

Where do meteorites come from?



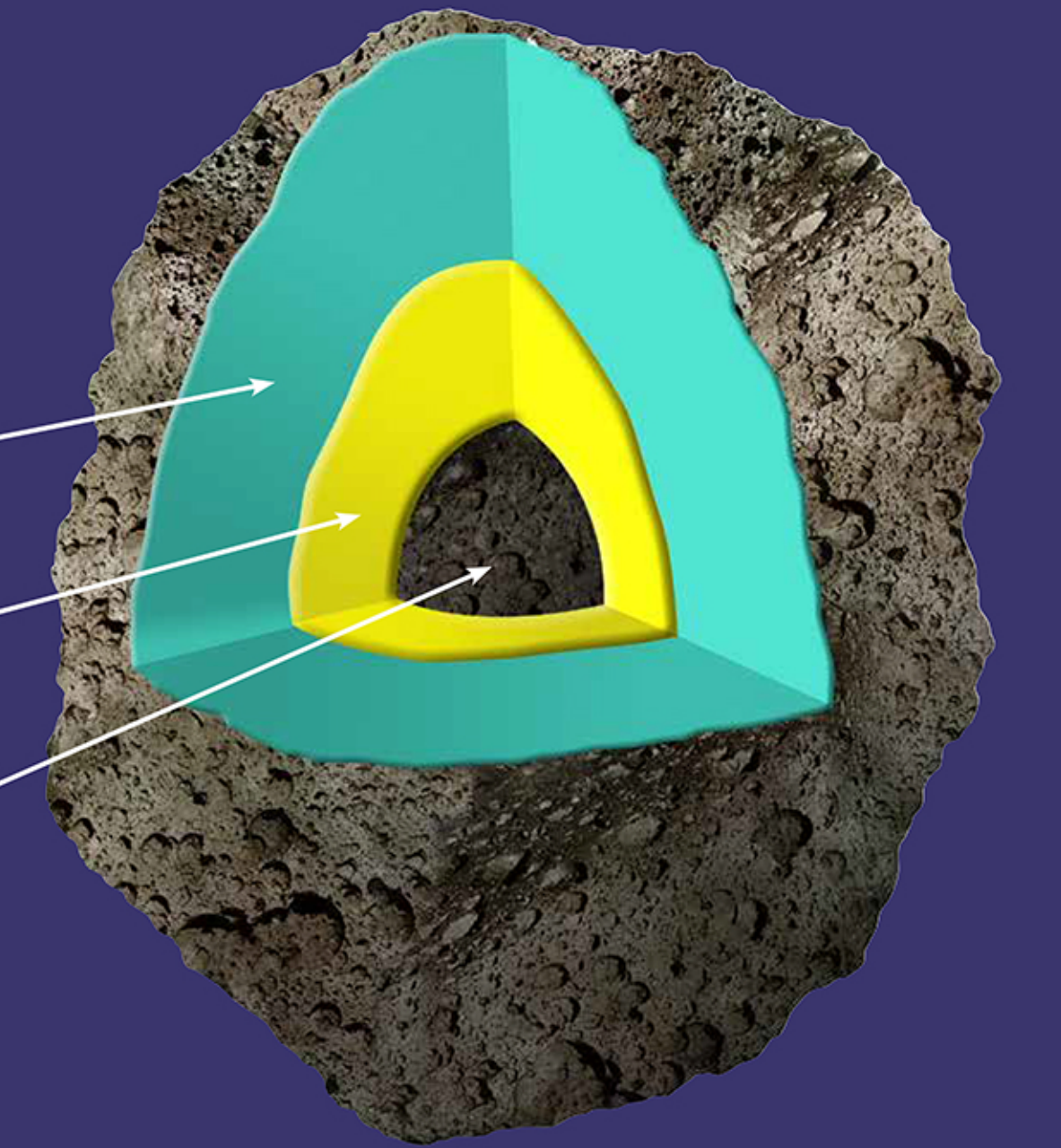
Inside a large asteroid

Similar to the way our Earth is structured, larger asteroids can also have layers. When these layers get fragmented, the different layers produce different types of meteorites, like the ones you see below.

Crust: The crust is the outside layer of a planetary body. You could think of this like the shell of an egg, the crust is what you can see.

Mantle: The mantle is the middle layer. This is what sits under the crust, and outside of the core. The mantle contains a majority of the body's mass.

Core: The core is the very center of a planetary body. Because of the mantle and crust sitting on top of it, the core is compressed and becomes very dense.



Types of meteorites



Bruderheim
 Fell: Alberta, Canada, March 4, 1960
 Mass: 180 kg
 Classification: L6, chondrite
 Specimen Wt: 310.0 g
 Provenance: Abrams Planetarium

Stony Meteorite: This is the most common type of meteorite. Stony meteorites are made of rock, sometimes small bits of iron, and are formed from the outer **crust** of an asteroid or planet. They can look very similar to Earth rocks, so it takes expert eyes to find them! Stony meteorites that are new to Earth will have a black fusion **crust**, which forms as a result of burning during their flight. There are two types of stony meteorites; chondrites and achondrites.



Northwest Africa 5697
 Found: Agadir, Morocco, 2008
 Mass: 547 g
 Class: L3, chondrite
 Specimen Wt: 7.7 g, Pt. slice
 Provenance: C. Giessler, C. Whitford

Chondrules/Chondrites: These meteorites are made up of small blob-like grains of stone called chondrules. Chondrules form over billions of years from dust and mineral debris. Over time they begin to clump together into a larger mass, as you see here. From the time of their formation to the time they fall to Earth these meteorites do not change. That means that they can tell us a lot about how the planets in our solar system were formed!



Seymchan
 Found: Magadan, USSR, 1967
 Mass: 323.3 kg
 Class: Pallasite, PMG
 Specimen Wt: 27.80 g
 Provenance: C. Whitford

Stony-Iron Meteorite: Part iron, part stone, these rare meteorites are equal parts metal and minerals. Pallasites contain beautiful crystals called olivine, which is a form of magnesium-iron. In some cases the olivine crystals cluster up, other times it spreads out through the metal around it in vein-like patterns. These meteorites come from the **mantles** of large asteroids, and scientists believe they are formed when metal from the core mixes with the rocky matter of the **mantle**.



Muonionalusta
 Found: Norrbotten, Sweden, 1906
 Mass: 230 kg
 Specimen Wt: 111.4 g
 Provenance: A. Jerochov, C. Whitford

Iron Meteorite: As the name tells us, these meteorites are made almost entirely of iron, though they could also contain small bits of nickel or other metals. These meteorites come from the **cores** of large asteroids that were heated up so hot that all the metal melted together. Iron meteorites are more rare than their stony cousins, but much easier to find. This is because they have a distinct appearance, and can be found underground by using metal-detecting technology.