



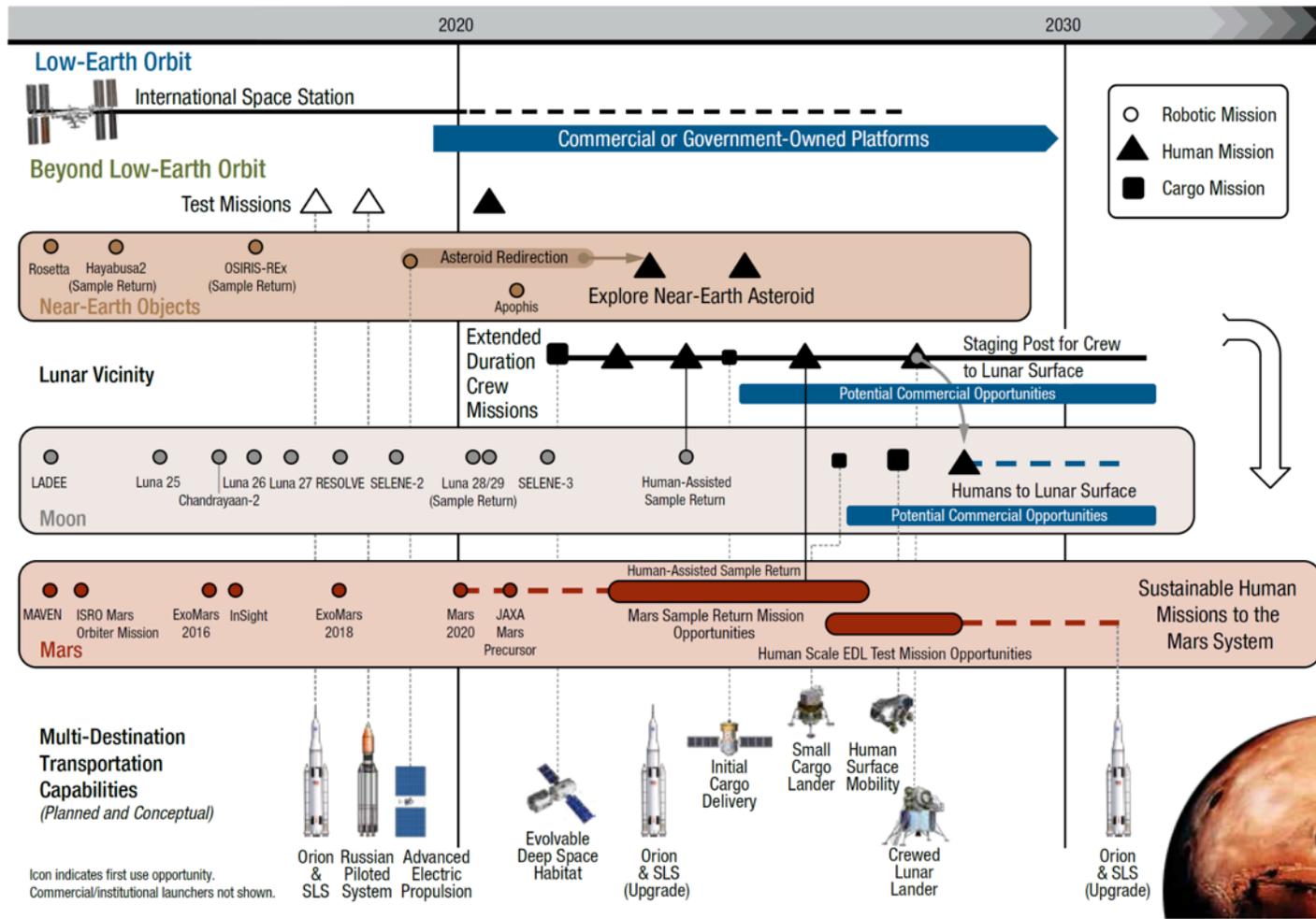
# ESA's plans for Lunar Exploration

James Carpenter on behalf of the ESA Lunar Exploration Team  
Directorate of Human Spaceflight and Operations

# Global Exploration Roadmap



## ISECG Mission Scenario

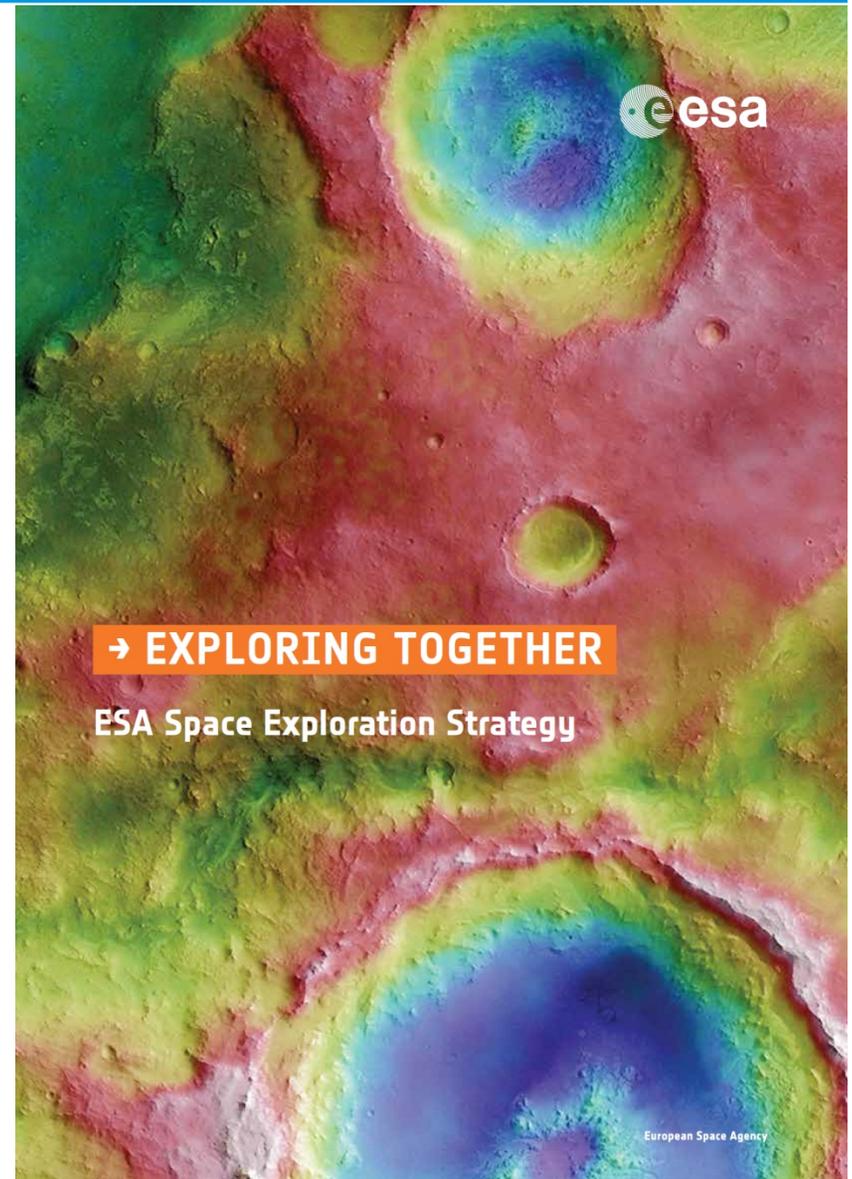


Icon indicates first use opportunity.  
Commercial/institutional launchers not shown.

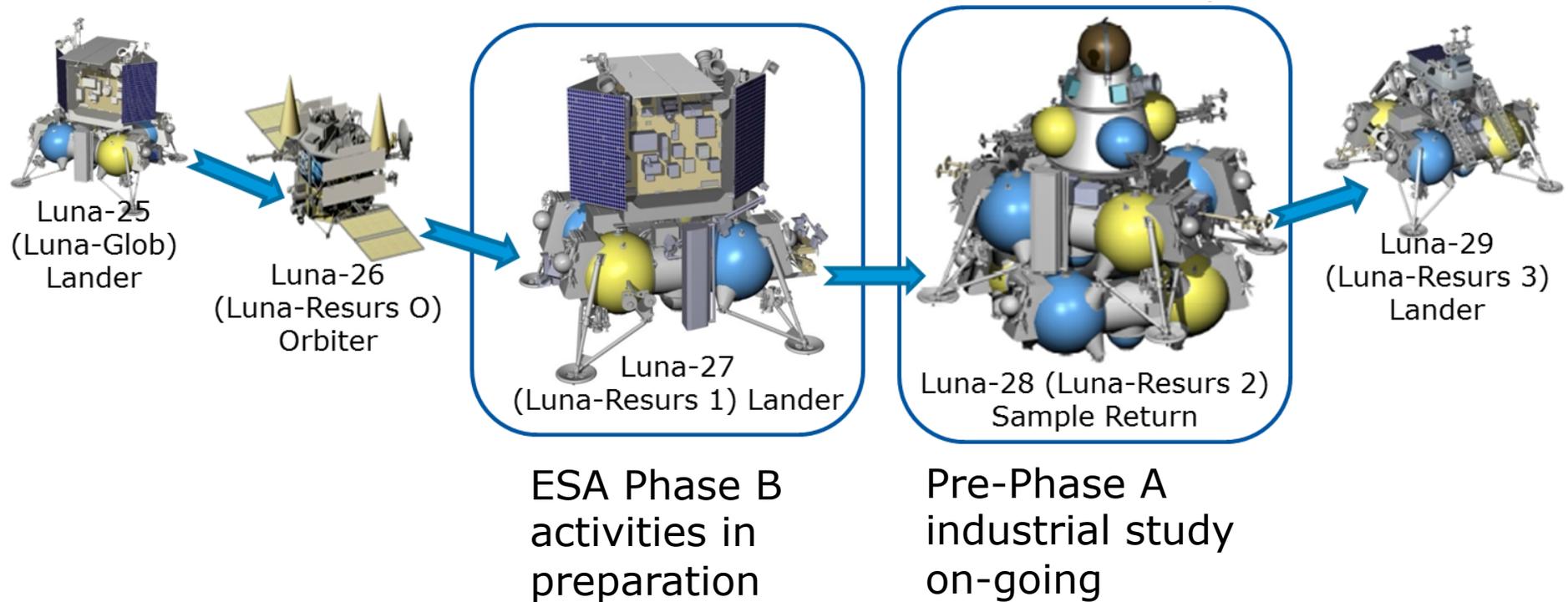
# ESA's approach



- Strategic roles
- International Partnerships
- [http://esamultimedia.esa.int/multimedia/publications/ESA\\_Space\\_Exploration\\_Strategy/](http://esamultimedia.esa.int/multimedia/publications/ESA_Space_Exploration_Strategy/)
- **New context:**
  - Decision at CMin 2014
  - lunar exploration preparatory activities to begin within the ISS programme



# Robotic surface access Cooperation with Russia

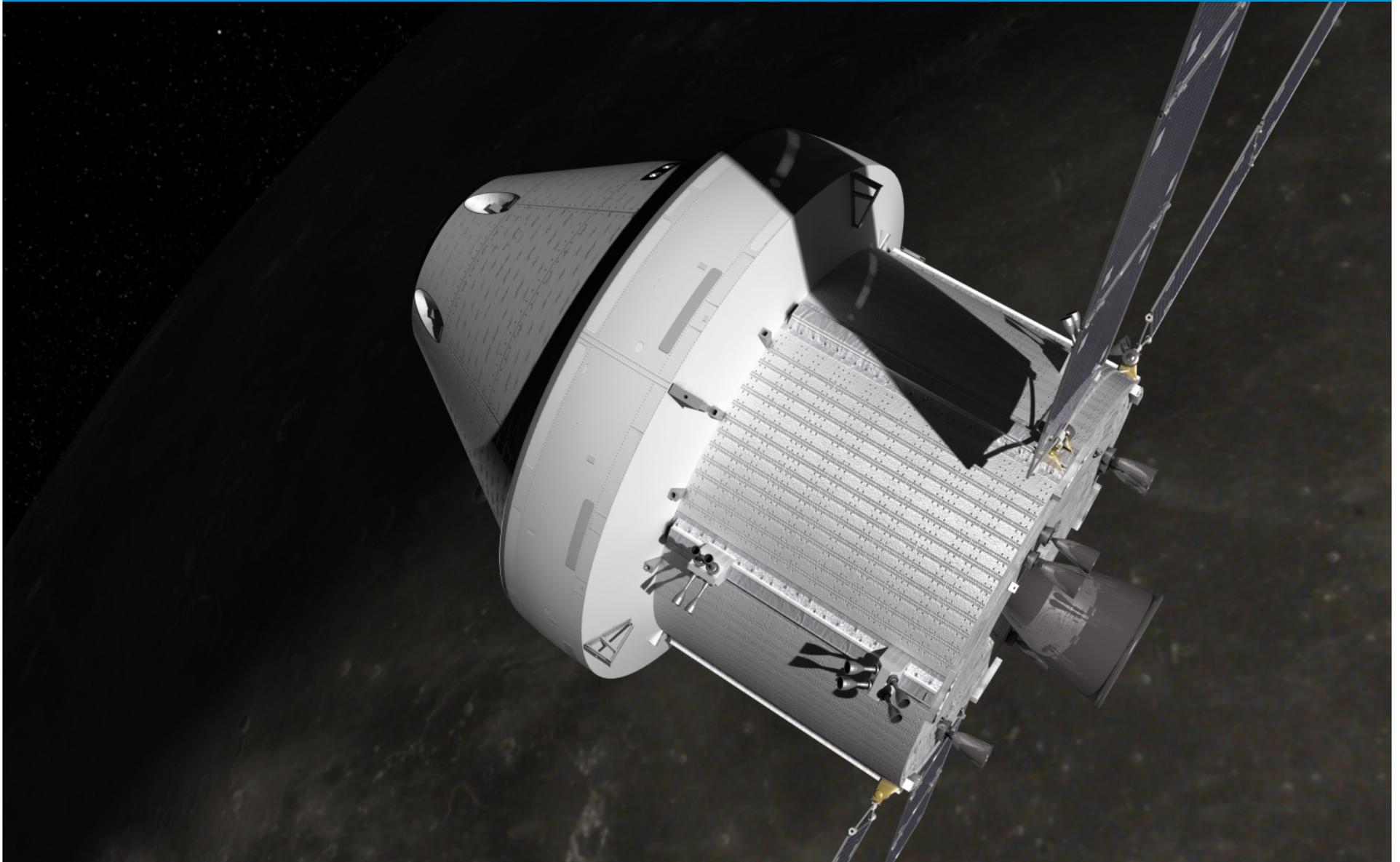


# Current Mapping of Possible ESA Contributions to Luna-missions



	Luna-Glob Lander	Luna-Resurs Orbiter	Luna-Resurs Lander	LPSR
<b>SPECTRUM: Mission Ground Support</b>	X	X	X	X
<b>SPECTRUM: UHF Comms Equipment</b>				
<b>PILOT: Navigation for Precision Landing</b>	X (camera only)		X	X
<b>PILOT: Hazard Avoidance</b>			X	X
<b>PROSPECT: Drilling &amp; Sampling</b>			X	X
<b>PROSPECT: Sample Processing &amp; Analysis</b>			X	X
<b>Other complementary products</b>		TBD	TBD	TBD
<b>Major Systems</b>				X

# Human Transportation



# Human-Robotic Partnership



- Studied with partners through ISECG
- Crewed deep space habitat
- Surface robots
- Sample return
- Preparing for humans
- Delivering science



• esa



Workshop to help prepare the next steps



# Moon 2020 - 2030:

A New Era of Coordinated Human and Robotic Exploration

December 15/16

ESA ESTEC

Noordwijk, The Netherlands

