

NASA satellite captures first view of 'night-shining' clouds

June 29 2007



This image shows one of the first ground sightings of noctilucent clouds in the 2007 season. Credit: Veres Viktor of Budapest, Hungary taken on June 15, 2007.

A NASA satellite has captured the first occurrence this summer of mysterious iridescent polar clouds that form 50 miles above Earth's surface.

The first observations of these clouds by the Aeronomy of Ice in the Mesosphere (AIM) satellite occurred above 70 degrees north on May 25. Observers on the ground began seeing the clouds on June 6 over northern Europe. AIM is the first satellite mission dedicated to the study of these unusual clouds.

These mystifying clouds are called Polar Mesospheric Clouds, or PMCs, when they are viewed from space and referred to as "night-shining" clouds, or noctilucent clouds, when viewed by observers on Earth. The clouds form during the Northern Hemisphere's summer season that begins in mid-May and extends through the end of August. They are being seen by AIM's instruments more frequently as the season progresses. The clouds also are seen in the high latitudes of the Southern Hemisphere during the summer months.

Very little is known about how these clouds form over the poles, why they are being seen more frequently and at lower latitudes than ever before, or why they have been growing brighter. AIM will observe two complete polar mesospheric cloud seasons over both poles, documenting for the first time the entire, complex life cycle of PMCs.

"It is clear that PMCs are changing, a sign that a distant and rarified part of our atmosphere is being altered, and we do not understand how, why or what it means," stated AIM principal investigator James Russell III, Hampton University, Hampton, Va. "These observations suggest a connection with global change in the lower atmosphere and could represent an early warning that our Earth's environment is being altered."

The AIM instruments are returning valuable information on the global extent and variability of these clouds and preliminary information on their particle sizes and shapes. Early indications are that the clouds occur at high latitudes early in the season then move to lower latitudes as time progresses. The AIM science team is studying these new data to understand whether the changes in the clouds may be related to global climate change.

When the Northern Hemisphere summer season ends in mid- to late August, the AIM science team will not have to wait long before the Southern Hemisphere's season starts. This occurs about three months

later in mid- to late November. The Southern season lasts until approximately mid-March of 2008. Early results from the AIM mission will be reported at a major international conference focused on PMCs and other high altitude layered phenomena to be held at the end of August 2007 in Fairbanks, Alaska.

The satellite was launched on April 25, only four weeks before the first science observations began. During the satellite-commissioning phase and now in routine observations, all three state-of-the-art instruments have been working exceptionally well and returning high quality data.

The Cloud Imaging and Particle Size instrument offers a 2-D look at the clouds, collecting multiple views from different angles. The cameras are providing panoramic PMC images of the Arctic polar cap daily. The Solar Occultation For Ice Experiment is measuring new information on cloud particles: their variability with altitude, the chemicals within the clouds and the environment in which the clouds form. The Cosmic Dust Experiment is recording the amount of space dust that enters Earth's atmosphere to help scientists assess the role this dust plays in PMC formation.

The AIM mission coincides with the two-year, worldwide scientific community's International Polar Year, and the mission is expected to make unique contributions to the International Polar Year's objective of advancing polar research.

Source: Goddard Space Flight Center

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