

Space Compass and ESA to explore joint in-orbit demonstration of inter-satellite optical communication network

TOKYO / PARIS, 25 March 2025 --- Space Compass Corporation and European Space Agency (ESA) have signed a Memorandum of Intent (MoI) to jointly conduct the feasibility study of inter-operability of optical communication between each network under Japan's LAIDEN project and ESA's "High Throughput Optical Network" (HydRON) demo system.



Space Compass is leading the national project, the K-program LAIDEN project, which is overseen by the New Energy and Industrial Technology Development Organization (NEDO) for the development and demonstration of the Japanese Inter-satellite LEO Optical Communication Network System. As the project leader, Space Compass has established a project formation with the National Institute of Information and Communications Technology (NICT), AXELSPACE Corporation, and NEC Corporation. Space Compass also plans to conduct a connectivity demonstration test between LAIDEN constellation and its first commercial GEO satellite for Optical Data Relay Services, as a part of the in-orbit demonstration.

The High Throughput Optical Network (HydRON) project is ESA's initiative to enable the development and validation of the "Internet beyond Cloud(s)" technology integrated in terrestrial networks at terabit-per-second capacity, led by European and Canadian industry. The HydRON project is implemented under the ARTES 4.0 Strategic Programme Line "Optical and Quantum Communication – ScyLight" within ESA's Connectivity and Secure Communications. The HydRON Demonstration System developed in the HydRON project will be built by two industrial consortia led respectively by Kepler Communications Inc. (Canada) and Thales Alenia Space Italia S.p.A. (Italy).

ESA and Space Compass have a strong interest in exploring potential collaborative opportunities between HydRON project and K-Program LAIDEN project and its associated system including Space Compass's Optical Data Relay Services in relation

to the in-orbit optical network among multiple layers including GEO/MEO/LEO/Optical Ground Station.

The Mol includes 3 key objectives as below;

- 1) discussion concerning the technical feasibility to perform inter-operability tests
- 2) discussion concerning the joint test plan to verify and validate the inter-operability between both systems
- 3) the actual execution of the joint test plan

Space Compass's vision of "Space Integrated Computing Network" is to integrate and process various space networks using innovative communication and computing technologies. This collaboration regarding the optical network among multiple layers, along with the high data rate optical link standardization activities led by ESA (ESTOL*), will further accelerate the realization of our vision.

*ESTOL: ESA Specification for Terabit/sec Optical Links

"This partnership exemplifies ESA's commitment to fostering international collaboration in developing and demonstrating optical communications," said Laurent Jaffart, ESA Director of Connectivity and Secure Communications. "The project showcases how ESA Member States are driving, developing and demonstrating world-class and recognised optical communications technologies to the benefit of our industry and international partners."

"This Mol with ESA represents a crucial step towards realizing a truly global optical communication network," said Koichiro Matsufuji, Co-CEO at Space Compass. "By integrating Japan's LAIDEN project with ESA's HyDRON system, we are advancing the technical feasibility of high-speed, high-capacity data relay between multiple orbital layers. This partnership also aligns with our vision of a 'Space Integrated Computing Network,' where innovative communication and computing technologies converge to create a more connected and efficient space infrastructure."

About Space Compass

Space Compass is a joint venture company between NTT, Japanese Information and Communications Technology (ICT) leader, and SKY Perfect JSAT Corporation, Asia's largest satellite operator. We will launch a Space Integrated Computing Network to aid the realization of a sustainable society. For more information, visit our corporate website,

<https://space-compass.com/en/>

This project is one of the initiatives of space business brand under NTT Group's "NTT C89" and SKY Perfect JSAT's "JSAT".



<https://group.ntt/en/aerospace>



<https://www.skyperfectjsat.space/jsat/en>

About ESA's Optical and Quantum Communications – ScyLight programme

The European Space Agency (ESA) is Europe's gateway to space, coordinating the financial and intellectual resources of its Member States to conduct space programmes and activities. Part of Advanced Research in Telecommunications Systems (ARTES), the Optical and Quantum Communications – ScyLight programme focuses on advancing optical and quantum technologies to revolutionise satellite communications. ScyLight supports the research, development and utilisation of these technologies, for instance through the HydRON project for seamlessly integrating space assets into terrestrial communication networks. ESA is enabling future quantum communication networks with ultra-secure global connectivity by advancing space-based quantum key distribution and maturing technologies already available today.

Through supporting industry to develop and extend its manufacturing capabilities, ScyLight helps prepare European and Canadian industry stakeholders to seize related market opportunities.

Learn more at <https://connectivity.esa.int/optical-and-quantum-communications>