Largest lunar impact caught by astronomers

Flash from meteor was bright enough to have been seen with the naked eye.

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24 February 2014



Spanish astronomers have reported the largest impact ever observed of a rock striking the Moon. According to the team, the impact's afterglow lasted a record eight seconds and could have been spotted with the naked eye; observers on Earth would have seen a bright light of almost the same magnitude as the North Star. The event took place on 11 September 2013 and is described in a paper published on 23 February in the *Monthly Notices of the Royal Astronomical Society*[1].

From the flash, which resulted from the glow of melting of meteor and lunar rock, the team deduced that the impact yielded the equivalent of 15 tonnes of TNT. That is three times higher than the previous record, which was measured in March 2013 by NASA scientists. The authors also estimated that the rock was between 0.6 and 1.4 metres wide and that it weighed about 450 kilograms.

The event was caught by the Moon Impacts Detection and Analysis System (MIDAS), a project that continuously monitors the Moon for impacts using telescopes situated in Seville and Toledo.

"It is a very bright, long, and energetic event: it is fair to say it is the brightest ever," says meteor physicist Peter Brown of the University of Western Ontario in London, Canada, who studied last year's massive Russian meteor but was not involved in the lunar observation.

The meteor fell on the Mare Nubium, a large volcanic basin. Researchers estimate that the resulting crater measures between 47 and 56 metres wide. "Hopefully a lunar probe may locate the crater and measure its size to learn more about the physics of these impacts," says Brown.

The observation changes previous estimates of how often rocks of that size hit the Moon, says José María Madiedo, an astronomer at the University of Huelva in Spain and a member of the team that reported the observation. "This means that impacts of that size may be more frequent than expected also on Earth." However, Brown points out that frequency estimates might be affected by the poor statistics available for such energetic events.

References

1. Madiedo, J. M., Ortiz, J. L., Morales, N. & Cabrera-Caño, J. Mon. Not. R. Astron. Soc. http://dx.doi.org/10.1093/mnras/stu083 (2014).