

# INNOVATIVE PROPULSION SYSTEM IN SERVICE OF SMALL SATELLITES

Small satellites are the new dominant platforms in the new space economy. Thanks to the very high capabilities of the electronic systems, small satellite, especially if working within the frame of a constellation, can provide innovative services with a cost not achievable from big satellites. However, to fully exploit their huge potential such a platform has specific need both in term of access to orbit and movement in space.

Regarding orbit access, most of the platforms fly as piggy bag on big launcher. This mean that they cannot choose the right orbit and they must fly within a schedule which is not based on their need. Around the world several companies are developing micro launchers to provide a dedicated access to space to small platforms. Micro launchers require the development of innovative propulsion systems capable to combine high performances with reasonable costs.

Once in orbit micro satellites need to reach the right altitude, the right phasing within the orbit and to maintain its position. To do it they do require an onboard propulsion system. These thrusters need to be designed to respect the reduced size of such a platform and to allow low recurring costs. Moreover, innovative missions, such as for example very low earth orbit (VLEO) require dedicated thruster to accomplish the specific mission, in VLEO for example a thruster capable of performing continuous drag compensation is required. These new scenarios open new challenges and opportunities for new innovative technology capable of reaching the right compromise between costs and performances.

Object of this webinar is to provide an overview of the ongoing market scenario related to small platforms than to provide an overview of the most innovative micro launchers developed or currently under development, and finally to provide an overview of the most promising propulsion systems suitable for small satellites developed or currently under development.

**Learning objectives:** market scenario, micro launchers, small thrusters.

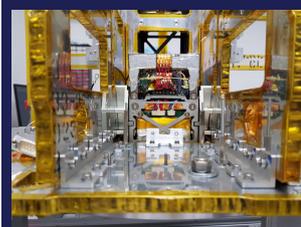
**Target audience:** doctoral students, non-academic professionals, and undergraduate students.

**Dates and time:** 4 November 2021, 9:00-13:00 CET.

## Speakers

**Dr Elena Toson** - COO Technology for Propulsion and Innovation, T4i - After taking my University Master Degree in Aerospace Engineering, specializing myself in Propulsion Systems, I had the chance to work in two established companies in the field: Thales Alenia Space and Avio Aero. It was during these years that I realized that I wanted to focus my efforts on projects with a strong and tangible social impact. As the Space Community was giving more and more attention to safety, environmental impact, and costs issues, I started a PhD focusing my research on hybrid rocket propulsion, well known inside the Rocket Propulsion Community for being a promising field of research. While doing the PhD research I got in touch with the sustainable approach of a NGO association - The Natural Step - realizing how the implementation of the sustainability concepts is essential to make innovation, especially in the aerospace field. That's how I knew D-Orbit, where I managed Alice-2 project, in which I successfully led the design, production, qualification, acceptance and launch phases of the core of D-Orbit disposal device, and D-SAT project. In D-Orbit I also grew my Business Development and Commercial competences in the Space sector and today. After being T4i manager of the Business Development and Marketing activities on New Propulsion Systems, I'm now T4i Chief Operational Officer. I enjoy being part of the space community, that's why I'm a member of the IAF International Space Propulsion Technical Committee and a member of SGAC and Women in Aerospace Europe Association.

**Dr Francesco Barato** - Assistant Professor in Space Science and Technologies, University of Padua - I'm currently RTDA at University of Padua teaching Aeronautic Propulsion. I was in charge for three years of the chemical space propulsion activities within T4i. My main tasks are numerical modelling, theoretical investigation, system design and optimization, project management. I'm an aeronautics and space enthusiast. I believe in the possibility of a revolution in space and I'm following the NewSpace industry since the start of my career.





## Educational Series & Academy

I like to develop innovative solutions to be applied on real applications. I studied at Università degli Studi di Padova. There, I received a Ph.D. in Space Science, Technologies, and Measurement (STMS), course of Astronautic and Satellite Science (ASS) from CISAS "G. Colombo". I've 8 years of experience in the R&D of hybrid propulsion systems. I've a strong background in fluid dynamics, thermodynamics, and physical modelling. Withing T4i and University of Padua I was technical manager for several Institutional and Private Research program focused on the development of innovative space propulsion systems.

**Prof. Daniele Pavarin** – T4i CEO and Associate Professor in Aerospace Propulsion, University of Padua – I hold a PhD in Mechanical Measurement in Engineering Science. I believe that everybody has a great power inside and that all of us is important in the engineering scheme of the world. I believe that we are part of this world to discover our weaknesses, fears, limits, and to overcome all of them, to go beyond to new harder challenges, more and more. In my life I was always trying to do something which I felt so challenging that most of the people considered impossible, that's why after my PhD I decided to specialize on Space Propulsion. I started and I am responsible for CISAS propulsion activities. I was Adjoin professor in Space Propulsion, Faculty of Engineering, University of Padua (2004-2013) Lecturer on Space Propulsion Laboratory, Faculty of Engineering, University of Padua (2005-present). I am also involved in many institutional research activities related to the development of innovative propulsion unit for orbital manoeuvres and access to space.

### Registration and Webinar Platform

The registration is mandatory via the online form at the web [link](#)

**Deadline:** 1 November 2021

**Fees:** there are no registration fees for AIDAA members. Instructions to become a member can be found here: <https://www.aidaa.it/become-a-member/>

**Webinar platform:** Webex, a link will be sent via email a few days before the event.

