

# European Space Exploration strategy 2030 workshop

21<sup>st</sup> June 2021 – Workshop Day 1

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| 9:00 – 9:05  | <p><b><u>Welcome and practicalities:</u></b><br/> <b>Jean-Charles Treuet</b> (Eurospace) - Head of Technology Strategy</p>  |
| 9:05 – 9:15  | <p><b><u>Opening speech:</u></b><br/> <b>David Parker</b> (ESA) - Director of Human and Robotic Exploration</p>   |
| 9:15 – 9:45  | <p><b><u>Keynote Addresses:</u></b><br/> <b>Eric Trappier</b> (Dassault Aviation) – CEO<br/> <b>Massimo Comparini</b> (Thales Alenia Space) - Deputy CEO TAS, ESVP Observation, Exploration and Navigation<br/> <b>Andreas Hammer</b> (Airbus Defence and Space) - Head of Space Exploration – SVP</p>  |
| <p><b>Session 1: The long-term ESA exploration strategy in the European and international geopolitical framework</b></p> |   |
| 9:45 – 10:05   | <p><b><u>ESA presentation:</u></b><br/> <b>Didier Schmitt</b> (ESA) - Strategy and coordination group leader for human and robotic exploration</p>  |
| 10:05 – 11:05  | <p><b><u>Chair:</u></b> <b>David Parker</b> (ESA)- Director of Human and Robotic Exploration<br/> <b><u>Moderator:</u></b> <b>Olivier Lemaître</b> (Eurospace) - Secretary General<br/> <b><u>Industry Panel:</u></b><br/> <b>Silvio Sandrone</b> (Airbus Defence and Space) - Vice President New Programmes, Space Exploration<br/> <b>Marco Brancati</b> (Telespazio) - Chief Technology &amp; Innovation Officer<br/> <b>Marie-Christine Bernelin</b> (Dassault Aviation) - Space Vehicles Programme Manager<br/> <b>Veronica La Regina</b> (Nanoracks Europe) - Director<br/> <b>Mariella Graziano</b> (GMV) - Executive Director - Strategy and Business Development, Flight Systems and Robotics<br/> <b>Walter Cugno</b> (Thales Alenia Space) - Vice President - Domain Exploration and Science<br/> <b>Hélène Huby</b> (Urania Ventures) - Founder &amp; CEO<br/> <b>Simone Centuori</b> (Deimos) - Head of Flight Systems business unit<br/> <b>Timo Stuffer</b> (OHB System) - Director Business Development</p> |
| 11:05 – 11:15  | <p><b><u>Q&amp;A: Moderator:</u></b> <b>Olivier Lemaître</b> (Eurospace) - Secretary General</p>  |
| 11:15 – 11:20  | <p><b><u>Session Wrap up and conclusions:</u></b> <b>Didier Schmitt</b> (ESA) - Strategy and coordination group leader for human and robotic exploration</p>  |
| 11:20 – 11:35  | <p><i>Coffee break</i></p>  |

| Session 2.1: Synergies of three destinations LEO, Moon, Mars |   |
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| 11:35 – 12:05  | <p><b>ESA overall vision:</b> <b>Stefaan De Mey</b> (ESA) - Senior Strategy Officer<br/><i>Terrae Novae - Three destinations – one vision</i></p> <p><b>ESA destinations vision:</b></p> <p><b>Alexander Gerst</b> (ESA) - ESA astronaut and geophysicist<br/><i>Terrae Novae - LEO long-term strategy</i></p> <p><b>Juergen Schlutz</b> (ESA) - LUNA Facility Engineer &amp; Moon Strategy Lead<br/><i>Terrae Novae - Moon long-term strategy</i></p> <p><b>Sanjay Vijendran</b> (ESA) - Future Mars studies (MarsX Team) coordinator &amp; Mars strategy lead<br/><i>Terrae Novae - Mars long-term strategy</i></p>   |
| 12:05 – 13:05  | Lunch Break   |
| 13:05 – 14:15  | <p><b>Chair:</b> <b>Juergen Schlutz</b> (ESA) - LUNA Facility Engineer &amp; Moon Strategy Lead</p> <p><b>Moderator:</b> <b>Rosario Pavone</b> (SME4Space) – Secretary</p> <p><b>Round table:</b></p> <p><b>Rolf Janovsky</b> (OHB System) - Director Predevelopment, Space System Studies and Proposals<br/><i>Technological Synergies</i></p> <p><b>Kjell Bengtsson</b> (Jotne EPM Technology) - Vice President<br/><i>A Norwegian SME view on LEO-Moon-Mars technologies</i></p> <p><b>Carlos Entrena Utrilla</b> (Plus Ultra Space Outposts) – CEO<br/><i>Enabling the lunar economy with progressive infrastructure deployment</i></p> <p><b>Raphaël Chevrier</b> (Arianespace) - Bid Management &amp; Innovation<br/><i>Highway to the Moon</i></p> <p><b>Cristian Chitu</b> (GMV Romania) - Director of Space, GMV Romania<br/><i>LEO-Moon-Mars Synergies: GMV's Views</i></p> <p><b>Tommaso Misuri</b> (SITAEL) - Head of Propulsion division<br/><i>Electric propulsion as an enabling technology for Space Exploration</i></p> <p><b>Franco Fenoglio</b> (Thales Alenia Space) - Head of Human Planetary Exploration<br/><i>From ISS to Exploration beyond LEO</i></p> <p><b>Stephen Kyle-Henney</b> (Tisics Ltd) - Managing Director<br/><i>Light weight Robotic Arms / Landing legs / Tubular structures</i></p> <p><b>Eugenio Ferreira</b> (Airbus Defence and Space) - Head of Space Exploration R&amp;D<br/><i>Interlinks among destinations</i></p> <p><b>Bertrand Baratte</b> (Air Liquide) - Space Market Director<br/><i>How Earth Industry could contribute to Sustainable Space Exploration?</i></p> |
| 14:05 – 14:25  | <b>Q&amp;A:</b> <b>Moderator: Rosario Pavone</b> (SME4Space) – Secretary  |
| 14:25 – 14:30  | <b>Session Wrap up and conclusions:</b> <b>Stefaan De Mey</b> (ESA) - Senior Strategy Officer   |

| Session 2.2: ESA inter-directorates synergies |  |
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| 14:30 – 14:40                                 | <p><b>ESA introduction: Didier Schmitt</b> (ESA) - Strategy and coordination group leader for human and robotic exploration<br/><i>ESA Multi-domain projects</i></p>   |
| 14:40 – 15:10                                 | <p><b>Moderator: Didier Schmitt</b> (ESA) - Strategy and coordination group leader for human and robotic exploration</p> <p><b>Round table:</b></p> <p><b>Leopold Summerer</b> (ESA) - Head of ESA's Advanced Concepts Team<br/><i>ESA Multi-domain projects - TEC</i></p> <p><b>Werner Balogh</b> (ESA) - Head of Space Transportation Policy and Communication<br/><i>ESA Multi-domain projects - STS</i></p> <p><b>Fabrice Joly</b> (ESA) - Head of Future Telecom Prog Consolidation Section<br/><i>ESA Moonlight Initiative</i></p> <p><b>Marco Caporicci</b> (ESA) - Head, Transportation and Re-entry Systems Division<br/><i>ESA Multi-domain projects - HRE</i></p> |
| 15:10 – 15:20                                 | <p><b>Q&amp;A: Moderator: Didier Schmitt</b> (ESA) - Strategy and coordination group leader for human and robotic exploration</p>  |
| 15:20 – 15:25                                 | <p><b>Session Wrap up and conclusions: Jose Manuel Sanchez</b> (ESA) - Programme Officer</p>   |
| 15:25 – 15:40                                 | <p><i>Coffee break</i></p>   |

| Session 3: Science and societal added value of Exploration for all mankind |  |
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| 15:40 – 16:30  | <p><b>ESA introduction:</b></p> <p><b>Alexander Gerst</b> (ESA) - ESA astronaut and geophysicist<br/><i>Beyond - Exploration benefits</i></p> <p><b>ESA presentations:</b></p> <p><b>James Carpenter</b> (ESA) - Exploration science &amp; research coordinator<br/><i>Terrae Novae - Benefits &amp; Socio-economic impact</i></p> <p><b>Klara Anna Capova</b> (ESA) - Research Fellow in Socio-Economic Benefits of Space Exploration<br/><i>Terrae Novae - Global Challenges</i></p> |
| 16:30 – 17:45  | <p><b>Chairs:</b></p> <p><b>James Carpenter</b> (ESA) - Exploration science &amp; research coordinator</p> <p><b>Klara Anna Capova</b> (ESA) - Research Fellow in Socio-Economic Benefits of Space Exploration</p> <p><b>Moderator:</b></p> <p><b>Pierre Lionnet</b> (Eurosace) - Research and Managing Director</p>   |

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|               | <p><b><u>Keynotes:</u></b></p> <p><b>Stella Alexandrova</b> (Belgium) - Commercialization expert and independent project manager<br/><i>Emerging Lunar Economy</i></p> <p><b>Claire Jolly</b> (OECD) - Head of Unit, Directorate for Science, Technology and Innovation at OECD<br/><i>Are the European space budgets commensurate to the ambitions?</i></p> <p><b>Marie Claire Perkinson</b> (Airbus Defence and Space) - Head of Exploration New Programmes UK<br/><i>Benefits of Exploration for STEM outreach and public engagement</i></p> <p><b>Diego Urbina</b> (Space Applications Services) - Future Projects &amp; Exploration team lead<br/><i>Space Resources – Sustained benefits to society</i></p> <p><b>Maria-Antonietta Perino</b> (Thales Alenia Space) - Director Space Economy Exploration and International Network<br/><i>Space Exploration as humankind's new horizon to build a better, sustainable life on Earth</i></p> <p><b>Marc Vales</b> (Dassault Aviation) - Vice President Space Programs<br/><i>Consider Space as a peace keeper</i></p> |
| 17:45 – 17:55 | <b><u>Q&amp;A: Moderator:</u></b> <b>Pierre Lionnet</b> (Eurospace) - Research and Managing Director   |
| 17:55 – 18:00 | <b><u>Session Wrap up and conclusions:</u></b> <b>James Carpenter</b> (ESA) - Exploration science & research coordinator   |
| 18:00 – 18:05 | <b><u>Workshop day 1 closure:</u></b> <b>Jean-Charles Treuet</b> (Eurospace) - Head of Technology Strategy   |

## 22<sup>nd</sup> June 2021 – Workshop Day 2

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| 9:00 – 9:05                     | <p><b><u>Welcome and practicalities:</u></b></p> <p><b>Jérémy Hallakoun</b> (Eurospace) - Technology Strategy Manager</p>  |
| 9:05 – 9:10                     | <p><b><u>Opening speech:</u></b></p> <p><b>Didier Schmitt</b> (ESA) - Strategy and coordination group leader for human and robotic exploration</p>   |
| <b>Session 4.1: CTO session</b> |  |
| 9:10 – 9:30                     | <p><b><u>ESA presentations:</u></b></p> <p><b>Giorgio Magistrati</b> (ESA) - Exploration Preparation, Research and Technology (ExPeRT) Team Leader<br/>and<br/><b>Jorge Alves</b> (ESA) - Exploration Technology Engineer and Implementation Lead (ExPeRT)<br/><i>ExPeRT and technology roadmaps per destination</i></p> <p><b>Andreas Schoen</b> (ESA) - Head of Research and Utilisation Group (HRE-R)</p> |

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|               | <i>SciSpacE, science payloads</i>  |
| 9:30 – 11:00  | <p><b><u>Moderator:</u></b> Pierre Lionnet (Eurospace) - Research and Managing Director</p> <p><b><u>CTO Panel:</u></b></p> <p><b>Pablo Colmenarejo</b> (GMV) - Head of Operational Program Department</p> <p><b>Serge Flamenbaum</b> (Airbus Defence and Space) - VP - Head of Space R&amp;D and Advanced Systems</p> <p><b>Marco Molina</b> (SITAEL) - Managing Director Sales and Products</p> <p><b>Pierre Crespi</b> (Air Liquide) - Director of Innovation</p> <p><b>Ludger Froebel</b> (ArianeGroup) - National Technical Authority (NTA)</p> <p><b>Xavier Roser</b> (Thales Alenia Space) - Product Line Manager for Science, Orbiter and In Orbit Servicer</p> <p><b>Guy Perez</b> (OHB SE) - CTO</p> <p><b>Paolo Bellomi</b> (AVIO) - SVP Engineering</p> <p><b>Lorenzo Ferrario</b> (D-Orbit) - CTO</p> |
| 11:00 – 11:15 | <i>Coffee break</i>  |

| Session 4.2: Innovation, game changers, showstoppers: technology, the ultimate enabler? |   |
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| 11:15 – 12:20   | <p><b><u>Chair:</u></b></p> <p><b>Sanjay Vijendran</b> (ESA) - Future Mars studies (MarsX Team) coordinator &amp; Mars strategy lead</p> <p><b><u>Moderator:</u></b></p> <p><b>Pierre Lionnet</b> (Eurospace) - Research and Managing Director</p> <p><b><u>Round table:</u></b></p> <p><b>Ilaria Cinelli</b> (AIKO -Autonomous Space Missions) - Business Developer<br/><i>The use of AI in autonomous spacecraft operations and astronaut support</i></p> <p><b>Pascal Barbier</b> (Air Liquide) - Space Project/Program department manager<br/><i>Gas &amp; Cryo refuelling in space: state of the art earth &amp; space, possible road map</i></p> <p><b>Andrea Cardellicchio</b> (Telespazio) - Commercial Development LOB SSO<br/><i>Space Logistics</i></p> <p><b>Cesare Lobascio</b> (Thales Alenia Space) - Exploration and Science Innovation Lead<br/><i>Technology and innovation: fuel for space exploration</i></p> <p><b>Ricardo Patricio</b> (Made in Space Europe) - Business Development Manager<br/><i>Robotics both as a precursor and as enabler of sustained human presence</i></p> <p><b>Augusto Caramagno</b> (Sener) - Director of the Institutional Space Department<br/><i>European Exploration Strategy – SENER Perspectives</i></p> <p><b>Jean-Luc Dumont</b> (ArianeGroup) - Supplier Manager<br/><i>Radioisotope Power Sources Enabling European Exploration</i></p> |

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|               | <p><b>Eugenio Ferreira</b> (Airbus Defence and Space) - Head of Space Exploration R&amp;D<br/><i>End-to-End Resources Utilization</i></p> <p><b>Francesco Morsillo</b> (SITAEL) - New Business Development Responsible for the Space Division</p> |
| 12:20 – 12:30 | <p><b>Q&amp;A:</b><br/><b>Moderator: Pierre Lionnet</b> (Eurospace) - Research and Managing Director</p>  |
| 12:30 – 12:35 | <p><b>Session Wrap up and conclusions</b><br/><b>Eric Istasse</b> (ESA) - Coordination Team</p>   |
| 12:35 – 13:35 | <i>Lunch break</i>  |

### Session 5: Fostering the emergence of the LEO/Moon/Mars ecosystems

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| 13:35 – 14:00 | <p><b>ESA Introduction:</b><br/><b>Didier Schmitt</b> (ESA) - Strategy and coordination group leader for human and robotic exploration</p> <p><b>ESA Presentations:</b><br/><b>Bernhard Hufenbach</b> (ESA) - Lead of Commercialisation and Innovation Team<br/><i>Commercialisation</i></p> <p><b>Marc Bruder</b> (ESA) - Head of Programme Management Support, Human and Robotic Exploration and PHIL AIREI (NMS Section Head)<br/><i>Industry Policy</i></p>  |
| 14:00 – 15:05 | <p><b>Chairs:</b><br/><b>Bernhard Hufenbach</b> (ESA) - Lead of Commercialisation and Innovation Team<br/><b>Marc Bruder</b> (ESA) - Head of Programme Management Support, Human and Robotic Exploration and PHIL AIREI (NMS Section Head)</p> <p><b>Moderator:</b><br/><b>Rosario Pavone</b> (SME4Space) – Secretary</p> <p><b>Round table:</b><br/><b>Julien-Alexandre Lamamy</b> (inspace Europe) - Managing Director<br/><i>Commercial capabilities for developing lunar ecosystems</i></p> <p><b>Timo Stuffer</b> (OH System) - Director Business Development<br/><i>Trends &amp; Developments into Future Commercial Exploration Programs</i></p> <p><b>Koen Geurts</b> (Telespazio) - Head of Operations and Engineering Department<br/><i>ESA's Moonlight Communication and Navigation Service</i></p> <p><b>Pascal Barbier</b> (Air Liquide) - Product Manager Space Exploration<br/><i>From H2O SRU to H2/O2 for space transportation / Life support / energy storage for Lunar night survival</i></p> |

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|               | <p><b>Carlo Mirra</b> (Airbus Defence and Space) - Key account manager - Space Exploration<br/><i>Some key aspects in exploration ecosystem development</i></p> <p><b>Mark Dumville</b> (GMV UK) - CEO GMV NSL<br/><i>Fostering the emergence of the LEO/Moon/Mars ecosystems: GMV's View</i></p> <p><b>Luca Rossetini</b> (D-Orbit) - Founder and CEO<br/><i>The Importance of Logistics in the LEO/MOON/MARS Ecosystem</i></p> <p><b>Christophe Talbot</b> (Dassault Aviation) - Space Vehicles Programme Technical Manager<br/><i>Lowering the barriers and increasing the values: reusability-versatility-economy triptych</i></p> <p><b>Roberto Provera</b> (Thales Alenia Space) - Director New Initiatives and Innovation, Exploration &amp; Science<br/><i>Challenges and opportunities for the development of the LEO/Moon/Mars eco-systems</i></p> |
| 15:05 – 15:20 | Coffee break   |
| 15:20 – 15:30 | <b>Q&amp;A: Moderator: Rosario Pavone</b> (SME4Space) – Secretary  |
| 15:30 – 15:35 | <b>Session Wrap up and conclusions: Jose Manuel Sanchez</b> (ESA) - Programme Officer  |
| 15:35 – 16:05 | <p><b>Workshop day 2 closure:</b></p> <p><b>Didier Schmitt</b> (ESA) - Strategy and coordination group leader for human and robotic exploration</p>  |
| 16:05 – 16:15 | <p><b>Event closing speech:</b></p> <p><b>David Parker</b> (ESA) - Director of Human and Robotic Exploration</p>   |