



**A New Danger
Threatening Our World?**

NASA Battles An Asteroid

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Although the chances of a gigantic rock falling from the sky through the atmosphere and destroying entire continents are miniscule, it is not impossible. In fact, a crash has already occurred at least once, though in that case it was in an uninhabited region. Now NASA is investing millions of dollars to develop a response in the form of a powerful device that can destroy dangerous asteroids or at least divert them before they strike.

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Hundreds of motorists and pedestrians in Chelyabinsk, a Russian city at the foot of the Ural Mountains near the border of Kazakhstan, stopped suddenly in awe and shock. In the early morning hours an incredible scene unfolded before their eyes, literally out of the blue. A blinding streak of light appeared in the sky, cutting through the air like a sword. Then it exploded in a fireball that shone with greater intensity than the sun. After a few moments it disappeared behind the hills, leaving in its wake a tale of fire and smoke that hung in the sky for another 10 minutes.

All across the region frightened residents became panicky. The authorities received a deluge of emergency phone calls. Many callers were convinced that they had just witnessed the test of a powerful secret weapon. Others assumed they had been attacked by a foreign power, probably America. Was World War III breaking out?

Not only did the terrifying incident bring traffic across the city to a complete halt, but 1,500 people were actually wounded as a result of the “attack.” Most of the injuries resulted from broken glass shattered by the powerful explosion. In one classroom with 44 schoolchildren, the teacher, recalling the lessons of the Cold War, ordered them to crouch under their desks. The children stayed safe, but the teacher remained standing and was seriously injured by flying glass.

Close to 200 people suffered temporary blindness from looking at the fireball. There were also several people who suffered burns from the intense heat released by the unknown “thing.” More than 7,000 buildings were damaged.

Alarms were set off at the highest levels of the government in the Kremlin. Initially, they were also concerned that they had come under attack. Russia’s top investigators were immediately dispatched to the area to determine what happened.

It didn’t take long for them to figure out that the cause of the commotion was an



The powerful explosion in Chelyabinsk, a Russian city at the foot of the Ural Mountains.



Smoke was visible in the sky for a short while after the explosion.



A piece of the asteroid crashed into the icy Lake Chebarkul.

asteroid, which exploded from the heat as it fell through the upper atmosphere.

Scientists determined that at the precise moment of the meteor’s explosion its light output was experienced as being 30 times more powerful than the sun. The explosion released so much energy that it was an estimated equivalent of 500 kilotons of TNT, or 25 times as powerful as the atom bomb America dropped on Hiroshima.

The explosion occurred 18.4 miles above the Earth and it took 2.5 minutes for the force of the blast to reach the ground. Most of the energy was absorbed by the atmosphere, so that the damage on the ground was relatively minor. The fact that the meteor struck a relatively unpopulated area was a lifesaver. Experts say that had it occurred over a city like New York thousands more would have been injured.

Scientists even recovered shards of the meteor that survived the cataclysmic entry. Shortly after the blast, many pieces of the meteor were found, ranging in size between half an inch and two inches. Six months later, Russian military investigators dragged a massive two-foot piece of meteor from a nearby river. It weighed 660 pounds.

After carefully studying the images and remnants of the meteor, researchers concluded that it was a relatively small meteor, around 66 feet in diameter. It weighed more than 13,000 pounds as it entered the atmosphere—more than the

Eiffel Tower—and it hurtled toward earth at a speed of over 40,000 MPH. Had it impacted on the ground with its full force, rather than evaporating in the atmosphere, the results would have been devastating.

Asteroids, Meteors and Comets

Millions of objects are flying through the space of our solar system. They are made up of stone, ice or similar materials and have been categorized to some extent by astronomers.

- Asteroids are large bodies of stone that are smaller than planets and follow a set path through space. Like planets, they have a fixed orbit around the sun.
- Meteoroids have the same physical makeup as asteroids but they are much smaller. Usually meteoroids are pieces that have broken off asteroids. Any stone measuring up to one meter or 3.28 feet across is designated a meteoroid. Larger than that, it becomes an asteroid.
- Comets are much larger than asteroids and they display a bright tail composed of trailing debris. They can be visible in the night sky, and on sighting, one recites the *berachah* “*Oseh Ma’aseh Bereishis.*”

Space bodies travel at breakneck speed, typically at 40,000 to 45,000 MPH. The friction created as they rub at high speed



A shard of the asteroid that was dragged from the lake for further investigation.



A pebble from the asteroid that exploded in the sky over Chelyabinsk.