



EMBARGOED UNTIL 9AM BST / 10AM CEST 9th JULY 2018

Big science and industry join forces to innovate new space technologies

9th July 2018: Grenoble, France / Germany – the Institut Laue-Langevin (ILL) and European Synchrotron Radiation Facility (ESRF) team up with leading European space companies OHB System AG and MT Aerospace AG to tackle industry challenges. They join forces to advance the characterisation of aerospace materials and make fabrication processes more efficient by probing matter with x-rays and neutrons.

Space exploration has led to many societal benefits that have vastly improved quality of life on Earth. The first satellites contributed critical knowledge and capabilities for telecommunications, global positioning, and advances in weather forecasting. Successful space exploration encompasses a broad range of missions requiring advanced systems and capabilities that will accelerate the development of many critical technologies, including advanced materials and structural concepts. Research innovating the materials behind space technologies as well as their manufacturing methods will pave the way for more successful space missions and applications for use on Earth. In 2016, the global space economy totalled [\\$345 billion \(€296 / £262 billion\) worldwide](#); developing innovative technologies is key to ensuring Europe continues to play an important role in this global and highly competitive sector.

Pooling European science and engineering resources for industry, across research techniques, is critical for innovation in space research, technology and its applications. This ethos is echoed in an agreement signed by the ILL and ESRF, establishing the intent to collaborate with leading European space companies OHB System AG and MT Aerospace AG to further the field. As the world's flagship neutron and synchrotron facilities, ILL and ESRF will unite their best-in-class resources, facilities and expertise to tackle challenges together with OHB System AG and MT Aerospace AG experts in the field of advanced characterisation of aerospace materials and fabrication processes. Together, the two sister companies boast more than 85 years of heritage in aerospace programs. Satellites by OHB System AG cover the whole range of satellite applications - from telecommunications, Earth observation, navigation, reconnaissance to exploration and science. MT Aerospace AG, a technological leader in light-weight metal and composite engineering, develops and delivers key components for Ariane launchers, aeronautics and space vehicles.

Requirements for space missions are broad and can include high-performance materials for vehicle structures, propellant tanks and propulsion systems; lightweight, deployable and inflatable structures for space infrastructures and crew habitats; and systems for reducing launch mass and volume of parts such as antennae and booms to be deployed in space. These requirements also therefore present several materials challenges – amongst which they also need to be durable and functional in a hostile environment.

To help further these studies, scientists and engineers are developing smarter materials and components to make more efficient devices and systems for space deployment. Mastering the methodologies that lead to new and better materials requires a detailed knowledge of their structure at the atomic or molecular level. As ILL's neutrons are non-destructive and can explore deep inside matter, they are an ideal probe for most materials. ESRF's high-energy non-destructive X-rays go far beyond lab-based X-ray beams, with their ability to penetrate deeply in large structures and provide atomic to micron-scale structural data using a huge range of techniques, including in-situ micro- and nano-computed tomography (CT).

Together the collaborators will conduct prototype manufacturing of new materials, progressing from multi-parameter studies through to qualifying models for testing and flight approval. Without the knowledge



from the deep-penetrating techniques provided by ESRF and ILL, many of these steps would have to be repeated from the beginning, wasting time and resources.

Working with ILL and ESRF will give OHB System AG and MT Aerospace AG access to a Non-Destructive Investigation (NDI) tool which will enable investigation of large complex parts such as brackets, valves or tank and structures on the one hand, and electronic components and circuit boards on the other.

“Europe operates the most powerful network of large scale materials characterisation facilities, among which the ESRF and ILL are the world-leading flagships for probing matter with X-rays and neutrons. Employing these tools for the benefit of Europe's space industry is an enormous opportunity to further develop Europe's competitiveness in this technology sector. The agreement with OHB System and MT Aerospace is laying the pioneering groundwork for fully seizing this opportunity”, says Professor Helmut Schober, Director of the ILL.

“It is essential for a satellite manufacturer to permanently innovate and develop new concepts, new systems and processes. The use of new materials and corresponding manufacturing processes represent key levers to improve performance, reliability, or cost efficiency of our space products. Since the quality requirements for our products are so challenging, the verification of material quality in all steps of space systems implementation plays an increasingly important role. The new methods and technologies developed by our scientific partners will help us stay at the forefront of satellite technology and systems”, says Andreas Lindenthal, COO of OHB System AG.

“The cooperation with ILL and ESRF is an important cornerstone within our development activities for competitive manufacturing technologies. The agreement will enable a most effective and innovative collaboration between space engineers and researchers in various future development projects. Neutron beams and synchrotron rays are outstanding investigation methods for new materials for satellites and launch systems. They give a much better understanding of material behaviour in correlation with modern manufacturing processes”, adds Roland Schneider, Vice President and Head of Technology Programs, MT Aerospace AG.

ILL will provide OHB System AG and MT Aerospace AG users with unique access to a complete world-leading suite of highly-specialised neutron instruments, supported by the expertise and know-how of experienced scientific and technical staff. The ILL's extensive range of sample environment facilities accurately mimic real working conditions: extreme temperatures and pressures, magnetic fields, mechanical constraints and therefore will play an essential role in the analysis of the in-operando industrial processes critical to accelerating their innovations. A dedicated group of engineers and scientists will also assist with all aspects of the project, from defining the problem, through data analysis and final experimental reporting.

A Memorandum of Understanding was signed between all Parties, to express their intention to establish potential collaborations in the field of advanced characterisation of aerospace materials and fabrication processes for peaceful means, in areas mutually agreed.

About ILL - the Institut Laue-Langevin (ILL) is an international research centre based in Grenoble, France. Funded by France, Germany and the United Kingdom, in partnership with 10 other European countries, it has led the world in neutron-scattering science and technology for almost 40 years. ILL operates one of the most intense neutron sources in the world, feeding beams of neutrons to a suite of 40 high-performance instruments. Research conducted at ILL covers a wide range of disciplines such as biology, (green) chemistry, materials science, condensed matter physics, as well as fundamental and nuclear physics. Within the framework of FILL2030 (a project funded by the European Union's Horizon 2020 research and innovation programme under grant agreement No 731096), the ILL is designing its



new business model to support the neutron users community with optimised services and financial resilience beyond 2030. www.ill.eu

About ESRF - the ESRF – the European Synchrotron – is the world-leading source of synchrotron X-rays and a centre of excellence for fundamental and innovation-driven research in condensed and living matter science. Based in Grenoble, France, and supported by 22 partner countries, the ESRF serves ~10000 scientists each year who study materials and living matter at the atomic and nanometric scale in all fields of research. In 2015, the ESRF launched the Extremely Brilliant Source project (EBS), an ambitious and innovative modernisation programme that will improve the brilliance and performance of the X-ray source by a factor of 100. Planned for completion in 2020, EBS will open a new era in X-ray science and for industry applications. www.esrf.fr

About OHB System AG - OHB System AG is one of the three leading space companies in Europe. It belongs to the listed high-tech group OHB SE, where around 2,400 specialists and system engineers work on key European space programs. With two strong sites in Bremen and Oberpfaffenhofen near Munich and more than 35 years of experience, OHB System AG specializes in high-tech solutions for space. These include small and medium-sized satellites for Earth observation, navigation, telecommunications, science and space exploration as well as systems for human space flight, aerial reconnaissance and process control systems. www.ohb-system.de

About MT Aerospace - MT Aerospace is an internationally respected company in the aerospace industry with around 700 employees at sites in Augsburg, Mainz (Germany), Cagliari (Italy) and Kourou (French Guyana). As a member of the listed European space and technology group OHB SE (Prime Standard, ISIN: DE0005936124), it develops and produces key components for the European Ariane launch vehicle, the Airbus fleet, space vehicles and flights. MT Aerospace is the technological leader in light-weight metal and composite engineering and, with a work share of around 10 percent, is the largest non-French components supplier for the Ariane program. www.mt-aerospace.de

About OHB SE - Domiciled in Bremen, OHB SE (ISIN: DE0005936124, Prime Standard) is Germany's first listed space and technology company. Two business units offer international customers sophisticated solutions and systems. With over 37 years of experience in high technology together with its integrated skills in the areas of space technology and telematics, OHB Group is ideally positioned as one of the leading independent forces in the European space, aeronautics and telematics industry. Total consolidated revenues came to EUR 860 million in 2017. www.ohb.de

For more information, please contact:

Nancy Williams, AprilSix Proof
nancy.williams@aprilsixproof.com
Direct: +44 (0)20 3141 2978
Mobile: +44 (0)73 8425 1997