

# Science Says: That Michigan meteor could have been meatier

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In this late Tuesday, Jan. 16, 2018, image made from dashcam video, a brightly lit object falls from the sky above a highway in the southern Michigan skyline. (Zack Lawler/WWMT via AP)

The fireball that streaked through the Michigan sky put on quite a show but as far as potentially killer space rocks, it was merely a flash in the pan.

There are much bigger asteroids careening through our solar system. Scientists who watch for them hope they spot them in time to get people

out of the way if a truly dangerous one is heading straight to Earth.

So far, one isn't coming.

Just as Tuesday's meteor lit up the Michigan skies, about 30 scientists were gathered in California to discuss the biggest meteor hit in modern history—the 1908 explosion over Tunguska, Russia, that flattened 800 square miles (2,100 square kilometers) of forest.

And that's nothing compared to what happened 65 million years ago when a 6-mile-wide (10 kilometer) asteroid that caused 70 percent of life on Earth to go extinct, including many dinosaurs.

"There are no Earth-crossing asteroids of that size in the solar system today," said NASA senior scientist David Morrison, a space [rock](#) expert who organized the California workshop.

Since the 1990s, NASA has been conducting the Spaceguard survey looking for those large asteroids. So far, astronomers can rule out rocks bigger than 3 miles wide (5 kilometers), Morrison said.

Still, "something as small as 2 kilometers (1.2 kilometers) could really ruin your whole day for the whole Earth" and maybe kill three-quarters of the people but "wouldn't be extinction," he said.

Tuesday's 6-foot-wide (2 meters) Michigan rock was too small to be tracked. It exploded in the air with the power of 100 tons of TNT, said Bill Cooke of NASA's Meteoroid Environment Office. Scientists will now try to figure out where it came from.

A meteoroid is a small chunk of asteroid or comet. When it enters Earth's atmosphere it becomes a meteor or fireball or shooting star. The pieces of rock that hit the ground, valuable to collectors, are meteorites.

Doppler weather radar shows flashes that indicate meteorites are on the ground northwest of Detroit, Cooke said.

For comparison, the fireball that shook Chelyabinsk, Russia, in 2013 was 60 feet wide (20 meters). It shattered windows and injured 1,600 people because of flying glass. It expelled 4,700 of times more energy than the Michigan one, Cooke said.

That one "came out of the sun at us like the Red Baron. It was too close to be picked up," he said.

There are nine asteroids NASA is tracking for "potential future Earth impact" but none of them are likely to hit.

Eventually, scientists hope to have a defensive system, especially for rocks bigger than 165 feet wide (50 meters).

"We do have the basic technology to deflect an asteroid. We haven't done it yet, but some of it is fairly basic physics. Like running into it with a spacecraft," said Ed Lu, a former astronaut and head of the B612 Asteroid Institute, which works to protect Earth from being hit by space rocks.

Once astronomers spot a space rock heading into our planet, they can calculate where on Earth it should hit, said Morrison said.

"Probably the most useful thing we could do is evacuate the target area," he said.

The world's [space](#) agencies and astronomers have agreed on guidelines for warning and possible action if scientists spot [space rocks](#) 33 feet (10 meters) wide, NASA planetary defense officer Lindley Johnson said in an email. They will start with "shelter in place" advice and consider

evacuations if there's time and the rock is about 100 feet wide (30 meters).

Space agencies will consider trying to deflect an asteroid if it is at least 165 feet (50 meters) wide, he said.

Meteor fireballs "appear every few days somewhere in the world," said Purdue University planetary scientist Jay Melosh. "Typically fireballs don't do much. If they occur in the sunlight, people don't notice them."

Tuesday's happened near Detroit—at night when it could be seen—so it got a lot of attention, Cooke said. It was powerful enough that it registered 2.0 on the U. S. Geological Survey's seismic monitors.

But even at 28,000 mph, it wasn't very zippy.

"For a meteor this is about as slow as it gets," Cooke said.

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