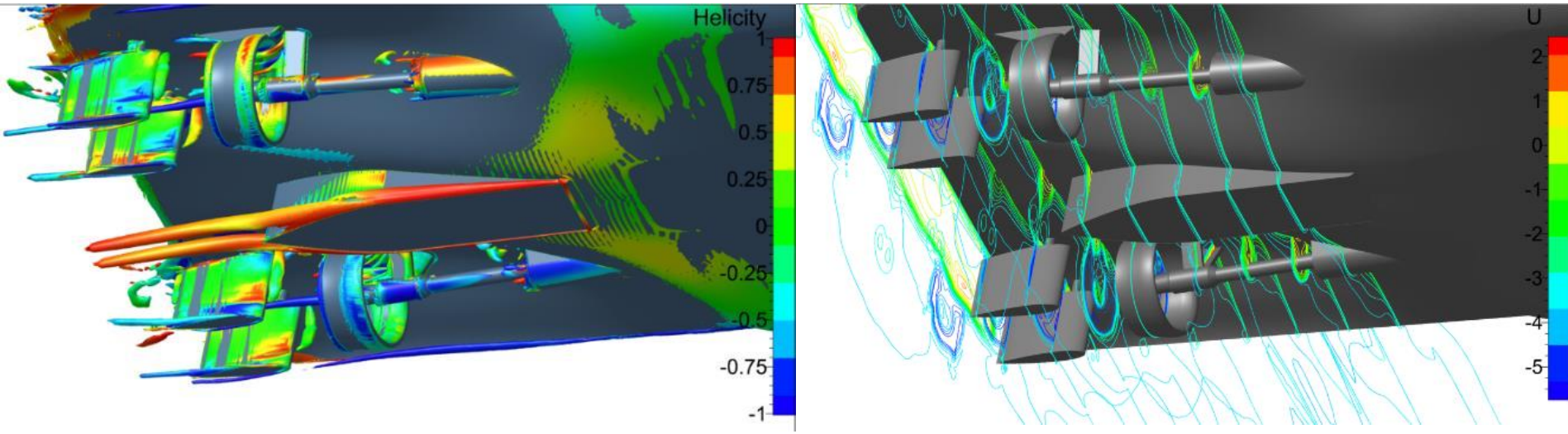
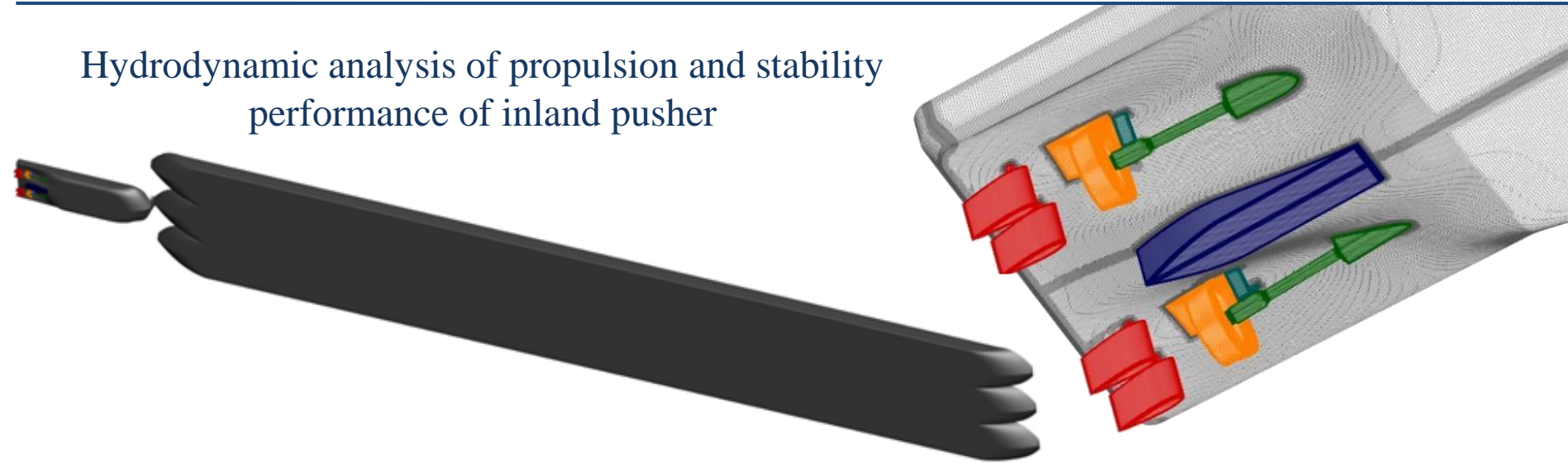
INOVATION UEFISCDI:

Solutions to improve the hydrodynamic performance of ships in planning regime

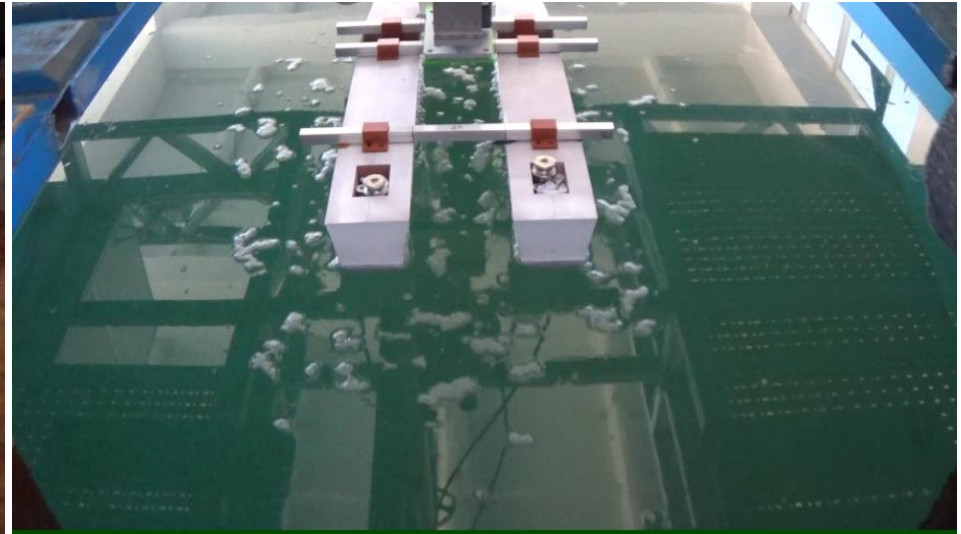


● RESEARCH PROJECTS

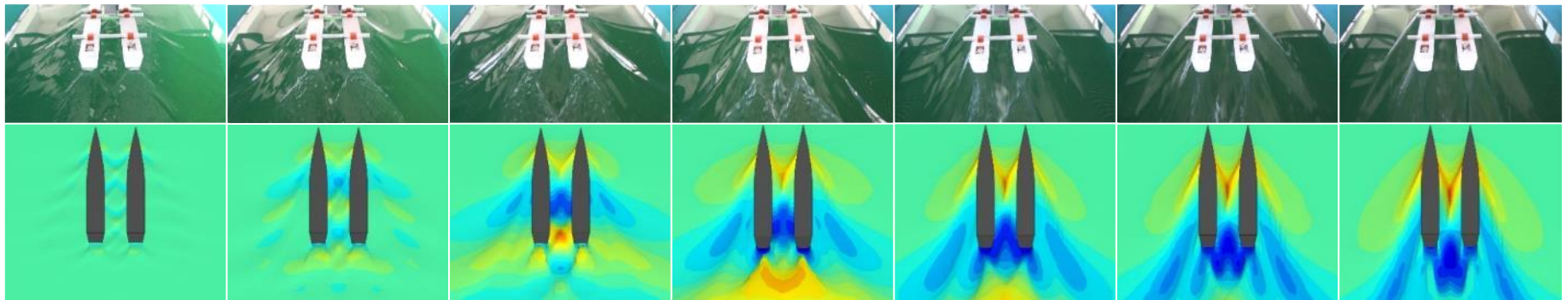
Hydrodynamic analysis of propulsion and stability performance of inland pusher



● RESEARCH PROJECTS

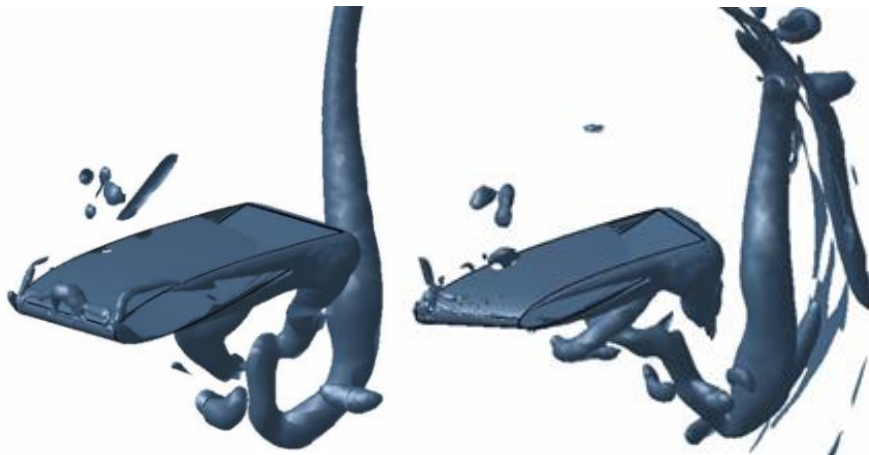
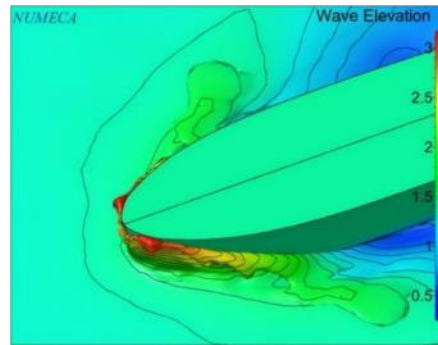
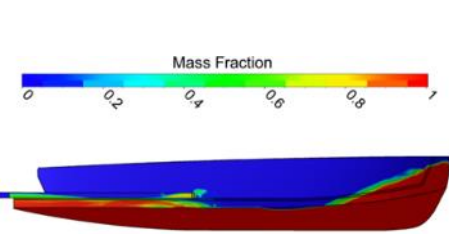


Experimental study on catamaran hydrodynamics Improving the hydrodynamics performance of a catamaran passenger

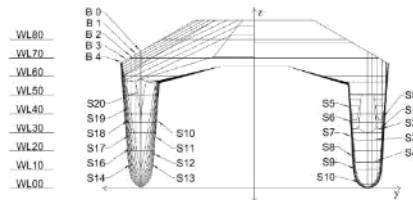
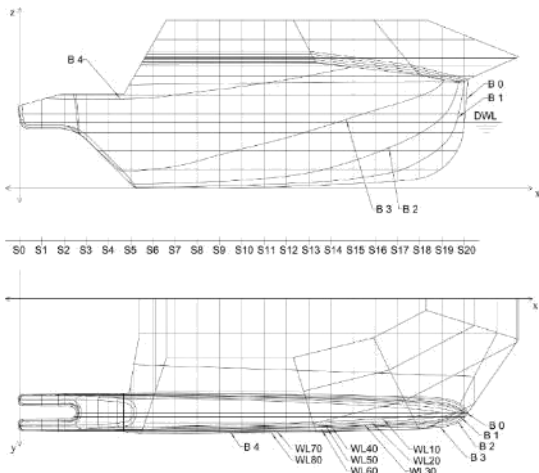


● RESEARCH PROJECTS

Development of an algorithm to control the active stabilizer fins to improve the roll motion. Project to be tested in the towing tank

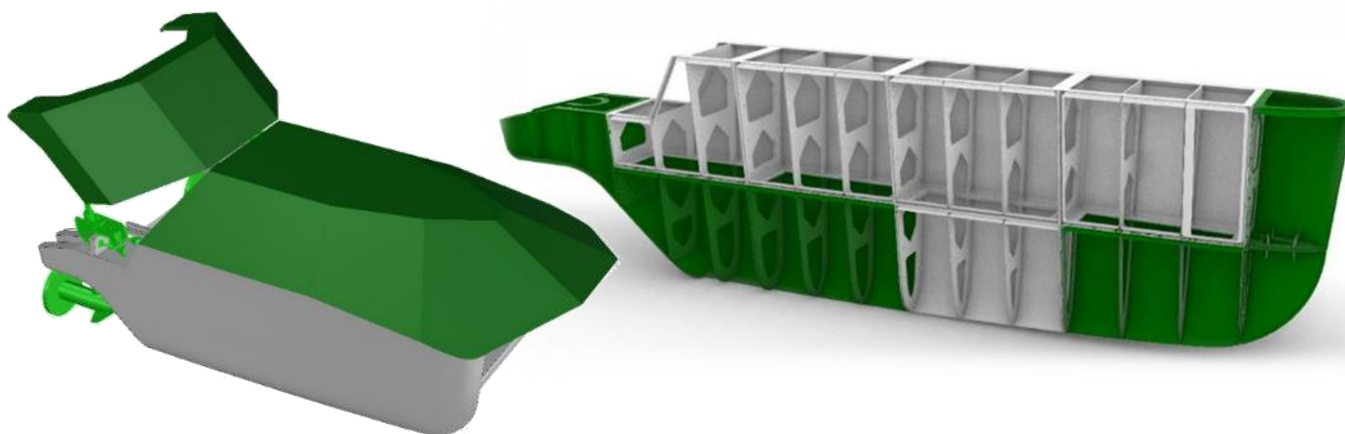


● RESEARCH PROJECTS



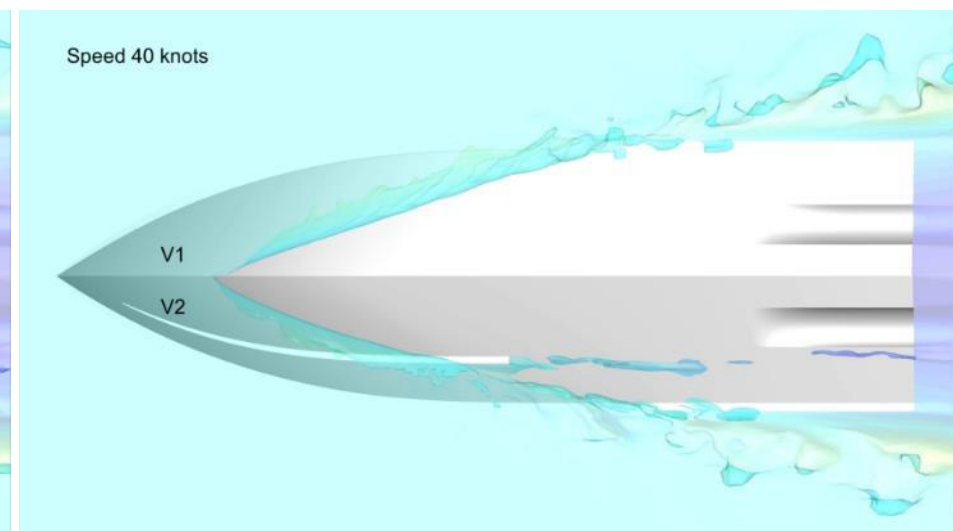
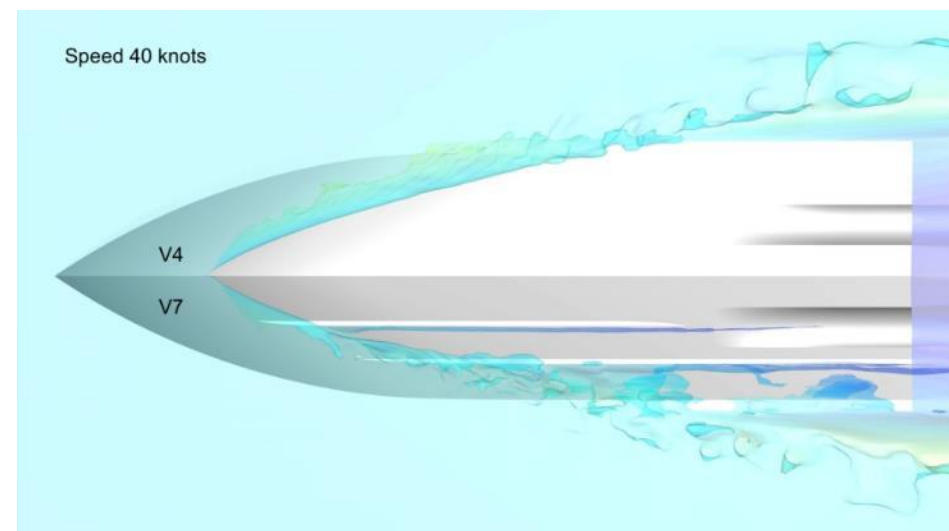
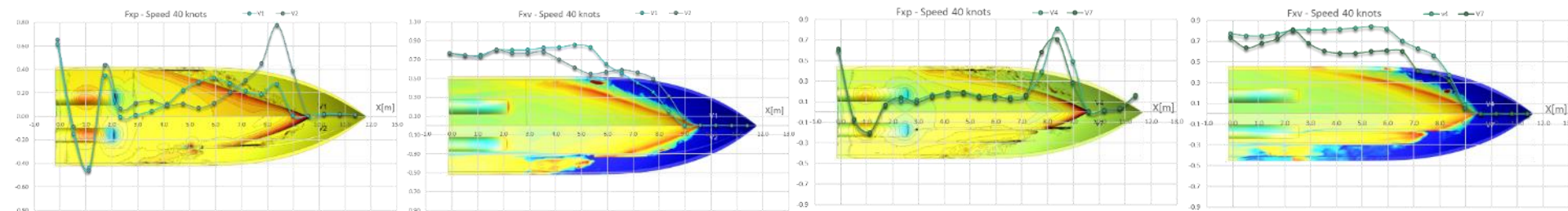
Caratteristiche principale	
LOA = 2695 mm	BOA = 1450 mm
D = 903 mm	T = 353 mm
Lwl = 2393 mm	Bwl = 1405 mm
Cb = 0.131	Cp = 0.599
Displacement = 160 kg	S = 2.939 m ²

Semi-autonomous catamaran. **GreenCat** demonstrator



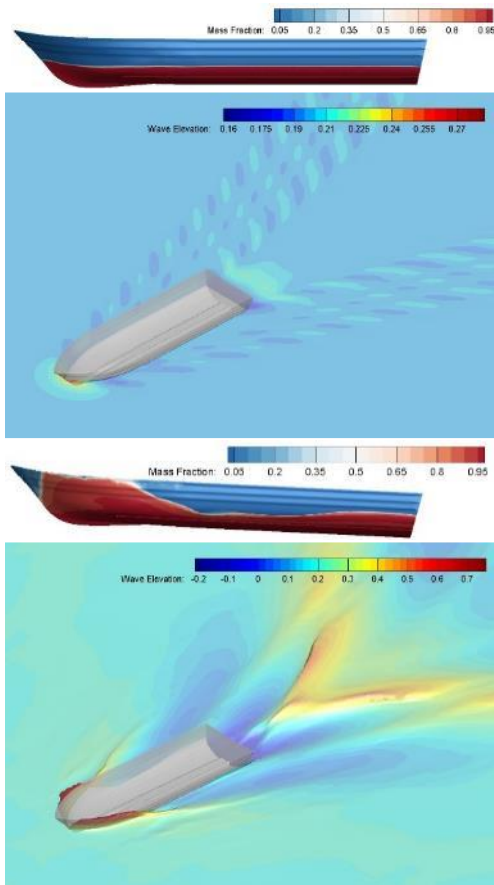
● RESEARCH PROJECTS

CFD study on hydrodynamic performances of a planing hull (3 versions) running in different operational conditions

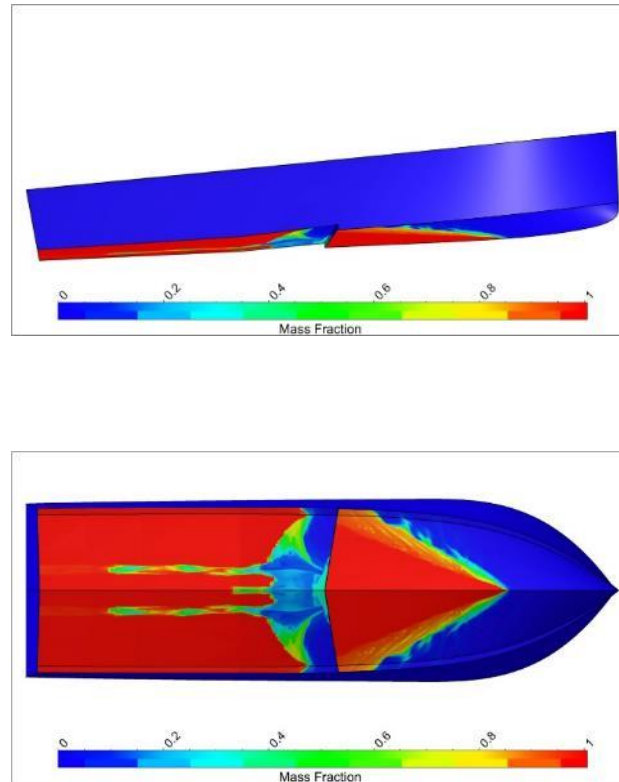


● RESEARCH PROJECTS

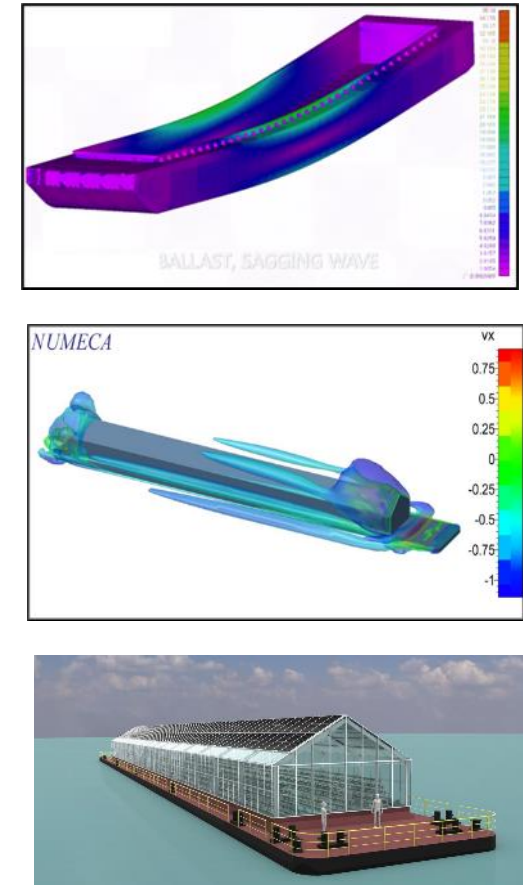
WaveForm



High Speed Boat



FISH & FAN



● ON GOING PROJECTS

LeaderSHIP

Shipbuilding Pact for Skills: ATTRACT, TRAIN AND RETAIN TALENT to reinforce the competitiveness of the industry

- ❑ Upskilling and reskilling 200 000 workers (7 % employees/year until 2030)
- ❑ Attracting 230 000 new talents
- ❑ Mobilising 1bn€ of public/private investment



- ✓ Strong industry & social partners engagement
- ✓ EU wide (16 countries)
- ✓ Main Shipbuilding Groups + SMEs
- New-building
- Repair and Retrofitting
- Civil and Military
- ✓ Regions and clusters
- ✓ Education providers
- ✓ EU Sectoral Social Partners



● ON GOING PROJECTS

HORIZON-CL5-2021-D6-01 - Cluster 5: Climate, Energy and Mobility

Safe, Resilient Transport and Smart Mobility services for passengers and goods

Resilience-centric Smart, Green, Networked EU Inland Waterways 2022-2025

ReNEW represents a multidisciplinary group composed of 24 participants from 11 countries of the European Union capable of playing a key role in supporting the transition of IWT to smart, green, sustainable and climate-resilient sector.

To achieve this, ReNEW delivers:

- An interdisciplinary IWT Resilience and Sustainability decision-support framework incorporating innovative models for IWT
- Targeted innovative infrastructure resilience and sustainability solutions building on autonomy developments and maturing green energy options;
- A Green Resilient IWT Dataspace and generic Digital Twin -infrastructure monitoring, traffic management and emergency systems and climate solutions;
- Living Labs focusing on integrated IW and hinterland infrastructure.



● ON GOING PROJECTS

- EUROPEAN INLAND WATERWAY TRANSPORT(IWT)
- SINTEF ENERGI NO
- SINTEF OCEAN NO
- PANTEIA BV NL
- INSTITUT FUR SEEVERKEHRSWIRTSCHAFT UND LOGISTIK DE
- INSTITUTO TECNOLOGICO DE ARAGON ES
- INSTITUT DE RECHERCHE TECHNOLOGIQUE SYSTEMX FR
- VLAAMS INSTITUUT VOOR DE LOGISTIEK VZW BE
- RESEARCH DRIVEN SOLUTIONS LIMITED IE
- INTERUNIVERSITAIR MICRO-ELECTRONICA CENTRUM (IMEC) BE
- AKKA HIGH TECH FR
- VLTN GCV BE
- MAGELLAN-ASSOCIACAO PARA A REPRESENTACAO DOS INTERESSES PORTUGUESES NO EXTERIOR
- APDL - ADMINISTRACAO DOS PORTOS DODOURO E LEIXOES SA PT
- KONNECTA SYSTEMS LIMITED IE
- INSTITUTE OF COMMUNICATION AND COMPUTER SYSTEMS EL
- BUDAPESTI MUSZAKI ES GAZDASAGTUDOMANYI EGYETEM
- CIAOTECH Srl IT
- SEAFAR BE
- 4SHIPPING B.V. NL
- OPLEIDINGSCENTRUM VOOR HOUT EN BOUW VZW BE
- **DUNAREA DE JOS UNIVERSITY OF GALATI RO**
- ZULU ASSOCIATES BE
- INLECOM INNOVATION ASTIKI MI KERDOSKOPIKI ETAIREIA EL



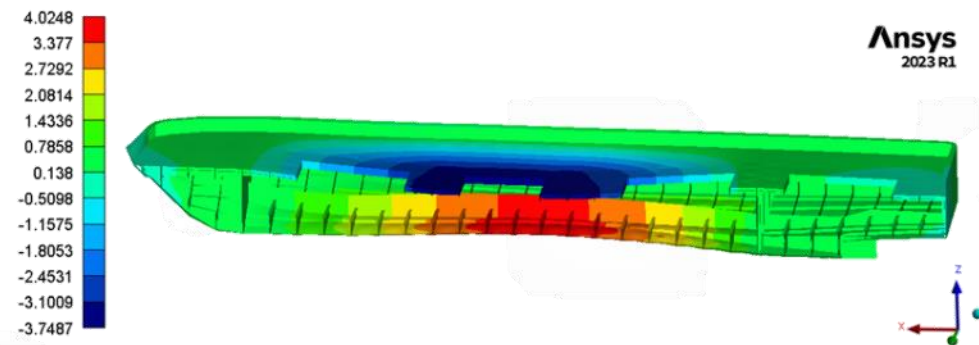
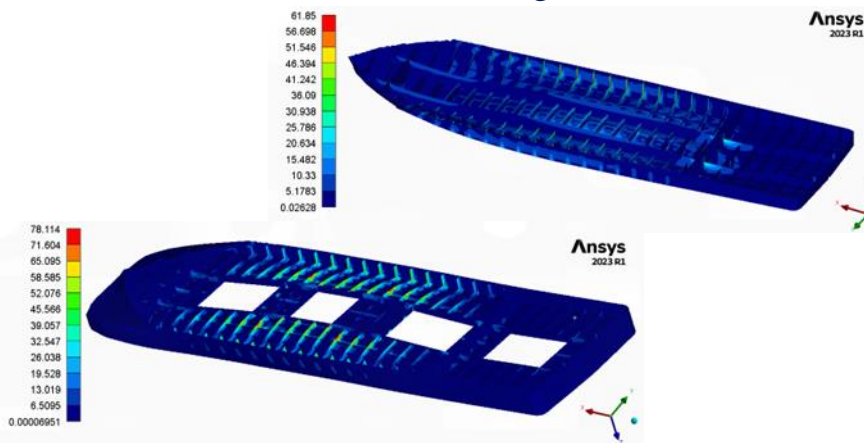
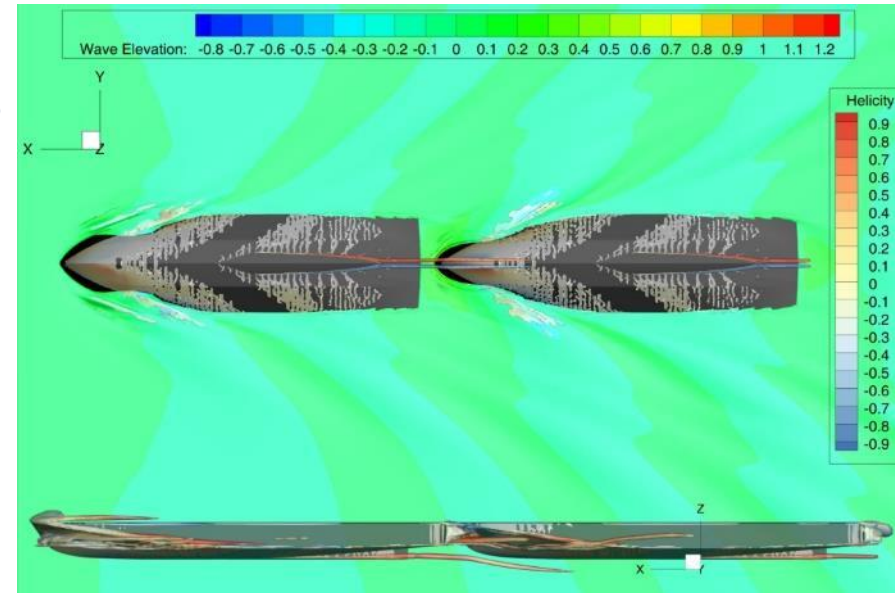
<https://renew-waterways.eu/>



● ON GOING PROJECTS

Innovative infrastructure resilience solutions building on autonomy developments and maturing green energy options

- Ghent's Multifunctional Synchromodality City Logistics Hub
- Resilience-assist Modular Platform and Pontoons
- Conceptual design of the floating platform & landing ramp
- CFD-computational fluid dynamics simulation
- Numerical analysis based on Finite Element Method
- Resilience oriented green energy solutions
- Autonomous Zero Emission Barge



● ON GOING PROJECTS

Programme: HORIZONCall: **HORIZON-CL5-2023-D5-01-16**

Developing small, flexible, zero-emission and automated vessels to support shifting cargo from road to sustainable Waterborne TransportTitle: Freight volumes transfer from Road to waterborne transport, using zero-Emission, Automated, Small and flexible vessel protoTypes - **FOREMAST**

FOREMAST is fully committed to sustainability, aiming to create a cleaner, smarter, and more efficient transportation system.

FOREMAST will facilitate the movement of goods in urban and coastal areas by creating the Small, Flexible Automated, Zero-emission (SFAZ) vessel that enables the efficient, safe, and sustainable transportation of cargo shift to inland waterways. The SFAZ vessels will seamlessly integrate to urban environments, connected infrastructures, supply chains and other modes, reducing road congestion, and enhancing accessibility.

Partners:

(Coordinator) INLECOM Group	BE
Opleidingscentrum voor Hout en Bouw vzw	BE
ABB Business Services sp. z o.o.	PL
ABB Corporate Research Center	SE
ABB OY, ABB Marine & Ports Division	FI
Universitatea Dunarea de Jos din Galati	RO
Ghent University	BE
SEAFAR nv	BE
CRITT T&L	FR
NEAC Industry	FR
PNO Innovation	
Technological Institute of Aragon	ES
Konnecta Systems IKE	EL
VLTN bv	BE
P&E Lowlands	NL
Magellan Circle - European Affairs Consultancy, LDA	PT
European Inland Waterway Transport (IWT) Platform	BE



● PROPOSAL PROJECTS

**Executive Agency for Higher Education, Research, Development and Innovation
Funding - UEFISCDI**

UEFISCDI:

- UEFISCDI - Autonomous floating unit design for collecting plastic waste
- UEFISCDI - Zero emission inland boat
- WATER4ALL 2023
- EU MISSION 2023
- COST (WEGEMT) 2023
- HE 2024 ...



Synergies Regarding European and Regional Development Strategies

-EU resilience, European Green Deal-

I

Participation in entrepreneurial discovery meetings in the field of Engineering and Naval Transportation, regarding the development of the 2021-2027 Southeast Regional Smart Specialization Strategy (SRSI SE). This document aimed to identify and validate priority areas at which investments are focused between 2021-2027, aligning future public policies and interventions. (our proposals have been considered and implemented in the final form of the strategy.)

II

Participation in regional workshops organized at a representative level for Galati County, in correspondence with preparation of Territorial Plans for a Just Transition in Romania. Galati County is one of the six counties in Romania benefiting from EU support through the Just Transition Mechanism. Participation in workshops and webinars organized by INTERREG Europe, INTERREG Danube Regio, Horizon Europe, and Connecting Europe Facilities. Partnership with other universities, research organizations, municipal and regional administrations regarding cooperation in strategic areas outlined by the EU policies - European Green Deal, EU Strategy for the Danube Region et al.

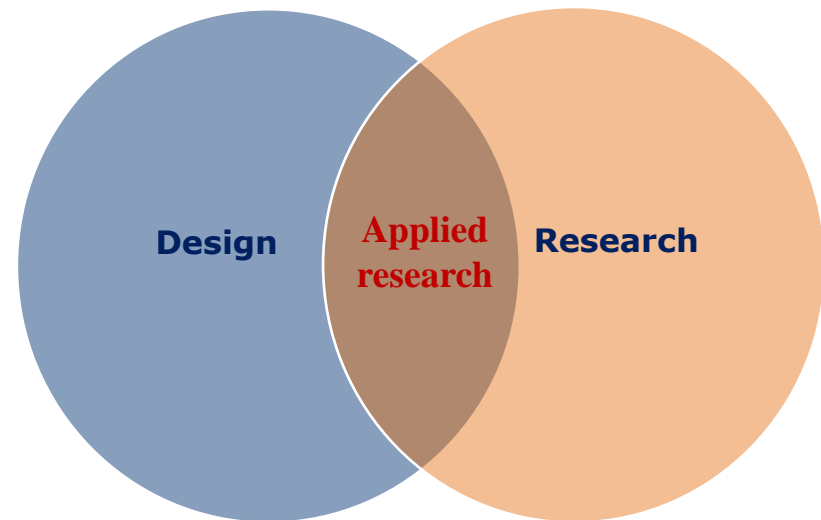
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Identification of infrastructure and logistics issues faced by companies operating in the naval sector - River Administration, Port Administration, inland operators.
Analysis of the identified problems (design, advanced numerical simulation methods, experimental methods for validating proposed numerical solutions).
Solutions for improving performance and investigated processes.
Development of NARC's activities and the increase in the number of researchers and students.
Promotion of interdisciplinary research activities.



● PARTNERSHIP PROPOSAL...

- Bachelor, dissertation and doctoral subjects
- Studies / analyzes (commercial contracts)
- Courses / training activities different software packages
- Collaboration and partnership in national and international project proposals
- Universities, Companies & NARC-UGAL workshops



● ADDRESSING LABOUR AND SKILLS ISSUES IN SHIPBUILDING AND MARINE EQUIPMENT

- *key labour issues in shipbuilding from the perspective of universities*

Aligning the curricula and skills with all the new directions & concepts such as **new design, green, resilient, smart, autonomous, climate change risks, cyber security**, etc.

- *actions taken by universities to provide initial and life-long education to train future workers in the maritime sector?*

Projects develop in partnership (ex. Universitatea Dunarea de Jos din Galati & Damen Workforce)

- *impact of insufficient training, skills, and competencies on maritime transport workers in relation to the adoption of new technologies*

Resistance to change

Competitiveness Challenges

To counteract these challenges, university-industry partnerships are essential. Cooperation at various levels between these two components in Europe leads to the identification of new directions funded by the EU, improves policies and strategies, and contributes to their implementation.



● OBJECTIVES...

European Green Deal

“The Partnership will provide and demonstrate zero-emission solutions for all main ship types and services before 2030, which will enable zero-emission waterborne transport before 2050.” <https://www.waterborne.eu/>

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**TRANSPORT
RESEARCH ARENA**



NAVAL ARCHITECTURE
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“Dunarea de Jos” University of Galati