

# Sky fall: Meteorites strike Earth every few months

February 15 2013, by Frank Jordans

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In this photo provided by Chelyabinsk.ru a meteorite contrail is seen over Chelyabinsk on Friday, Feb. 15, 2013. A meteor streaked across the sky of Russia's Ural Mountains on Friday morning, causing sharp explosions and reportedly injuring around 100 people, including many hurt by broken glass. (AP Photo/Chelyabinsk.ru)

(AP)—A meteor exploded in the sky above Russia's Ural Mountains on Friday, causing a shockwave that blew out countless windows and injured hundreds of people with flying glass. Here's a look at those

objects in the sky:

Q. What's the difference between a meteor and a meteorite?

A. Meteors are pieces of space rock, usually from larger comets or asteroids, which enter the Earth's atmosphere. Many are burned up by friction and the heat of the atmosphere, but those that survive and strike the Earth are called meteorites. They often hit the ground at tremendous speed—up to 30,000 kilometers an hour (18,650 mph)—releasing a huge amount of energy, according to the European Space Agency.

Q: How common are meteorite strikes?

A: Experts say smaller strikes happen five to 10 times a year. Large meteors such as the one Friday in Russia are rarer, but still occur about every five years, according to Addi Bischoff, a mineralogist at the University of Muenster in Germany. Most of them fall over uninhabited areas where they don't injure humans.

Q: How big was Friday's bang in Russia, and why did it cause so many injuries?

A: Alan Harris, a senior scientist at the German Aerospace Center in Berlin, said most of the damage would have been caused by the blast—or blasts—as the meteor broke up in the atmosphere. The rapid deceleration of the meteor released a huge amount of energy that would have been heard and felt many miles away. Witnesses say it shattered windows and sent loose objects flying through the air.

While estimates of the mass of the meteor range from 10-100 tons, and it is still unclear if it was made of rock or iron, "the explosive force of the airburst might have been some 10 kilotons of TNT," said Harris. But he noted that since the blast occurred several miles above the Earth, the

damage isn't comparable to an explosion of that magnitude on the Earth's surface.

By comparison, the U.S. bomb dropped over Hiroshima during World War II had an explosive force of about 15 kilotons, but it detonated just 2,000 feet above a densely populated city.

**Q:** Is there any link between this meteor and the asteroid fly-by taking place later Friday?

**A:** No, it's just cosmic coincidence. According to NASA, the trajectory of the Russian meteorite was significantly different than that of asteroid 2012 DA14. "In videos of the meteor, it is seen to pass from left to right in front of the rising sun, which means it was traveling from north to south. Asteroid DA14's trajectory is in the opposite direction, from south to north," the U.S. space agency said.

**Q:** When was the last comparable meteorite strike?

**A:** In 2008, astronomers spotted a meteor similar to the one in Russia heading toward Earth about 20 hours before it entered the atmosphere. It exploded over the vast African nation of Sudan, causing no known injuries.

The largest known meteor in recent times caused the "Tunguska event"—flattening thousands of square miles of forest in remote Siberia in 1908. Nobody was injured by the meteor blast, or by the Sikhote-Alin meteorite that fell in eastern Siberia in 1947.

Scientists believe that a far larger meteorite strike on what today is Mexico's Yucatan Peninsula may have been responsible for the extinction of the dinosaurs about 66 million years ago. According to that theory, the impact would have thrown up vast amounts of dust that

blanketed the sky for decades and altered the climate on Earth.

Q: What can scientists learn from Friday's strike?

A: Bischoff says scientists and treasure hunters are probably already racing to find pieces of the meteorite. Some meteorites can be very valuable, selling for up to \$670 per gram, depending on their origin and composition. Because meteors have remained largely unchanged for billions of years—unlike rocks on Earth that have been affected by erosion and volcanic outbreaks—scientists will study the fragments to learn more about the early universe.

Harris, of the German Aerospace Center, says some meteorites are also believed to carry organic material and may have influenced the development of life on Earth.

Q: What would happen if a meteorite hit a city?

A: A blast at low altitude or on the surface would result in many casualties and cause serious damage to buildings. The exact extent would depend on many factors, including the mass of the meteorite, its speed and composition, said Harris.

Scientists have been discussing for several years how to prepare for such an event—however remote. European Space Agency spokesman Bernhard von Weyhe says experts from Europe, the U.S. and Russia are working on way to spot potential threats sooner and avert them. But don't expect a Hollywood-style mission to fly a nuclear bomb into space and blow up the asteroid, like the movie "Armageddon."

"It's a global challenge and we need to find a solution together," he said. "But one thing's for sure, the Bruce Willis 'Armageddon' method won't work."

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