



# High Performance Yacht Design 8 Public session program



## General information:

Date: Thursday 21<sup>st</sup> of March 2024, 18:00 to 22:00 NZDT

Venue: The maritime room, Princes Wharf, Auckland CBD, Auckland 1010

Free event, registration required at: <https://www.hpyd.org.nz/>

## Planning:

All times are on NZDT (Auckland time).

18:00: doors opening at the venue, refreshments.

18:25: Introductory note by chair and MC

18:30: start of presentations.

18:30-19:00: **Design of AC40** by *Emirates Team New Zealand*.

19:00-19:30: **A Data-driven Race Strategy Tool for Olympic Sailing Competitions** by *Dr Laura Marimon Giovannetti*, RISE, Sweden.

19:30-20:00: **IMOCA's design structure, recent developments and future challenges** by *Mr Yoan Stephant* (Gurit).

20:00-20:30: refreshments and nibbles, social mingling

20:30-21:30: panel session / round table discussions: **The evolutions of foiling technology.**

21:30-21:35: closing words from MC and chair.

21:30-22:00: last social mingling time of the evening.

22:00 : End of event.

The presentations and panel discussion will be live streamed for online attendees.





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## Design of AC40

### Abstract:

The one-design AC40 yacht, launched by ETNZ in 2022 and winner of World Sailing's 'Boat of the Year' in 2023, is a key part of this year's America's Cup event and is soon to enter the sailing mainstream through private owners. This presentation will provide some insight into the design process of the yacht, including the structural and fluid dynamics modelling, simulation, and the mechanical system design.

### About the speakers:

**Dr. Tanya Peart** is fluid dynamics engineer at Emirates Team New Zealand. She is primarily working on the aerodynamic modelling of the America's Cup yachts, and creating models that can be used as part of the yacht design process, as well as by the sailors in the team's sailing simulator. Prior to starting at ETNZ in 2021, Tanya studied mechanical engineering, completing a Bachelor of Engineering (Hons) degree with first class honours from the University of Auckland in 2018. She then completed a PhD in mechanical engineering in 2023 in association with Doyle Sails, where she looked at how the performance of yacht sails could be more efficiently predicted. Tanya is a keen sailor, having cruised and raced dinghies and keelers since she was young.

**Dr. Chris Hickey** is a Materials and Process Engineer at Emirates Team New Zealand, where he works as part of the structures team. He holds both a BE (Mech) and PhD from the University of Auckland. His PhD thesis investigated sources of variability in marine composite manufacturing processes, under the supervision of Prof. Simon Bickerton. Chris joined ETNZ in 2018 for the AC36 campaign. Prior to this he worked at Southern Spars for 5 years. Chris's specialty is turning composite manufacturing from an art to a science.





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## Data driven investigation of Sailing Olympic venue

### Abstract:

Venue specific training has proven to be a key asset for teams over the years to perform at major championships and at the Olympics. A deep knowledge and understanding of the environmental features and of the possible weather scenarios in an outdoor sport like sailing could give a strategic advantage.

At the same time, GPS tracking is becoming a readily available technology that sailors use both in training and during races to analyse their own boat speed compared to their competitors.

The current research couples environmental data with GPS tracks for Sailing Olympic classes with the aim of linking weather features with strategic moves around a race track. This paper analyses the routes taken by sailors using the local wind and GPS measurements for explaining decisions taken at every step of the path.

### About the speaker:

**Dr Laura Marimon Giovannetti** started working in SSPA, now RISE, in October 2019. She graduated from the University of Southampton in 2013 with an MEng in Yacht and small crafts with a first class (hons) degree. She then carried on her research during her PhD based both at the University of Southampton and in the British Americas' Cup Challenger (Land Rover BAR).



Her PhD was based on both fluid structure interaction numerical investigations and experimental analysis of a flexible wing/foil. She finished her PhD in early 2017 and worked as a PostDoc at the University of Southampton in the Sport Performance Laboratory as a project manager/engineer for a number of sport-related projects. Whilst working as a PostDoc, she carried on an Olympic campaign as a NACRA 17 sailor for the British Sailing Team in the World Class program. She now works both in hydro-aerodynamics related research for wind assisted propulsion and in sport engineering questions for a range of sports in Sweden.



## IMOCA's design structure, recent developments and future challenges.

### Abstract:

The IMOCA Class is a very dynamic and high-performance fleet of 60ft monohull offshore sailing yachts governed by the International Monohull Open Class Association. Since the last Vendee Globe edition in 2020-2021, the single handed, nonstop, round the world race, there has been 13 new boats launched. The IMOCA 60 class has been selected to race the Ocean Race 2022-2023 (ex. Volvo Ocean Race) and is getting more interest from international sailing teams, with 40 IMOCA's set to take part in the next Vendee Globe starting in November 2024.

Gurit Engineering has been involved in the design & structural engineering of 8 projects for the last two generations of IMOCA's since 2018. Among these were **Malizia Seaexplorer** (VPLP Design, launched in 2022), **Charal 2** (Sam Manuard Design, launched in 2022) and **Stand As One & Finistere-Armor Lux** projects (David Raison & D2E, launched in 2023).

During this presentation, Gurit will share the recent development in the design and engineering of the latest generation boat, where a strong focus was put around structure reliability in a context of load inflation, implementation of new systems and use of data acquisition as an element of performance.

Gurit will also discuss the challenges ahead for the next generation design, the design of which is starting now.

### About the speaker:



**Mr Yoan Stephant** CEng (MRINA)

Project Engineer – Gurit (Asia Pacific) Limited

Email: [yoan.stephant@gurit.com](mailto:yoan.stephant@gurit.com)



Yoan Stephant is a Project Engineer for Gurit, initially working as part of the Gurit Engineering Team in Europe and is now based in New Zealand working on various composite projects across the Asia Pacific region and raceboat projects in Europe.

Prior to joining Gurit in 2017, Yoan worked with various shipyard and naval architects in Brittany - France, for the design & engineering of sailing / power boat vessels and spars design and manufacture.

As a Project Engineer for Gurit, Yoan has been involved in the design and engineering of various marine composite structures, ranging from small power boats, sailing superyachts, large commercial catamaran ferries, racing boats and wing-sails spars.

On the high-end racing boat scene, Yoan has been involved with seven IMOCA boat structure designs or double-check since 2018, as well as two Class 40' boat structures and was integrated within an America's Cup design team for several month during the 36th edition.



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## The evolutions of foiling technology.

From the America's cup to IMOCA and Olympic sailing, hydrofoils have taken a place of choice in high performance sailing. The golden age of foiling is now clearly upon the sailing world. The rise in this technology keeps pushing the researchers, designers, architects, engineers, yachties and athletes beyond their own limits to break new records, win races and showcase higher performance. With our world class selection of panelists, we will discuss the evolution of foiling with time. What are the past and present key technological factors that have unlocked such performance gains? What are the implications for the way we design existing and next generations boats? What does the future hold for that technology? How have they affected the way we sail? Here are a few topics that we will discuss tonight so sit back, relax and enjoy the hydro-foiling flight.

### List of panelists:

Mr Burns Fallow, Emirates Team New Zealand

Mr Bobby Kleinschmit, Emirates Team New Zealand

Dr. Laura Marimon Giovannetti, RISE

Mr Yoan Stephant CEng (MRINA), Gurit

