ESA SPACE EXPLORATION STRATEGY AND PROGRAMMATIC FRAMEWORK

BERNHARD HUFENBACH
Head of Strategic Planning and Outreach Office,
Directorate of Human Spaceflight and Robotic Exploration

UN Workshop on Human Space Technology
7 - 11 March 2016, San Jose, Costa Rica

CONTENT OVERVIEW

- Strategy
- Objectives and Programmes
- Future perspectives

ESA EXPLORATION STRATEGY

Getting access to unknown terrains, with robots and humans

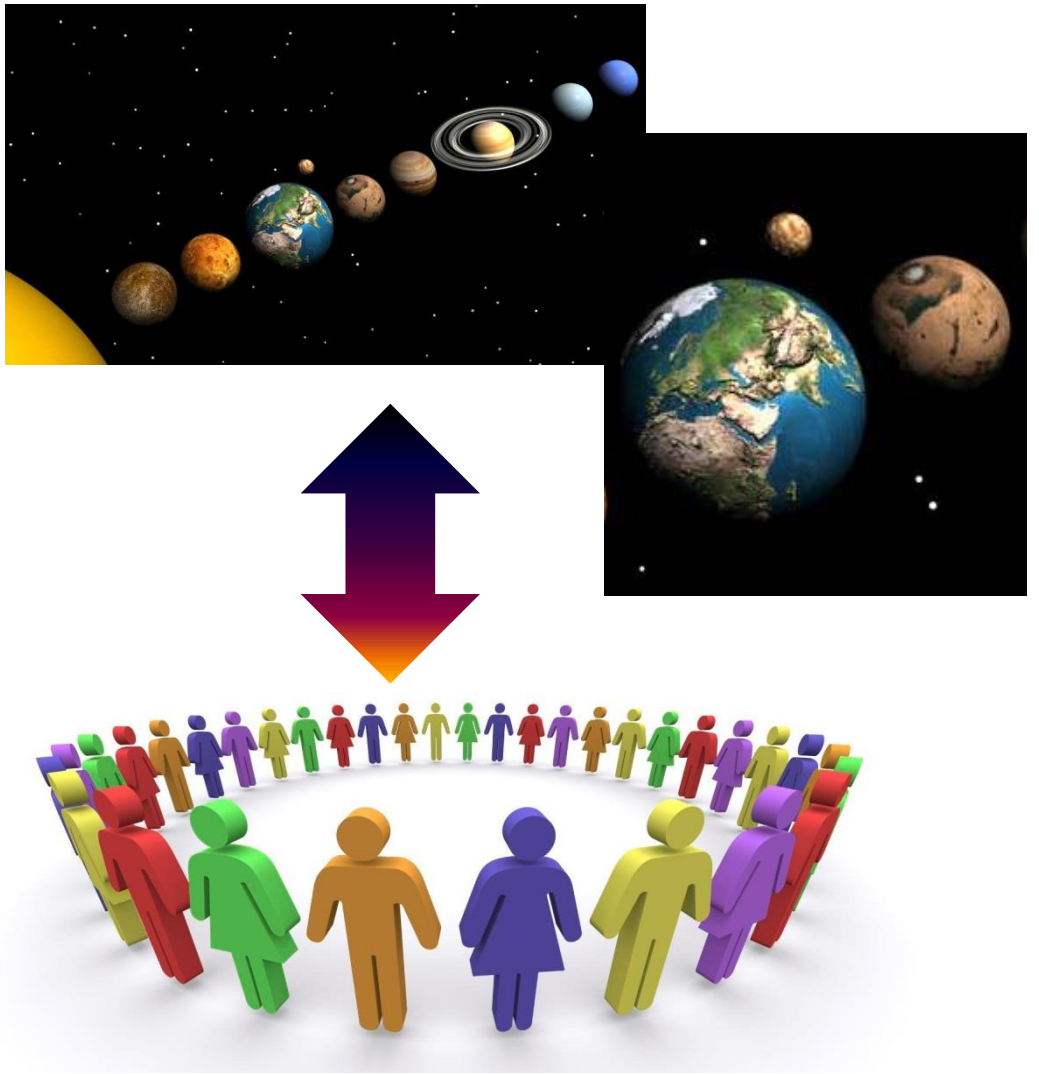
Destination based

Mission focused

Partnership enabled

For the benefit of society at large

- Scientific dimension
- Economic dimension
- Public dimension (inspiration)
- Political dimensions (cooperation)



LOW EARTH ORBIT
OBJECTIVES AND ACTIVITIES

User-driven utilisation of ISS and post-ISS platform

- Addressing global challenges
- Preparing human exploration beyond LEO

ESA participation in ISS programme

Cooperation with China: long-term objective to fly European astronauts to Chinese Space Station

Partnerships with private sector: New ISS utilisation facilities and post-ISS platforms

European Space Agency

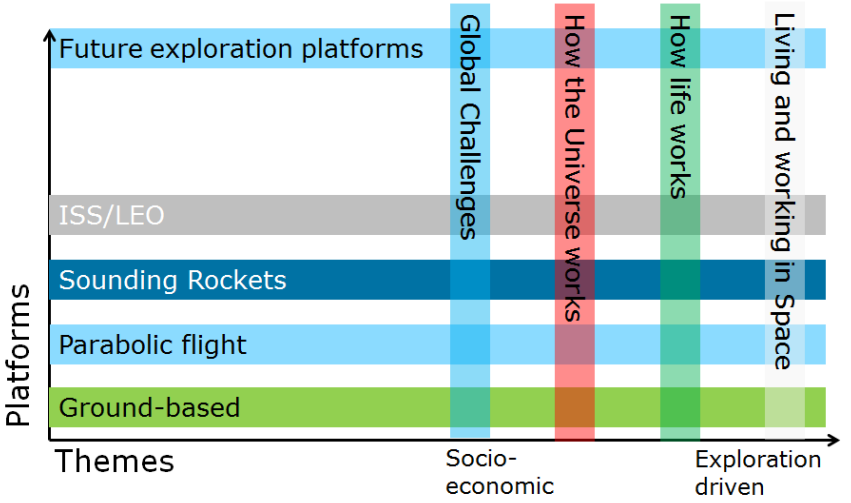
LOW EARTH ORBIT
ISS

ISS Exploitation: secures access to ISS

- System and payload operations
- Astronaut activities
- ISS sustainability, evolution and technology
- Common System Operations

Research in Life and Physical Sciences: supports focused research and applications

- Science support and coordination
- ISS payloads
- Non-ISS payloads and platforms



MOON
OBJECTIVES AND ACTIVITIES

History of solar system,
cosmic context for understanding life on Earth

Resource assessment and exploitation

Cooperation with Roscosmos on lunar robotic missions

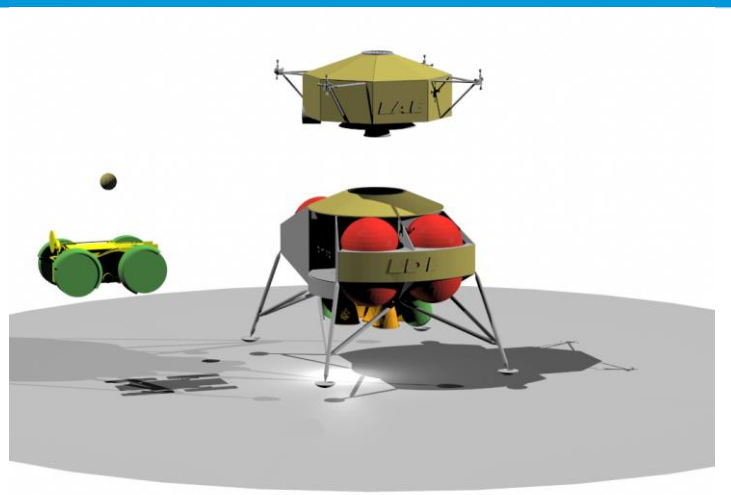
Cooperation with NASA on human transportation

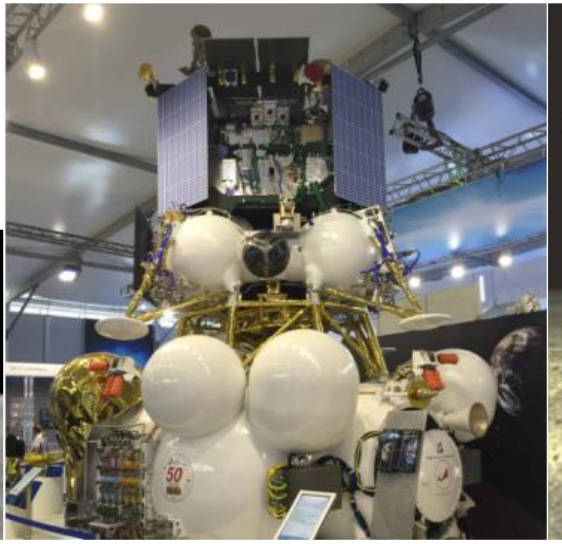
Cooperation with private sector on establishing lunar exploration related services

Study with ISS partners on cis-lunar transit habitat

MOON
ROBOTIC MISSIONS

- ESA navigation camera demonstrator to be flown on Luna-Glob mission (launch end 2018)
- PILOT (navigation) and PROSPECT (drill) elements to be flown on Luna-Resurs mission (launch 2020)
- Post 2020 missions driven by goals to return samples and prospect lunar resources prepared through mission assessment studies

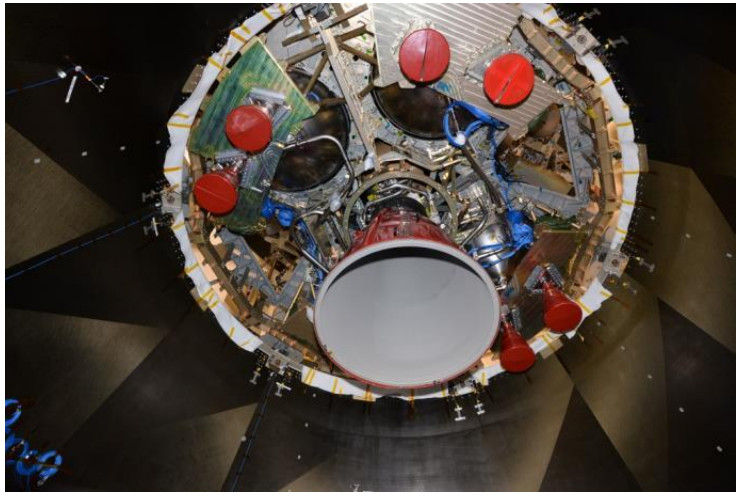




MOON
HUMAN TRANSPORTATION

Development of service module for NASA Multi-purpose Crew Transportation System

- Implemented within ISS programme framework
- Opens perspective for critical path role in human transportation through recurrent production and joint design evolution



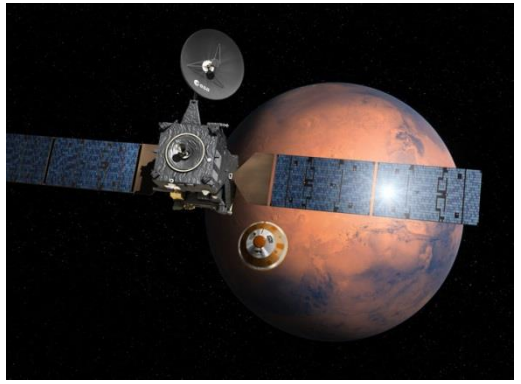
MARS
OBJECTIVES AND ACTIVITIES

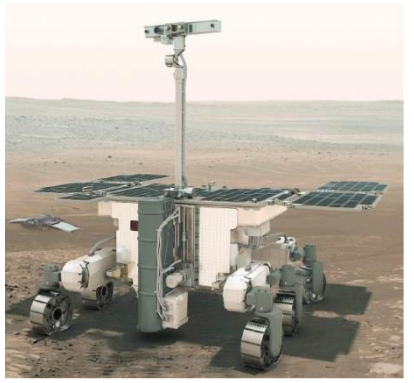
Search for life,
co-evolution of life within its planetary environment

Demonstrate independency from Earth

ExoMars missions in cooperation with Russia

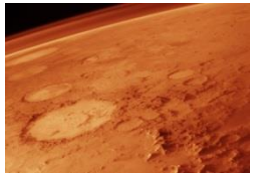
- 2016 – Trace Gas Orbiter and a module for demonstrating atmospheric entry technologies
- 2018 (2020) – Landing of stationary science platform and rover




FUTURE PERSPECTIVES
STRATEGIC POSITIONING OF ESA

Participate in NASA-led journey to Mars, long-term focus for R&D.

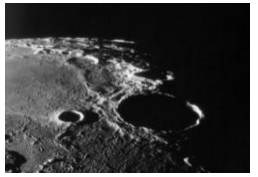


Exploration driven robotic missions, returning samples

Secure surface access (robots & humans).
Provide critical capabilities (communication, power, resources).
Integrate human and robotic assets for increasing mission performance.

Cis-lunar Habitat

Common step of ISS partnership, open to new Partners, enabling sustained human exploration BLEO.



Moon Village

Foster broad participation (public and private) and establish open governance structure.

ISS

Secure participation up to 2024.

Diversification of LEO platforms post ISS.
Strategic Partnership with private sector.
Partnership with CMSA.

User-driven LEO Exploitation, at sustainable cost levels