

## ORU-BOAS ABOUT

ORU-BOAS is an EU-funded collaborative research project focused on the development of a concept allowing the assembly, repair, or upload of space infrastructures directly in-orbit.

With a strong focus on in-orbit services, ORU-BOAS (Orbital Replacement Unit - based on Building Blocks for On Orbit Advanced Assembly of Space Systems) researchers aim to develop an ORU standard module up to TRL5/6.

This plug-in module, will be compatible with a wide range of payloads and will include standard interfaces for interconnection with other ORUs, satellite platforms or robotics elements, as well as with the elements developed in the "Plan European Roadmap and Activities for Space Exploitation of Robotics and Autonomy" (PERASPERA) roadmap.

Several types of services like life extension, refueling, repairing, and other station-keeping missions will be elaborated, upgrading the European strategic autonomy and robotic missions.

“Loading for autonomous future European robotic missions”

## OUR TEAM



## ORU-BOAS CONNECT

Designed by EASN-TIS

101082078

01.01.2023

24 months

SENER AEROESPACIAL SOCIEDAD ANONIMA

info@oru-boas.eu

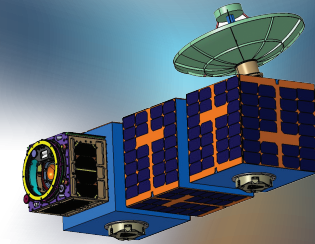
https://oru-boas.eu



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# ORU-BOAS



Orbital Replacement Unit based on Building Blocks for On Orbit Advanced Assembly of Space Systems

“Sustainable, highly automated, flexible and economically cost-efficient space infrastructure, to maximize commercial opportunities in space and on Earth”

## ORU-BOAS OBJECTIVES

### First Functional Satellite Module

To define the most versatile ORU standard module service provider to upgrade, repair or reconfigure a satellite platform or modular space system in an orbital scenario.

### Design and Development Specifications for a Satellite Construction Kit (DSSCK)

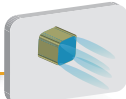
DSSCK will simplify the integration of payloads inside the ORUs and reuse them in other ORUs as recurrent elements.

### Beyond In-Orbit Demonstration (IOD) mission and future ORU applications

To identify future applications of the satellite construction kit concept. In the longer term, ORU-BOAS will behave as fully autonomous satellite that can dock to other ORUs to form larger and more complex satellite systems.

## ORU-BOAS ROADMAP

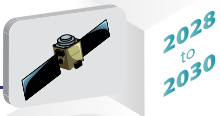
### Future missions



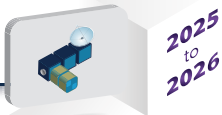
### Coming Developments



### Horizon Europe IOD



### ORU-BOAS project



2023 to 2024

## ORU-BOAS IMPACTS

### Increase EU space actors' accessibility to global markets

- Improved space systems' and satellites' flexibility by reducing the production and launch costs, with a strong focus on modularization and standardization of ORU elements.
- Increased space sectors' accessibility to new companies, universities, and researchers, by introducing mass customization and cooperative design and by simplifying operations.

### Contribution to the Space Traffic Management and Clean Space program

New in-orbit services, such as de-orbiting or life extension, refueling capability, functional modules replacement, and module re-use will lead to safer and more sustainable space systems.

### Optimized space services in continuous evolution

- Reconfiguration and flexibility capacities in orbit of the proposed ORU-BOAS concept, allow a continuous adaptation according to evolving necessities.
- Enhanced European autonomy strategy, providing the European community with a wide choice of in-orbit services.
- Updated in-orbit systems functionalities by integrating cutting-edge technologies and optimizing services on ground.
- Plug and play (PnP) philosophy, both at hardware and software levels, will facilitate payload re-engineering for obsolescence or for upgrades.

### Enlarging new space opportunities

ORU-BOAS will open the door to missions not economically viable with current state-of-the-art and to new market business related to the promising new space in-orbit servicing.

## ORU-BOAS KEY-FEATURES



AppStore and Open-Architecture mentality



Use of Artificial Intelligence (AI) in the ORU for the coupling operation



Plug-and-play modules enabling on-orbit services



New space ecosystem