

# Protecting Our Home

## *Text-Only Version*

*Panel 1*

### When and where will the next asteroid strike?

Fifty thousand years ago, an iron asteroid struck what is today Arizona. The resulting impact crater, called Barringer (or Meteor) Crater, is still visible today. Though common four billion years ago, today, impacts this size usually occur once every few thousand years.

Asteroids can also explode in the air. These explosions generate a shockwave that travels down to the surface with energies greater than World War II-era atomic bombs. Such an airburst leveled 800 square miles of forest in Siberia in 1908. More common than impacts, airbursts can strike once every hundred years or so.

Asteroids wandering through Earth's neighborhood can strike with no warning. As the population of Earth grows and cities cover more land, it becomes more likely that impacts and airbursts may strike where they can harm people and damage buildings.

*Panel 2*

### What kind of damage do these events cause?

An asteroid impact with Earth's surface can cause significant damage:

- A fireball would extend 6 miles (10 km) from the impact site (red circle)
- The impact shock wave would injure or kill animals within 15 miles (24 km) (yellow circle)
- Hurricane-force winds would be felt as far away as 25 miles (40 km) (blue circle)

An airburst surprised residents of the city of Chelyabinsk, Russia on February 15, 2013. An asteroid entered Earth's atmosphere and exploded about 16 miles above the ground near the city. The resulting shock wave knocked people off their feet, caused walls to collapse (above), and shattered windows. Over 1,000 injuries were reported by local hospitals.

Scientists are learning more about asteroids wandering through Earth's neighborhood.

Dr. Ellen Howell and Dr. Michael Nolan observe near-Earth asteroids from the Arecibo Observatory in Puerto Rico. This observatory uses radio waves (radar) rather than visible light to determine an asteroid's distance from Earth, its orbit, size, and how quickly it spins.

In parallel, Dr. David Kring and colleagues study meteoritic samples of near-Earth asteroids that have fallen to Earth and the impact craters that larger asteroids sometimes produce. Their measurements reveal the compositions and structural properties of asteroids.

Both astronomical observations and geological analyses are critical to our assessment of future impact hazards and for developing spacecraft missions that will assist us in protecting our home.

*This exhibit was developed by the Center for Lunar Science and Exploration (<http://www.lpi.usra.edu/exploration/>) of the NASA Solar System Exploration Research Virtual Institute.*