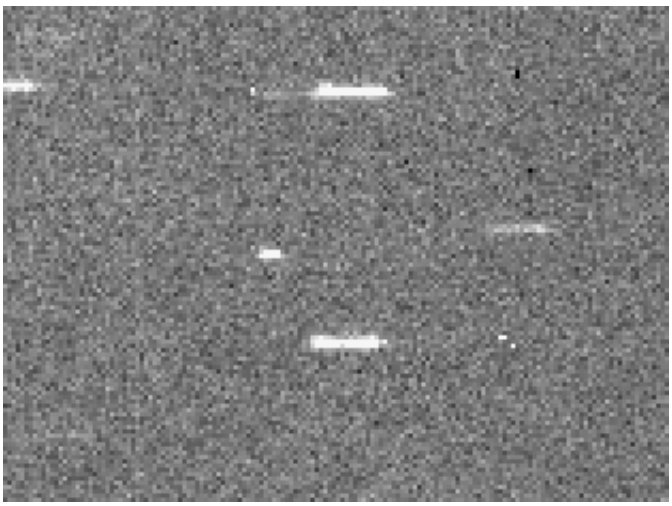
Reentry data will help improve prediction models

October 26 2015



Space object WT1190F observed on 9 October 2015 with the University of Hawaii 2.2-metre telescope on Mauna Kea, Hawaii. The expected 13 November 2015 re-entry of WT1190F, a suspected rocket body, poses very little risk to anyone but could help scientists improve our understanding of how any object – man-made or natural – interacts with Earth's atmosphere. Credit: B. Bolin, R. Jedicke, M. Micheli

A rare reentry of a suspected rocket body from a very high orbit next month offers an excellent opportunity to gather data to improve our knowledge of how objects interact with Earth's atmosphere.

The expected 13 November reentry of what is likely to be a rocket body poses very little risk to anyone but could help scientists improve our

understanding of how any object – man-made or natural – interacts with Earth's atmosphere.

Observing and studying the reentry will help improve orbital models and reentry prediction tools, and can be used by scientists studying near-Earth objects (NEOs), such as natural asteroids, or the orbital decay of artificial objects such as satellites.

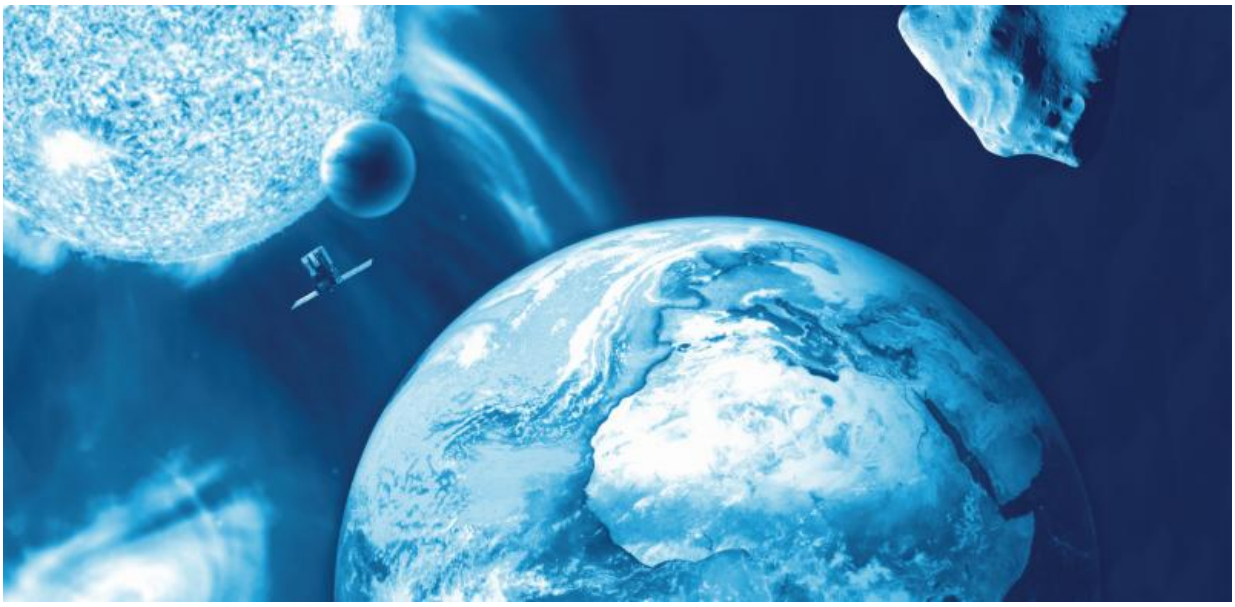
It was discovered by the Catalina Sky Survey in 2013 and has been observed several times since then by the same team, who have been sharing their data via the US-based Minor Planet Centre (MPC), the International Astronomical Union's official repository for such observations.

Man-made origins

As confirmed by experts at ESA's NEO Coordination Centre (NEOCC), ESRIN, Italy, the object, dubbed WT1190F, is thought to be a discarded rocket body; it is orbiting Earth every three weeks in a highly 'eccentric' – that is, non-circular – orbit.

"NEO experts have used observational data to estimate the object's density, which turns out to be much less than that of the solid rocky material that comprises many asteroids," says Detlef Koschny, responsible for NEO activities at ESA's Space Situational Awareness (SSA) programme office.

"This density is in fact compatible with the object being a hollow shell, such as the spent upper stage of a rocket body or part of a stage."



ESA's Space Situational Awareness programme supports Europe's independent utilisation of, and access to, space through the provision of timely and accurate information, data and services regarding the space environment, and particularly regarding hazards to infrastructure in orbit and on the ground. More via http://www.esa.int/ssa. Credit: ESA - CC BY-SA IGO 3.0

Forecast reentry next month

It is now predicted to reenter Earth's atmosphere in a few weeks, around 06:19 GMT (11:49 local; 07:19 CET) on 13 November 2015.

"The object is quite small, at most a couple of metres in diameter, and a significant fraction if not all of it can be expected to completely burn up in the atmosphere," says Tim Flohrer, from ESA's Space Debris Office at the ESOC operations centre in Darmstadt, Germany.

Whatever is left is expected to fall into the ocean about 100 km off the southern coast of Sri Lanka. Its mass is not sufficient to cause any risk to

the area, but the show will still be spectacular, since for a few seconds the object will become quite bright in the mid-day sky.

Tim says this object is rather special as it is likely man-made, but was discovered by an NEO monitoring system and its orbit has many similarities with an NEO orbit.

This enables ESA experts to predict the impact time and location quite precisely, well in advance, which is usually not possible in comparison with reentering space-debris objects.

The more observations, the better

During the next few weeks, the NEOCC will implement observational campaigns to collect as much data as possible on this object, explains Marco Micheli, as astronomer working at the NEOCC.

"The first goal will be to better understand the reentry of satellites and debris from highly eccentric orbits," he says.

"Second, it provides an ideal opportunity to test our readiness for any possible future atmospheric entry events involving an asteroid, since the components of this scenario, from discovery to impact, are all very similar."

Astronomers who may wish to observe the object are welcome to contact ESA's NEOCC for further information.

About Space Situational Awareness

The objective of ESA's SSA programme is to support Europe's independent utilisation of, and access to, space through the provision of

timely and accurate information and data regarding the space environment, especially regarding hazards to infrastructure in orbit and on the ground. In general, these hazards stem from possible collisions between objects in orbit, harmful space weather and potential strikes by natural objects, such as asteroids, that cross Earth's orbit.

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