



## IMAREST Benelux branch presents Programme 2019

Practical information for technical lectures (unless otherwise specified):

Venue: TUDelft 3ME, Mekelweg 2 Delft  
 Coffee/drinks: 18.30  
 Starting time of lecture: 19.00  
 Closure: 21.30

For more information, updates of the programme and membership visit the website:

<http://www.imarest.org/events-courses/events-conferences>



### Tuesday 29<sup>th</sup> of January 2019

*Technical lecture*

Speakers: Rogier Eggers (MARIN) and Michael Vahs (Hochschule Emden/Leer)

**Topic:** Wind assisted propulsion, Flettner rotor, propeller interaction, energy reduction.

The ambition to achieve substantial reductions of greenhouse gas emissions in the maritime industry is growing and stricter legislation is very likely forthcoming. Whereas this is going to be a big challenge, there are many techniques that are considered. A typical focus is to change to some type of synthetic fuel that then must be produced also without creating much air emissions. But at the forefront should also be the general reduction of energy consumption on ships. And to make big steps there, wind assisted ship propulsion is considered to have high potential for particular ship types and operational scenarios. Past and present research and practical developments in wind propulsion are discussed in the lecture to highlight what it can bring and which questions or hurdles still need to be tackled.

### Thursday 4<sup>th</sup> of April 2019

*Technical lecture*

Speakers: Lindert van Biert, Harsh Sapra (TUD) and Celia Wei (WUR)

**Topic:** the GasDrive project: fuelcells, combustion engines, hull resistance reduction and underwater organisms.

Maritime industry is changing rapidly together with different renewable fuels that are emerging on the market. The GasDrive project focusses on a solid oxide fuel cell connected in series with an internal combustion engine on-board of ships powered with LNG. The results of the work show how to include fuel cells in future propulsions concepts that are based on fully renewable fuels. Besides novel power concept, the GasDrive project aims at reducing the amount of exhaust emissions on deck of ships by underwater exhaust and utilizing it further in the form of air-lubrication. The effect of underwater exhaust on the maritime ecosystem is investigated through series of experiments that enable better understanding of the impact of ships on underwater organisms. The air-lubrication was investigated using different nano-coating materials for hull coating as a way to capture the exhaust gasses and reduce the ship resistance.

**Tuesday 4<sup>th</sup> of June 2019**

*Technical lecture*

Speaker: TBD (Damen Schelde Naval Shipbuilding)

**Topic:** Icebreaker RSV Nuyina, hybrid propulsion, dynamic positioning, ice loads.

RSV 'Nuyina' is Australia's upcoming icebreaker and will replace the current icebreaker 'Aurora Australis' after roughly 30 years of loyal service.

After concept development of the vessel by Knud E. Hansen, design and construction is currently being managed by Damen Schelde Naval Shipbuilding in Vlissingen.

Besides operating as a complex vessel in an inclement environment the vessel showcases an innovative propulsion arrangement in order to marry the functionalities of a research vessel, supply vessel and an icebreaker.

In the process several engineering challenges had to be overcome. For example, the safe operation and control of the propulsion train under ice-induced loads, or the impact of redundancy on the electrical grid to safeguard DP-operations had to be accounted for in the design.

**Thursday 19<sup>th</sup> of September 2019**

*Technical lecture*

Speakers: Rinze Geertsma and TBD

**Topic:** The energy transition of the Royal Netherlands Navy.

The Netherlands armed forces have adopted the Operational Energy Strategy in order to reduce the dependency of operations on their logistic supply lines of fuel and reduce the impact of their operations on the environment. In this lecture, the Defence Materiel Organisation will discuss the developments in the future Royal Netherlands Navy fleet in support of this energy transition, through two case studies: the propulsion and power generation plant of the future frigate and the power generation plant of the future hydrographic survey vessel.

For the future frigate various hybrid propulsion configurations have been compared on basis of energy efficiency and various performance parameters. The control strategy turns out to provide opportunities to find a good trade-off.

For the future hydrographic survey vessel, various future technologies, such as batteries, fuel cells and combustion engines running on alternative fuels have been investigated. The results of both studies will be discussed.

**Friday 15<sup>th</sup> of November 2019**

*Annual General Meeting & Mini-symposium*

**Topic:** Submarine design

Details to be announced.