Press release

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CALIPSO mission
10 years analysing clouds and aerosols

Ten years ago to the day, on 28 April 2006, the French-U.S. CALIPSO satellite was sent aloft from Vandenberg Air Force Base, California, atop a Delta II launcher to take up its place in the A-Train constellation. With CALIPSO set to celebrate 10 years of science measurements this June, it is time to reflect on a mission that has yielded a wealth of data offering new insights into the workings of Earth's climate system.

The CALIPSO mission (Cloud Aerosol Lidar and Infrared Pathfinder Satellite Observations) is intended to deliver measurements of the vertical profile of Earth's atmosphere from around the globe. The data collected on the location, altitude and optical properties of clouds and aerosols by the satellite's instruments—such as the Infrared Imaging Radiometer (IIR), France's contribution to the science payload—have enabled scientists to gain a closer understanding of climate mechanisms and the role of clouds and aerosols in climate change.

Results from CALIPSO have been published in more than 1,650 papers in the world's most prestigious international scientific reviews. This rich harvest of data has been especially beneficial to atmospheric science, the field of research pursued by climatologists that is focusing on the burning environmental issues of the day. In 10 years, CALIPSO has acquired more than 5.7 billion laser remote-sensing measurements to explore the vertical structure of the atmosphere and the properties of clouds and aerosols like dust, marine salt, ash and soot, as well as volcanic aerosols (for example, in 2010 CALIPSO's lidar was able to directly measure the altitude and extinction coefficient of aerosols from the erupting Eyjafjallajökull volcano in Iceland).

Originally planned to last three years, the CALIPSO mission has been extended several times, largely thanks to the quality of the design and development work undertaken by engineers at CNES, NASA and contractor Thales Alenia Space. The satellite is still in good working order and a further extension to 2018-2019 is envisioned.

CALIPSO was launched in tandem with NASA's CloudSat satellite, both satellites carrying similar instruments that employ the same operating principle. A pulse—of light from CALIPSO's lidar and a microwave signal from CloudSat's instrument—is bounced off the different layers of the atmosphere to sense their spectral signatures. The lidar is good at detecting thin clouds and aerosols, whereas the radar microwave instrument is more sensitive to thicker ice clouds. The two satellites are also part of the A-Train constellation of satellites that has produced a three-dimensional picture of Earth's atmosphere.

On 21 April, NASA's Langley Research Centre in Hampton, Virginia, celebrated the 10th anniversary of the satellites' launch a few days ahead of the anniversary date, in the presence of representatives from CNES and the Institut Pierre Simon Laplace (IPSL) in Guyancourt, the research institute, overseen by the French national scientific research centre - CNRS, that initiated the project. CNES will be celebrating the CALIPSO mission's anniversary on 9 June with NASA and science teams at an international workshop at the Maison des Océans in Paris.

More about the CALIPSO mission:
https://calipso.cnes.fr/fr/la-mission-calipso-fete-ses-10-ans

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