Eurospace Exploration WG

HORIZON 2061 – SYNTHESIS WORKSHOP

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ASD-EUROSPACE

The Space group in ASD

ASD-Eurospace: The association

- Created in 1961
  - and since April 2004: the Space group in ASD
- ASD-Eurospace is the professional organisation of the European space manufacturing industry
  - A not for profit association
    - incorporated under the French Law of July 1901
  - Mandates
    - Promote space activities in the interest of its members
    - Define, adopt and express common views for the European space manufacturing sector
  - Membership
    - Eurospace members are European companies active in design, development and manufacturing of space systems
    - Eurospace membership represents more than 90% of the total European manufacturing industry employment
    - Eurospace members are distributed among 13 European countries (ESA Member States)
- ASD-Eurospace is a recognised actor of European space policy and strategy

Eurospace competencies on Space Exploration

- Eurospace is participating in various activities related to Space Exploration via
  - Eurospace Space Exploration WG
    - ESA Exploration Roadmaps review in 2015 and 2018
  - Eurospace R&T roadmapping activities
    - Eurospace RDT activities, including specific needs for
      - Science
      - Human presence in Space and Exploration
    - Engineering roadmap of the Planetary Protection of Outer Solar System European Commission project – PPOSS

Science

- **Critical functions/system constraints** are driving future developments.
  - High stability, pointing accuracy
  - EMC & radiation requirements
  - Temperature challenges
- **Key aim is to improve instruments capabilities**
  - Detection chain
  - Infra-red/Low-temperature
  - Synergies with the Materials roadmap e.g. for stable and large structures
- **Recommendations**
  - Improve system performance and payload capabilities, promote European readiness for state of the art instrument technologies, including large and vary large structures (ultra-stable, deployable, thermal properties).

Science

- **Key areas for action**
  - **State of the art Instruments:**
    - Large Telescopes
    - Detection chain improvement
    - Infra-red/far Infra-red, mm-wave technologies
    - Low temperature/cryogenic temperature operations
    - Radiation environment (check if relevant)
    - Time measurement
  - **Structures, large & distributed instruments:**
    - Wide field of view (FoV), large/deployable/ultra-stable structures
  - **Data handling:**
    - Long distance communications, high data rate/high throughput, ka/ku/optical solutions

Human Presence in Space & Exploration

- **Key aim is to improve**
  - Automation and robotics (including crew/robot synergies and crew collaborative robotics, but also automatic docking aspects)
  - Developments of large structures, also considering habitats, together with critical aspects related to propulsion and aerothermodynamics.
- **Recommendations**
  - For Exploration: address long duration travel issues (e.g. radiations impact), increase readiness level for planetary activities.
  - For human exploration: investigate and develop synergies between crew and robotics, improve European readiness level on habitats.

Human Presence in Space & Exploration

Key areas for action

- **Robotics, automation/autonomy, habitats, planetary activities**
  - End to end automation/autonomy
  - Flexible automation/autonomy
- **Long distance travel**
  - Propulsion systems(EP and Advanced concepts)
  - Fuel and power aspects
  - Large assemblies
  - Communications
  - Breakthrough concepts
- **Synergy between human and robotics**
  - Crew collaborative robotics
  - Astronaut support
- **Life support**
  - ECLS
  - Habitats
- **Safety and protection issues**
  - Radiation shielding
  - Debris/micro-meteoroid/dust
- **Large structures**
  - Inflatables: outfitting the interior
  - International cooperation
- **Planetary activities**
  - Atmospheric entry: Shielding
  - Soft/precise landing: Propulsion aspects, mechanical aspects and GNC aspects
  - Surface activities: Autonomy, range & mobility and drilling/manipulation requirements
  - Planetary protection
- **Return mission**
  - Sample handling
  - Contamination control