

FUTURE SPACE TRANSPORTATION FLPP SPRING SESSION 2026



ESA PERMATHRUST

COMPANY INFORMATION

Company: DeltaOrbit GmbH

Location: Germany

Founded: 2023

Employees: >9

Mission: DeltaOrbit GmbH, a Munich-based company, is developing an in-space transporter enabling responsive orbital logistics through a high-performance, reignitable cryogenic methalox propulsion system. Our architecture is designed for multi-orbit agility, supporting precise deployment, orbit raising and plane changes, providing a robust, multi-purpose capability for institutional and commercial missions - with a clear, scalable path toward beyond-Earth-orbit applications.

Consortium:

DLR Lampoldshausen:

Subcontractor Main Engine Design & Testing



ACTIVITY

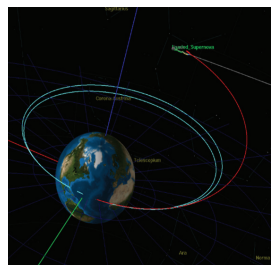
Project name: SUPERNOVA

Objective: Development up to TRL 2-3 of a multi-purpose, reusable and efficient cryogenic propulsion engine, and integrated Reaction Control System (RCS) subsystem for in-space applications.

Applications: The engine use cases include:

- LEO satellite servicing (deployment, maintenance, de-orbiting and orbital tugging)
- Translunar cargo transport, including Moon surface landing and ascent for cargo and human transportation

The engine design focuses on versatility, reliability and long operational life. The project fits in the framework of increasing in-space operations and future exploration endeavours.



TECHNOLOGY AND INNOVATION

What we developed: We designed an integrated propulsion system, composed of a 25kN main engine and multiple 500N Reaction Control System thrusters, both fed by the same tanks with Methane and Oxygen. The product is conceptualised as a modular subsystem that will be connected to present and future spacecraft for extensive in-space operations. Both thrusters have a pressure fed architecture connected to an Autogenous Pressurisation System handling the storage tanks. Both thrusters benefit of the in-house-developed Resonance Ignition System, extending engine durability and reducing operation complexity.

Unique features: The designed product has the strong advantage of unifying the required propellants for both the main engine and RCS thruster which, combined with the resonance ignition system, reduces the number of overhead structures and subsystems necessary to store the spacecraft propellant, ignite the thrusters and simplify engine control and operations. Both the main engine and RCS use regenerative cooling, resulting in a very high specific impulse and good controllability.

KEY RESULTS

- Full product development plan defined, from conceptual design to commercialisation and industrial production.
- Innovative technological advancement in capabilities for in-space operations.
- Demonstration of the methalox propellant combination competitiveness in terms of performance, overall system mass, complexity and durability.

NEXT STEPS AND MARKET READINESS

Roadmap:

2028: Main engine acceptance testing in vacuum of thrust chamber assembly by mid-2028

2029: Main engine test flight by end of 2029

2027: RCS thruster acceptance testing in vacuum of thrust chamber assembly by mid-2027

2029: Full integrated system qualification by end of 2029

2030: Product commercialisation by 2030

Opportunities: Both the main engine and RCS thrusters will be commercially available for integration in future landers and in-space transportation vehicles. Manufacturing will partly be subcontracted, creating opportunities for production partners.

Target Launch: RCS Thrusters: End of 2027
Main Engine: End of 2029
Integrated System: Mid-2030

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