



# THE ITALIAN CONTRIBUTION TO SPACE EXPLORATION THROUGH ALTEC

V. Giorgio ALTEC CEO

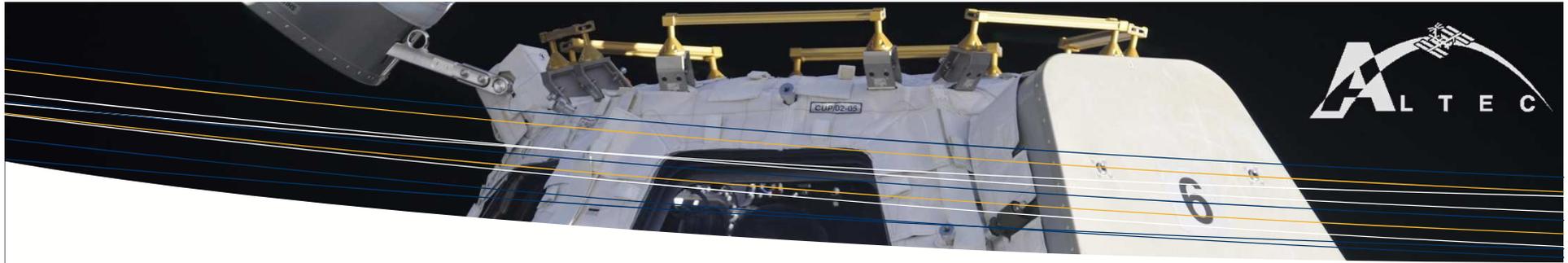
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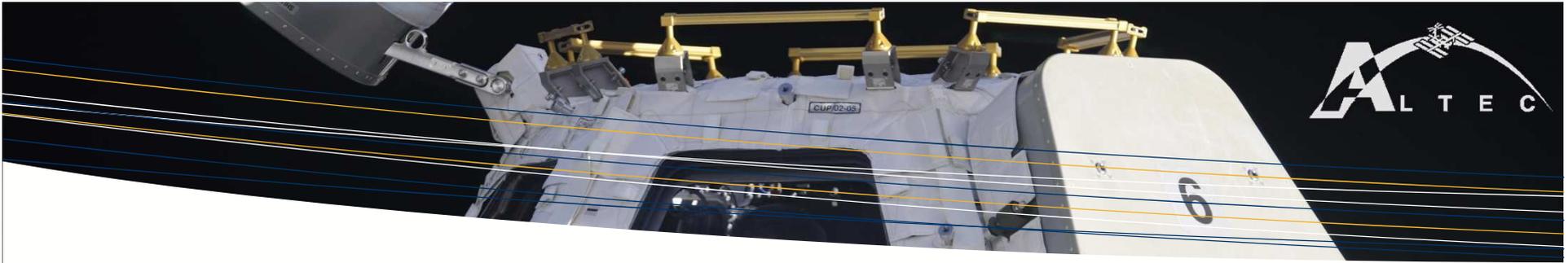
## ALTEC

ALTEC – Aerospace Logistics Technology Engineering Company – is the Italian center of excellence for the provision of engineering and logistics services to support operations and utilization of the International Space Station and the development and implementation of planetary exploration missions.

ALTEC is a public-private company owned by the major European space company, Thales Alenia Space Italia and the Italian Space Agency, ASI.

ALTEC is based in Turin and has liaison offices at NASA and ESA.





## ITALIAN GOALS FOR SPACE EXPLORATION

- Maximise the ISS Utilisation activities and returns both at bilateral and multilateral levels
- Contribute to the development of Technology Innovation for the future international programmes in explorations
- Contribute to Robotic Exploration Missions
- Lead the ExoMars Missions (having as the topmost priority the establishment at ALTEC of the Rover Operations Control Centre).



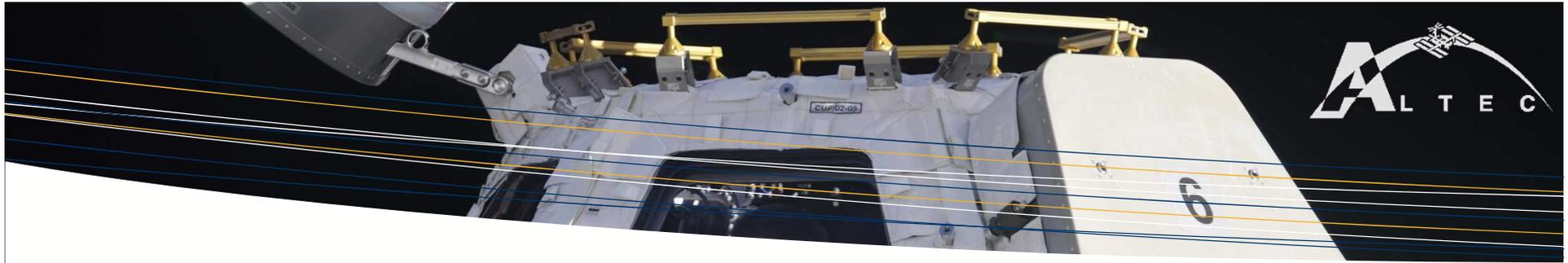
JUNO - JRAM



MRO - SHARAD

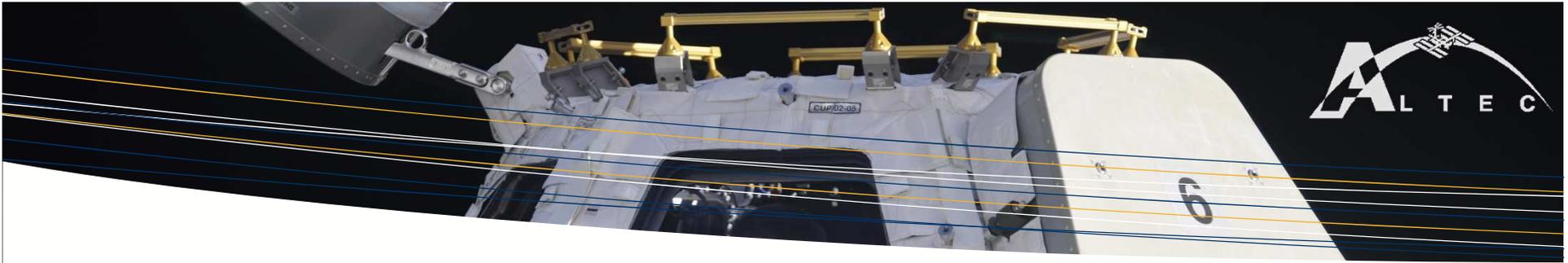


CASSINI - Antenna



## ALTEC ACTIVITIES RELATED TO SPACE EXPLORATION

- INTERNATIONAL SPACE STATION OPERATIONS
- EXOMARS MISSIONS
- INNOVATION & TECHNOLOGICAL RESEARCH
- SCIENCE DATA MANAGEMENT & ARCHIVING

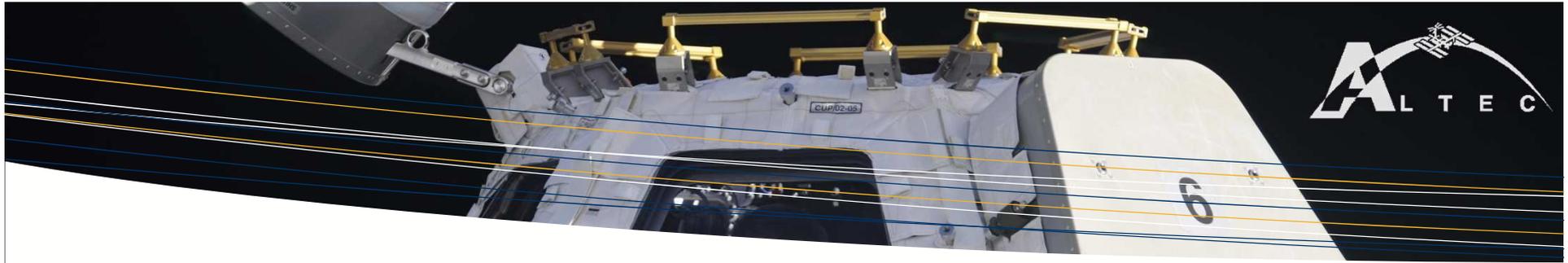


## ITALY CONTRIBUTION TO ISS PROGRAMME

Italy participates to the International Space Station Program (ISS) within two different international channels:

- NASA and Italian Space Agency bilateral Agreement for the provision of logistics pressurized modules (now modified as permanently attached to the Station)
- Italian contribution to the ISS Program , through the European Space Agency (ESA)

**Italy realized about 50% of the ISS pressurized volume**



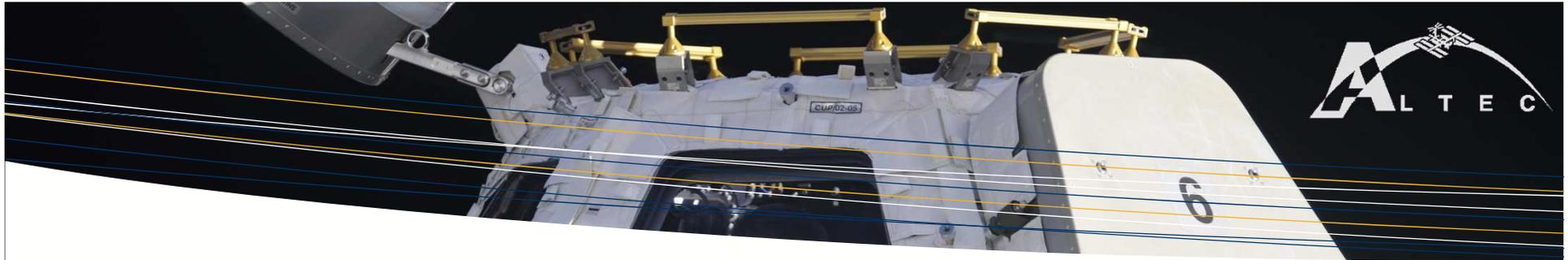
# ISS PROGRAMME

## ENGINEERING SUPPORT SERVICES TO NASA

ALTEC provides engineering support services to ASI for activities related to the "Permanent Multipurpose Module" (PMM) docked to the International Space Station.



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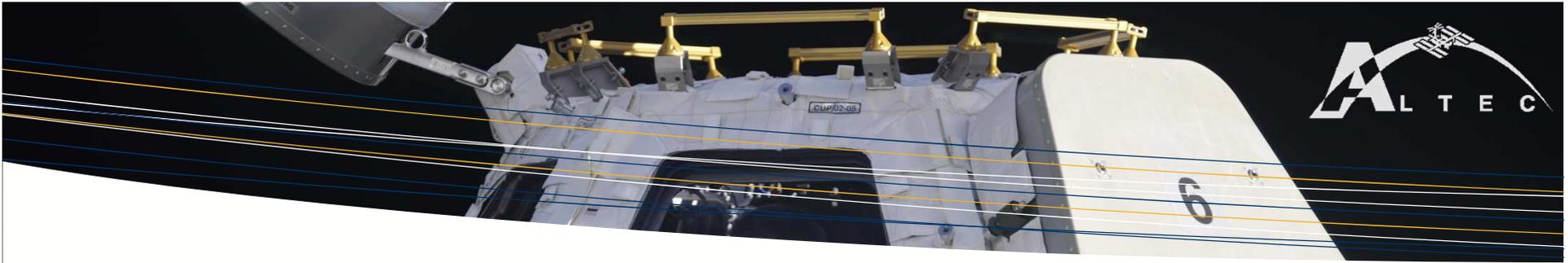
# ISS PROGRAMME

## ENGINEERING SUPPORT SERVICES TO ESA

In the frame of the Integrated Logistics Support provided to ESA elements on ISS, ALTEC operates as Ground Logistics Center.

ALTEC operates one of the ISS "Engineering Support Centers" (ESC), connected via the IGS-ESA network to the Columbus Control Center in Germany.





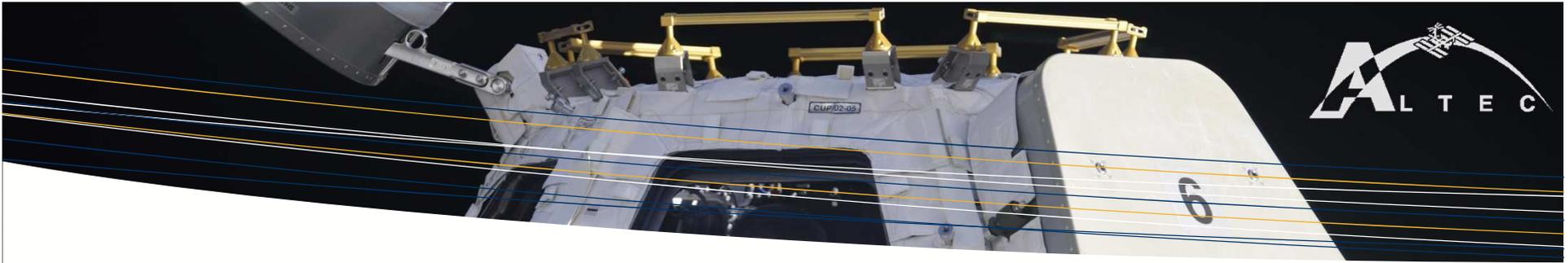
## ISS PROGRAMME

### OPERATIONS AT COLUMBUS CONTROL (COL-CC) AND EUROPEAN ASTRONAUT(EAC) CENTRES

ALTEC and other Italian industries participate to the activities of the Columbus Control Centre (Col-CC) in Oberpfaffenhofen, Germany.

ALTEC is responsible for the global technical coordination of the ESA ISS Training.





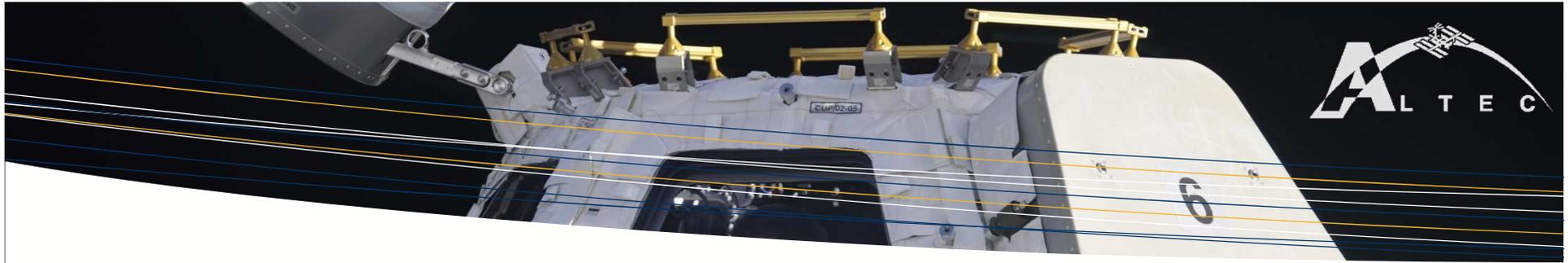
# ISS PROGRAMME

## EXPERIMENTS AND RESEARCH ON ISS FOR HUMAN IN SPACE

ASI has a strong program of ISS Utilization dedicated to the Space Biomedicine.

This is one of the areas of the space exploration activities with direct benefits to Earth application: how to cope with diseases and guarantee human health.





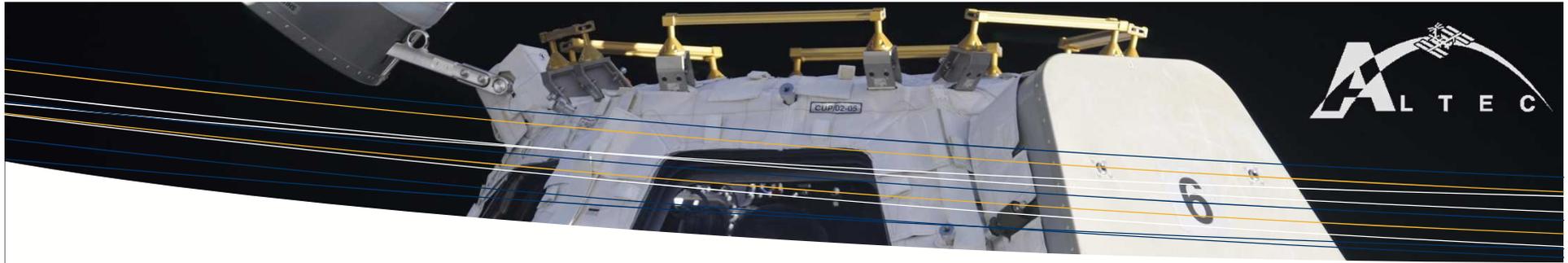
## EXOMARS MISSION

Under the ESA "EXOMARS" program, Italy and ALTEC are responsible for the design, development and management of the "Rover Operations Control Centre" (ROCC).

The ROCC includes the "Science Operation Centre" (SOC).

The Centre will be open, through proper international agreements, to support investigations by scientists from all over the world.



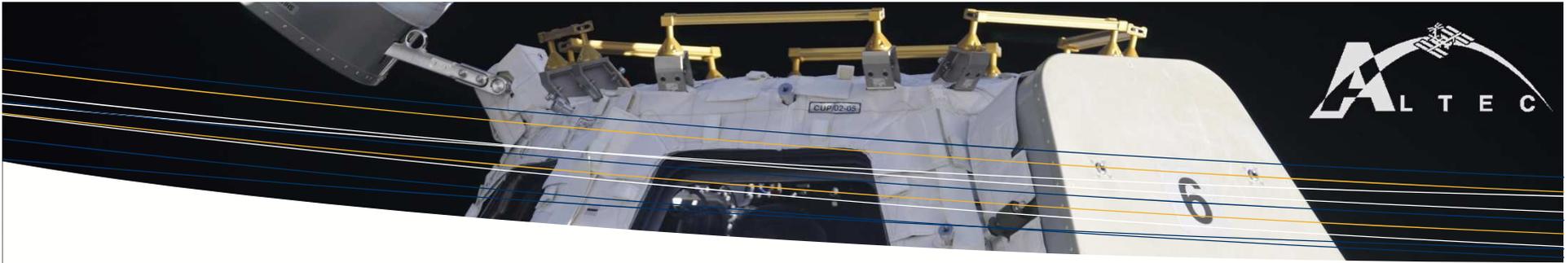


## EXOMARS MISSION

The ROCC will:

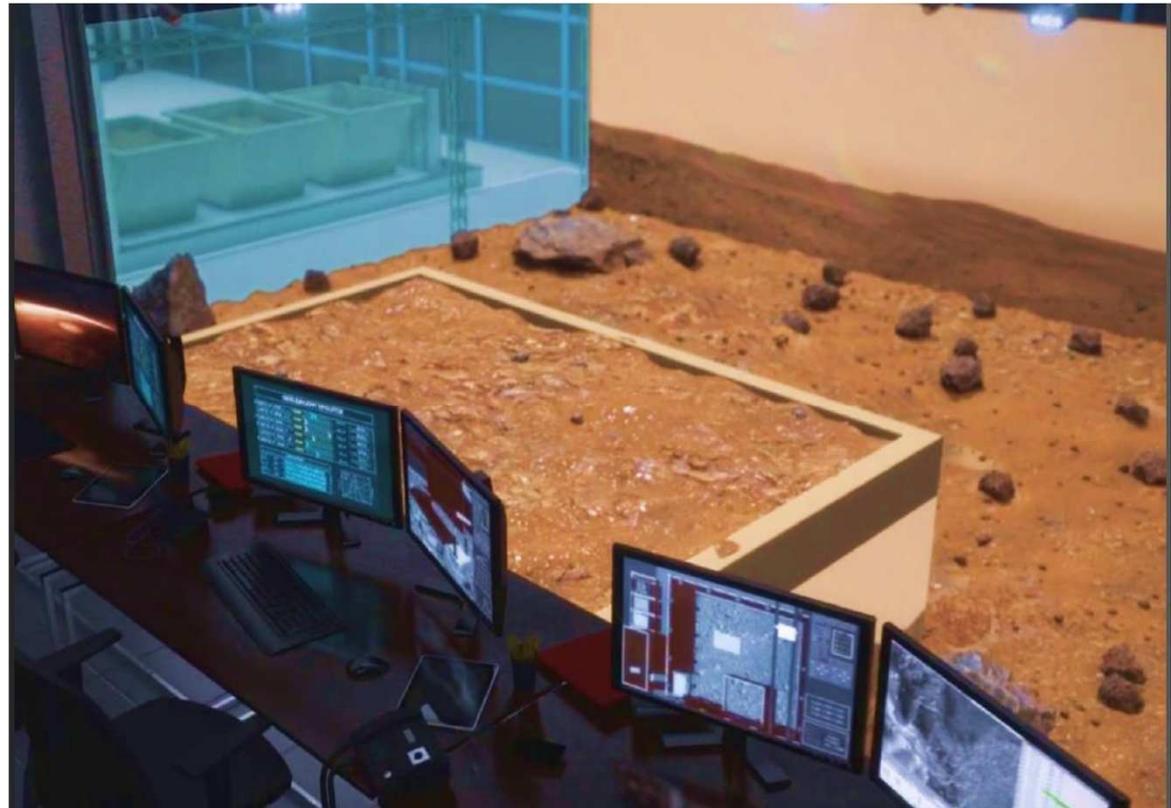
- Support the Rover during all the lifetime phases.
- Support the Scientists in performing science investigations.
- Plan all the activities on a day by day basis.

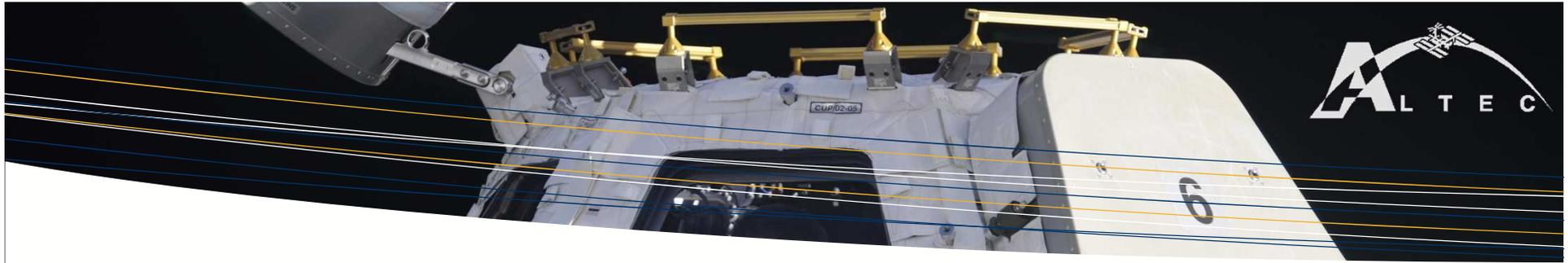




## EXOMARS MISSION

The ROCC will be equipped with a Mars Terrain Simulators addressed to support engineering and scientific investigations.



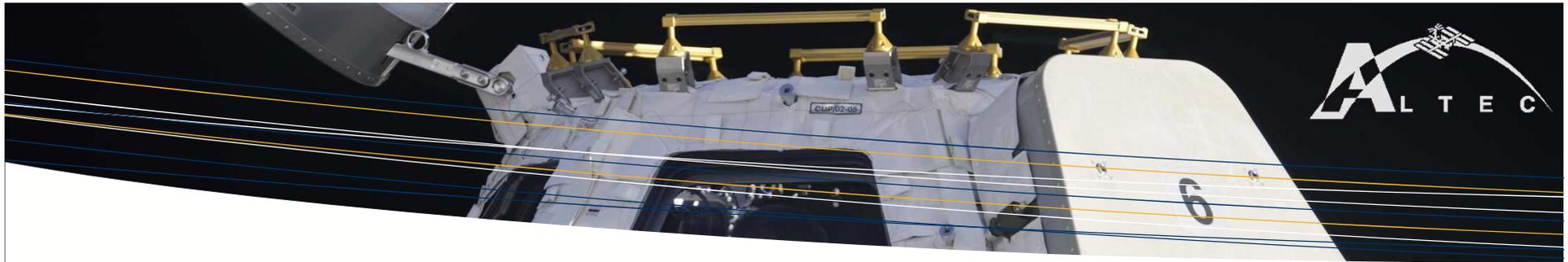


## RESEARCH FOR THE SPACE EXPLORATION

ASI has several initiatives addressed to scientific and technological researches in the frame of Space Exploration, that will bring benefits on Earth in several areas, such as:

- Optimization of resources exploitation
- Development of new approaches for agriculture
- Innovative concepts of habitation modules
- Development of advanced e-training, e-learning tools based on virtual/augmented reality
- Development of innovative low-cost and robust medical instrumentations enabling distributed health monitoring and prevention

ALTEC, in particular, deals with the ICT related front of innovation through programs co-funded by the European Union.

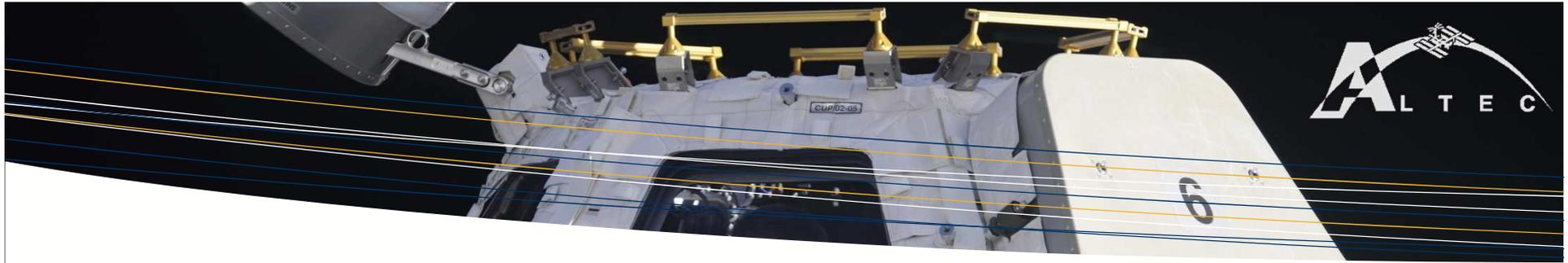


## SPACE SCIENCE

ALTEC is responsible for the development and system operations of the Gaia Data Processing Centre - Turin (DPCT), the Italian node of the ESA data centers network.

Gaia data produced by the five-year mission will fill over 1.5 million CD ROMs. This means for ALTEC the necessity to face the “Big Data” challenge .



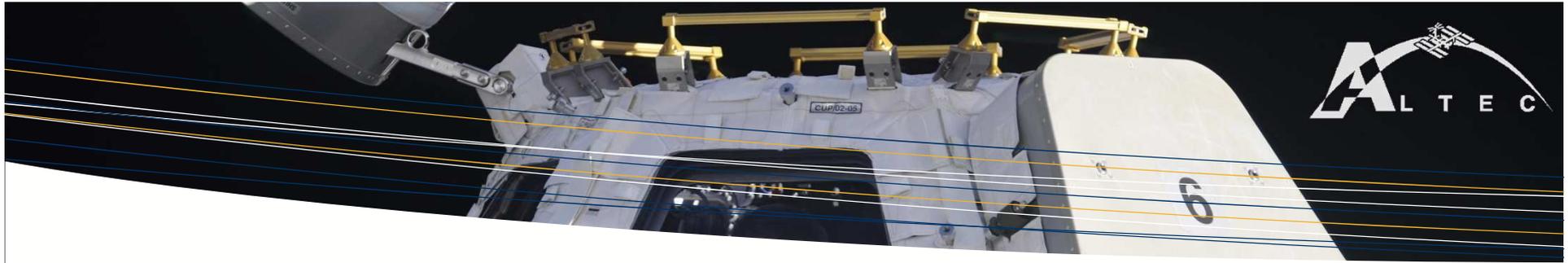


## MISSION SUPPORT CENTRES



- CONTROL ROOMS
- ENGINEERING SUPPORT CENTRE
- LOGISTICS INFRASTRUCTURE





## NEUTRAL BUOYANCY TEST-FACILITY

- A POOL ALLOWING SIMULATION OF ACTIVITIES TYPICAL OF A REDUCED GRAVITY ENVIRONMENT

