

Earth's new 'moon': What you should know

February 27 2020, by David Rothery



The Earth currently has two moons - but they won't look like this in the sky.
Author provided

The [Minor Planet Centre](#) has just announced that the Earth has been orbited [by a second moon](#) for the past three years or so. But while excitement about the discovery [is growing](#), it is important to keep in mind that this moon isn't as impressive as our main satellite. It is extremely faint—it is estimated to be only between one and six metres across—and won't be with us for much longer.

The body was first spotted by US astronomers [Theodore Pruyne](#) and

[Kacper Wierzchos](#) using a 1.52-metre (60 inch) telescope at [Mount Lemmon Observatory](#) near Tucson, Arizona on February 15.

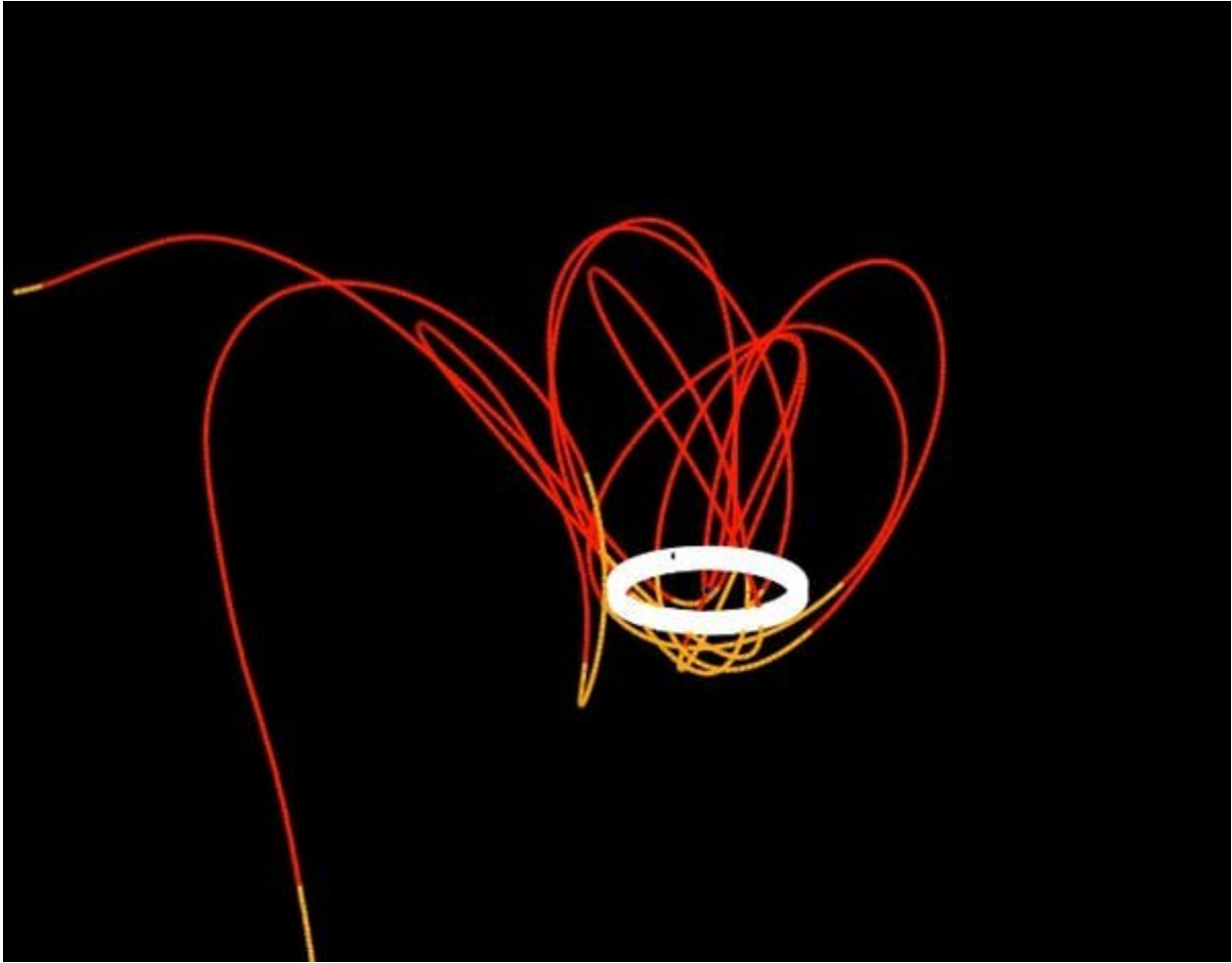
Subsequent observations enabled its orbit to be calculated, and at 22:53 Universal Time (UT) on February 25, the Minor Planet Center announced the discovery, designating it as 2020 CD₃ and confirming that it is temporarily bound to the Earth.

The object 2020 CD₃ is essentially just a tiny member of a class of [asteroids whose orbits cross the Earth's orbit](#). Occasionally, they come near or collide with the Earth, but in this case a collision would not have been a catastrophe for us because 2020 CD₃ is so small that it would have broken up in the atmosphere before reaching the ground.

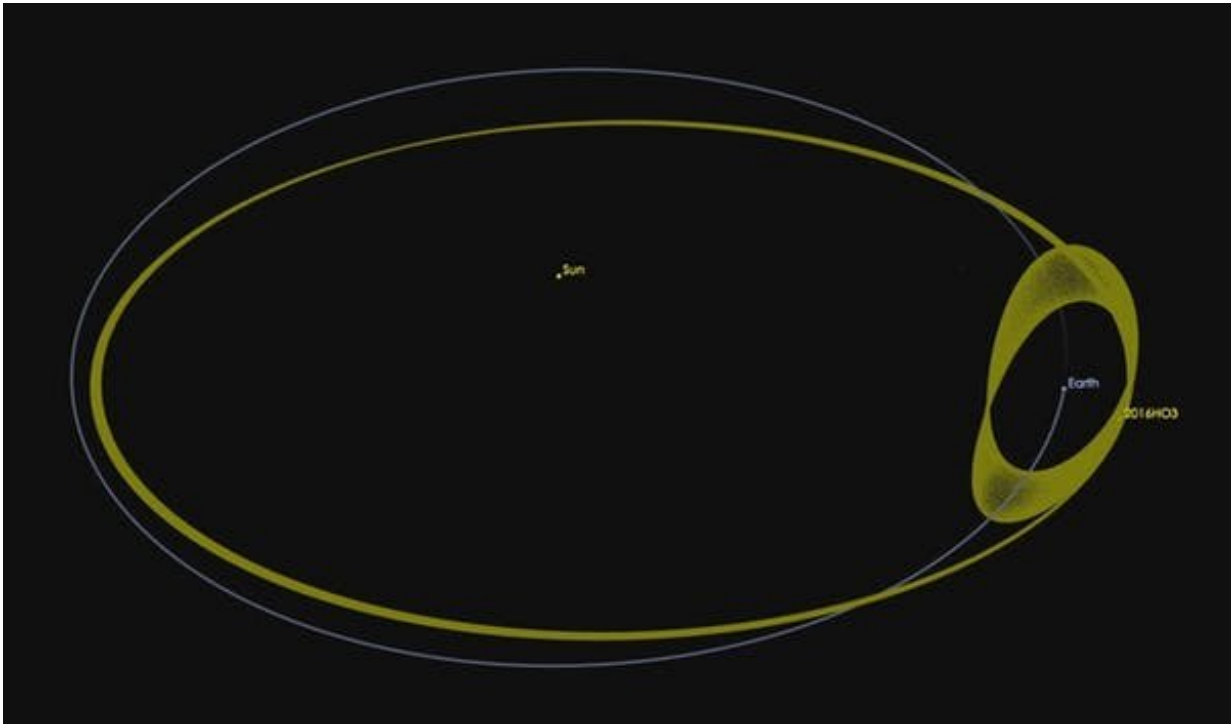
Instead of colliding with our planet, however, the initial approach of 2020 CD₃ towards the Earth meant that it was captured into orbit at a somewhat greater distance than our much larger, permanent moon.

So-called "mini-moons" like this one come and go, and 2020 CD₃ is probably already on its final loop before breaking free. [One study](#) has suggested that at any one time, the Earth is likely to be accompanied by at least one temporary mini-moon greater than one metre in size that makes at least one loop around the Earth before escaping.

None of these stays long, because gravitational tugs from our much larger permanent moon and the Sun make their orbits unstable. After being captured, they typically orbit the Earth for no more than a few years before breaking free to reclaim an independent orbit about the Sun.



Perspective view of the orbit of 2020 CD3 about the Earth. The white band is the orbit of Earth's main, permanent, moon. Credit: Tony873004



The orbit of asteroid 2016 HO3 relative to the Sun (big loops) and relative to the Earth (small loops). Credit: NASA/JPL-Caltech

Hard to predict

Once a mini-moon has been discovered, its orbit is impossible to predict exactly because bodies this small are pushed perceptibly by the Sun's radiation, and we know too little about their sizes, shapes and reflectivity to calculate the resulting effect. A previous visitor designated [2006 RH₁₂₀](#) made four orbital loops around the Earth between September 2006 and June 2007 before proceeding on its way. By now it will have traveled to the far side of the Sun, but will pass close to Earth again in 2028.

[Other claimed "moons"](#) of the Earth are asteroids whose orbital period

about the Sun averages out at exactly one year. So while they appear to have a relationship with Earth, they are actually just orbiting the Sun in company with, but independently of, the Earth.

These are known as "quasi-satellites" of the Earth. One of those, [1991 VG](#) seems to have made at least one genuine [orbit](#) of the Earth in 1992, and could well do so again in the future.

So while 2020 CD₃ is an interesting new discovery, don't expect a catastrophic collision or extra moonlight for that evening stroll. Nevertheless, for a while at least, our main [moon](#) has a very tiny cousin.

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