

Dr Kathryn Hadler, FNR PEARL Chair, nominated as Director of ESRIC as of 1st April 2022.

Luxembourg based European Space Resources Innovation Centre pioneering sustainable space resources utilization.

LUXEMBOURG, JANUARY 31, 2022 - Dr Kathryn Hadler, an internationally renowned scientist in mineral processing and beneficiation, has been appointed Director of the European Space Resources Innovation Centre (ESRIC) as of 1 April 2022. Backed by a PEARL Chair from the Luxembourg National Research Fund (FNR) with an endowment of 3.7 M€ over five years, Kathryn Hadler will join ESRIC to lead the further development of the Centre, advancing scientific discovery and technology development in In situ Resources Utilisation (ISRU) and asserting ESRIC and Luxembourg's position in space resources. The PEARL programme, funded by the FNR, provides competitive funding to attract top researchers in strategic research areas for Luxembourg.

Led by Dr Mathias Link as ad-interim Director since its creation, ESRIC's activities revolve around space resources research and development, support for economic activities, knowledge management and community management. Launched in 2020, ESRIC is powered by the Luxembourg Space Agency (LSA), the Luxembourg Institute of Science and Technology (LIST) and the European Space Agency (ESA) as strategic partner.

The Centre, which has grown to a core team of a dozen persons, has made fast progress over the past 15 months in cooperation with its partners. 2021 saw the launch of the world's first start up programme dedicated to space resources, the build-up of the first labs and the start of the centre's first research projects, as well as the organization of the Space Resources week 2021 – a major international event in the field of space resources. ESRIC also initiated important partnerships with industrial partners such as Airbus and Air Liquide, and launched a space resources prospecting challenge together with ESA.

Dr Hadler's nomination will build ESRIC's expertise in mineral processing and beneficiation and allow the creation of an internationally recognised research group that will advance scientific discovery and technology development in In-situ Resources Utilisation (ISRU).

"A new era of human and robotic exploration of space beyond low Earth orbit is underway", explains Kathryn Hadler. "For humans to travel further and stay longer in space requires the development of systems to support human life and refuel spacecraft using resources found locally. As a consequence, ISRU (In Situ Resource Utilization) is now a key element in space agency strategy for space exploration.

As a new resource use system, it is essential that ISRU is used as an exemplar of best practice in resource extraction, based on the concepts of end-to-end process optimisation, circularity of materials, zero-waste and restoration of pristine environments."

The 3.7 MEUR FNR PEARL funding complements resources from ESRIC and will serve to build up a world-leading research team working on a programme dedicated to "Solutions for the Sustainable and Responsible use of Space Resources (SoISR)". The strategic objectives of the SoISR programme include developing technologies that provide solutions to the technical challenges presented by ISRU, producing technologies, tools and roadmaps that demonstrate sustainable and responsible approaches to resource use in space, and creating tangible opportunities for collaboration with space and terrestrial industries, including mining and recycling. With these additional researchers, ESRIC is planned to grow to more than 30 researchers within the next 2 years.

While Dr Kathryn Hadler will be entrusted with the mission of further building up ESRIC, Dr Mathias Link will remain involved in the Centre's activities as Chair of the ESRIC steering committee. "After this first launch phase, LSA is looking forward to continuing powering ESRIC as one of its founding members." states Mathias Link. As part of his Director mandate at the LSA, he will also continue coordinating the SpaceResources.lu initiative launched in 2016, of which ESRIC is a key element.

"Luxembourg has been a frontrunner in launching the SpaceResources.lu initiative a few years ago. It is now acknowledged as a strategic topic for the future of space exploration by key partners such as ESA, with which we were able to create the ESRIC. Luxembourg was again at the forefront, with the launch of the ESRIC Start up Support Programme (SSP), the first programme worldwide dedicated to commercial initiatives in the field of space resources utilization (SRU). The nomination of Dr Hadler will allow to further advance SRU research and continue positioning Luxembourg as a trailblazer in the field, while putting sustainability at its core." says Franz Fayot, Minister of the Economy.

"I am looking forward to welcoming Dr Hadler, as a new director of ESRIC and as a member of LIST's Executive Committee. This PEARL programme will, under Dr Hadler's leadership, instigate many transversal collaborations within LIST, seeking for instance opportunities for terrestrial uses of space technologies developed within the programme. It will contribute to LIST's sustainability strategy and to the further positioning of Luxembourg's research at an international level." Says Thomas Kallstenius, CEO of LIST.

"Research and technology work into space resources is a growing part of ESA's Terrae Novae exploration programme, and the strong partnership with Luxembourg that has created ESRIC is a key part of our plan. Therefore, we are really looking forward to working with Kathryn to ensure that Europe's ambitions are soon turned into reality." Confirms David Parker, Director of Human and Robotic Exploration - ESA

"The work of ESRIC is critical for advancing the ESA Space Resource Strategy and preparing for the sustainable exploration of the Moon and Mars. The experience and competence of Dr. Hadler will

help ensuring that the technologies developed for space resources will contribute to building a circular economy on Earth." Reinforces Bernhard Hufenbach, Lead of Commercialisation and Innovation Team- ESA Directorate of Human and Robotic Exploration

"I am very pleased to see that Dr Hadler will be joining the European Space Resources Innovation Centre. "The PEARL grant from FNR will allow her to set up an ambitious research and innovation programme on sustainable utilisation of space resources, with important dual-use terrestrial ramifications - fully in line with the national research priorities", states Dr Marc Schiltz, CEO of the FNR.

About ESRIC

Based in Luxembourg, the European Space Resources Innovation Centre (ESRIC) fosters innovation and growth in the space resources industry by connecting leading academic, industrial and entrepreneurial talents. ESRIC's activities are based on four main pillars: space resources research and development; support for economic activities; knowledge management and community management. The Centre, launched in November 2020, is an initiative of the Luxembourg Space Agency (LSA) and the Luxembourg Institute of Science and Technology (LIST) in strategic partnership with the European Space Agency (ESA).

www.esric.lu

About FNR

The Luxembourg National Research Fund (FNR) is the main funder of research activities in Luxembourg. We invest public funds and private donations into research projects in various branches of science and the humanities, with an emphasis on selected core strategic areas. Furthermore, we support and coordinate activities to strengthen the link between science and society and to raise awareness for research. We also advise the Luxembourg government on research policy and strategy.

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Annex : Dr Hadler's Biography

Dr Kathryn Hadler is a chemical engineer with many years of experience in the mineral processing sector. She has been a Lecturer in the Department of Earth Science and Engineering, Imperial College London since 2011. Her research has a strong industrial focus, and she has carried out numerous experimental trials at processing plants around the world. In her main area of research, froth flotation, she developed an optimisation methodology that has been implemented worldwide. In



recent years, she has built a new research group in ISRU, translating terrestrial expertise to the space resources sector. She is lead of the ESA Topical Team on space resources.

Dr Hadler obtained her Masters in Engineering and PhD in Chemical Engineering from the University of Manchester. She has many years of teaching, supervision and public engagement experience and is passionate about using concepts from ISRU to improve mining on Earth.