

*Luxembourg / Cologne, 18 October 2019*

## **LUXEMBOURG TO SET UP SPACE RESOURCES INNOVATION CENTRE**

- *Luxembourg Deputy Prime Minister, Minister of the Economy Etienne Schneider and ESA Director General Johann-Dietrich Wörner commit to strengthening international collaboration in the field of space resources research and innovation, during a visit to the European Astronaut Centre, in Cologne.*
- *Europe must be an active player and create opportunities to position itself as key partner in the next space resources related activities and missions.*
- *European Space Agency and the Luxembourg Space Agency have, together, identified common objectives for research and development.*

Following the setup of SpaceResources.lu initiative in 2016 to promote and develop the research, economic and legal aspects of space resources, the European Space Agency (ESA) and the Luxembourg Space Agency (LSA) established a working group to explore the opportunities for international cooperation in the field of space resources.

During the last two years, ESA has made significant progress in this field, including the development of the ESA Strategy for Space Resources and the implementation of related ground-based research, technology and mission definition activities. ESA research activities focus solely on in-situ resource utilisation for enhancing the sustainability of space exploration. It is for this reason that the ESA Space Resources Initiative is an integral element of E3P (European Exploration Envelope Programme).

ESA and the LSA have, together, identified common objectives for research and development in the field of space resources, along with a number of useful cooperative activities such as joint studies and the organization of dedicated events.

### **Space Resources Research**

The Luxembourg Space Agency is committed to a program of investment designed to spur research and development in fields relevant to the exploration and utilisation of space resources. The goal is to foster the development of new capabilities, and technologies, in close collaboration with the space industry.

As part of its space research program, the LSA is in the process of establishing the Luxembourg Space Resources Research Centre in cooperation with its partners. The Space Resources Research Centre will focus on extraction, processing and manufacturing.

Luxembourg aims to expand this Space Resources Research Centre towards a larger Space Resources Innovation Center with a European and even international scope. In this matter, Luxembourg will further investigate a close cooperation with ESA which will advance their common goals.

While the Space Resources Research Centre will focus on scientific research on a national level, the European Innovation Centre will be broader in scope by also including other functions such as business support, community and knowledge management and have a European dimension.

### **Potential areas of European collaboration**

The initiatives from Luxembourg and the ESA have partnership and business creation at their core, alongside R&D and technology maturation. The following possible areas of cooperation have been identified:

**Research** – Including ground-based research and the advancement of technologies used for activities such as prospecting, extracting, refining and storing space resources.

**Business incubation** – Including the evaluation of the Space Resources value chain, mapping and identification of key actors at European and global level, conducting of a study to better understand the economics of, and markets for, space resources, as well as targeting of new partnerships with primarily non-space industry.

**Knowledge Management** – Monitoring of progress in the science, technology, finance and legal frameworks, as well as the establishment of knowledge management and the identification of knowledge gaps and new needs.

**Community Management** – Fostering broad collaboration with European academic and research institutes housing key expertise in relevant fields.

### **In-Situ Resource Utilisation Research (ISRU)**

Sustainable space exploration is currently limited by the huge costs associated with launching people and material into space, from Earth. And, by the lack of an established, affordable means to resupply essentials such as life support and fuel. Finding and using resources at the point of need - in space - promises a way to overcome these challenges. And as a result, interest in space resources is growing internationally.

Called In-Situ Resource Utilisation (ISRU), this approach is driving technological innovation and opening new business opportunities for the short, medium and long term. But, research and development of ISRU technologies and underlying processes is crucial if this new paradigm is to succeed.

Progress in the field will come by solving innovation challenges and maturing technology in multidisciplinary areas such as space systems, robotics, materials handling and purification or chemical process engineering.

Agencies, scientific academic community, start-ups, traditional space industry and new non-space companies have all a unique expertise and a role to play in a successful development of SRU.

The work on SRU challenges will stimulate innovation on Earth and generate potential midterm economic returns.

In this context, Europe must be an active player and create opportunities to position itself as key partner in the next space resources related activities and missions.

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