PRESS RELEASE #1

OCTOBER 2025

CARIOQA-PHB

CARIOQA Phase B: Space and Quantum experts from across EU advance mission to launch quantum sensors in Space

Toulouse, France — 15–16 October 2025. Leading quantum, space geodesy, Earth science and space technology experts from across the EU gathered at the French Space Agency (CNES) for the launch of Phase B of the CARIOQA project, the EU's Quantum Pathfinder Mission.

CARIOQA Phase A laid the groundwork for a Quantum Space Gravimetry Pathfinder Mission with a focus on evaluating system architectures, operational concepts, and the feasibility of critical components for both spacecraft and ground segments. Instrument Engineering Model hardware is now being delivered, and is due to be assembled in 2026. Meanwhile, mission feasibility has been successfully demonstrated by the European prime industrial contractors within the consortium.

Over the next 24 months, CARIOQA PHB will consolidate the mission concept and advance critical technologies for both the payload and satellite platform up to Technology Readiness Level (TRL) 6, demonstrating their maturity and readiness for integration into future space missions.

European leadership in quantum sensing

The EU has established global leadership in quantum sensing, with proven expertise covering ground-based, marine, and airborne applications. CARIOQA consortium partners have successfully deployed and tested cold atom–interferometric instruments on ships and aircraft, and demonstrated stand-alone systems operating in ground-based microgravity facilities, including drop towers and parabolic flight campaigns. Partners also achieved a major scientific breakthrough with the first Bose–Einstein Condensate (BEC) created in space, realised by Leibniz University Hannover (LUH) and the German Aerospace Center (DLR) on a sounding rocket mission.

For its part Exail, also part of CARIOQA, is currently the only industrial company to have developed a commercial quantum gravimeter. This proven ground-based technology will be adapted for space applications as part of the CARIOQA mission, marking a significant step forward in Europe’s leadership in quantum space instrumentation.

Funded by the European Union

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A European team, united on quantum sensing in space

CARIOQA-PHB brings together 14 European partners, including the French and German Space Agencies (CNES and DLR), alongside leading quantum research institutes, space geodesy and Earth science institutes and space industry partners from France, Germany, Italy and Spain. Building on the success of the collaborative approach established in previous phases, the consortium's combined expertise in quantum sensing and industrial development of space instruments will further consolidate European leadership in quantum space technologies.

About CARIOQA-PHB

CARIOQA-PHB will develop the preliminary mission concept, architecture, and critical technology maturation plan for the CARIOQA Quantum Space Gravimetry Pathfinder Mission. The project *will confirm* feasibility across space and ground segments and prepare the programme for subsequent development phases.

About the CARIOQA programme

Supported with funding from the Horizon Europe Programme, CARIOQA is a European initiative to demonstrate quantum sensing from space, paving the way for next-generation, gravimetry-based climate and Earth-system observations. The project aims to strengthen Europe's technological sovereignty in quantum technologies while advancing the global frontiers of space research.

The potential applications of this breakthrough quantum technology are immense — from mapping Earth's gravity field and monitoring the water cycle to assessing seismic risks. It will empower future space missions to deepen our understanding of Earth's dynamics, support sustainable resource management, and improve natural disaster prevention. In the longer term, CARIOQA will also open new frontiers in fundamental physics, including tests of the weak equivalence principle.

CARIOQA-PHB CONSORTIUM

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