

More than 1,000 new asteroids discovered thanks to 'photobomb' phenomenon

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The Hubble Space Telescope is famous for its clear, eye-catching images of distant galaxies, but it has also been useful in helping to study objects within our own Solar System. Recently, researchers have gotten creative and found a way to use Hubble data to discover previously unknown asteroids, many of which are located in the main asteroid belt between Mars and Jupiter.

The team discovered a staggering 1,031 new asteroids. Many of them are small and extremely difficult to spot—hundreds of them are less than 1 kilometer in diameter, for example. To identify these asteroids, the researchers combed through 37,000 Hubble images taken over a 19-year period, looking for and carefully analyzing the characteristic streaks of light that come from asteroids passing by Hubble's lens.



To help process this massive amount of data, professional astronomers enlisted the help of a community of citizen scientists called the Hubble Asteroid Hunter. Together, they combed through the Hubble image archives to look for signs of asteroids. The team also used machine learning algorithms to detect signs of 'photobombs'—when an asteroid flies by and leaves a bright trail in a Hubble image. The team found a

surprisingly large number of objects.

'We are now looking more closely at small asteroids in the main belt,' said Dr Pablo García Martín from the Autonomous University of Madrid, Spain, lead author of the study. 'It was surprising to see such a large number of potential objects. There had been some hints about the existence of this population before, but now we are confirming it with a random sample from the Hubble image archive. This is important to provide insights into models of the evolution of the Solar System.'

By analyzing the shapes of the light trails in the images, especially those that appear over multiple exposures, astronomers can calculate the orbits and distances of asteroids. Then, by comparing the brightness of each object to its distance, their sizes can be estimated with relative accuracy.

'The location of asteroids changes over time, so you can't find them just by entering their coordinates, because at different times they may no longer be there,' explains study co-author Dr Bruno Merín, from the European Space Astronomy Centre in Madrid, Spain. *'As astronomers, we don't have enough time to look at all the asteroid images. So we came up with the idea of ??collaborating with more than 10,000 amateur volunteers to search through the huge Hubble archive, ' he says.*

Thanks to the combination of modern technology and the power of community, this research not only expands our understanding of the asteroid belt but also shows the great potential of open scientific collaboration in the era of big data.

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