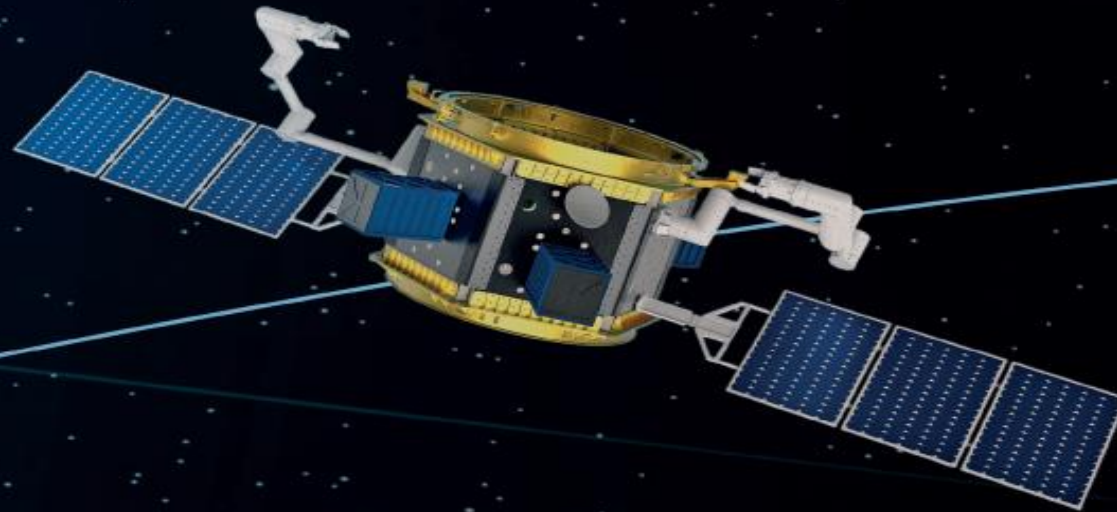




IOSHEX and Space Rider interaction as a new range of in-orbit complementary services in LEO

Clean Space Industry Days 2022



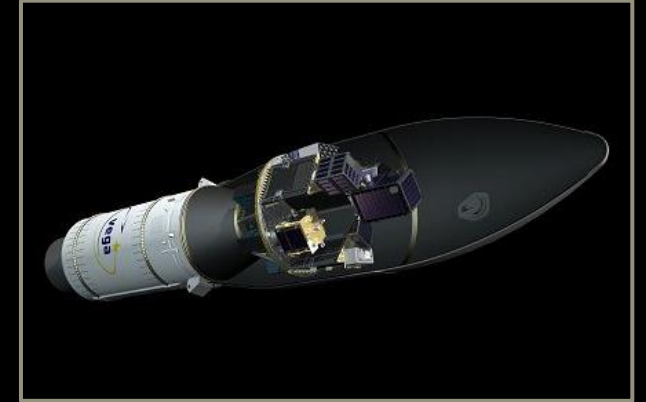
SAB Aerospace Field of Activities



**Satellites Mechanical S/S,
Equipment and Payloads**



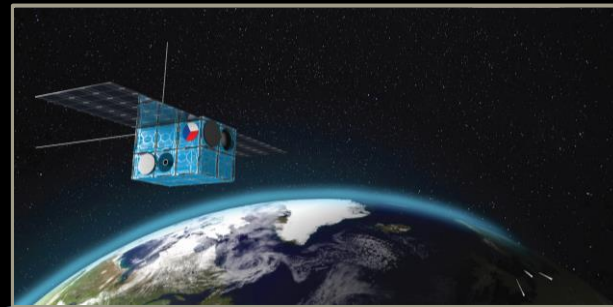
Launch Services



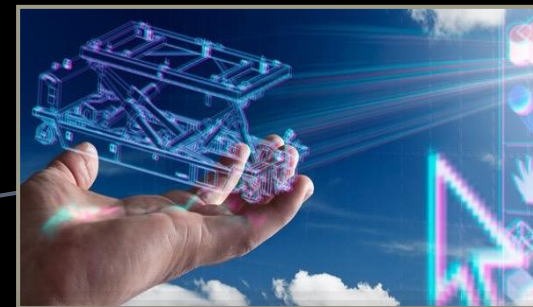
**Launchers Adapters, Dispensers
and I/F System**



Micro-Gravity Payloads



Scientific Missions



Ground Support Equipment



Mechanisms

Commercial approach

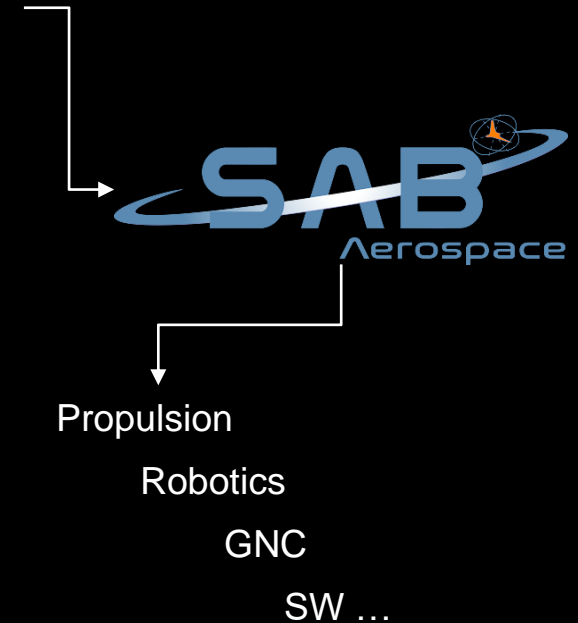


SAB LS defining a business case where IOS is offered as part of the service performed by the launcher

higher potential opportunities for IOS missions in LEO: rescue-like missions in support of a suddenly malfunctioning spacecraft.

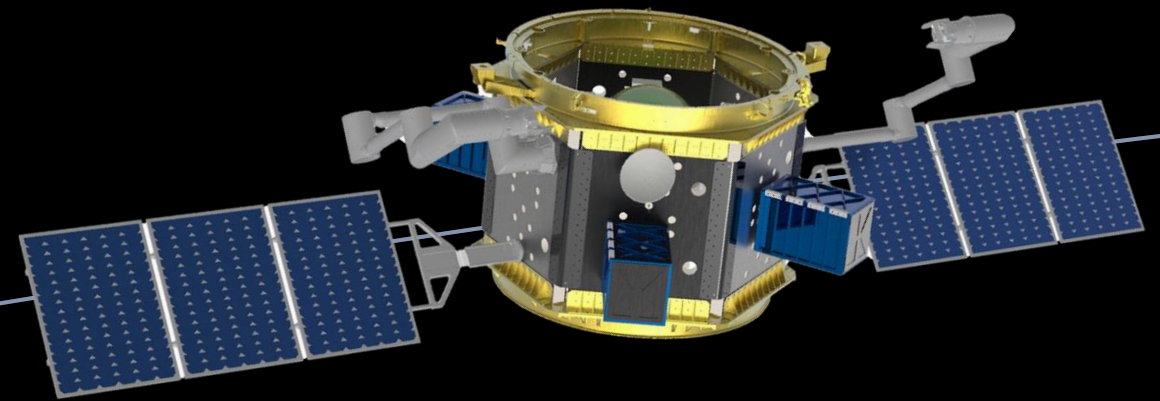
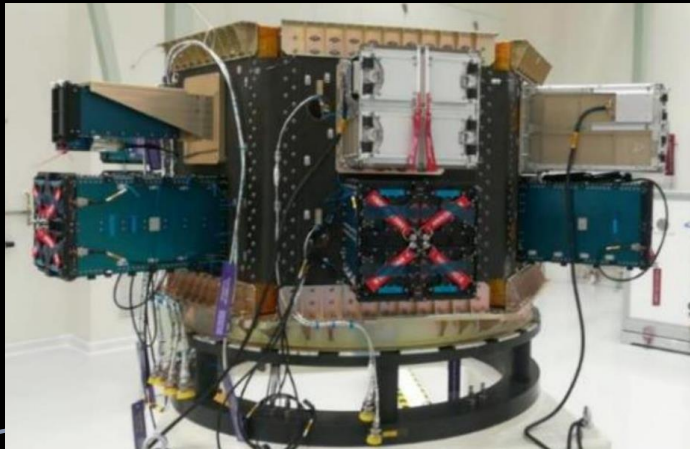
LEO life extension service for EOS satellite is relevant mostly for big institutional satellites; smaller commercial customers will likely prefer to replace with newer/updated S/C

however, steep increasing of the LEO population (eg, large constellations), will increase number of critical failures drastically



IOSHEX (In Orbit Servicing HEXagonal module)

- Part of the Vega launcher - separate from the last stage and perform independent mission activities as a fully independent spacecraft.
- Sharing the launch cost with the main passengers.
- Modular configuration depending on the mission profile.



Space Rider Europe's first reusable space transportation system

Mission possibilities

Experiments in microgravity

In-orbit validation/demonstrations in:

- Robotic exploration
- Earth observation
- Science, telecommunication

Satellites inspection



In-Orbit Servicing Operations


Refuelling


Active Debris Removal


Co-operative AOCS
Takeover


Cooperation with Space Rider

In-Space Assembly and
Disassembly


Recycling

Synergies of IOSHEX and Space Rider

User requirement	Space Rider	IOSHEX	SR + IOSHEX
To perform IOD for longer than 6 months	Usual time on orbit ~2 months	Not able to bring the PLD back	Launch with IOSHEX, stay on orbit, return with SR
To perform a recycling of space debris	Limited capabilities to perform the orbital manoeuvres to get to the target	Not able to bring the debris back	IOSHEX perform the ADR to the SR cargo bay
To perform the manufacturing and assembly in space	Limited capabilities to perform the orbital manoeuvres	Limited capabilities to bring the material	SR with 3D printer on-board and IOSHEX to perform the assembly
To perform recurrent refuelling and coolant replenishment	Limited capabilities to perform the orbital manoeuvres	Limited capabilities to bring the resources	SR supplying with resources and IOSHEX performing refuelling
To test a new IOS technologies	Require collaborative vehicle	Require collaborative vehicle	SR and IOSHEX performing a demonstration of IOS

2. IOSHEX is released and deploys the passenger satellites to designated orbits

3. Proximity maneuvers to approach SR

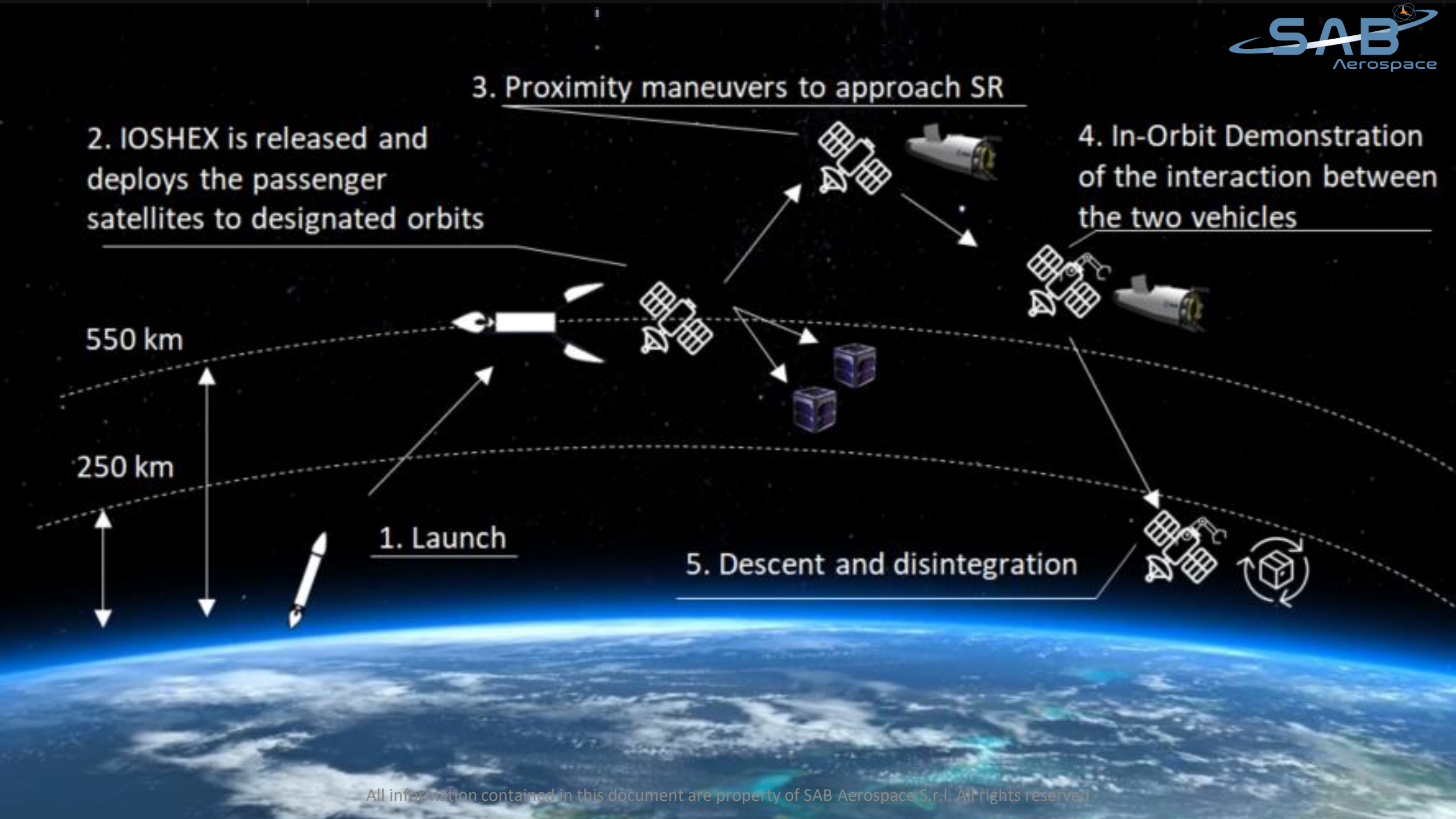
4. In-Orbit Demonstration of the interaction between the two vehicles

5. Descent and disintegration

1. Launch

550 km

250 km



IOSHEX - Development Status and Business Plan

IOSHEX Phase A

The business plan is being studied in parallel as the system development proceeds. The plan is based on the commercial objectives that SAB Launch Services identified when the development started, the main being targeting a market share of the future IOS market.

Space Rider Maiden Flight scheduled for 2024

First synergy demonstration mission 2027



Thank you for your attention.

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