

## Other Celestial Bodies

### Exoplanets

- **Exoplanets** are planets orbiting stars other than our Sun. They are found in solar systems other than our own.
- Scientists can use methods to identify exoplanets, and confirmed examples are increasing rapidly.
  - Detecting slight periodic motion of a planet can indicate that it may be an exoplanet pulled by a star out of our solar system.
  - Detecting the change in brightness of a star can indicate that there might be an exoplanet passing in front of it.

#### Study Tip

New guidelines in 2000 defined Pluto as a dwarf planet. Instead of nine planets, our Solar System now only has eight.

### Asteroids

- **Asteroids** are small, irregular-shaped rocks that orbit the Sun, and often look like points of light. Their collisions with Earth have caused mass extinctions in history.
- The **asteroid belt** is a region between Mars and Jupiter where many asteroids are found. Scientists believe they were supposed to form a single planet, but were pulled apart by Jupiter's gravity.
- **Near-Earth asteroids** cross Earth's orbit path, and scientists are always on the lookout for large ones that may cause problems.
- Scientists are fascinated by asteroids, looking to discover the origins of our universe, and possibly to mine some rare minerals.



### Comets

- **Comets** are small, icy objects that orbit the Sun. Their collisions with Earth have brought water and other substances. Ice evaporates during their flight, and reflects light from the sun, creating a colorful tail.
- Comets only appear when they are close to the Sun. The time between one appearance of a comet and the next is called the comet's period.
- Short-period comets, with periods of about 200 years or less, come from a region beyond the orbit of Neptune called the **Kuiper belt**.
- Comets with periods as long as thousands or even millions of years come from a very distant region of the solar system called the Oort cloud.



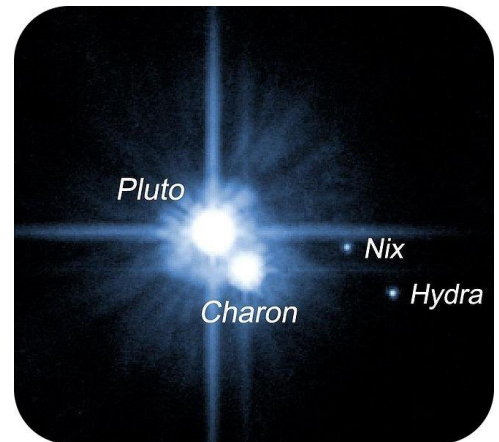
## Meteors

- **Meteors** are small pieces of matter burning up as they enter Earth's atmosphere from space. People often call them "shooting stars."
- **Meteoroids** are meteors before they reach Earth's atmosphere.
- When Earth passes through a cluster of meteoroids, it is called a **meteor shower**.
- **Meteorites** are leftover meteors that don't burn up completely, and manage to strike Earth. They provide important scientific information.



## Dwarf Planet

- A planet needs to orbit a star, be big enough that its own gravity shapes it as a sphere, be small enough that it isn't a star itself, and have cleared its orbit of smaller objects.
- A **dwarf planet** needs to orbit a star, have enough mass to be a sphere, not have cleared its orbit of smaller objects, and not be a moon.
- Pluto is a dwarf planet. It was considered a planet before, because early scientists mistakenly thought its moon was a part of its size. It has an odd, tilted orbit, and fails to clear other bodies out of its orbit.
- Ceres is the closest dwarf planet to the Sun, and is the largest object in the asteroid belt. It is large enough to shape itself as a sphere, but doesn't clear its orbit.
- Other dwarf planets include Makemake, Eris and Haumea. Scientists are still discovering and adding more to the list.



## Concept Check

- What are exoplanets?
- What are asteroids? How can you differentiate them from comets and meteors?
- What is a dwarf planet? Name a dwarf planet in our Solar System.