

IAF HUMAN SPACEFLIGHT SYMPOSIUM (B3)
Governmental Human Spaceflight Programmes (Overview) (1)

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KEYNOTE: HUMAN SPACEFLIGHT WITHIN ESA'S SPACE EXPLORATION PROGRAMME FOR
THE NEXT DECADE

Abstract

ESA's space exploration activities were integrated in 2016 into a single programme, the European Space Exploration Envelope Programme. This programme includes the operations and utilisation of the International Space Station in Low Earth Orbit (LEO) as well as robotic and human missions to cis-lunar space, Moon and Mars. The Council Meeting at Ministerial level in 2019 made important decisions to prepare the next decade of space exploration and to shape the European exploration profile for all exploration destinations.

With the ISS at the core of human spaceflight, no major new developments have been initiated for human platforms in LEO. However, ESA has increased its efforts to support the development of a LEO economy through the establishment of industrial services enabling access to ISS for commercial customers and to stimulate non-ESA funded demand for such services. The most visible flagship project of the ESA commercialisation initiative, the Airbus built Bartolomeo platform, has been installed on the European Columbus module in March 2020 and commercial operations are starting in 2021.

Specifically, in the field of human exploration, the development of two European-led elements of the NASA-led lunar Gateway – an international habitat as well as a robotic element for refuelling, science and communication – and the continued production of the European Service Module for the NASA Orion system have all been decided. These elements secure the first European Astronaut missions to cis-lunar space and open access to European scientists to human-assisted science and research in deep space and eventually on the lunar surface. Furthermore, important preparatory activities are starting in the ongoing programme period to position Europe in the international industrial landscape providing lunar mission support services. ESA is studying two alternative transportation services for delivering cargo and science to the lunar gateway or directly to the lunar surface as well as the deployment of a lunar spacecraft constellation for providing broadband communication and navigation services. Activities are also intensified around lunar resource management.

European contributions to the Mars Sample Return campaign in partnership with NASA are being developed for the next leap in understanding the red planet after the European flagship mission Exo-Mars. The next decade of exploration will further mature European capabilities, enable a sustained lunar presence and prepare ESA for the horizon goal of human missions to Mars.