

Will an asteroid collide with Earth?

By: **Germán Morales Chávez**

Every day, or almost every day, asteroids pass very close to Earth, which can be considered potentially dangerous because their orbits take them close to the orbit of our planet, which would imply that at some point they could collide with Earth. A limit of almost 20 times the distance from the Earth to the Moon has been assigned for this classification, which also takes into account the dimensions of the asteroid.

Identifying and cataloguing these objects in our Solar System is a task that in recent decades has received a greater push and several programs are dedicated to tracking the sky. This allows us to anticipate any impact situation that could occur, especially with asteroids that exceed 500 meters in size and would represent a serious threat to our society and us. An asteroid impact of a kilometre or more would imply a catastrophe of apocalyptic proportions. Although the Earth would not be affected, the conditions of the biosphere would be.

Life would continue, despite the possibility of mass extinction, life would once again develop the diversity and abundance that characterizes it. However, for the human being, the conditions could make him disappear, or in a less tragic scenario lead him to a pre-technological age similar to the Stone Age. We will not extend on the consequences of this collision at this time.

We have the possibility to anticipate any potential impact, especially if we have registered all those objects (a task that is not easy but that is being done). At the moment, in more than a century from today into the future, of all the catalogued asteroids and comets, there is not one that will hit Earth, but there are still many to discover. The survival of our species depends on it. Of course, it is not the only risk we face, but it is one of the most significant due to natural causes. To this we must add the pollution of the environment by various factors, the alteration of climatic conditions due to the excess of fossil fuels, etc. that the human being generates in his little conscious system of production and economic development, unconcerned of the consequences of putting profits and monetary benefit before respect and sustainable coexistence with nature.

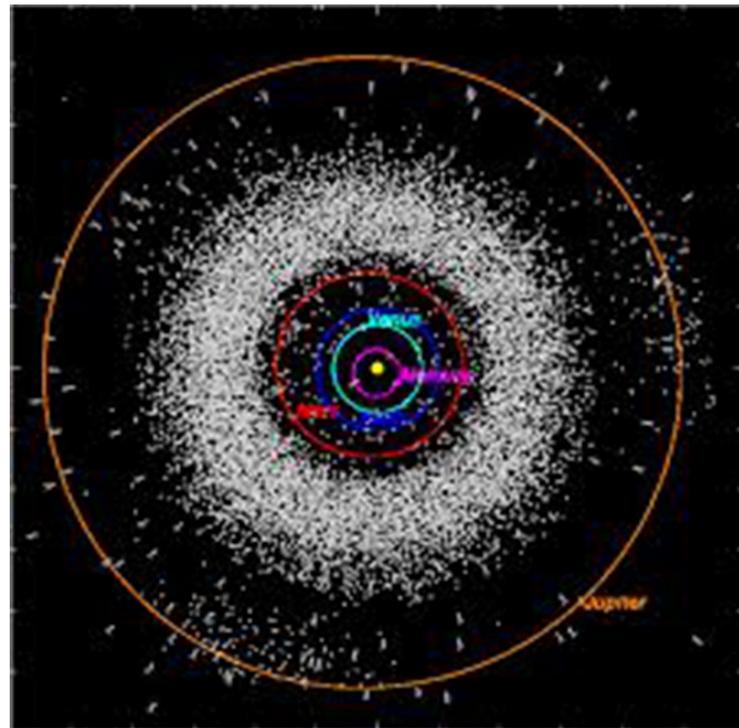


Fig. 1 Picture that represents the mean distance to the Sun of the known asteroids, the graph is not to scale, which determines such a dense point cloud, the real situation should not be confused. Most asteroids are between Mars and Jupiter. So far, those discovered exceed 100,000 asteroids in total. However, there are some groups that cross the Earth's orbit and that are those that may represent collision risks (approximately 25 thousand). Of these to date, 900 have been discovered that are larger than 1 km and almost half are in size less than 100 meters.

Nevertheless, what today may concern many: This September 1st, two asteroids will pass close to our planet. One of them will pass at 7 times the Earth-Moon distance, but the other will do so at a fraction of that distance; barely 20%, which implies that at its maximum approach it would be about 73 thousand kilometres. This taking the shortest distance due to uncertainties in the calculation. Nominally, its passing would be 142 thousand kilometres. The size of this asteroid (its name is 2011 ES4) is estimated between 24 and 49 meters, which is far from producing an impact with Hollywood-style consequences. Of course, objects like this, if they fall near a populated area, they could cause some serious damage. However, we will not speculate about it, since the closest possible distance of this object shows that there will be no collision.

In these next two months, 19 asteroids will pass close to the Earth. Another of them will have an approach to the Earth of 134 thousand kilometres, which means that there is also no possibility of an impact; this other asteroid has an estimated size between 11 and 25 meters. Of these 19 asteroids that will pass close to Earth in the indicated period, the largest is about 250 meters, which is somewhat more significant, but will pass more than 7 million kilometres away, almost at the limit of what it is considered potentially dangerous.

The media and social networks publish and spread these news, without an adequate explanation, or giving unclear numerical information for the understanding of non-specialists. This situation causes concern and alarm in people quite frequently.

As the reader will be able to understand from what is explained in this short note, there is no reason to be anxious, nor any reason to fear any catastrophe of this type. These asteroids will pass through the vicinity of our planet without us knowing it, they are so small that their brightness is so weak that they can only be detected with large instruments or ultra-sensitive photographic systems.

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(Translated by: Micaela Morales)

