

Offered Title: The Asteroid Belt

It's called a belt and it has lots of asteroids, but you can't see it. You cannot see the "belt", only the individual objects residing within the belt. Why? Space.

Even inside the asteroid belt there is so much space between asteroids most are not visible from other asteroids. Don't let sci-fi movies lead you to think traversing the asteroid belt requires dodging a bunch of big rocks. It's not bad.

The asteroid belt was discovered during the search for a planet predicted between Mars and Jupiter. Johannes Kepler in the 16th century thought there needed to be a planet between the orbits of Mars and Jupiter. In the 18th century Johann Titus recognized a mathematical pattern in planetary positions and layout. He expected a planet between Mars and Jupiter existed and this expectation was validated when William Herschel discovered Uranus in 1781. Uranus's position matched nearly perfectly with the pattern layout discovered by Titus.

A search was started in 1800 to find the missing planet. A "planet" was discovered in 1801 by Giuseppe Piazzi and named Ceres. Then another "planet" was found and named Pallas. Ceres and Pallas were deemed planets until the flood gates opened in the 19th century as more than 100 "planets" were found in this region between Mars and Jupiter. That became a problem. Astronomers finally decided the objects were too small to be planets and called them asteroids (star - like). As equipment and detection techniques improved more and more asteroids were found. Now we know there are at least billions of asteroids in the belt.

Asteroids come in a variety of sizes and shapes, but Ceres became more spherical (from the action of gravity and rotational forces), due to its size and mass. Many of the smallest are likely solid, but many are thought to be collections of rubble held together loosely by gravity. Their composition is classified into three major types: C-type are the most prevalent, are carbon rich and very dark. S-type are silicate rich, mixed with iron and magnesium. M-type are metallic, mostly nickel-iron. There are other but rare types and even subtypes. Ceres, OK it's not an asteroid (it's a dwarf planet) is rocky, icy, and contains organic material. Vesta is currently the largest asteroid and is elongated, somewhat like a standard watermelon.

How did the asteroid belt form? The leading theory as evidence supports, is that early in the solar systems formation Jupiter's great mass and gravity perturbed the material between Mars and Jupiter. Perturbed it enough to produce more erratic orbits of the objects, and more violent collisions instead of accretion (growth by accumulation). Some accretion eventually occurred, making the larger asteroids and the dwarf planet Ceres.

Send questions to Ask the Astronomer: eweandnle@gmail.com

What's in the Sky?

May 31; 10pm: The Moon and Saturn are close in the southeast

June 3; dawn: The Moon and Mars are close in the south