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ANNOUNCEMENT

**“Made in Greece” Optical Satellite Link: Partnership Between the
National and Kapodistrian University of Athens and Aristotle University**

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The first optical communication experiments between the Greek ERMIS-3 nanosatellite and the Optical Ground Station on Mount Cholomon were highly successful. The ERMIS-3 nanosatellite was designed and built by the School of Aerospace Science and Technology at the National and Kapodistrian University of Athens (NKUA). The Optical Ground Station was developed by the Laboratory of Theoretical Mechanics and Astrodynamics of the School of Physics at Aristotle University of Thessaloniki (AUTH), in collaboration with Astrolight and the European Space Agency (ESA).

The collaboration between these two pioneering Greek universities—the School of Aerospace Science and Technology at NKUA and the School of Physics at AUTH—has achieved one of the first stable optical links worldwide between a nanosatellite (CubeSat) in Low Earth Orbit (LEO) and an Optical Ground Station (OGS) on Earth, using an infrared laser beam. This technology is considered secure and offers a promising solution for transmitting large volumes of data in the future. At the same time, this achievement marks the first successful optical link in Greece with a low-orbit satellite travelling at high speed across the sky.

The ATLAS-1 laser device aboard the Greek ERMIS-3 nanosatellite can currently transmit data at a rate of 1 Gbps, while the link budget indicates that the system could support rates of up to 10 Gbps. Both ATLAS-1 and the OGS on Mount Cholomon achieved “first light” during the satellite’s first active pass over the ground station. By the third pass, both systems had been fully calibrated and were operating autonomously, according to a predefined schedule, at both ends of the link. Since then, the satellite and the ground station have established two optical links per day on a regular basis.

Initial results show that the link's performance—in terms of duration, signal quality and reception stability—supports reliable data transmission at a level suitable for operational or commercial use. The system operates both day and night, even under partly cloudy skies, at low satellite elevation angles or when the optical line of sight is partially obstructed. The ground station received signals at elevation angles of less than ten degrees above the horizon, even when clouds or trees intermittently obstructed the optical path. Following appropriate calibration, link availability exceeded 85% of the available observation time.

Laser-based optical telecommunications are opening up new possibilities. According to the scientists involved, this technology will enable the transmission of vast amounts of data for 5G networks, artificial intelligence applications, inter-satellite links and highly secure government and military communications. They note that laser-based optical telecommunications offer the highest level of security for communications, particularly in national security and defence applications, as they cannot be intercepted. They also pave the way for Greece to develop advanced quantum telecommunications technologies, which only a small number of countries currently possess.

These successful experiments mark a milestone in the space collaboration between NKUA and AUTH. The laser transmitter aboard the satellite and the receiver at the ground station were built by the Lithuanian company Astrolight. The experiments received support from the European Space Agency (ESA), the Ministry of Digital Governance and the Hellenic Space Center.

NKUA Professors Vaios Lappas and Antonis Pashalis, scientific leads for the ERMIS project and the experiment, stated: "The ERMIS-3 nanosatellite ranks among the most advanced CubeSat-type satellites developed in Europe. Using ATLAS-1 as a laser communications terminal has led to a unique collaboration and the establishment of the first stable laser links from a nanosatellite worldwide. This achievement opens up new possibilities and significant opportunities for secure communications involving small satellites within the European ecosystem."

"This is an important milestone for our team and for optical communications in Greece, as it marks the first successful optical link from Greece, using our facilities on Mount Cholomon, with a satellite in Low Earth Orbit (LEO). What makes this achievement even more significant is that the link was established with the ERMIS nanosatellite, a mission developed in Greece by NKUA. We should also highlight that Astrolight's expertise and commitment to meeting our evolving needs proved invaluable to this joint effort," said Cleomenis Tsiganis, Head of AUTH's Space Situational Awareness (SSA) and Optical Ground Station (OGS) activities, Principal Investigator of the HoLOGS programme and Professor in the School of Physics. According to Frederic Rouesnel, Head of the ESA Office for the Implementation of Resilience Initiatives:

"This achievement demonstrates that Europe can deliver world-class innovation through close collaboration between industry, academia and institutions. For the first

time, an 8U CubeSat microsatellite developed by the University of Athens established a direct optical laser link with Earth, using a compact optical terminal developed by Astrolight and a corresponding receiver hosted at Aristotle University of Thessaloniki's Optical Ground Station on Mount Cholomon, as part of the National Space Programme. ESA is proud to have provided programme management, technical oversight and support throughout this journey, helping turn an ambitious idea into a pioneering demonstration of resilience in orbit."

The Minister of Digital Governance and Artificial Intelligence, Dimitris Papastergiou, stated: "The National Microsatellite Programme is turning Greece's investment in space into tangible technical expertise. The successful optical acquisition between a CubeSat and a national observatory demonstrates how Greek universities and technology companies can jointly leverage new infrastructure, multiplying the value of the national programme and paving the way for the satellite communications of tomorrow. At the same time, the programme offers the next generation of scientists and engineers valuable opportunities to train and gain hands-on experience with cutting-edge technologies."

The ERMIS programme forms part of the National Microsatellite Programme and is funded by the European Recovery and Resilience Facility (RRF – EU NextGenerationEU) and the Ministry of Digital Governance. It receives support from the European Space Agency (ESA) and the Hellenic Space Center.

Video: ERMIS Laser Optical Satellite Link <https://youtu.be/zXHgPp4wo2Y>

Further information about the Optical Ground Station on Mount Cholomon:

https://websites.auth.gr/ltma/en/hologs_1/

<https://www.satelliteevolution.com/post/astrolight-and-aristotle-university-of-thessaloniki-to-boost-europe-s-space-connectivity-with-new-op>

Further information about the ERMIS mission and video:

<https://www.aerospace.uoa.gr/erevnitika-erga.php>

<https://youtu.be/M8ndq8RLzjk>

Photographs of the experiments are attached.

Image 1 caption: View from the Optical Ground Station control dashboard. The satellite's laser emission can be seen in the centre of the middle image, above the trees, and in an enlarged view on the right. These are infrared cameras connected to the telescope. The lower panel displays the signal received by the detector, which remains stable and above the acceptable noise threshold for almost the entire duration of ERMIS's pass across the local sky.

We kindly request that this event be published, broadcast, and covered by the media.