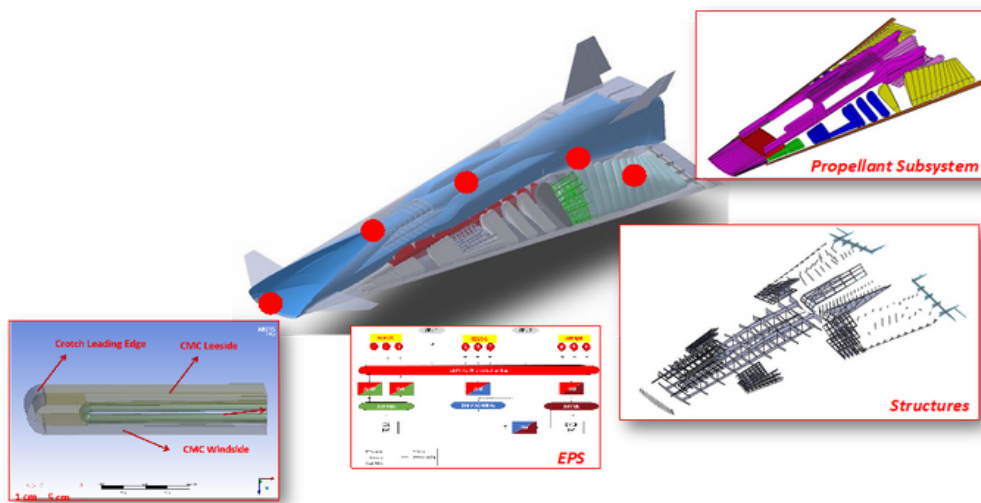


## HIGH-SPEED CIVIL AIRCRAFT ON-BOARD SYSTEMS INTEGRATION

High-speed civil aircraft may range from supersonic civil vehicles to hypersonic systems, which can be considered future civil stratospheric passenger or cargo transportations or as the first stage of reusable access to space vehicles. Integration shall be pursued at all levels, systems and subsystems as a key element of success. The webinar will focus on the on-board systems integration of such vehicles. Cryogenic liquid hydrogen is considered a propellant for its potential to extend further the range and its capability to decarbonize the flight. Liquid hydrogen is the core of the multifunctional Thermal and Energy Management System that combines the Fuel System, the Environmental Control System, the Thermal Control and Thermal Protection System, and the Electric Power System. The course will first introduce high-speed vehicles, then the high-speed vehicle on-board systems, highlighting their mutual relationships. Next, main on-board subsystems will be described and sized, and finally, conclusions will be drawn. Students and professionals interested in the high-speed mission and vehicle design can attend the webinar.



### LEARNING OBJECTIVES

- On-board systems integration
- Multifunctional Thermal and Energy Management System
- High-speed mission and vehicle design

**Target audience:** Doctoral students, non-academic professionals, and undergraduate students.

**Dates and time:** 23 May 9-11 CEST; 25 May 9-11 CEST/ 14:30-16:30 CEST; 26 May 14:30-16:30 CEST

### REGISTRATION AND CONTACTS

**Course Code:** 20220523

This course is part of the 2022 institutional activity for AIDAA members. The registration requires the purchase of one of the packages described here [LINK](#), and the completion of the online form available here [LINK](#).

**Course platform:** Webex, a link will be sent via email as the registration is complete.

At the end of each course, **attendance certificates** will be sent to participants via email.

For further info, please, contact [academy@aidaa.it](mailto:academy@aidaa.it)



## **SPEAKERS**

**Nicole Viola** has been Associate Professor of Aerospace Systems Design at the Department of Mechanical and Aerospace Engineering at Politecnico di Torino since 2018. She is Coordinator of STRATOFLY project about hypersonic civil flight under the Horizon 2020 Program, Coordinator of MORE&LESS project about environmentally sustainable supersonic civil flight under the Horizon 2020 program, and she is Principal Investigator of the technological payload currently on-board the International Space Station "Thermal Exchange", developed in "Advanced Research for passive Thermal passive Exchange, ARTE". In addition, Nicole Viola is also the Principal Investigator of research programs about high-speed vehicles and reusable access to space and re-entry systems and space tug mission design in collaboration with space agencies and industries.

**Roberta Fusaro** has been Assistant Professor of Aerospace Systems Design at the Department of Mechanical and Aerospace Engineering at Politecnico di Torino since 2018. She is actively contributing (as WP Leader) to the STRATOFLY project about hypersonic civil flight and MORE&LESS project about environmentally sustainable supersonic civil flight, both under the Horizon 2020 Program. Her main area of interest relates to the broad field of high-speed aircraft conceptual design. Specifically, she has been working at the development of up to date design methodologies to anticipate at conceptual stage reliable estimates for multidisciplinary design aspects, including aero-thermodynamic and propulsive characterization, pollutant and noise emission estimation, sonic boom signature, life-cycle cost modelling, the impact of the integrated and multifunctional subsystem, mission analysis and technology road mapping.

**Davide Ferretto** is Assistant Professor at the Department of Mechanical and Aerospace Engineering at Politecnico di Torino, where he started his career as a Research Assistant in 2014. He received the PhD degree in Aerospace Engineering from Politecnico di Torino in 2020 with a dissertation entitled "Model-Based Systems Engineering approach for the design of hypersonic transportation systems". His research activities include the design of aerospace systems for conventional and innovative aircraft and the systems engineering methods and tools. He is currently contributing to Horizon 2020 Projects STRATOFLY and More&Less, for which Politecnico di Torino acts as Coordinator, dealing with European calls on "Breakthrough innovation" in the aerospace domain "Towards global environmental regulation of supersonic aviation".

