

Asteroid Sizes The sizes of the asteroids in the asteroid belt range from tiny particles to objects 940 km in diameter. Ceres is the largest and the first one discovered. The next three in order of size are Vesta (530 km), Pallas (522 km), and 10 Hygiea (430-km). The asteroid Gaspra, shown in **Figure 22**, was photographed by *Galileo* on its way to Jupiter.

Exploring Asteroids On February 14, 2000, the *Near Earth Asteroid Rendezvous* (NEAR) spacecraft went into orbit around the asteroid 433 Eros and later completed its one-year mission of gathering data. Data from the probe show that Eros has many craters and is similar to meteorites on Earth. The Japanese space probe *Hayabusa* arrived at the asteroid Itokawa in November 2005. Its mission is to collect samples and return them to Earth in a capsule in June 2010.

Comets, asteroids, and most meteorites formed early in the history of the solar system. Scientists study these space objects to learn what the solar system might have been like long ago. Understanding this could help scientists better understand how Earth formed.

Comets

- Comets consist of dust, rock, and different types of ice.
- The Oort Cloud was proposed as a source of comets in the solar system.

Meteoroids, Meteors, Meteorites

- When meteoroids burn up in the atmosphere, they are called meteors.
- Meteor showers occur when Earth crosses the orbital path of a comet.

Asteroids

- Many asteroids occur between the orbits of Mars and Jupiter. This region is called the asteroid belt.

Summary

section 4 review

Self Check

- Describe** how a comet changes when it comes close to the Sun.
- Explain** how craters form.
- Summarize** the differences between comets and asteroids.
- Describe** the mission of the NEAR space probe.
- Think Critically** A meteorite found in Antarctica is thought to have come from Mars. How could a rock from Mars get to Earth?

Applying Math

- Use Proportions** During the 2001 Leonid Meteor Shower, some people saw 20 meteors each minute. Assuming a constant rate, how many meteors did these people see in one hour?

Figure 22 The asteroid Gaspra is about 20 km long.

