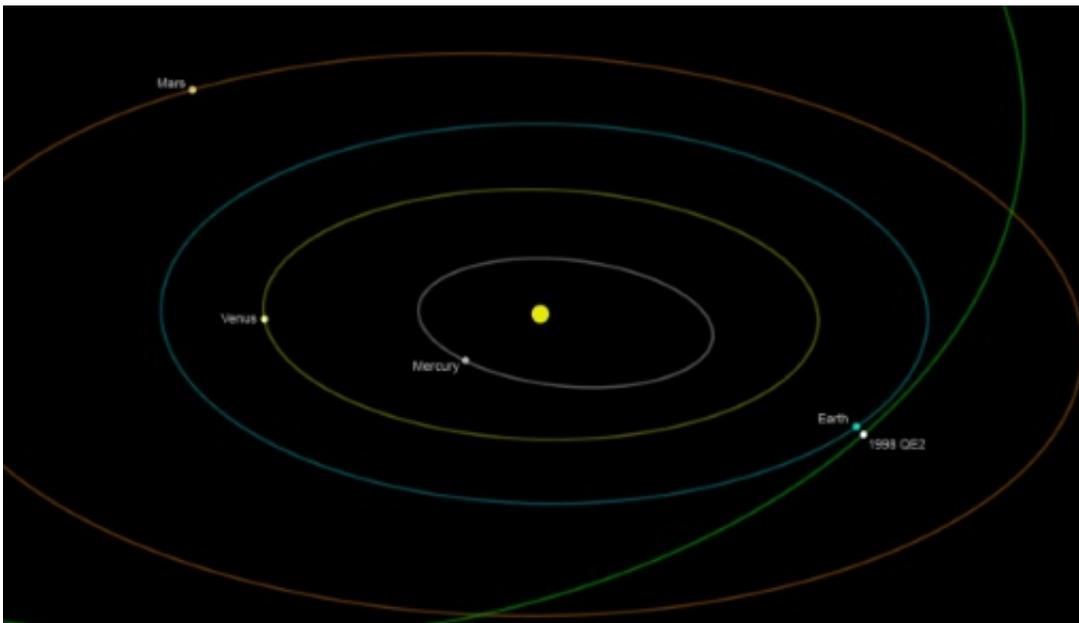


# Are asteroids humanity's 'greatest challenge'?

June 28 2017, by Mariëtte Le Roux

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Close encounter: NASA graphic showing asteroid 1998 QE2, which caused a brief scare when it skimmed past Earth in 2013. But one day a space rock is bound to be on target, say worried scientists

Throughout its 4.5-billion-year history, Earth has been repeatedly pummelled by space rocks that have caused anything from an innocuous splash in the ocean to species annihilation.

When the next big impact will be, nobody knows.

But the pressure is on to predict—and intercept—its arrival.

"Sooner or later we will get... a minor or major impact," Rolf Densing, who heads the European Space Operations Centre (ESOC) in Darmstadt, Germany, told AFP ahead of International Asteroid Day on Friday.

It may not happen in our lifetime, he said, but "the risk that Earth will get hit in a devastating event one day is very high."

For now, there is little we can do.

And yet, the first-ever mission to crash a probe into a small [space](#) rock to alter its trajectory suffered a major setback when European ministers declined in December to fund part of the project.

"We are not ready to defend ourselves" against an Earth-bound object, said Densing. "We have no active planetary defence measures."

Hitherto relegated to the realms of science fiction, tactics could include nuking an incoming asteroid, using lasers to vaporise it, sending a space "tractor" to drag it off course, or bumping it into a new direction.

But first, we need to be able to spot the threat.

Astrophysicists monitoring the risk classify objects into sizes ranging from a few millimetres to behemoths 10 kilometres (6.2 miles) across—the size of rock that wiped out non-avian dinosaurs some 65 million years ago.

The smallest type enter Earth's atmosphere daily, burning up prettily as shooting stars.

## **End of days**

The largest occur once every 100 million years, and the next impact could well ring in the end of human civilisation.

But when would it happen?

So far, experts have managed to list more than 90 percent of asteroids in the dino-killing range, and determined that none poses an immediate threat.

A much bigger concern is the whereabouts of millions of asteroids in the 15- to 140-metre (49- to 460-feet) range.

One such object, a 40-metre space rock, caused the largest impact in recent history when it exploded over Tunguska, Siberia, on June 30, 1908—the date on which Asteroid Day is marked.

The blast flattened some 80 million trees over 2,000 sparsely-populated square kilometres (772 square miles)—an area bigger than greater London.



The shockwave from the 2013 Chelyabinsk impact damaged thousands of buildings—many people were hurt from flying glass

Tunguska-sized events happen, on average, every 300 years or so.

"Imagine that this type of asteroid would fall in a very populated area like... Paris or Germany, I mean this is something that would be really, really a catastrophe," said Nicolas Bobrinsky, programme manager of the European Space Agency's Space Situational Awareness project, which surveys asteroids.

At least the ones it knows of.

The Chelyabinsk impact in 2013, for example, caught everyone

unawares.

A once-a-decade category rock of about 20m exploded in the atmosphere over central Russia with the kinetic energy of some 27 Hiroshima bombs.

The resulting shockwave blew out the windows of nearly 5,000 buildings and injured more than 1,200 people.

"Now that we have discovered most of the (asteroids) that are about a kilometre in size and larger, the goal is to discover most of the ones which are (up to) about 140 m," said Patrick Michel, an astrophysicist with France's CNRS research institute.

"This is the threshold—if an object of this size impacts the Earth—for regional damage at the scale of a country or a continent."

Another unknown is long-period comets: wanderers of the Solar System which can take centuries or millennia to orbit the Sun, and whose passage has never been recorded.

## **Eye on the sky**

Europe is setting up a network of telescopes to provide us with a heads-up.

Scheduled for completion in about two years, it "will scan systematically the sky every night and any asteroid which is coming... would be detected with a warning time of approximately two to three weeks," said Bobrinsky.

This is admittedly "not much, but it's better than what we have now," he added.

At the very least, it would allow for cities to be evacuated, or a shockwave warning to be issued.

"Contrary to all other natural risks that we face on Earth, like tsunamis, earthquakes and things like that, this is the only one that we can predict," Michel said.

What is needed is cooperation between politicians and space agencies—and especially money.

An [asteroid deflection](#) system would require "something in the order of 300-400 million euros" (dollars), according to Bobrinsky—a minuscule amount compared to the cost of disaster.

The United Nations declared June 30 International Asteroid Day to raise public awareness about what event organisers describe as "humanity's greatest challenge".

It was initiated by astrophysicist and Queen guitarist Brian May, and moviemaker Grigorij Richters who directed the sci-fi film 51 Degrees North about an asteroid headed for London.

The initiative has the backing of dozens of scientists, astronauts, and celebrities, many of whom will take part in a special 24-hour live broadcast Friday, with round-the-clock asteroid programming by the European, Japanese and American space agencies.

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