L-Università ta' Malta

VENTuRE

a Virtual and physical ExperimeNtal Towing centre for the design of eneRgy Efficient sea-faring vessels

VENTuRE National Networking Event
Wednesday, 18 May 2022
Admiral Hall, Fort St Angelo, Birgu Waterfront

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

VENTuRE

L-Università ta' Malta

Twinning the UM with USTRATH and UNIGE
Increasing the scientific excellence, research, and innovation capacities and profiles

January 2020 to December 2022
Project Coordinator (PC): L-Universita` ta' Malta

UM

Claire De Marco (PL)
Tonio Sant (QCM)
Simon Mizzi
Mitchell Borg (DCEM, PM)
Miguel Mangion
(project finance administrator)

USTRATH

Yigit Kemal Demirel
(partner contact)
Atilla Incecik
Tahsin Tezdogan
Zhiming Yuan
Margot Cocard

UNIGE

Massimo Figari
(partner contact)
Giorgio Tani
Michele Martelli
Diego Villa
Silvia Donnarumma

NAS

Kurt Mizzi
(partner contact)
Kurt Gutteridge

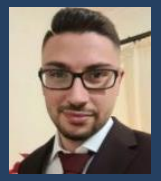
VENTuRE was one of the 37 successful proposals to be chosen from 456 applications (6% success rate)

May 2022

VENTuRE Team

L-Università ta' Malta

L to R: Soonseok Song, Diego Villa, Andrea Corraddu, Massimo Figari, Angus Gray-Stephens, Simon Mizzi, Claire De Marco, Tonio Sant, Tahsin Tezdogan, Yigit Demirel, Kurt Mizzi



Miguel Mangion

Mitchell Borg

Atilla Incecik

Mehmet Atlar

Osman Turan

Michele Martelli

Giorgio Tani

Kurt Gutteridge

Sandy Day

Zhiming Yuan

Margot Cocard

Silvia Donnarumma

May 2022

VENTuRE Programme

L-Università ta' Malta

The programme involves many activities and events for the academic, technical staff, researchers, and the general public, and is divided into four main sections

- Short specialist courses
- E-Platform for training
- Short visits UM → USTRATH & UNIGE
- Partner visits to NAS
- Expert visits USTRATH, UNIGE, NAS → UM
- Technician /Lab staff visits UM → USTRATH & UNIGE

Enhancing Scientific and Technological Capacity

Raising the Research Profile

- Research groups
- Networking activities
- Conferences
- Co-operation NAS ↔ UM

- PG research conferences
- Student exchanges
- Mentoring & joint supervision
- Secondments in industry
- Schools
- Development of joint MSc programmes
- Development of training networks

Building Tomorrow's Maritime Professional and Academic Innovators

Communication Dissemination & Exploitation

- Website & electronic media
- Communications
  - Electronic - newsletters
  - Printed - brochures, leaflets, posters, magazines, newspapers
- Scientific publications
- Online repository
- CDE plans

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Twinning UM with USTRATH and UNIGE
Increasing the scientific excellence, research, and innovation capacities and profiles

Specific Objective 4: To enhance the capacity building of the early career researchers

Specific Objective 1: To enhance the scientific and technological capacity and knowledge

WP5 - Communication Dissemination & Exploitation Plan

WP4 - Building Tomorrow's Maritime Professional & Academic Innovators

WP3 - Raising the Research Profile of UM

WP2 - Enhancing Scientific & Technological Capacity

Specific Objective 5: To link with stakeholders and national, regional, and international authorities

Specific Objective 3: To increase the participation of UM to European funded R&I activities

Specific Objective 2: To enhance the research and innovation capacity

WP1 - Project Management

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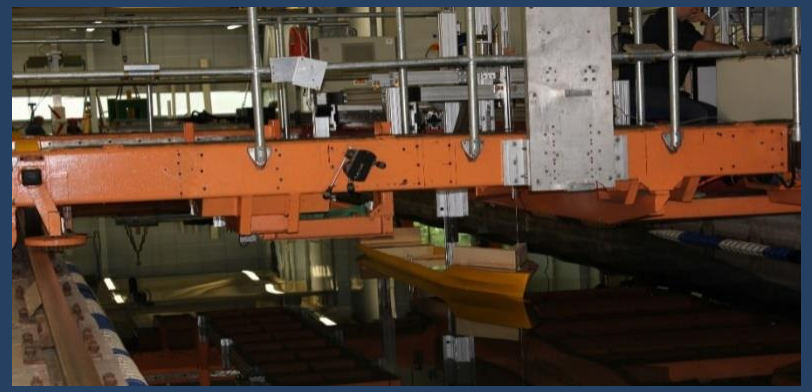
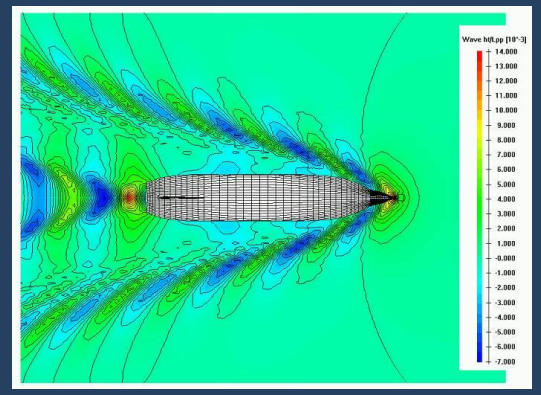
➢ Enhancing Scientific and Technological Capacity

❖ Short Specialist Courses

- **Physical towing tank testing for the prediction of ship resistance & propulsion (USTRATH)**
  - experimental technologies and techniques on ship resistance measurement and prediction





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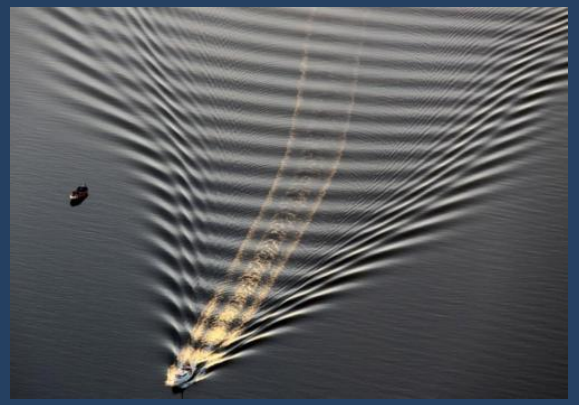
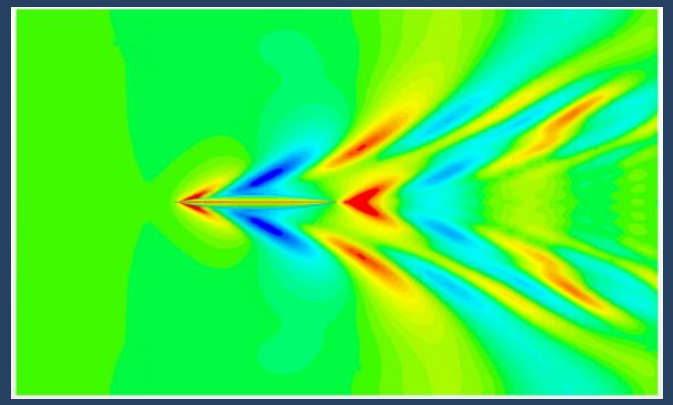
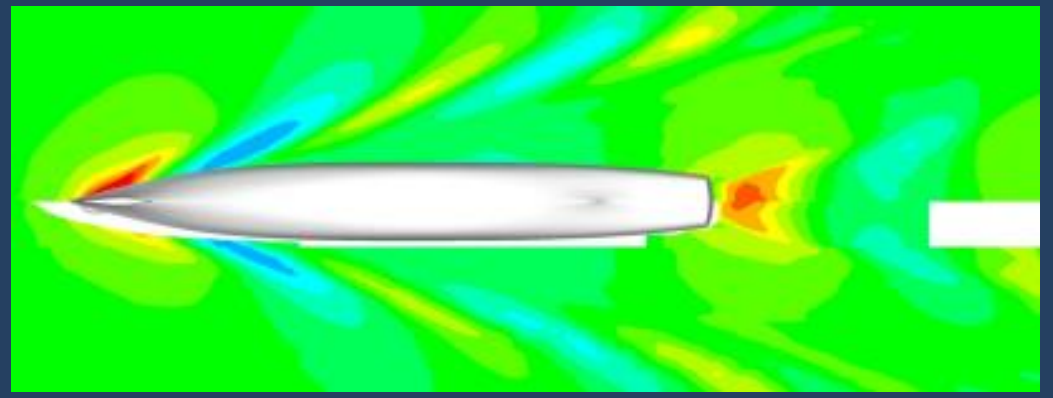
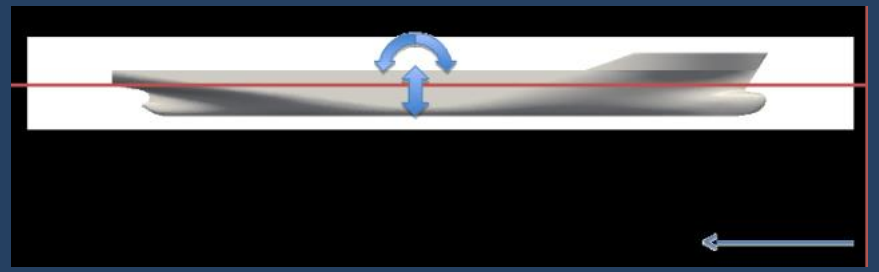
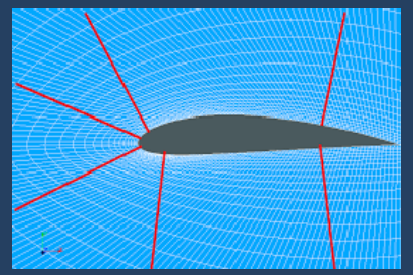
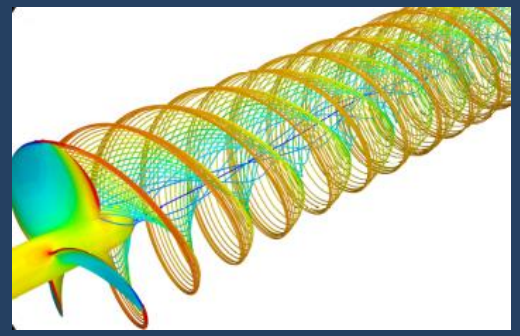
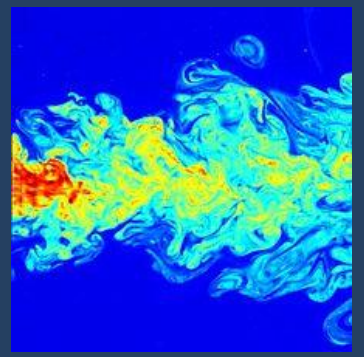
➢ Enhancing Scientific and Technological Capacity

❖ Short Specialist Courses (UNIGE)

- **Virtual towing tank testing for the prediction of ship resistance & propulsion using virtual tank testing**
  - Theories, numerical methods, tutorials and examples for the prediction of ship resistance & propulsion using virtual tank testing

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➢ Enhancing Scientific and Technological Capacity

❖ Short Specialist Courses

- **Virtual towing tank testing for the prediction of ship hydrodynamics with a focus on seakeeping** (UNIGE)
  - Theories, numerical methods, tutorials and examples for the prediction of ship resistance & propulsion using virtual tank testing
- **State of the art Measurement, Calibration and Data Analysis Techniques** (USTRATH) - June 2022
- **Virtual Towing Tank Applications in Marine Industry** (NAS) - September 2022
  - Numerical techniques can be applied to the marine industry to predict various parameters of ship performance

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EDINBURGH DESIGNS

➢ Enhancing Scientific and Technological Capacity

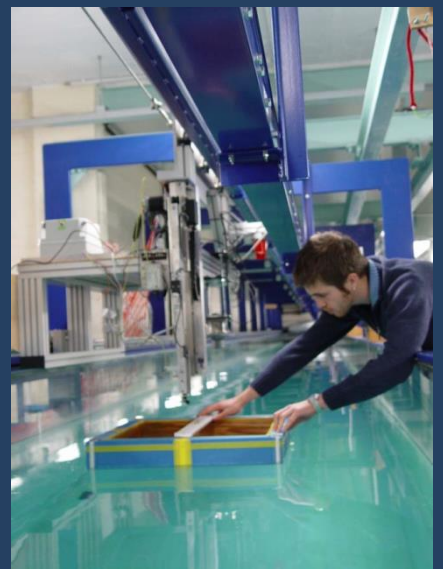
❖ Short Term University Visits

- How to design and spec a towing tank - tanks, wave generation, towing equipment, beaches

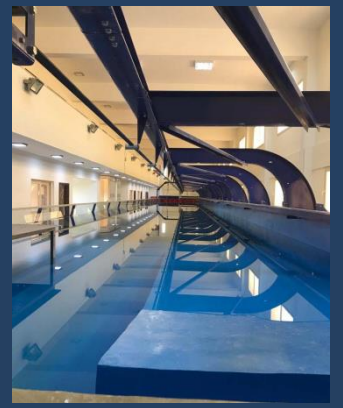
Carderock MASK basin, USA

Cranfield University towing tank

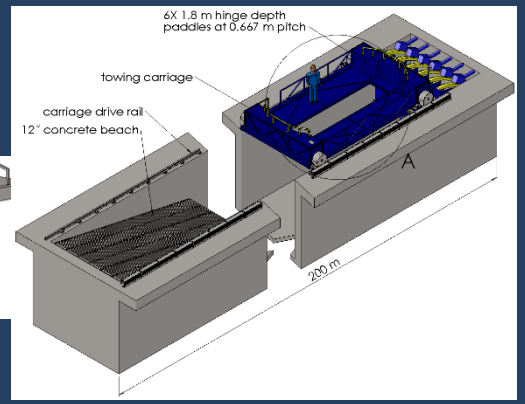
- Not man riding
- 30 m long
- 1.5m wide
- 3.5 m/s design max speed
- Cable drive



Egypt towing tank



University of Edinburgh, Flowave, UK



Concept towing tank

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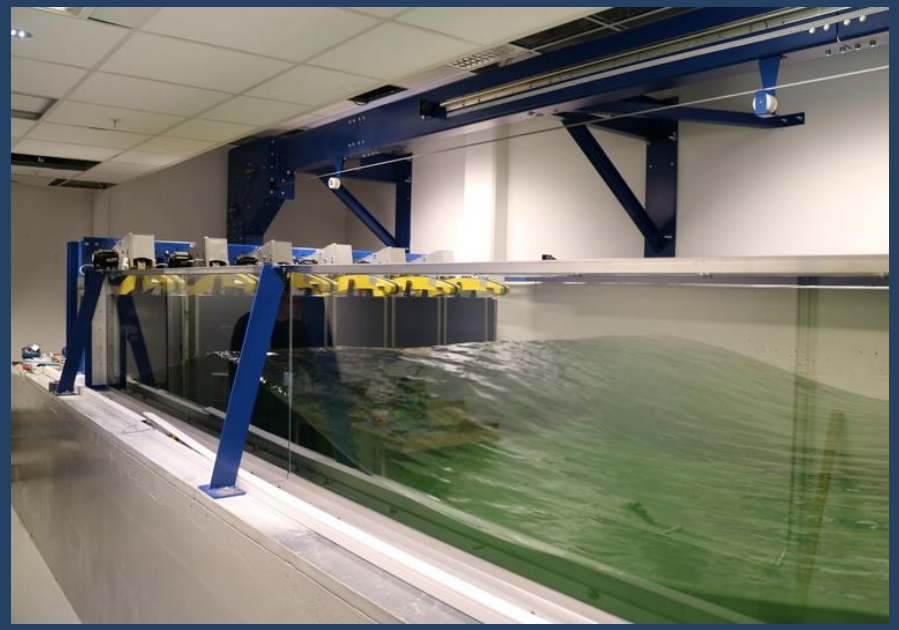
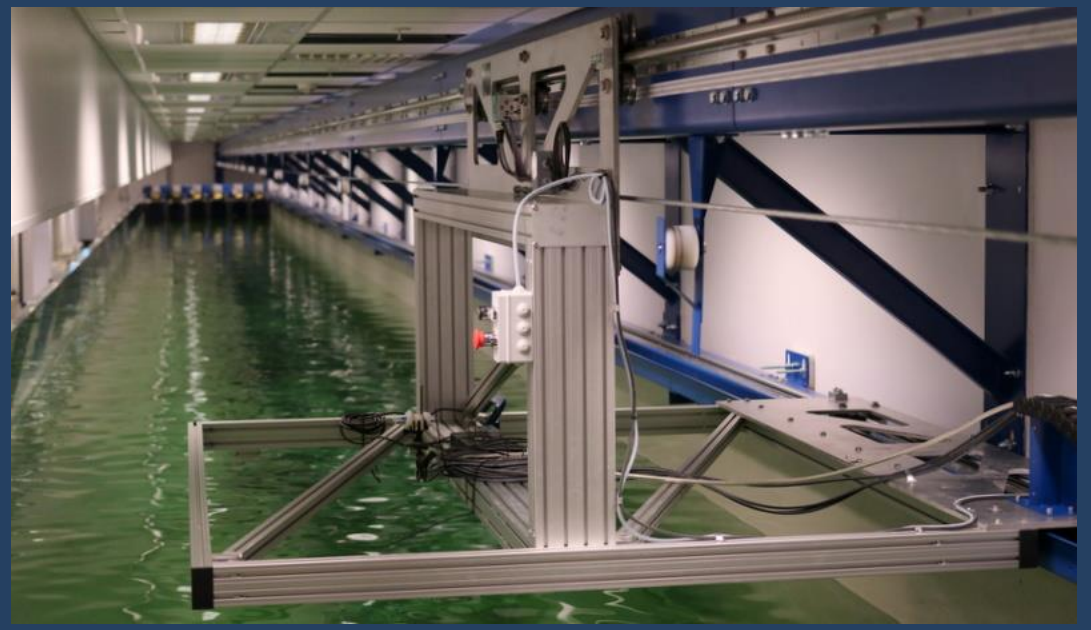
EDINBURGH DESIGNS

➢ Enhancing Scientific and Technological Capacity

❖ Short Term University Visits

- Bergen University Towing Tank





- 6 flap paddles, 500mm wide x 1200mm hinge depth
- Towing carriage capable of 5m/s and 2m/s² acceleration
- 3m wide x 30m flume
- Glass wall extension with model access hatches

http://www4.edesign.co.uk/portfolio/bergen-towing-tank/

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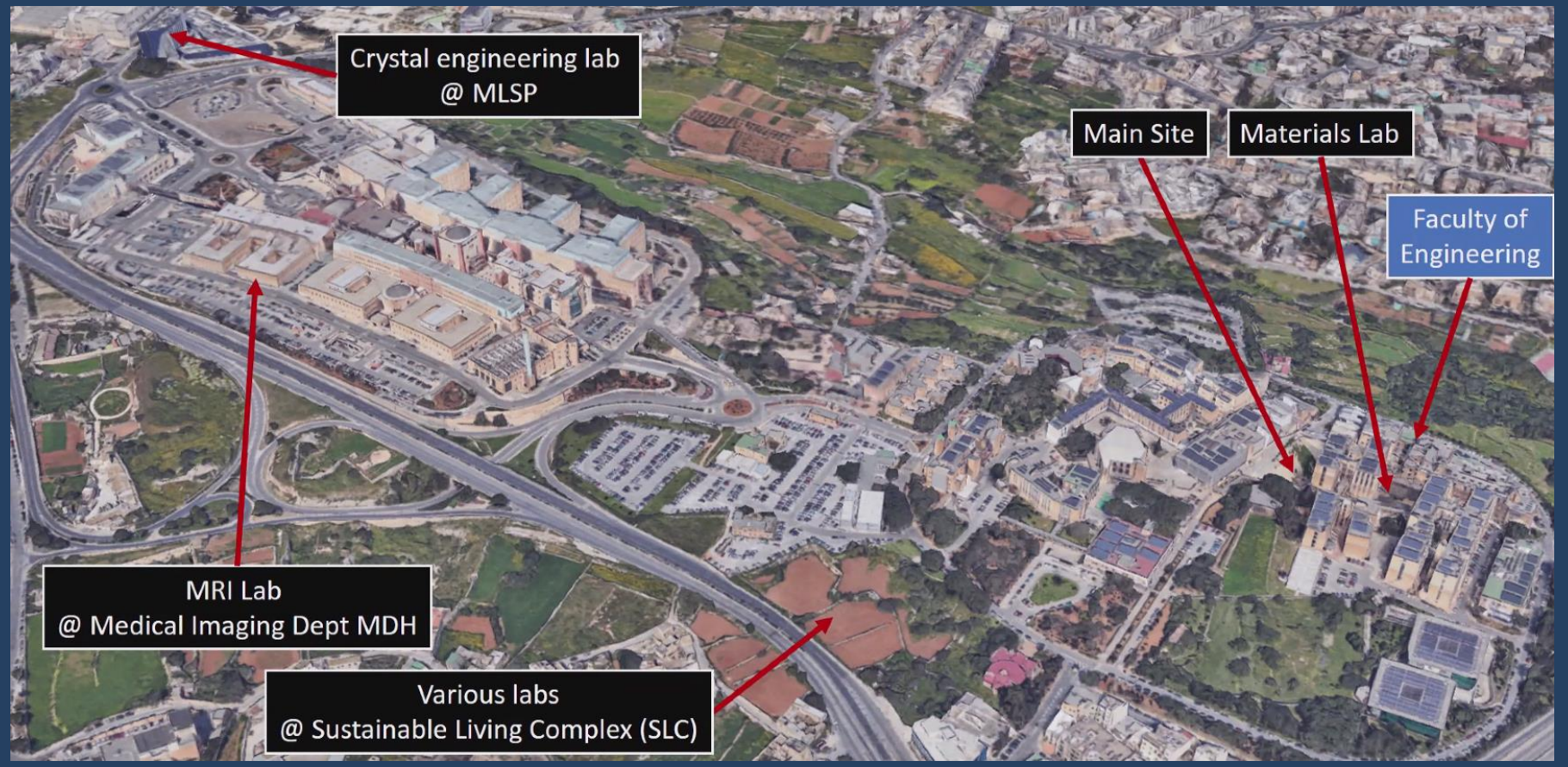
➢ Enhancing Scientific and Technological Capacity

TRAKE: Transdisciplinary Research and Knowledge Exchange Complex @ UM



Operational Programme I - European Structural and Investment Funds 2014-2020
"Fostering a competitive and sustainable economy to meet our challenges"
Activity part-financed by the European Regional Development Fund
Co-financing rate: 80% European Union; 20% National Funds

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➢ Enhancing Scientific and Technological Capacity

❖ Short Term University Visits

- Cavitation Tunnel @ UNIGE

tip vortex cavitation

break down of wake

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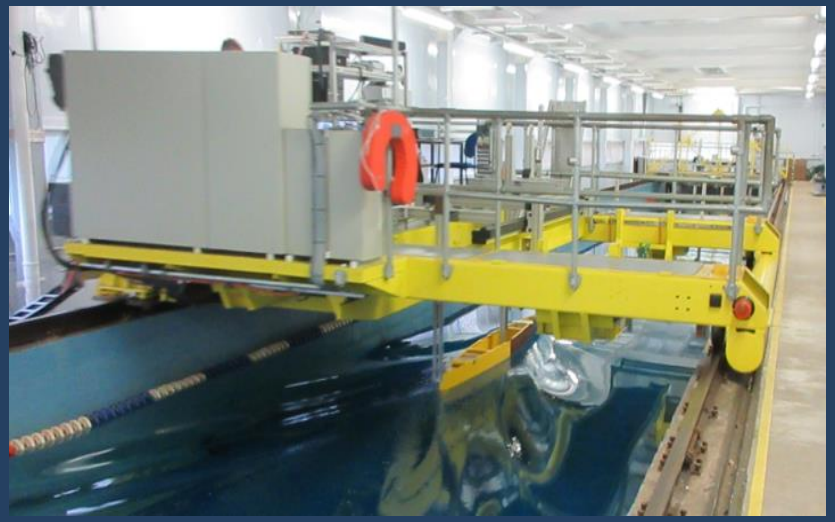
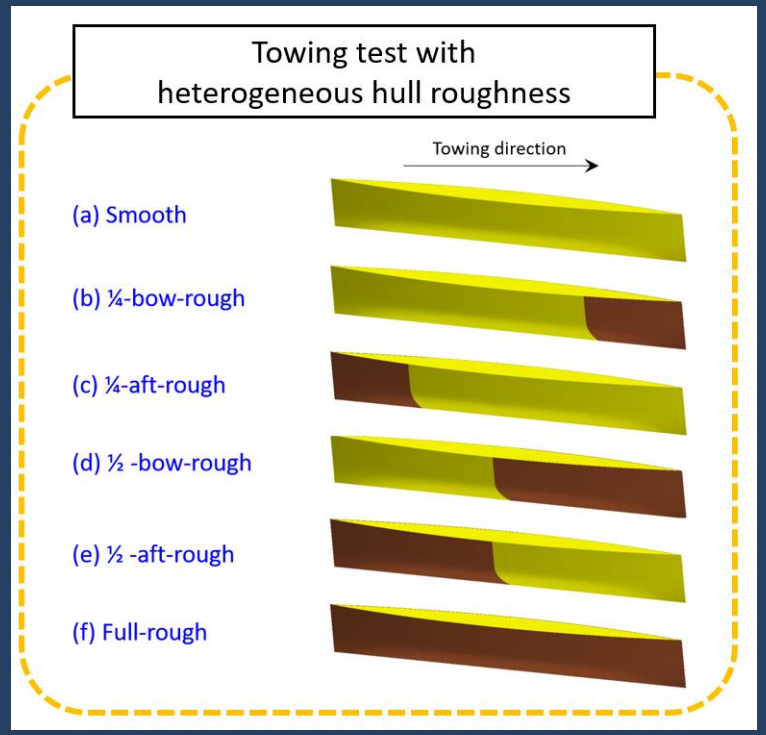
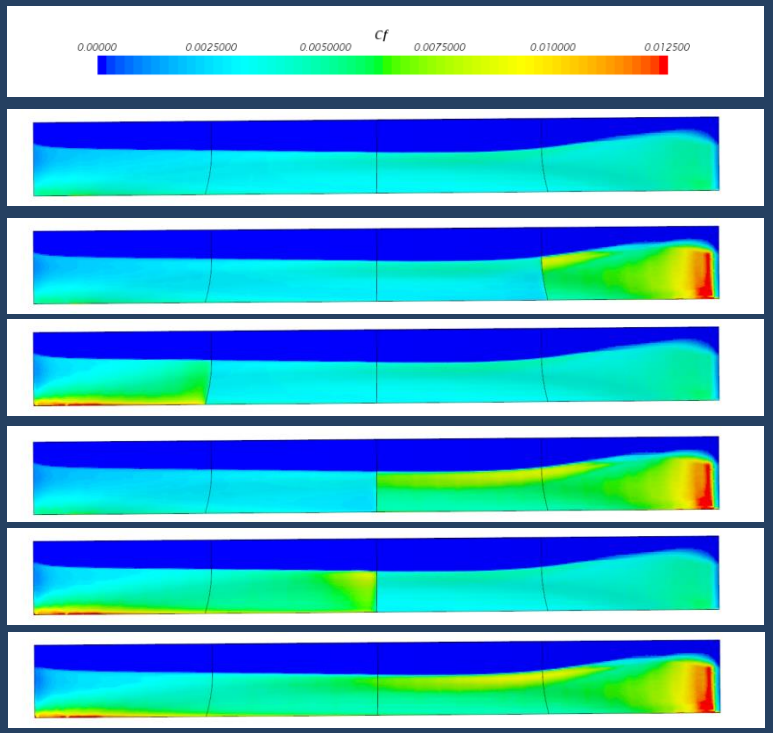
➢ Raising the Research Profile

❖ Research Groups

- **Resistance and Propulsion**
  - Effect of heterogeneous hull roughness on ship resistance







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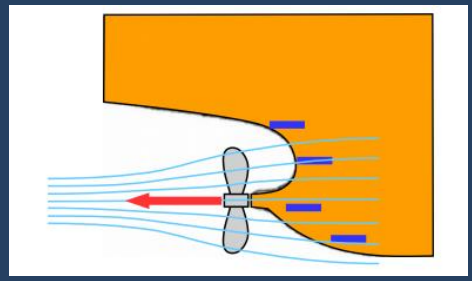
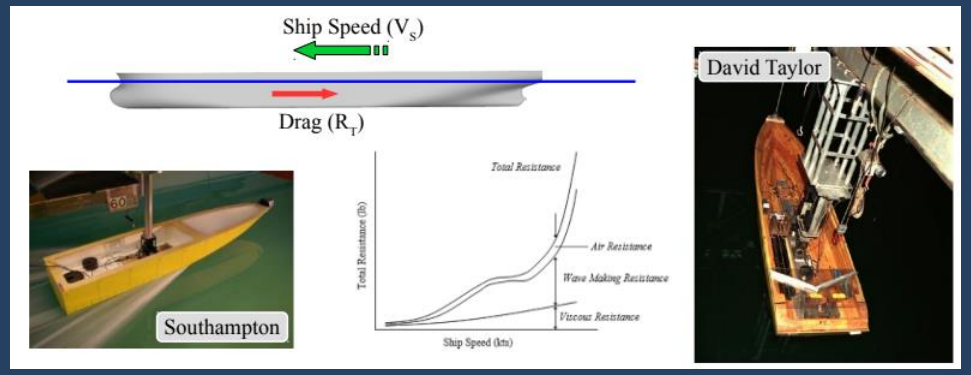
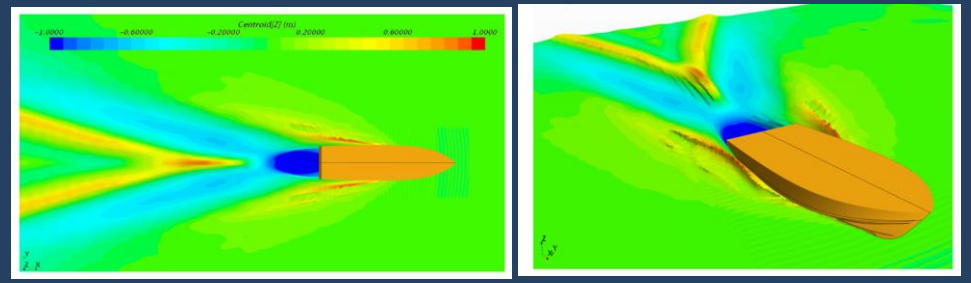
➢ Raising the Research Profile



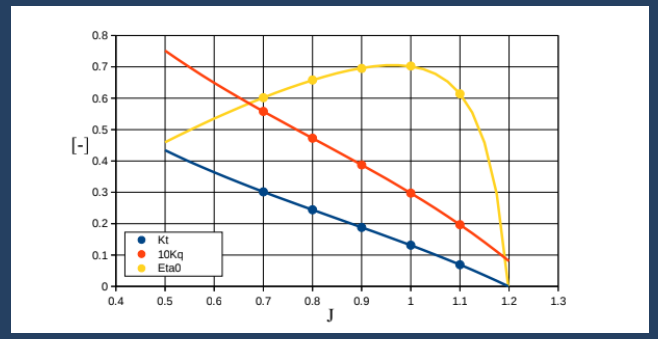
❖ Research Groups

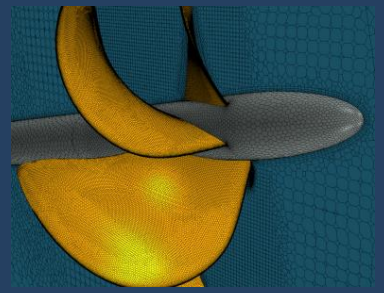
- **Resistance and Propulsion**
  - Numerical & experimental (ITTC guidelines and procedure) prediction of high-speed craft in the self-propulsion condition



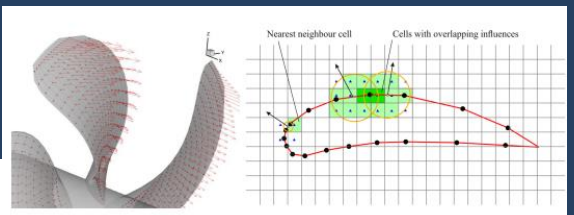


resistance tests

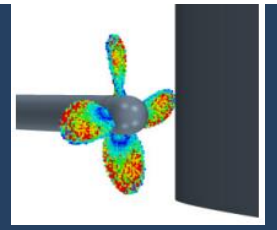




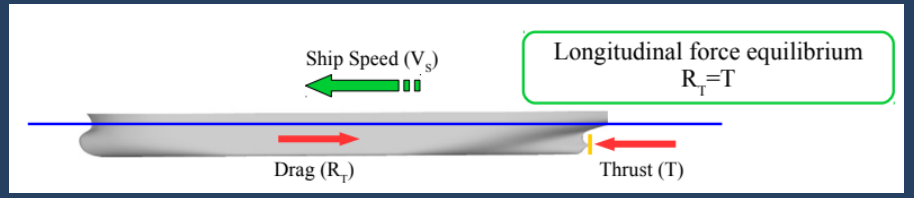
open water propeller tests



body force approach



RANS/BEM coupling approach



propulsion tests

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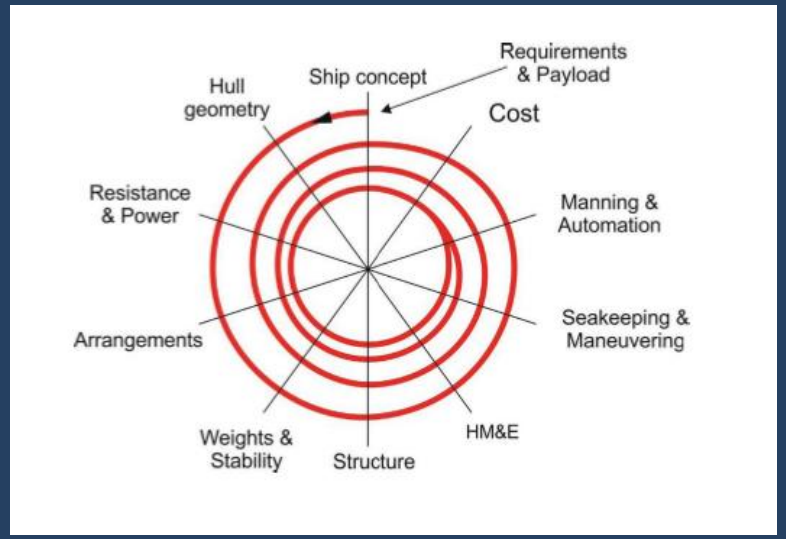
➢ Raising the Research Profile

❖ Research Groups

- **Resistance and Propulsion**
  - Preliminary design of a diesel-electric passenger ferry for the island of Malta

Objectives:

- Maximise the number of localities serviced in the fastest way possible
- Maximum number of people per trip.
- Minimize time window at each stop
- Minimize CO2 emission for the operation of the ECO Vessel



NAS Ltd concept design

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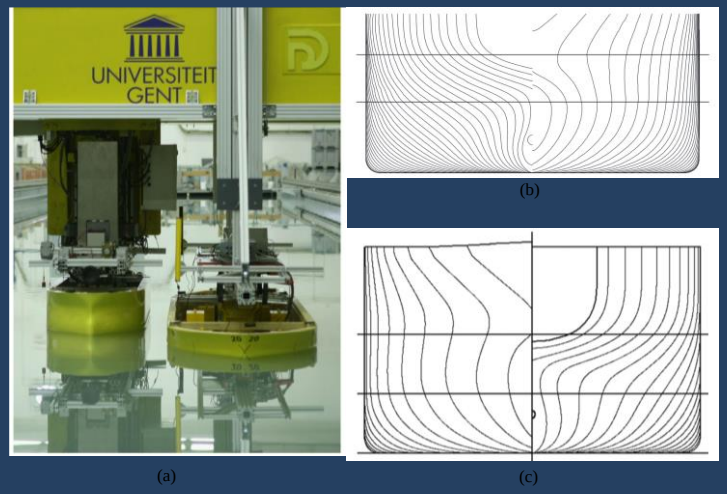
➢ Raising the Research Profile

❖ Research Groups

- **Seakeeping and Manoeuvring**
  - The interactions between two ships during overtaking or encountering operations

Two ships passing in inland waterways



Two ships overtaking/passing

Two ships offloading

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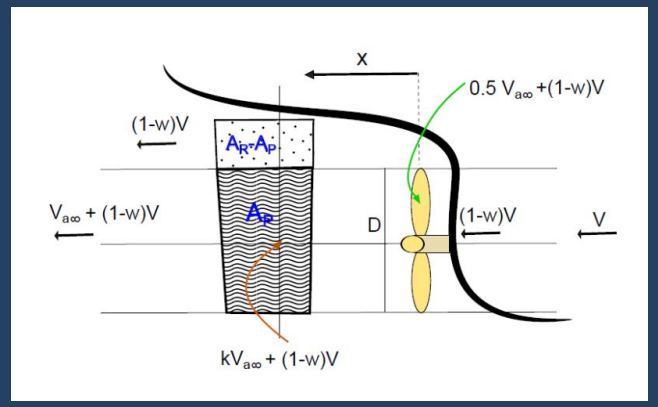
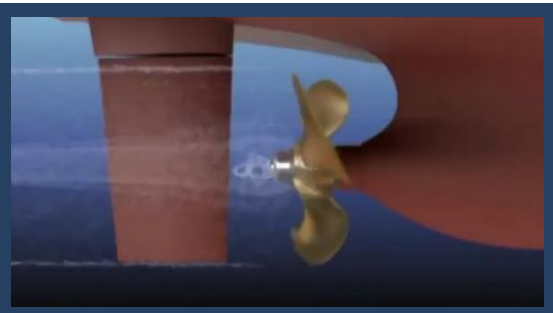
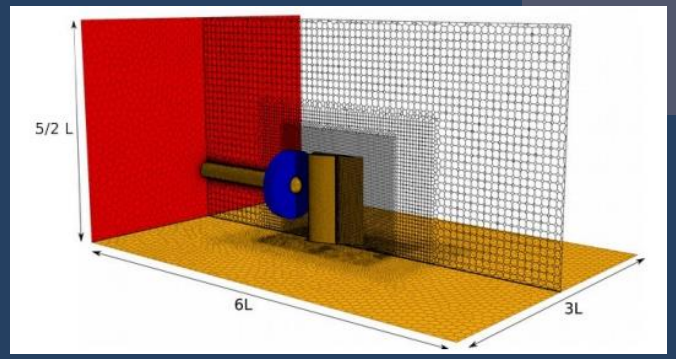
➢ Raising the Research Profile

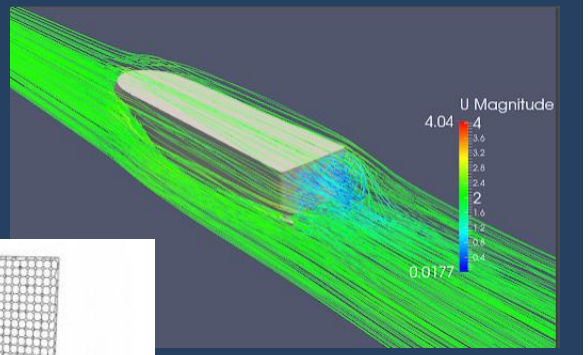
❖ Research Groups

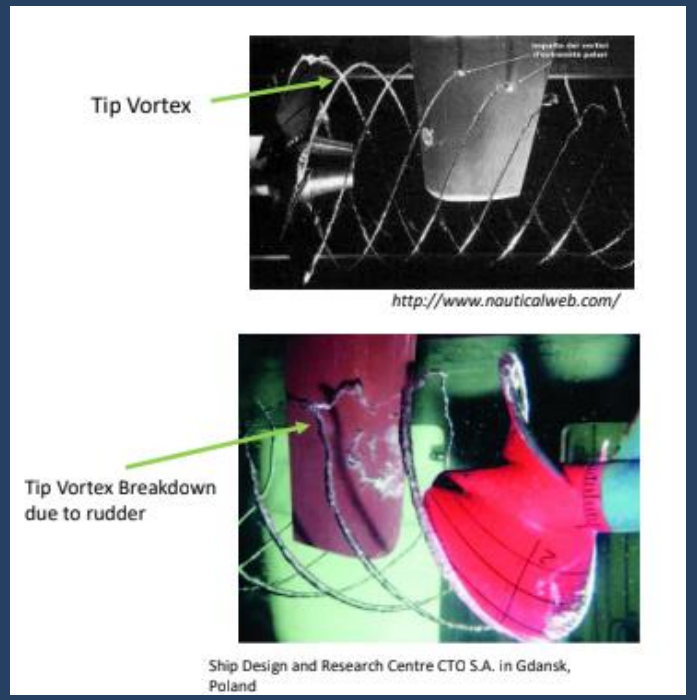
- **Seakeeping and Manoeuvring**
  - To investigate the effects of hull-propeller-rudder interactions











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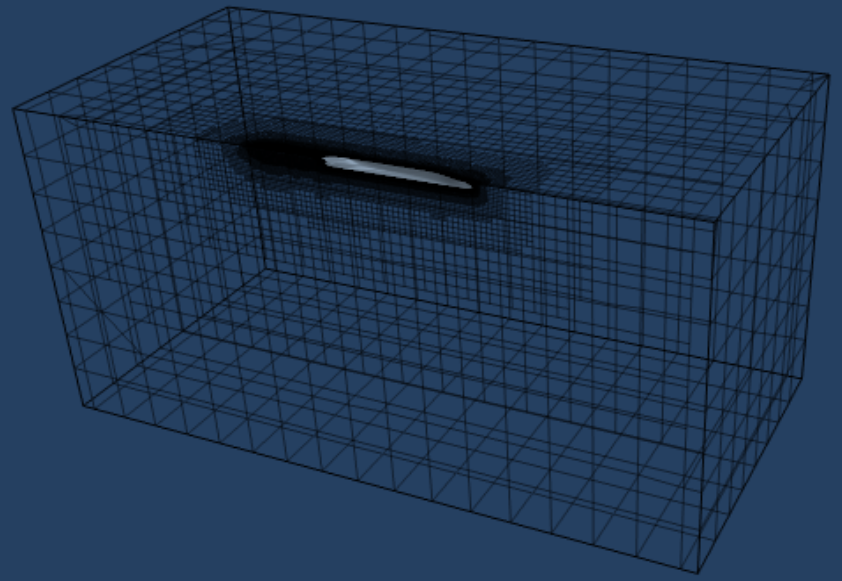
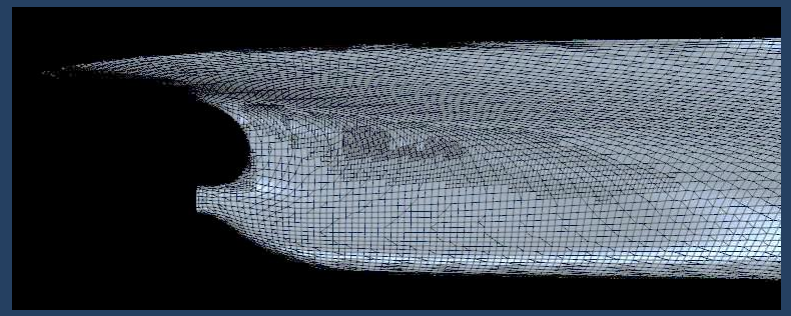
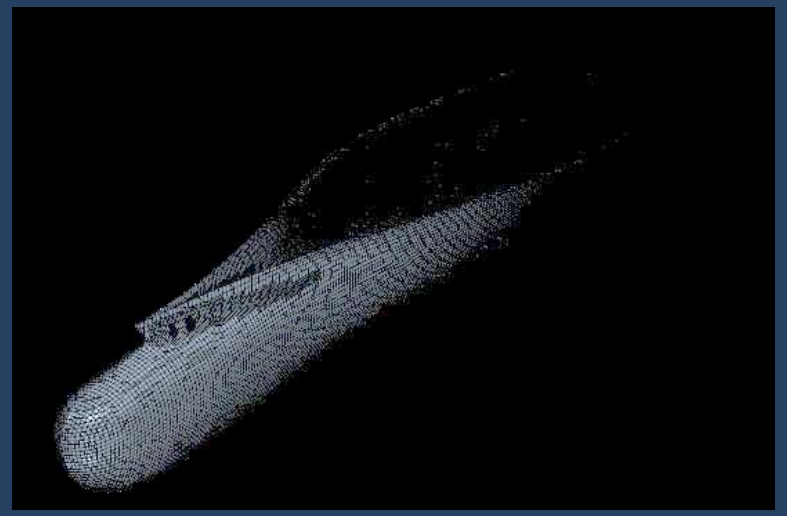
➢ Raising the Research Profile

❖ Research Groups

- **Combined CFD/EFD Methods**
  - To investigate the effects of ship velocity on the form factor (1+k)







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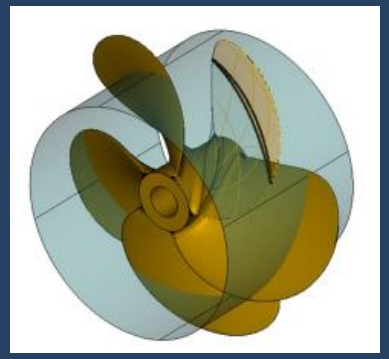
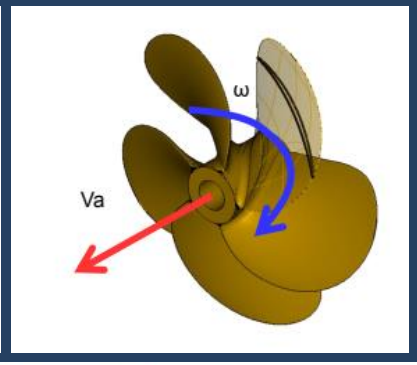
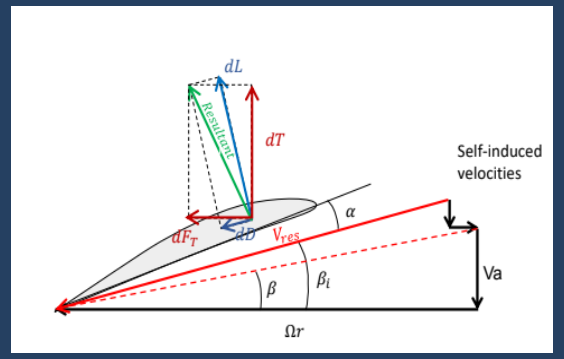
➢ Raising the Research Profile

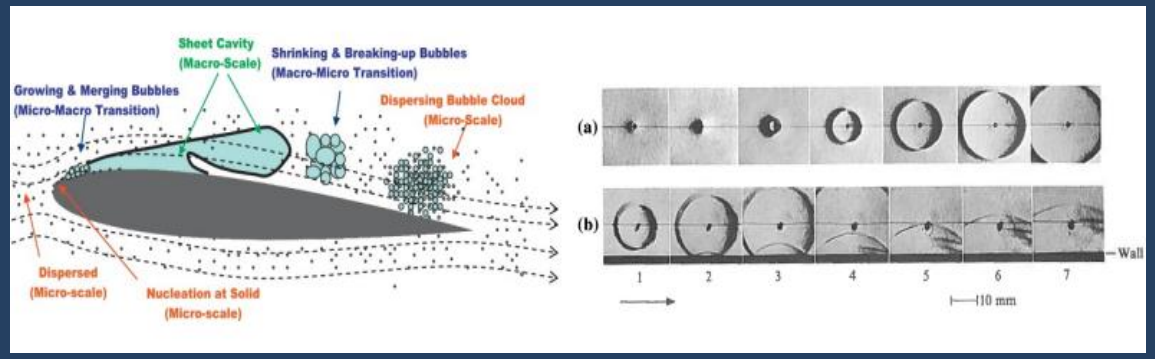
❖ Research Groups

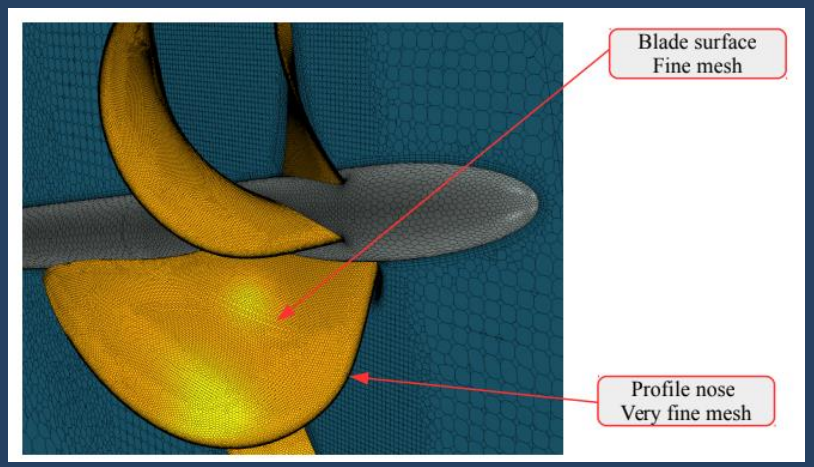
- **Combined CFD/EFD Methods**
  - Analysis of propellers in oblique flow: bearing forces without and with cavitation.



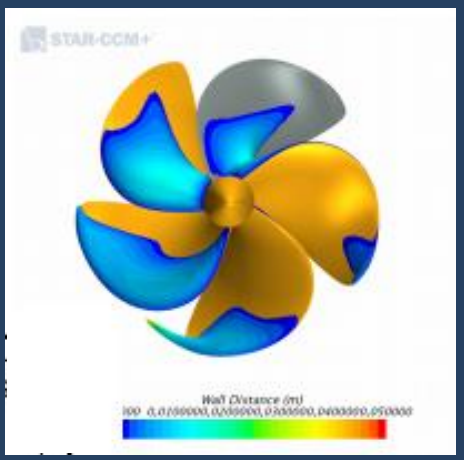








cavitation model



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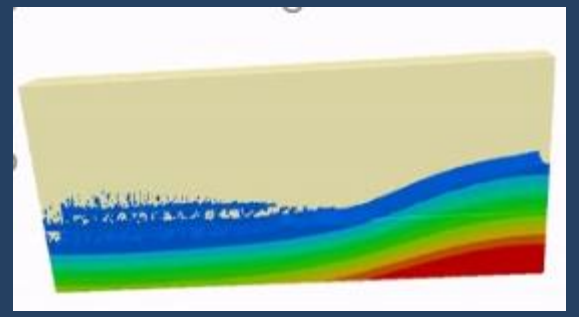
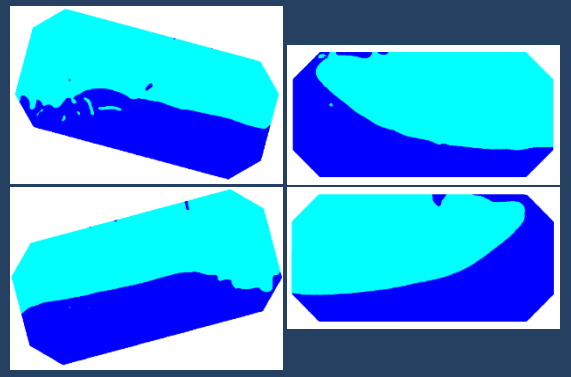
➢ Raising the Research Profile

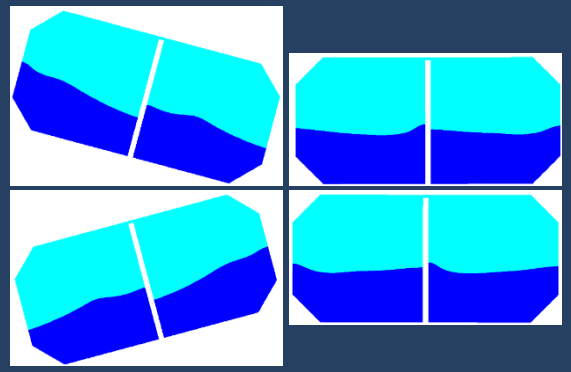


❖ Research Groups

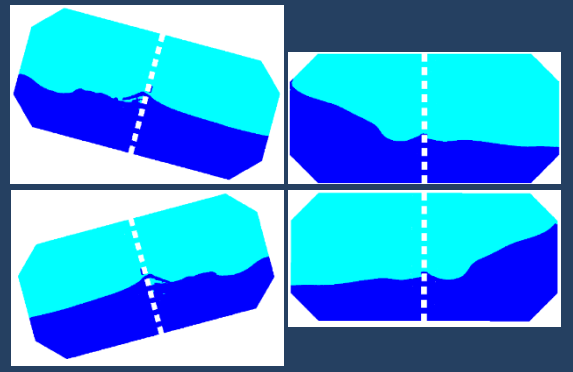
- **Combined CFD/EFD Methods**
  - An experimental & numerical analysis of dynamic slosh dampening utilising perforated partitions in partially-filled rectangular tanks



Open-bore tank



Partitioned tank



Perforated-Partitioned tank

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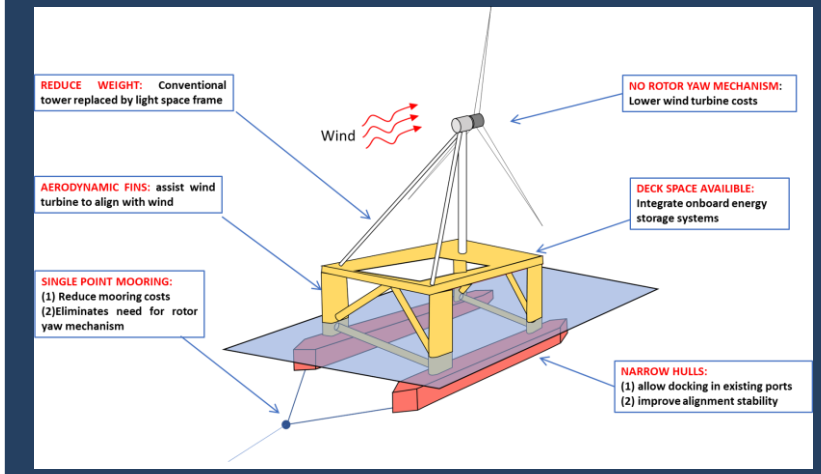
➢ Raising the Research Profile

❖ Joint Proposal Strategy

- National funding from Malta
  - ❖ Maritime Seed Award - MarSa Funds

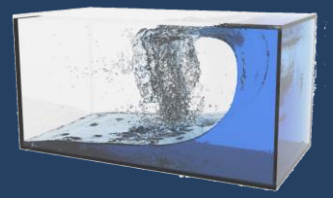
Transport Malta | TAKEOFF THE ENTERPRISE CAMPUS | MALTA MARITTIMA

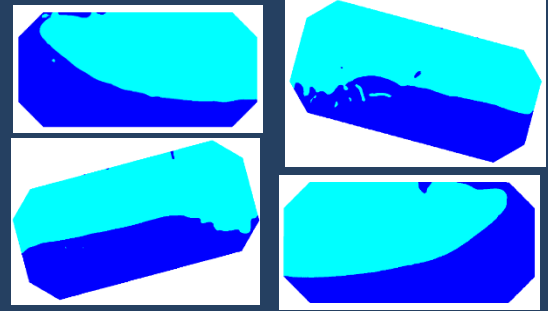
A versatile **F**loating **O**ffshore **W**ind **T**urbine platform concept for Central **Med**iterranean Conditions (MedFOWT) - completed



Decreasing the **Sl**oshing-effect **o**n **S**hip **H**ulls (DeSloSH) - completed

deSloSH





Cavitation Experimentation Acquisition Technology (CAVEAT) - ongoing

Project/s supported through the Maritime Seed Award 2020/1

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➢ Raising the Research Profile

❖ Joint Proposal Strategy

- VENTuRE wins the Horizon 2020 Blue Award
  - The awards to MT coordinated & Maltese partner beneficiaries having participated in R&I projects within the Horizon 2020 Framework Programme

The Malta Council for Science & Technology

Xjenza

https://www.youtube.com/watch?v=2sxRGdP3tOY

VENTuRE

L-Università ta' Malta

➢ Building Tomorrow's Maritime Professional and Academic Innovators

❖ Summer and Winter Schools

- **School #1 - Data Analytics for Engineering** - M16 ✓
- **School #2 - CFD Marine Applications** - M14 ✓
- **School #3 - Boundary Element Method on Hydrodynamics -** M30
- **School #4 - Building a Successful Research Career -** M30
- **School #5 - Energy efficiency in Marine Engineering applications -** M31
- **School #6 - Dynamic Simulation of Marine Systems** - M18 ✓

VENTuRE

L-Università ta' Malta

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VENTuRE National Networking Event
Wednesday, 18 May 2022
Admiral Hall, Fort St Angelo, Birgu Waterfront

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