

#EUSpaceResearch

# THE EU FUTURE SPACE ECOSYSTEM

**AN ENABLER FOR  
INDUSTRIALISATION AND  
NEW SERVICES** IN SPACE

WITH

**SMART SOLUTIONS  
AND CONCEPTS**



Horizon Europe,  
a programme of the  
European Union



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# THE EU FUTURE SPACE ECOSYSTEM

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## In-space services:

A paradigm shift

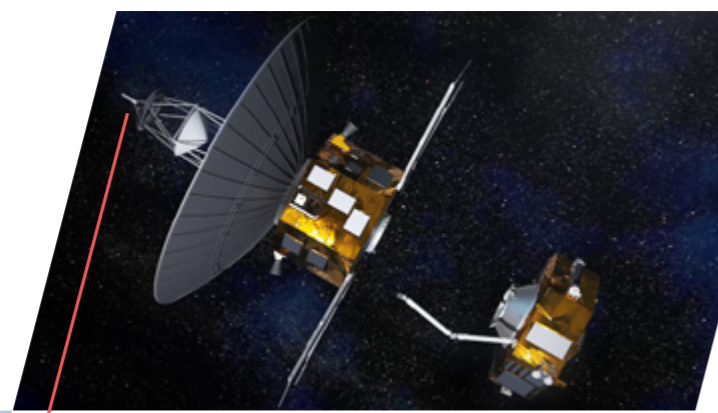
In the future, in-space services (such as on-orbit satellite servicing, assembly, manufacturing, recycling, debris removal and logistic services) will enhance the **resilience and sustainability of space assets**.

New technologies and capabilities will increase the freedom of action, service life, system reliability, safety, economy as well as performance and function of systems. We will move from “static space” towards “**flexible, cost-efficient and sustainable space**”. Relevant space EU-funded R&I actions aim at accelerating the commercial opportunities and enhance European competitiveness.

## Toward a flexible, highly automated, sustainable and economically viable EU future space ecosystem

At the core of the paradigm shift toward intelligent space systems are lying robotic technologies, new industrial processes, modular and maintainable spacecraft designs, architectures and approaches, digitalisation and artificial intelligence. Together with other **enabling technologies** such as electric propulsion systems, they will change how space assets are designed, produced, tested, transported and operated. Different means like Design-to-Manufacture, Design-to-Service, Design-to-Recycle, Design-to-Customise or Design-to-Value, realised with the construction kit and the “AppStore”/ Open-Architecture principles, will benefit

the EU future space ecosystem and foster a circular economy. In-space services will reduce costs and time-to-market. They will also make multi-mission a possibility, enable reusability, protect the space ecosystem and incisively mitigate space debris. The European Commission recognises the **strategic importance of in-space services**.



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### Boosting innovative R&I

35 projects focusing on Space Robotics and Electric Propulsion selected for funding over 2014-2021 for €115.5 million

## Towards operationality:

What are the next steps to achieve in-space services?

Already under Horizon 2020, the Commission launched two Strategic Research Clusters: **PERASPERA in Space Robotics Technologies** and **EPIC in Electric Propulsion**. With PERASPERA, the Union funds the development of capabilities and technological building blocks that will enable applications and services in orbit and system concepts. With EPIC, the Union funds electric propulsion, a key technology to sustainably and efficiently manoeuvre in orbit. With the support of these two Strategic Research Clusters, the European Commission has paved the way for the EU Future Space Ecosystem.

The **EU Future Space Ecosystem will continue developing and taking shape through dedicated actions** in the Horizon Europe work programmes over 2021-2027. Calls will target topics such as On-Orbit Servicing/Assembly/ Manufacturing (OSAM) and other in-space services (e.g. logistics, warehousing and disassembly/reuse/recycling), new system concepts, functional building blocks, tools required for design, and new approaches for production and testing.



### Reshaping space

Using standardisation and automation for space



### Supporting EU objectives

By ensuring a globally competitive and innovative European space sector

## Introducing current space R&I projects

Examples of Horizon R&I projects

**Project EROSS+** (European Robotic Orbital Support Services)'s objective is to demonstrate the European solutions for the servicers and the serviced LEO/GEO satellites, enabling a large range of efficient and safe orbital support services. Focus of application: On-Orbit Servicing.

**Project PERIOD** (PERASPERA In-Orbit Demonstration) prepares the paradigm shift to change the way space systems are designed, built and operated, moving from mission-specific solutions to a modular spacecraft environment. Focus of application: On-Orbit Assembly.



**Be part of the EU-funded space R&I**

Horizon Europe is the EU's key funding programme for research and innovation, with a budget of around €95 billion over 2021-2027, of which close to €1.6 billion is dedicated to space research. The space R&I is managed by the **Health and Digital Executive Agency (HaDEA)**, the **EU Agency for the Space Programme (EUSPA)**, the **European Space Agency (ESA)** and the **European Commission** itself. Most calls are also published on the **EC Funding and Tenders participant portal**.

