

It Is Too Early To Be Santa's Sleigh, Isn't It?

20 December 2006



An unusual object was found on ESO Paranal MASCOT images in the morning of 18 December 2006. The whole sequence, seen above, shows how the object then takes the shape of a cloud that vanishes. Credit: ESO

Astronomers at ESO's frontline Paranal Observatory got a surprise on the morning of 18 December when looking at the observatory's all-sky camera, MASCOT. For about 45 minutes in the early morning, an object appeared first as a bright stripe then as a cloud that dissolved.

The discovery was made a little after 4 o'clock in the morning (7:00 GMT) by Christian Esparza, the operator of Antu, the first Unit Telescope (UT1) of ESO's Very Large Telescope who showed it to ESO astronomer Thomas Rivinius. Looking at the Mini All-Sky Cloud Observation Tool (MASCOT), Esparza was surprised by the presence of a nebular object.

MASCOT is the All-Sky Monitor of the Paranal Observatory. It delivers, every three minutes, images of the complete night-time sky, mainly to allow the detection of clouds.

"I went outside to make sure this was not an

optical effect," said Rivinius. "At the time I saw it, it had already taken the appearance of a cloud. In fact, it was as large and as bright as the Large Magellanic Cloud."

Having been convinced this was no fault on the camera, the astronomers went on a real detective chase to try to find out what the object could be. ESO's comet specialist Emmanuel Jehin quickly established that it could not be a meteor nor a comet. It was moving too slowly for a meteor - a meteor is seen for example on one of the images as a tenuous and fleeting streak - or for the International Space Station. Moreover, no other known satellite was supposed to pass above Cerro Paranal, in the Atacama Desert at that time. And why would the ISS or a satellite suddenly change shape from a bright point to a cloud?

Checking the Night Sky Live web site, the astronomers then found out that the same phenomenon had been observed with the all-sky camera located at the site of Gemini South at Cerro Pachon, also in Chile and 600 km south of Paranal. Using these observations and a simple triangulation technique used, for example, in land surveys, it was then possible to measure the distance of the object. It appeared that the object was about 6000 km high when first seen and about double that in the later images. The object was moving away from Earth at tremendous speed!

Given this close distance, an astronomical object seemed unlikely and the only remaining possibility left to the scientists was to consider if a rocket had been launched. And, eureka!, it was quickly discovered that the same morning, about one hour before the object was seen from Paranal, the Japanese Aerospace Exploration Agency (JAXA) had launched a H-IIA rocket carrying the KIKU No. 8 (ETS-VIII) engineering test satellite, one of the largest geostationary satellites in the world.

The launch took place from the Tanegashima Space Center at 3:32 p.m. on December 18, 2006, Japan Standard Time (that is 3:32 a.m. Chilean

time or 6:32 a.m. GMT). The launch vehicle flew smoothly, and, at 27 minutes and 35 seconds after lift-off, the KIKU No. 8 separation was confirmed. The Santiago station (in Chile) started receiving signals from the KIKU No. 8 at 4:27 a.m. Chilean Time.

Finally the mystery was solved: the object was most probably the 2nd stage of the launcher and the cloudy appearance at the end of the sequence most likely a dump of liquid fuel, made to avoid the explosion of the rocket in hundreds of scattered pieces, as a result of leftover fuel inside spent rocket stages. Having cracked the problem with his colleagues, Thomas Rivinius could finally go to sleep!

Source: ESO

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