



## **IPN Develops Payload to Map Earth's Magnetic Field from Space**

- **The mission, which will place Mexico on the international scientific map through the IPN, involves the Mexican Space Agency and is scheduled for the first half of 2027**
- **Project director Mario Alberto Mendoza Bárcenas of the IPN said the information gathered will help develop strategies to mitigate the impacts of natural phenomena linked to climate change**

The Instituto Politécnico Nacional (IPN), in scientific and technical collaboration with several national institutions, is designing and developing the THERMAG-1 (Thermal Magnetic 1) payload. The project aims to measure Earth's magnetic field for further analysis and correlation with atmospheric temperature changes aboard a low-Earth-orbit satellite mission scheduled for the first half of 2027.

Dr. Mario Alberto Mendoza Bárcenas, project director of THERMAG-1 and researcher and coordinator of Cooperation, Regulation, and Outreach at the IPN's Centro de Desarrollo Aeroespacial (CDA), explained that in light of the climate-related phenomena affecting the planet, the mission will make it possible to quantify magnetic variables for subsequent analysis and their relationship with atmospheric dynamics.

He noted that the information collected could also contribute in the long term to the development of strategies aimed at mitigating the effects of natural phenomena, particularly those associated with climate change.

The project, which also involves the Mexican Space Agency (AEM), forms part of the strategy promoted by President Claudia Sheinbaum Pardo's administration to strengthen science and technology, as well as initiatives supported by Secretary of Public Education Mario Delgado Carrillo.

In scientific terms, a "payload" refers to a scientific experiment; in this case, it is based on a sensor designed to measure Earth's magnetic field.



The scientific objective of THERMAG-1 is to measure Earth's magnetic field across its three axes from low Earth orbit to analyze geomagnetic variability and its correlation with climate change and other related natural phenomena.

The proposal also includes the integration of an X-band ground station in Mexico, which will enable the download of satellite data as it passes over national territory.

To better understand the complex relationship between Earth's core, the atmosphere, and the global climate system, researchers will use a triaxial magnetometer aboard a satellite orbiting at an altitude of 800 kilometers.

This will allow the collection of valuable data for studies related to monitoring the health of Earth's magnetic field — considered the planet's natural shield — as well as the influence of clouds and albedo, and the analysis of ocean currents. Through this effort, the IPN will contribute to positioning Mexico within the international scientific community.

Specialists from several IPN research units are participating in the design and development of the THERMAG-1 space project, including the Centro de Desarrollo Aeroespacial (CDA); the Centro de Investigación en Ciencia Aplicada y Tecnología Avanzada (CICATA), Altamira Unit; the Centros de Estudios Científicos y Tecnológicos (CECyT) No. 3 "Estanislao Ramírez Ruiz" and No. 19 "Leona Vicario"; as well as the Universidad Nacional Autónoma de México (UNAM), through its Instituto de Ciencias Aplicadas y Tecnología (ICAT); Universidad Marista de Mérida, A.C. (UMM); and Universidad Veracruzana (UV).

The design and integration of the ground station is also being carried out in collaboration with specialists from the Faculty of Telematics at the Universidad de Colima (UdeC), the Instituto Tecnológico de Tuxtla Gutiérrez of the Tecnológico Nacional de México (TecNM), and the Unidad de Investigación y Desarrollo Tecnológico (UNINDETEC) of the Mexican Navy Secretariat, based in Antón Lizardo, Veracruz.

**For more information, visit [www.ipn.mx](http://www.ipn.mx)**

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