



Close Encounter: Earth-Asteroid Near Miss

11:21am UK, Wednesday March 04, 2009

The Earth has had a near miss this week when a huge asteroid whizzed past, less than 50,000 miles away.

The asteroid - about the size of a 10-storey building - flew past the Earth at roughly twice the distance of the highest Earth-orbiting satellites, according to website space.com.

Asteroid 2009 DD45 was closest to the earth on Monday at around 8.30am, at just under 45,000 miles above the surface of the planet. Astronomers knew it was coming after it was spotted last Saturday as a faint dot showing up in pictures at the Siding Spring Observatory in Australia.

The closest listed "flyby" to Earth by an asteroid happened in March 2004 when a small one - 2004 FU162 - measuring about 20 feet across came within about 4,000 miles of the earth.

There was never any risk of collision, experts said, but anything flying within 50,000 miles of the Earth is taken very seriously.



The asteroid had been spotted by astronomers monitoring the skies

It is similar in size to a rock that exploded above the **Tunguska River in Siberia** on 30 June 1908 at 07:17 am, flattening 80 million trees across an 800 square mile area. The impact had the force of a thousand atomic bombs, astronomers say.



Definitions

A **meteoroid** is a small sand- to boulder- sized particle of debris in the Solar System. The visible path of a meteoroid that enters Earth's atmosphere is called a meteor, or commonly a "shooting star" or "falling star". If that meteor is brighter than any of the planets in the sky, it is deemed a fireball (also called a bolide). A blazing bolide can create a sonic boom that can be heard up to 30 miles away.

A meteor that reaches the ground, is called a meteorite. Many meteors are part of a meteor shower. The root word meteor comes from the Greek *meteōros*, meaning "high in the air".

Many meteoroids are formed by impacts between asteroids or left in trails behind comets. Meteoroids are also known to have been ejected by impacts on the Moon or Mars as some meteorites from these bodies have been identified.

Asteroids, sometimes called minor planets or planetoids, are small Solar System bodies in orbit around the Sun; they are smaller than planets but larger than meteoroids.

The term "asteroid" has historically been applied primarily to bodies in the inner Solar System since the outer Solar System was poorly known when it came into common usage. Most of them orbit the sun in the asteroid belt between Mars and Jupiter.

The distinction between asteroids and comets is made on visual appearance: Comets show a perceptible coma while asteroids do not.

A **comet** is a Small Solar System Body that orbits the Sun and, when close enough to the Sun, exhibits a visible coma (atmosphere) or a tail — both primarily from the effects of solar radiation upon the comet's nucleus.

Comet nuclei are themselves loose collections of ice, dust and small rocky particles, measuring a few kilometres or tens of kilometres across.

Fireball in 2008 linked to the breakup of a comet in 1920

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In a forthcoming paper in *Monthly Notices of the Royal Astronomical Society*, an international team of astronomers link a brilliant fireball seen on 11 July 2008 to the break up of Comet C/1919 Q2 Metcalf in 1920.

Last July, people in Spain, Portugal and France watched the brilliant fireball produced by a boulder crashing down through the Earth's atmosphere. At maximum intensity, it was 150 times brighter than the full moon. It was first picked up by the SPMN above Bejar in the western part of Spain at a height of about 61 miles (98 kilometers) and disappeared from view at about 13 miles (21 kilometers) above the surface of the Earth.

In a paper to be published in the journal *Monthly Notices of the Royal Astronomical Society*, astronomers Josep M. Trigo-Rodríguez (Institute of Space Sciences, CSIC-IEEC, Spain), José M. Madiedo (University of Huelva-CIECEM, Spain) and Iwan P. Williams (Queen Mary, University of London) present dramatic images of this event.



Image: J. Madiedo, University of Huelva-CIECEM, Spain

The scientists go on to explain how the boulder may originate from a comet which broke up nearly 90 years ago and suggest the tantalising possibility that chunks of the boulder (and hence pieces of the comet) are waiting to be found on the ground.

It has been proposed that comets consist of large boulders glued together by a mixture of smaller particles and ice. If the nucleus of the comet disintegrates, the boulders are set loose in space. Finding chunks of the Bejar bolide could help confirm this theory. "Handling pieces of the comet would fulfill the long-held ambitions of scientists — it would effectively give us a look inside some of the most enigmatic objects in the solar system," Trigo-Rodríguez said.

Two of Earth's Meteor Craters

Wolf Creek – Australia

the Wolf Creek crater (located in north-central Australia), is young and well-preserved. With a rim that tops out at 82 feet (25 meters) from ground level, this crater was carved out only about 300,000 years ago when a big lump of iron, at approx. 50,000 tons in size, hit the Earth.



Barringer – United States

The Barringer Meteorite Crater in Arizona is almost 1 mile (1.6 kilometers) wide and 570 feet (174 meters) deep. Originally thought to be of volcanic origin, it was later discovered that the crater was formed by a meteorite just 50,000 years ago – not very long ago by geologic standards.

