Asteroid making its closest approach to Earth this week

February 2 2024

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On 4 February, asteroid 2011 MD will make its closest approach to the Earth. Though it will not be visible with the naked eye, the asteroid will pass 15,000,000 km away from Earth—much closer than those in the asteroid belt and less than 10% of the distance from Earth to its next nearest planet, Mars.

Described by NASA as a "Near Earth Asteroid," it orbits the sun every 396 days. Its orbit is 0.00 astronomical units (AUs) from Earth's orbit at its closest point. This means that its orbit is very close to Earth's orbit.

Asteroid 2011 MD will make another close approach to Earth in August this year. It was first was discovered by a pair of robotic telescopes in New Mexico that scan the skies for near-Earth asteroids.

Dr. Minjae Kim, Research Fellow, Department of Physics, University of Warwick, said, "2011 MD is one of several asteroids expected to make close approaches to Earth this year. Notable ones include 2020 BX12 passing close to the Earth on 19 February. 2022 YO1 follows in December 2024, coming within 0.014 AU.

"Despite frequent sensationalist media coverage about distant asteroids, real danger is often not present. For example, On April 13, 2029, the 1,100-foot-wide asteroid 99942 Apophis will pass closer than 20,000 miles from the surface, which is closer than some satellite orbits. However, it will not collide with our planet.

"Of course, if a significant asteroid threat were imminent, the public would be well-informed by Planetary Defense at NASA. So far, NASA hasn't issued a warning about a dangerous asteroid impact, as most celestial objects of interest pass by safely. In the event of an asteroid on a collision course with Earth, NASA would provide either a notification of a close encounter or a potential impact.

"While the likelihood of a direct hit on land is reduced due to Earth's vast oceans, the potential impact of an asteroid remains a serious concern. NASA continues to discover and track asteroids, with the goal of completing the survey of all significant NEOs (Near-Earth objects), an essential step in planetary defense. Also, the DART (Double Asteroid Redirection Test) mission was crucial in demonstrating our capability to

target and alter the orbit of an asteroid during a high-speed encounter.

"With its successful execution, DART has shown that we have the technology and expertise needed for asteroid deflection. Consequently, this significantly reduces concerns about potential asteroid threats.

"Asteroids can be detected in both visible and infrared images because they move across the sky with respect to stars. The most common method for detecting asteroids is through optical telescopes. These telescopes capture the light reflected from the asteroid. As asteroids move against the background of fixed stars, they can be identified by their motion across the sky.

"Some telescopes are designed to detect infrared light, which is heat radiation emitted by asteroids. Infrared telescopes are particularly useful for detecting dark asteroids, which do not reflect much visible light but emit infrared radiation.

"By analyzing an asteroid's orbit and dimensions using infrared telescopes, and understanding its composition through visible light, scientists can determine the probability of an impact and estimate the asteroid's mass. This evaluation is crucial in assessing potential threats and devising strategies to divert these space rocks from Earth's path, exemplified by missions like DART.

"Additional detection methods include radar observations, automated surveys, and the use of space-based telescopes such as the JWST. Collaborative networks and data sharing among amateur astronomers also play a significant role. In particular, amateur astronomers equipped with high-quality consumer telescopes and advanced image processing software, actively contribute to the discovery and tracking of new asteroids."

Provided by University of Warwick