

Watch Asteroid 2016 VA pass through Earth's shadow

November 3 2016, by David Dickinson



An artist's conception of an asteroid passing near the Earth. NASA is getting better at spotting them and giving us advance warning of their approach. Credit: ESA

Holy low-flying space rocks, Batman.

Newly discovered asteroid 2016 VA snuck up on us last [night](#), and

crossed through the Earth's shadow to boot.

Discovered just yesterday by the Mount Lemmon Sky Survey based outside of Tucson Arizona, 2016 VA passed just 58,600 miles (93,700 kilometers) from the surface of the Earth this morning at 00:42 Universal Time (UT). That's a little over 20% of the distance from the Earth to the moon, and just over twice the distance to the ring of geosynchronous and geostationary satellites around the Earth.

This sort of close pass of a newly discovered asteroid happens a few times a year. What made 2016 VA's passage unusual, however, was its transit through the Earth's shadow. The discovery was announced yesterday by the Minor Planet Center, and astronomer Gianluca Masi soon realized that the Virtual Telescope Project had a unique opportunity to capture the asteroid on closest approach.

Gianluca Masi explained how the difficult capture was done:

"The image is a 60-second exposure, remotely taken with "Elena" (a PlaneWave 17" +Paramount ME+SBIG STL-6303E robotic unit) available at the Virtual Telescope project. The robotic mount tracked the extremely fast apparent motion of the asteroid, so stars are trailing. The asteroid is perfectly tracked; it is the sharp dot in the center, marked with two white segments. At imaging time, asteroid 2016 VA was at about 200,000 kilometers from us and approaching."



Asteroid 2016 VA. Credit: The Virtual Telescope Project

Catching a fast-moving asteroid such as 2016 VA on closest approach isn't easy. First off, there's an amount of uncertainty surrounding the orbit of a newly discovered object until more observations can be made. 2016 VA passed close enough to the Earth that our planet's gravity substantially altered the tiny asteroid's future orbit. Also, a house-sized Earth-crosser like 2016 VA is really truckin' across the sky on closest approach: 2016 VA was moving at 1500" a minute through Earth's shadow – that's 25" a second, fast enough to cross the apparent diameter of a Full moon in just 72 seconds.

Masi also notes:

"During its flyby, asteroid 2016 VA was also eclipsed by the Earth. We covered the spectacular event, clearly capturing the penumbral effects. The movie is an amazing document showing the eclipse. Each frame comes from a 5-second integration."

At an estimated 16 to 19 meters in size, 2016 VA shined at 13th magnitude as it crossed the southern hemisphere constellation of Sculptor on closest approach. It crossed through the Earth's shadow for 11 minutes from 23:23 to 23:34 UT last night, just over an hour before closest approach. You can see the dimming effect of the Earth's outer penumbral shadow in the video, just before the asteroid strikes the inner dark umbra and emerges back into eternal sunshine once again. Sitting on 2016 VA, an observer would have seen a total solar eclipse, as the bulk of the Earth passed between the asteroid and the Sun in an event not witnessed by the tiny world for thousands of years.



Watch as 2016 VA winks out as it hits Earth's shadow. Credit: The Virtual Telescope Project

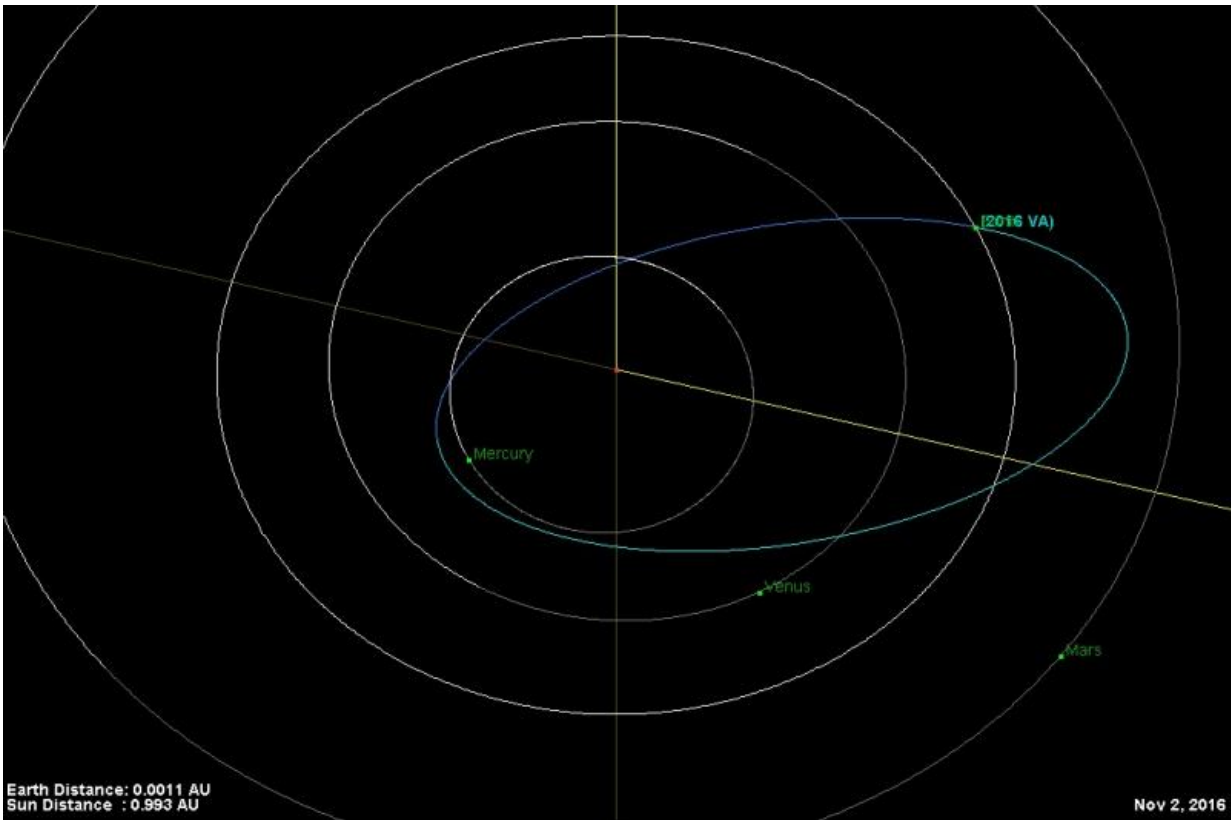
Such transits of asteroid through the Earth's shadow have been observed before: 2012 XE54 crossed through the Earth's shadow a few years back, and 2008 TC3 crossed through the Earth's shadow before striking the Nubian desert in the early morning hours of October 7th, 2008.

Satellites in geostationary orbit also pull a similar vanishing act right around either equinox as well.

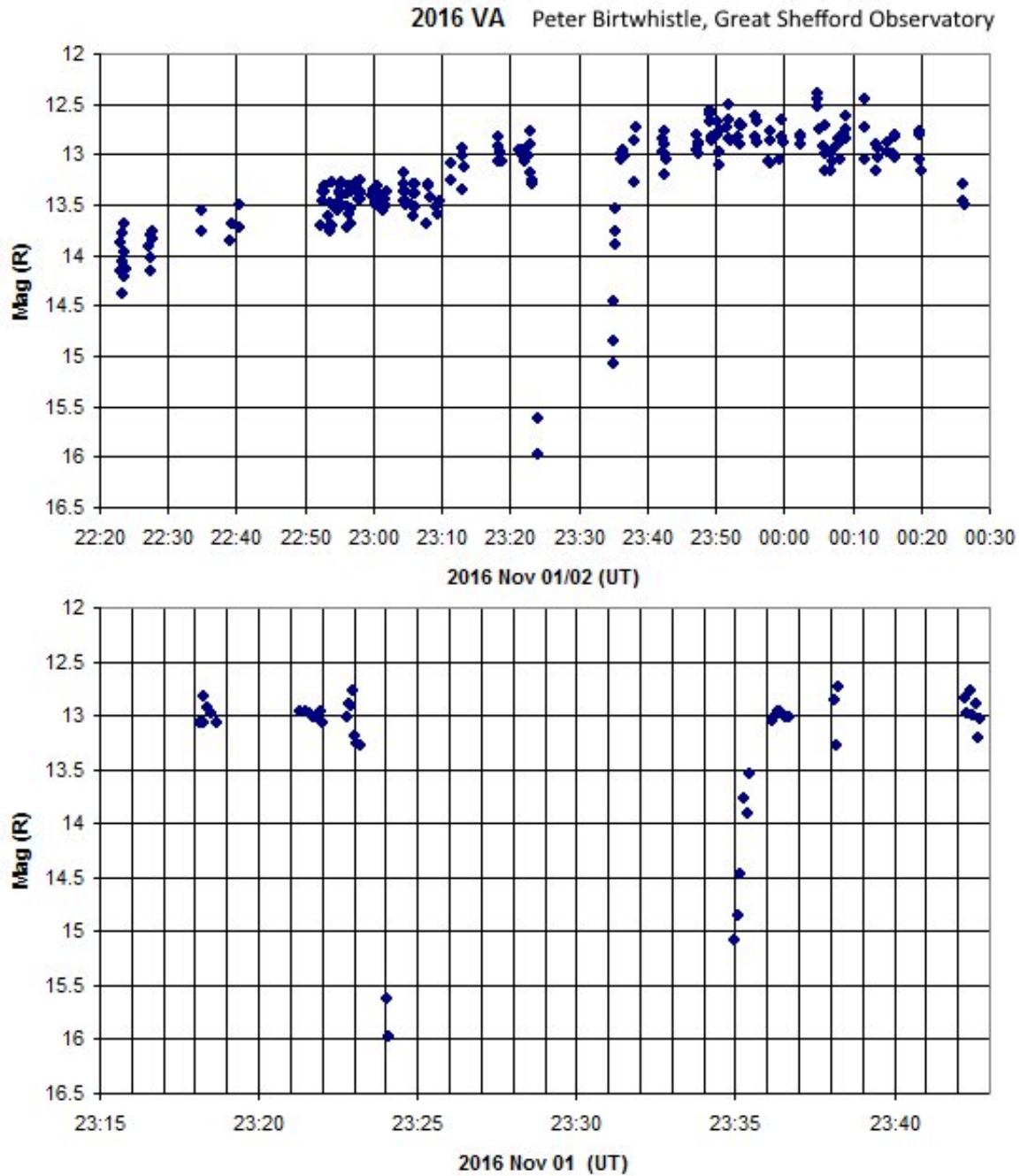
2016 VA is also a similar size to another famous space rock: the 20 metre asteroid that exploded over the city of Chelyabinsk the day after Valentine's Day in 2013. 2016 VA gave us a miss, and won't make another pass as close to the Earth again for this century.

To our knowledge, such a video capture of an asteroid crossing through Earth's [shadow](#) is a first, or at least the first that we've seen circulated on the web.

Congrats to the good folks at the Virtual Telescope Project for swinging into action so quickly, and providing us with an amazing view!



The orbit of 2016 VA. Credit: NASA/JPL



The light curve of 2016 as it passed through the Earth's shadow. Credit: Peter Birtwhistle, Great Shefford Observatory

Source: [Universe Today](#)

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