

HUMAN SPACE ENDEAVOURS SYMPOSIUM (B3)  
Overview Session (Present and Near-Term Human Space Flight Programmes) (1)

Author: Dr. Thomas Reiter  
European Space Agency (ESA), The Netherlands

ESA'S HUMAN SPACEFLIGHT PROGRAMME: PRESENT AND FUTURE

**Abstract**

With the International Space Station assembly now complete and all ISS partner laboratories in operation, a solid foundation has been laid for at least a decade of research. Assuring continuity of ISS utilisation and logistics, makes space transportation capability an absolute priority for Europe and its ISS partners. Europe contributes to this effort through the excellence of its Automated Transfer Vehicle (ATV) programme, and with studies for developing a versatile service module to support future exploration missions.

The ISS hosts some of the most technologically sophisticated facilities supporting a world-class European research programme in Life and Physical Sciences and Applications in Space (ELIPS) which benefits the lives of citizens on Earth. To date more than 200 European experiments have been conducted. Mid 2012 ESA astronaut André Kuipers completed his ISS long-duration mission, and European astronauts - Luca Parmitano and Alexander Gerst - have each been assigned to six-month ISS missions in 2013 and 2014 respectively.

Importantly, the Station serves as a unique platform for testing and validating new technologies and processes, required for future human exploration missions beyond low Earth orbit (LEO).

The response to ESA Announcement of Opportunity issued in July 2011, has demonstrated the high potential to utilise the ISS as an observation platform for performing experiments to understand global climate change. Such experiments will validate new methodologies which could be deployed on operational satellites in the 2020's, permitting novel long term observations relevant to measuring Essential Climate Variables and the development of more accurate climate models.

ESA is also running ground-based, multidisciplinary research relevant to preparing manned missions beyond LEO. For example, ESA has participated in the first, full-length simulation of a human mission to Mars (Mars500) lasting 520 days. During the simulated 'flight', the crew performed more than 100 experiments aimed at better understanding the psychological and physiological impact of extended human spaceflight.

Furthermore, ESA is advancing concrete projects in preparation of a future global exploration initiative: a European Lunar Lander mission is proposed for 2018. This mission would bring together the results of Europe's technological investment and experience, particularly in soft precision landing with hazard avoidance, to achieve a first in lunar exploration: landing at the Moon's South Pole.

The next years will be promising for Europe in continuing to harvest scientific return and operational experience from the ISS and to demonstrate to all Europeans the usefulness of its investments in the Human Spaceflight programme.