In-flight opportunities
on FLPP Flagship demonstrators

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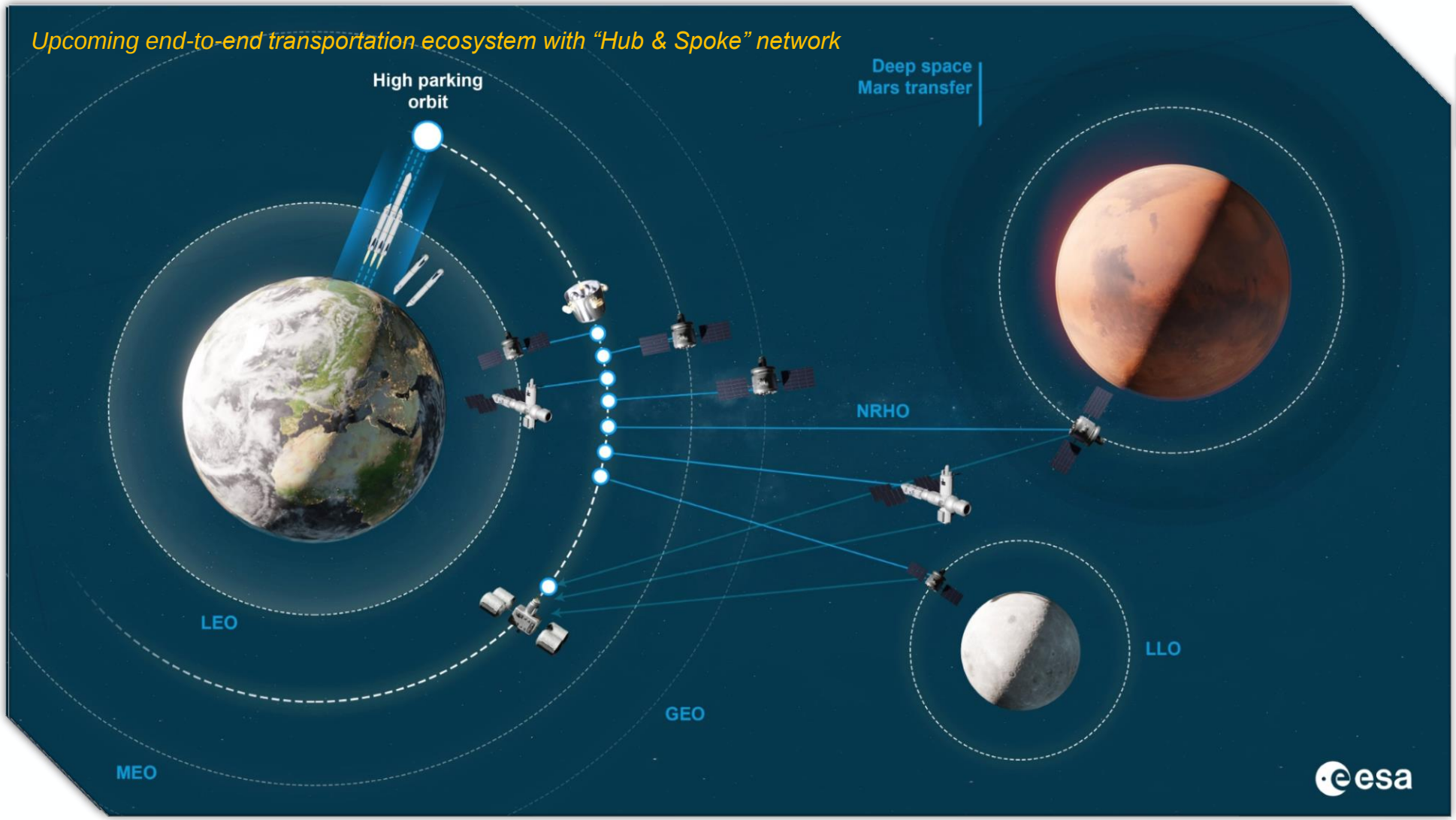
Space Transportation Ecosystem Conference – 27 June 2024

Vision: Enable “Hub & Spoke” end-to-end Space Transportation

A vision shaped with SpaceTech, for the benefit of Europe



Towards an integrated space logistics

- End-to-end transport service with hub & spoke approach
- **Fully reusable heavy lift launchers**
- Frequent missions
- **Fleet of interoperable in-space transportation vehicles**
- Standard interfaces
- Dedicated launches to specific orbits with reusable or expendable launchers

Transform this vision into reality…

Through coordinated system studies, technology maturation & demonstrators integration

System

System-Pull

Flow-down Systems needs towards mandatory and promising Technologies

Demonstrators integration

Embark selected technologies to raise their Integration Readiness Level

Demonstrators

Ensure demo representativeness wrt. System targets for techno maturation

Continuity

Ensure continuity with FLPP technology analyses history, updating trade-offs & choices

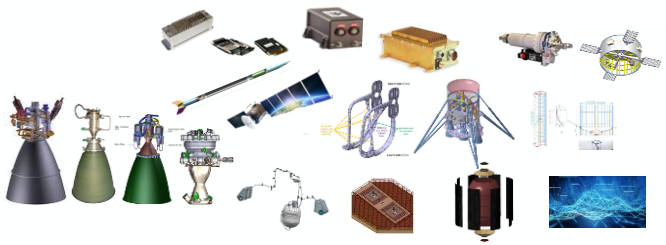
Future space transportation roadmapping

Techno-Push

Identify promising early-stage technologies to be considered

Techno maturation

Procure and steer technology maturation contracts



Technologies

Overall synergy

Align technology roadmaps and R&T plans with internal and external stakeholders to foster collaboration

OHB · DLR · horizon europe · arianeGROUP · The Exploration Company · esa One-ESA · MT AEROSPACE An OHB Company · RFA Rocket Factory · SPACE TEAM EUROPE

… with a portfolio of flagship demonstrators

For the benefit of European launchers

Routine access to space with reusable launchers

Modular liquid propulsion systems

THRUST! – high-thrust staged combustion engine

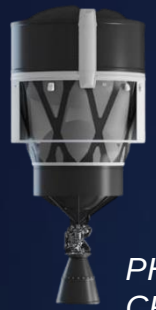
Disrupt propulsion

BEST! - Liquid reusable boosters

Themis – reusable first stage demo

Enable reusability

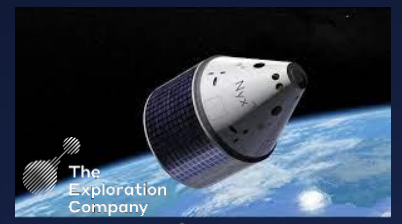
Enablers for…

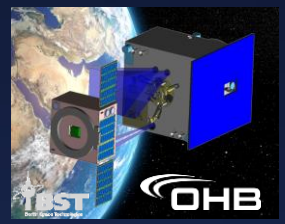


PHOEBUS – optimised CFRP Upper-Stage

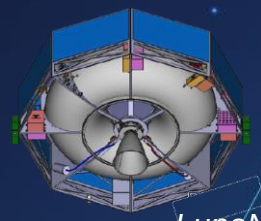
Optimise Upper-stages

To unleash the full potential of the orbital economy



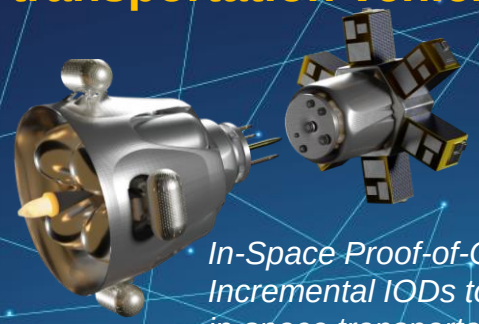


Fleet of interoperable In-space transportation vehicles



LunaNova Advanced Kick-Stage

& Kick-stages



In-Space Proof-of-Concepts: Incremental IODs to enable in-space transportation

Transform kick-stages into reusable spacetugs

… that offer opportunities to derisk your technologies

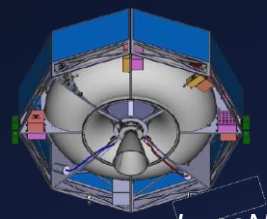
Modular liquid propulsion systems

THRUST! – high-thrust staged combustion engine

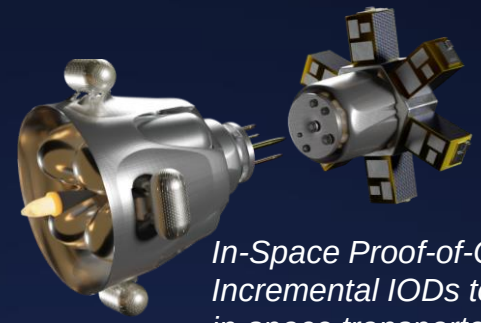
BEST! - Liquid reusable boosters

Themis – reusable first stage demo

PHOEBUS – optimised CFRP Upper-Stage



LunaNova Advanced Kick-Stage



In-Space Proof-of-Concepts: Incremental IODs to enable in-space transportation

Hot firing tests

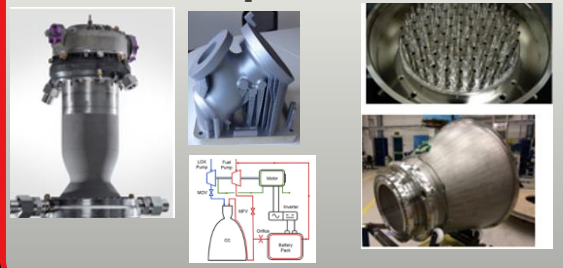
Hop-tests and in-flight demo opportunities

Integrated CFRP stages with cryogenics

In-Orbit Demonstrations:
Rendezvous & docking, orbital propellant lab…

Hot firing tests — *Technology integration & demo opportunities in…* — **In-Orbit Demonstrations**

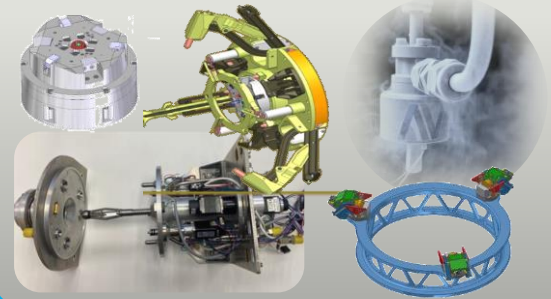
Propulsion



Lightweight structures

Avionics & GNC

Interfaces & robotics



Embark in FLPP flagship demonstrators to derisk your technologies

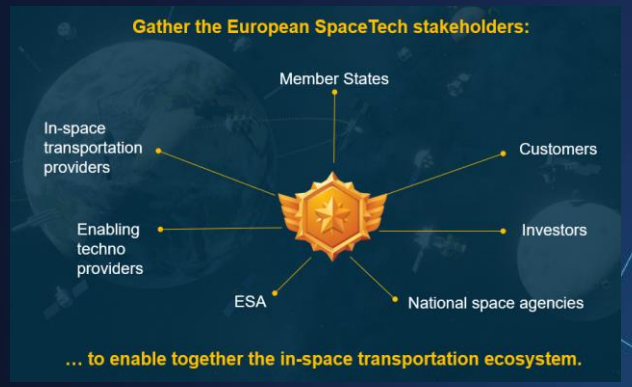
Mature your key technologies
with FLPP Technology contracts
FIRST!, THRUST!, BEST! and much more

Embark your technologies
in FLPP demonstrators

Prepare your product applications
with Primes and future customers

Embark with ESA, customers & investors to grow your business

Match with customers & primes
through FLPP projects & ecosystem facilitation events



Benefit from our STS-F x CIC collab:

Shape your business case
& increase your Commercial Readiness Level

Access ESA Investors Network

Focus on Upper-stages demonstrators

Integrated System studies, techno maturation & PHOEBUS demonstrator

ICARUS and MUSE System studies

MUSE & ICARUS Upper-Stage:
Mass and cost-effective upper-stage

- ✓ Structures with functional integration and reduced structural mass
- ✓ Improved mission capabilities and reduced non-propulsive mass
- ✓ Cost reduction due to efficient manufacturing technology

ArianeGROUP

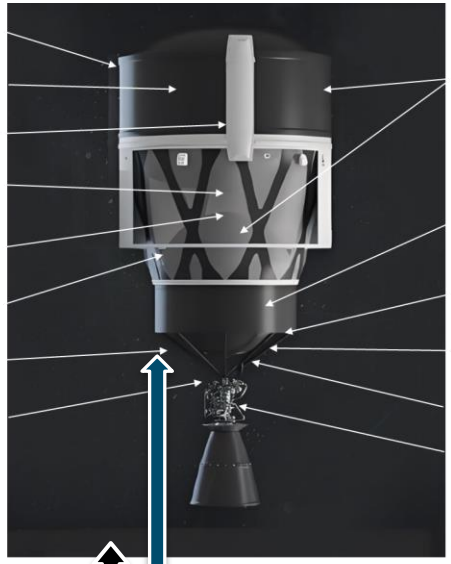
MT AEROSPACE

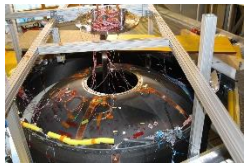
System-Pull

Demo integration

Techno maturation

PHOEBUS demonstrator





Pictures - courtesy of ArianeGroup

Technologies

Propulsion

- Thermal insulation
- Gauging
- Electrical Command System
- Functional Cryogenic equipment

Composite Cryogenic tank

- LH2 permeability resistant
- LOx resistant
- Leak-resistant CFRP / metal interface
- Cleaning, manufacturing,
- Inspection, SHM

Lightweight structures

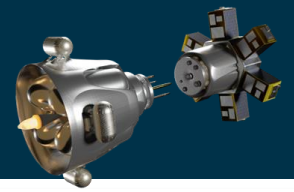
- Advanced Thrust Frame
- Composite Inter Tank Structure
- Innovative interfaces
- Composite lines
- Additive Manufacturing

Avionics & GNC

- Advanced Sensors
- Wireless communication
- High density batteries
- Next generation avionics

Enable in-space transportation

Focus on In-Space Proof-of-Concept (InSPoC) Programme



Enable end-to-end Space transportation ecosystem & space logistics

In-Space Proof-of-Concepts (InSPoC) incremental IODs

OHB The Exploration Company

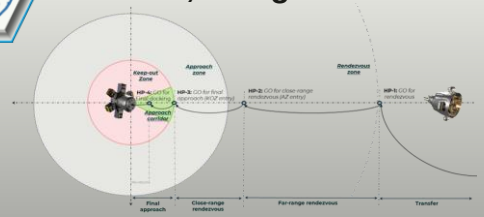
arianeGROUP RFA Rocket Factory

DLR IBST Berlin Space Technologies MT AEROSPACE An OHB Company

KINETIK SPACE DELTA ORBIT

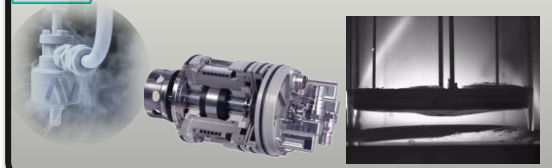
Standardised enabling technologies

Guidance, Navigation & Control



Robotics & docking interfaces

Propellant management & in-orbit refilling



Secured communication

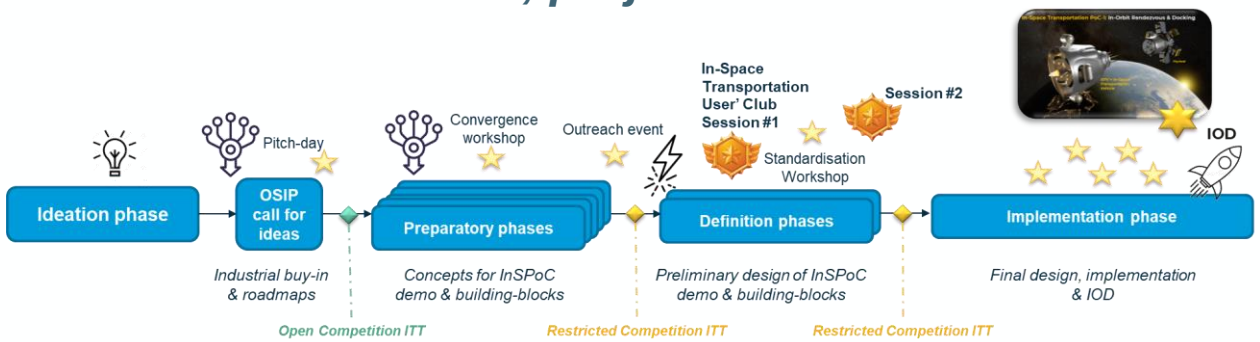
Intelligence & collaboration

Containerisation and plug-&-play elements

Willing to de-risk your Technos & embark in our Demos?

Compete & collaborate

Join our ventures, projects & events



InSPoC

In-Space Proof-of-Concepts

Inspire Prove Create

FLPP brochure available here

Embark with FLPP

Get info on next steps

Contact us

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Thank you

Let’s enable the future together