

# PERIOD

## PERASPERA In-Orbit Demonstration

Preparing  
the paradigm shift  
for changing the way  
space systems are designed,  
built and operated

### OUR CONCEPT & AMBITION

The Horizon 2020 **Space Strategic Research Cluster (SRC) on Space Robotics Technologies** is the approach adopted by the European Union to achieve this paradigm shift by gradually **increasing the maturity of space robotics technologies** for on-orbit servicing and assembly and validating them in the 2023-2027 timeframe with sizeable demonstration missions.

PERIOD is proposing as baseline an ambitious demonstration concept that will allow **building a functioning satellite in a robotized orbital "Factory"** including antenna fabrication, satellite assembly, reconfiguration and verification.

This will be the precursor to future assembly of large structures in orbit. Producing directly in orbit will **revolutionize the way space systems are designed, built and operated**, moving from mission-specific solutions to modular spacecraft fully optimized for their mission in orbit, and freed from the constraints and requirements of launch.

“*On Orbit Services (OOS) and In Space Manufacturing & Assembly (ISMA) is the way to increase functionality, capacities & resilience of space assets while reducing costs*”

### KEY FEATURES OF THE PARADIGM SHIFT

New capabilities

Flexibility

Cost savings

Increased value

Time to market

### PROJECT OBJECTIVES



Define an orbital demonstrator concept along with its system technical requirements for satellite manufacturing & assembly and for refueling experiment



Develop the core space robotic technologies of the previous Operational Grants (OGs): ES-ROCOS, ERGO and InFuse to TRL5



Evaluate the available Standard Interconnect (SI) components for the specific demonstration scenario in a benchmark



Evaluate ESROCOS, ERGO, InFuse, I3DS and SIs for assembly capability in a breadboard

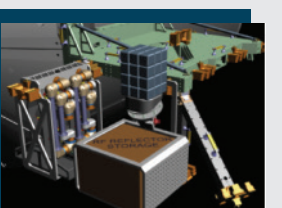


Implement communication and dissemination activities to inform the space community and potential customers on the In Space Manufacturing & Assembly (ISMA) capabilities and provide transparency on risks and mitigations

### DEMONSTRATION MISSION CONCEPT

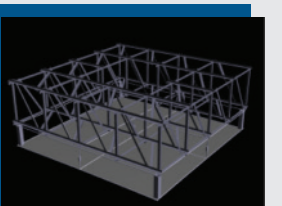
#### Commissioning & Initialization

- Commissioning of factory (providing service) with manufacturing material and satellite kit (receiving service)
- Experiments with the robotic subsystem (finalize validation like characterization of joints in space, ...)



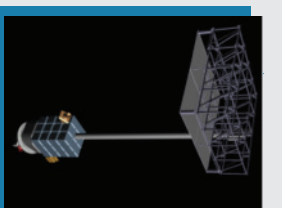
#### Manufacturing

- Build antenna reflector (fabrication)
- Inspection and verification of build antenna (quality control)



#### Assembly & Integration

- Assembly of cubesat bus and cubesat payload through Standard Interconnect (EO / science payload)
- Assembly of integrated cubesat with antenna
- Inspection, test and validation of integrated cubesat (quality control)



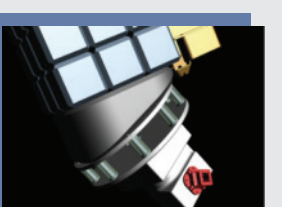
#### Reconfiguration & Upgrade

- Reconfiguration of the integrated cubesat with the other cubesat payload (exchange of EO / science payload)
- Inspection, test and validation of integrated cubesat (quality control)



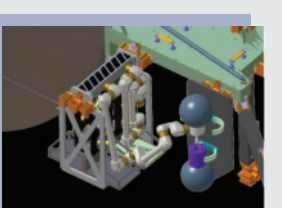
#### Release & Operation

- Release of integrated cubesat with deployer
- Operation of integrated cubesat (reception of EO / science operational data)



#### Attachment & Refueling

- Test of attachment with ASSIST (separate experiment, no cubesat)
- Test of refueling / propellant transfer for life extension (separate experiment, no cubesat)



### OUR TEAM

### CONNECT WITH US

