FUTURE OF IN-ORBIT SERVICING

ESA CLEANSPACE INDUSTRIAL DAYS
21-09-2021

SABRINA ANDIAPPANE – HEAD OF ON-ORBIT SERVICING

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CHANGING ENVIRONMENT

EXPECT GROWTH AND EVOLUTION OF SPACE SYSTEM DEFINITION

Satellite life extension

New customer needs

Sustaina-bility

Debris management, end of life management, reduce CO2 footprint

Space System scala-bility

New capabilities on the long run

Need to have new and smarter mission to better manage the future in space

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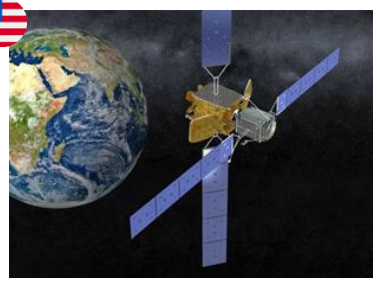
COMPETITIVE ENVIRONMENT

SEVERAL IN-ORBIT SERVICING MISSIONS PLANNED IN THE US



Northrop Grumann – MEV/MRV

Northrop Grumann – RSGS

Maxar – OSAM-1 (ex Restore-L)

Lockeed Martin – LINUSS

EUROPE NEEDS TO HAVE ITS OWN SOLUTION

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PROPOSING THE RIGHT SERVICE

Unprepared and collaborative S/C	Prepared and collaborative	In-Orbit Assembly
Station-keeping Orbit Transfer End of Life Removal	Station-Keeping Orbit Transfer End of Life Removal + Refuelling for life extension or deorbiting Upgrade and delivery of units	Fuel Stations Large Platforms

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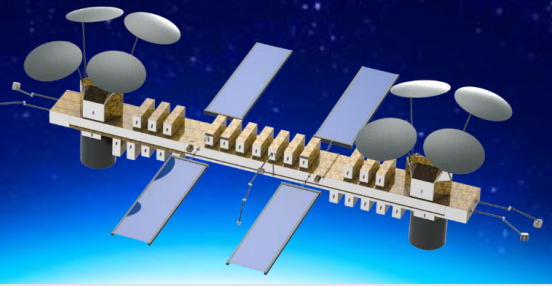
AND THE RIGHT SOLUTION

1 Preparing our satellites

2 Servicer vehicule « START »

Emerging new business models like fuel stations or hosted payload platforms



Space rider

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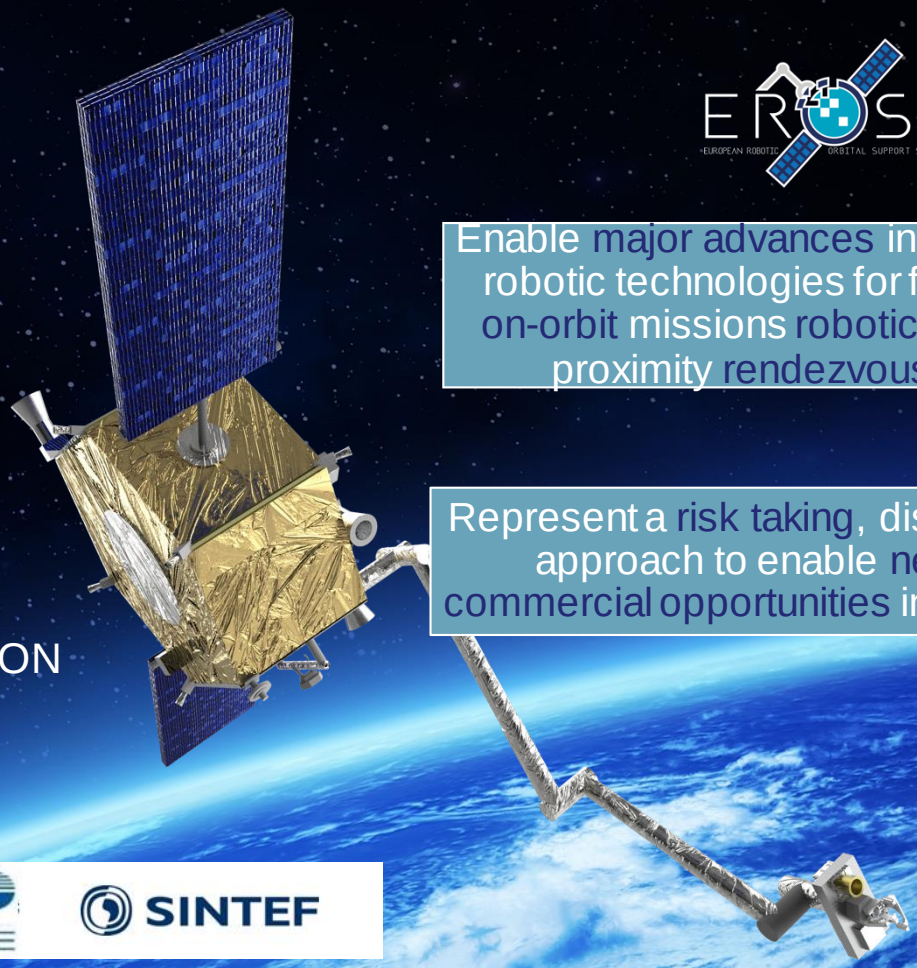
EROSS+
EUROPEAN ROBOTIC ORBITAL SUPPORT SERVICES

EUROPEAN ROBOTIC ORBITAL SUPPORT SERVICES

TOWARDS IN-ORBIT DEMONSTRATION



Enable major advances in space robotic technologies for future on-orbit missions robotics and proximity rendezvous)

Represent a risk taking, disruptive approach to enable new commercial opportunities in space

DLR Deutsches Zentrum für Luft- und Raumfahrt German Aerospace Center

gmv INNOVATING SOLUTIONS

PIAP SPACE

SINTEF

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EUROPEAN ROBOTIC ORBITAL SUPPORT SERVICES

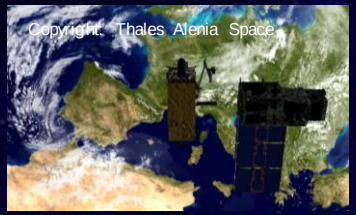
GROUND DEMONSTRATION OF AN IOS MISSION

/// TRL raising of the key robotic building blocks (BB)

/// Building Blocks Integration in a System Demonstrator

/// Closed-Loop demonstration of performance & autonomy

1 - Straight Line Approach

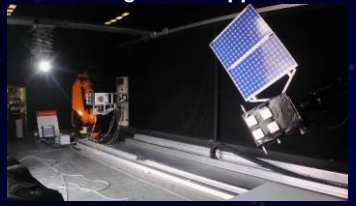


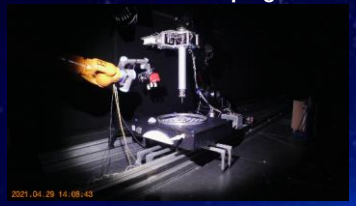
2 - Station Keeping

3 - Robotic Capture

4 - Docking & Refuelling

5 - Servicing | ORU exchange





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ESPRIT (GATEWAY)
FUEL TRANSFER SYSTEM

/// Fuel Transfer System under development in the ESPRIT Programme

/// Chemical and Xenon Active Fuel Transfer.

/// Ground Demonstration Performed

/// Will be flown on Lunar Gateway with high reliability and Safety requirements.

/// Key Capability for Exploration and Reusable systems

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CONCLUSION

///Thales Alenia Space focusses on designing and manufacturing a solution that will enable:

1 Sustainability

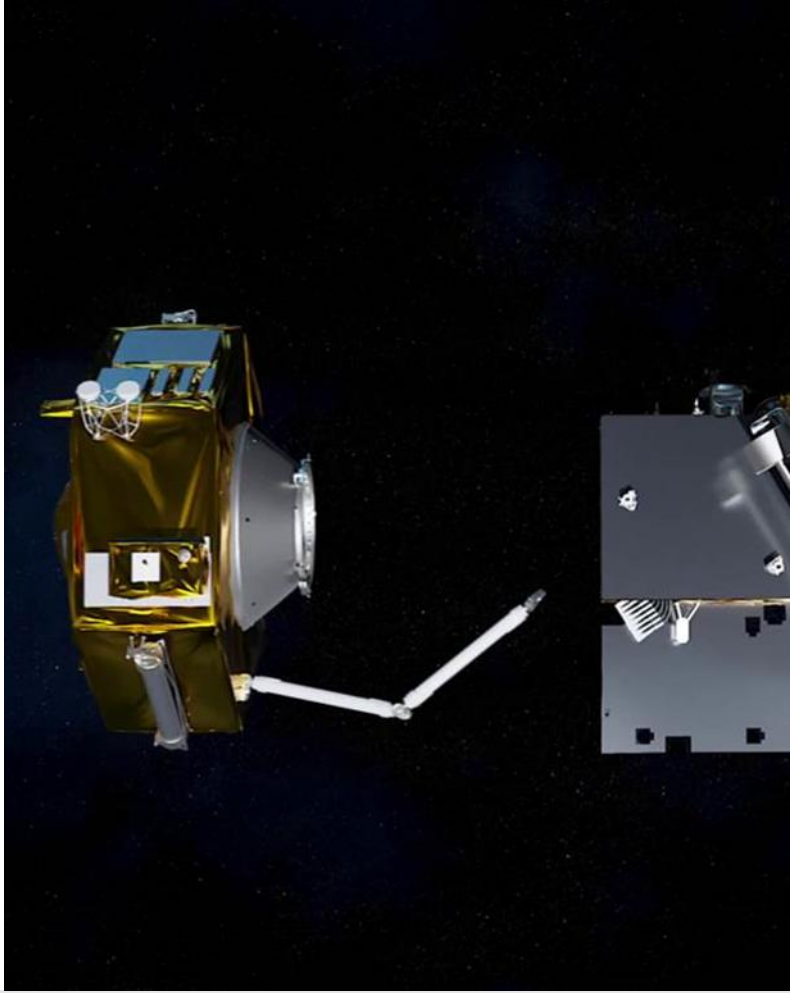
- *For managing the space assets today and tomorrow*

2 Scalability

- *For providing new functionalities to the future space systems*

3 Flexibility

- *To adapt to the missions of tomorrow*



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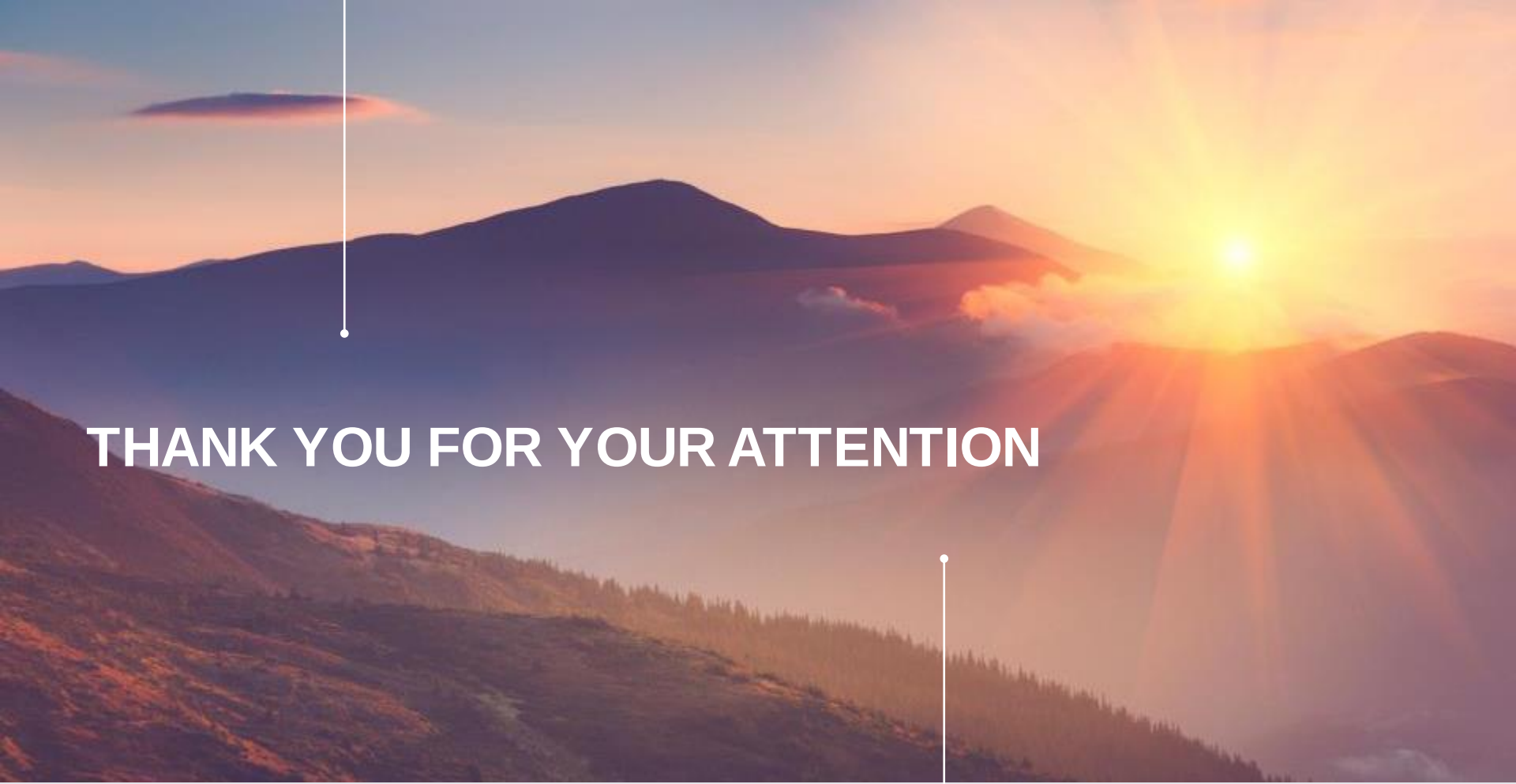

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