



It weighed about 10,000 tons, entered the atmosphere at a speed of 64,000 km/h and exploded over a city with a blast of 500 kilotons. But on 15 February 2013, we were lucky. The meteorite that showered pieces of rock over Chelyabinsk, Russia, was relatively small, at only about 17 metres wide. Although many people were injured by falling glass, the damage was nothing compared to what had happened in Siberia nearly one hundred years ago. Another relatively small object (approximately 50 metres in diameter) exploded in mid-air over a forest region, flattening about 80 million trees. If it had exploded over a city such as Moscow or London, millions of people would have been killed.

By a strange coincidence, the same day that the meteorite terrified the people of Chelyabinsk, another 50m-wide asteroid passed relatively close to Earth. Scientists were expecting that visit and know that the asteroid will return to fly close by us in 2046, but the Russian meteorite earlier in the day had been too small for anyone to spot.

Most scientists agree that comets and asteroids pose the biggest natural threat to human existence. It was probably a large asteroid or comet colliding with Earth which wiped out the dinosaurs about 65 million years ago. An enormous object, 10 to 16 km in diameter, struck the Yucatan region of Mexico with the force of 100 megatons. That is the equivalent of one Hiroshima bomb for every person alive on Earth today.

Many scientists, including Stephen Hawking, say that any comet or asteroid greater than 20 km in diameter that hits Earth will result in the complete destruction of complex life, including all animals and most plants. As we have seen, even a much smaller asteroid can cause great damage.

The Earth has been kept fairly safe for the last 65 million years by good fortune and the massive gravitational field of the planet Jupiter. Our cosmic guardian, with its stable circular orbit far from the sun, sweeps up and scatters away most of the dangerous comets and asteroids which might cross Earth's orbit. After the Chelyabinsk meteorite, scientists are now monitoring potential hazards even more carefully but, as far as they know, there is no danger in the foreseeable future.

#### Types of space rocks

**Comet** - a ball of rock and ice that sends out a tail of gas and dust behind it. Bright comets only appear in our visible night sky about once every ten years.

**Asteroid** - a rock a few feet to several kms in diameter. Unlike comets, asteroids have no tail. Most are too small to cause any damage and burn up in the atmosphere. They appear to us as 'shooting stars'.

**Meteoroid** - part of an asteroid or comet.

**Meteorite** - what a meteoroid is called when it hits Earth.

