

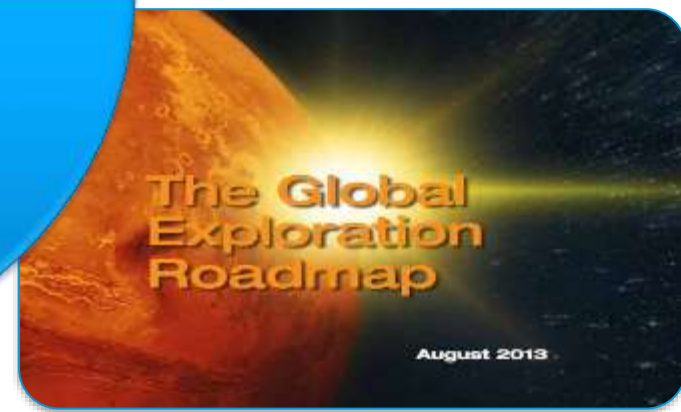
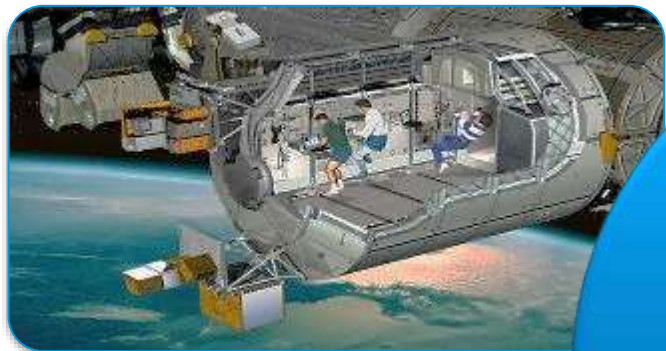
# *Europeans: Once Explorers, Always Explorers*

## ESA's Space Exploration Plans

UK Space Conference

Manchester  
1 June 2017

# Why Explore ?





**New for 2017 !**

# ***European Exploration Envelope Programme***

A single programmatic tool for Europe's space exploration goals



# E3P content: 2017-2022



Safe ISS operation & astronaut missions



Service modules for first two Orion missions



World-class science in the space environment



First Mars life search mission



First European science & technology for lunar surface



New human and robotic missions readied for decision at CM19

Technology, Commercial Partnerships and Benefit Management

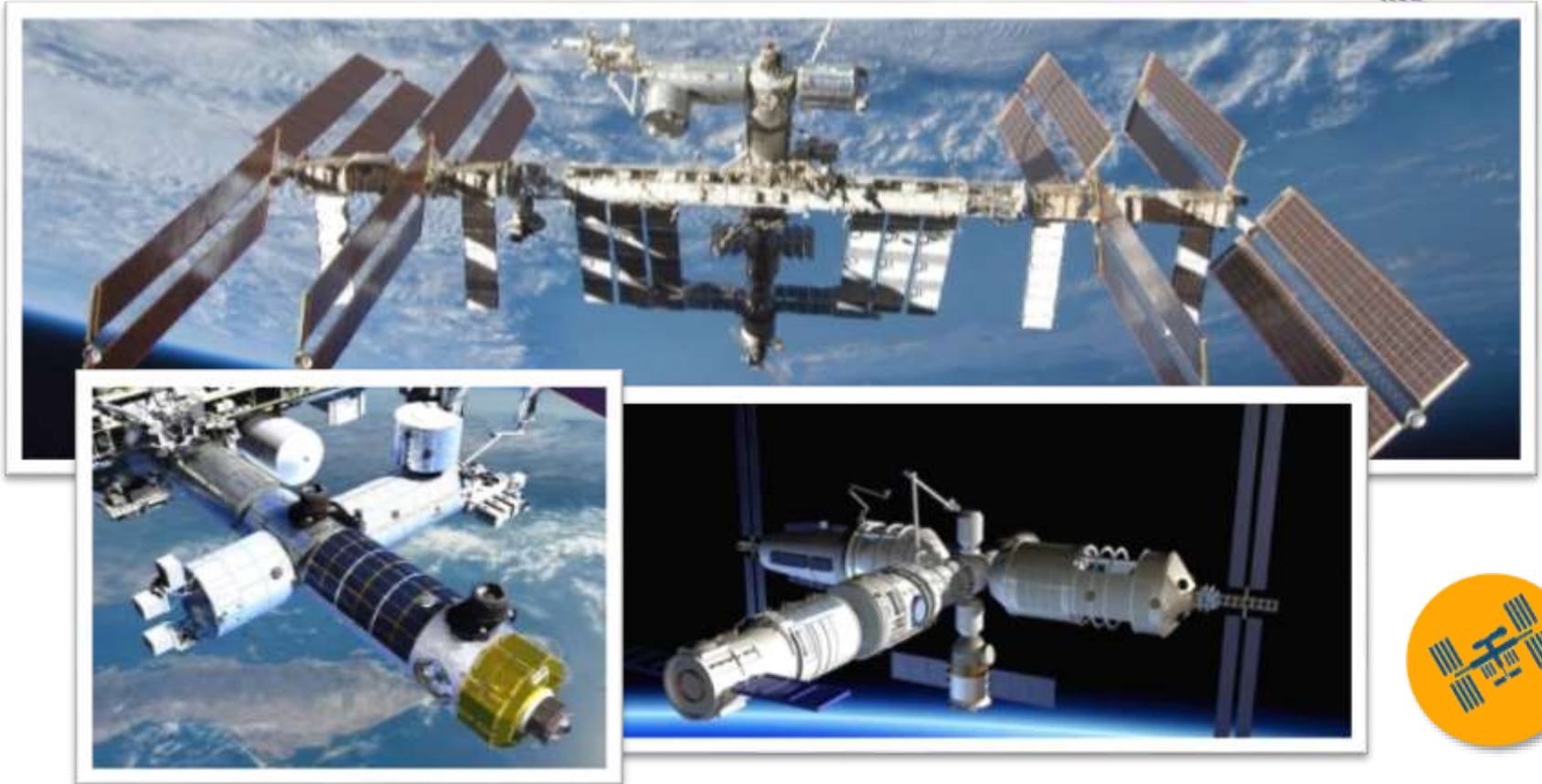


# Commercial Partnerships driving Exploration





# Exploitation of LEO – Looking beyond the ISS



## Outcome

Addressing key challenges :

- High power electric propulsion
- Radio-biological protection
- Logistics and life support

First European Astronaut missions beyond LEO

New opportunities for science and applications

Opens access to lunar surface



# Roscosmos/ESA Cooperation on Lunar Exploration

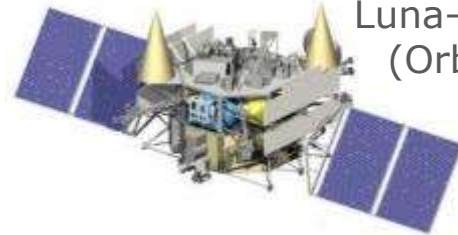


## RUSSIAN MISSION ROADMAP



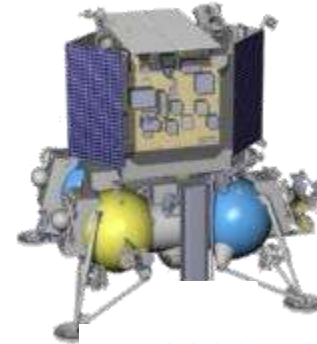
Luna-25  
Luna-Glob  
(Lander)

2019



Luna-26  
Luna-Resurs  
(Orbiter)

2020



Luna-27  
Luna-Resurs  
(Lander)

2022



PILOT-D: navigation  
camera demonstrator



PILOT: Descent & Landing  
Navigation & Hazard Avoidance  
System

PROSPECT: Drilling & Sample  
Analysis Package



SPECTRUM: ground segment  
support to all missions



## EUROPEAN LUNAR PRODUCTS



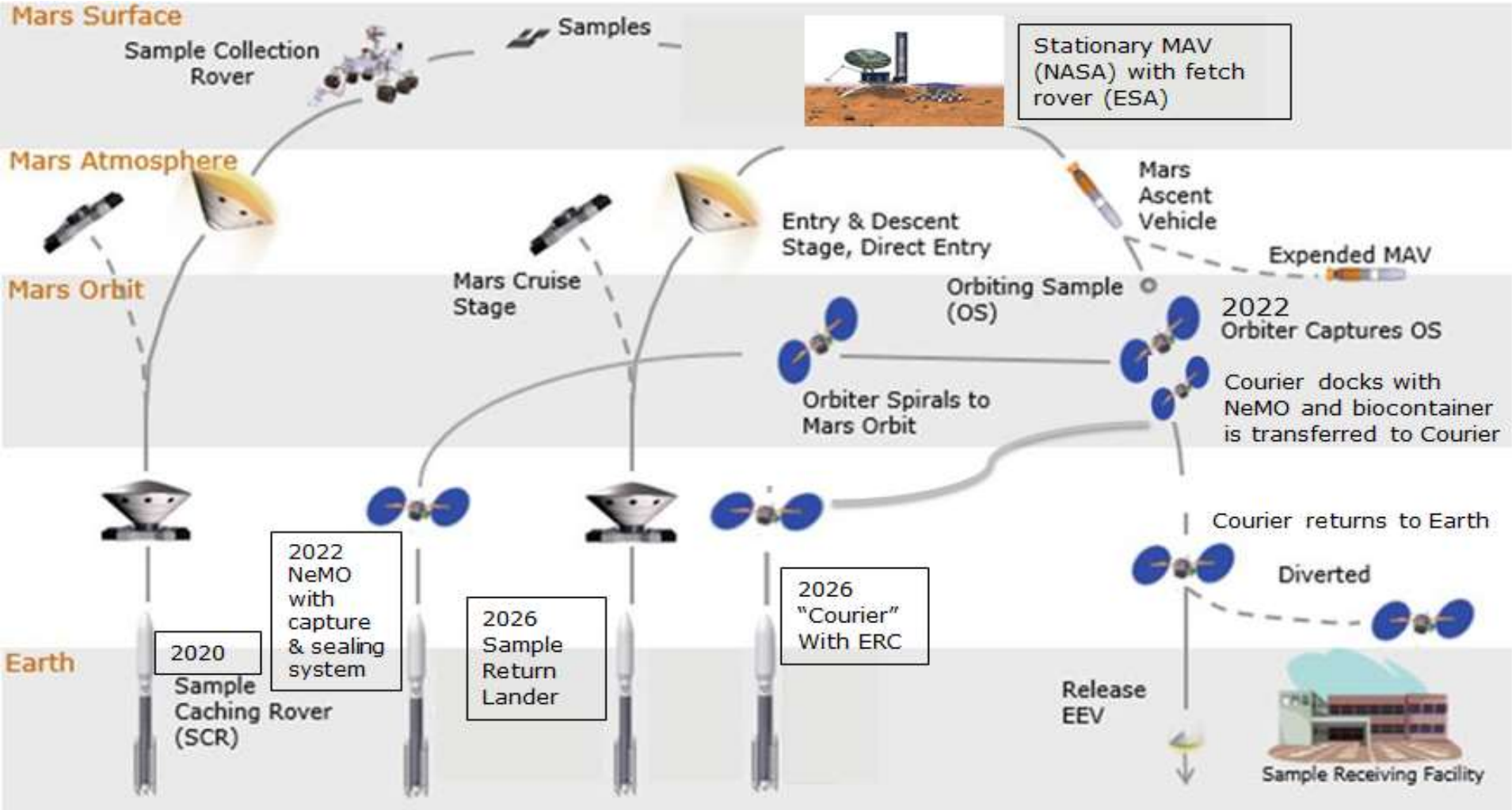
## Outcomes

- Validation of ISRU processes/technologies
- Opportunistic lunar science
- Established commercial services for lunar exploration
- Academia engagement through education payloads
- Coordinated mission campaign with international Partners



- Demonstration of integrated human-robotic mission scenario
- Return of lunar samples
- Risk reduction for human missions
- Establishment of logistic cargo lander





Note: Sample Return Lander (SRL) and Sample Return Orbiter (SRO) can be launched in either order



# Goals for 2020s

