

First results dealing with the impact of a celestial body on the planet Jupiter

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The Planetary Sciences Group at the UPV/EHU-University of the Basque Country (Spain) led by Professor Agustín Sánchez Lavega, has published the first results of research into one of the recent events that has sparked off maximum interest in the world of astronomy: the impact of a large-sized celestial body on the planet Jupiter last July.

Sánchez Lavega's work, in which the researchers of his group Santiago Pérez Hoyos and Ricardo Hueso have also participated alongside American scientists, has appeared in "*Astrophysical Journal Letters*", one of the most prestigious publications in the world of astrophysics and astronomy.

It was an amateur Australian astronomer who came across the presence of a large, black spot close to the polar region of the planet [Jupiter](#), the biggest in the Solar System, on 19 July last year. The impact had taken place at a very high latitude close to the planet's South Pole barely 3 or 4 hours before the spot was seen on Jupiter's dark side (in other words, at night), and this prevented it from being observed directly. The trajectory was in the opposite direction of the fragments of the Shoemaker-Levy 9 comet that crashed into Jupiter exactly 15 years previously, in July 1994.

After the world's large observatories had been alerted, the confirmation came through in a matter of hours that the spot consisted of the remains of ash left behind following the impact of a comet or asteroid. The world's main observatories, including the Hubble space telescope among others, immediately set about analysing the phenomenon. After several

months' work the first two papers dealing with the conclusions about the nature of the impact and its effect on the planet's atmosphere have been published.

The University of the Basque Country's Planetary Sciences Group has shared this science scoop with researchers from the United States in the journal *Astrophysical Journal Letters*, one of the most prestigious publications worldwide in the field of Astronomy and which has been in existence for over a century.

Results of the research

According to the studies, the main spot, a very black cloud comprising the waste materials produced by the impact, reached a size of about 5,000 km in the atmosphere of Jupiter, even though it was surrounded by a halo caused by the falling of the material expelled from the atmosphere of up to 8,000 km, slightly smaller than the size of the Earth. It is not known whether the thick cloud consisting of very fine particles (barely a thousandth of a millimetre) and very black, is a product of the waste materials of the object or whether these particles were produced by the extremely high temperatures generated by the impact in Jupiter's atmosphere.

Over the days that followed the ash was blown by Jupiter's winds -which are gentle at these latitudes- in a way similar to the ash being blown from the Icelandic volcano currently erupting. There are doubts as to whether the [celestial body](#) that crashed onto the surface of Jupiter was a comet or an asteroid. Assuming that it was of a comet type, -in other words, mainly made up of ice substances-, the size of the meteorite would have been in the region of 500 metres.

This second clearly detected impact on Jupiter seems to suggest that objects ranging between 0.5 and 1 km in size fall onto the planet more

frequently than originally thought: until now an impact was reckoned to take place on average once every 50 to 250 years, but with the new findings events like this one could well be occurring every 10 to 15 years.

The study of the impacts on planets helps us to get a better understanding of those that could happen on Earth. If this object had crashed into our planet, the result would have been cataclysmic. Fortunately there are few objects of this size close to us, and in some way Jupiter acts like a "protective umbrella", because its very strong gravity forcefully attracts towards itself roving objects that pass close by it in the solar system.

Provided by Elhuyar Fundazioa

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