

DENSITY

DEFINITION: : how much mass is in a certain volume

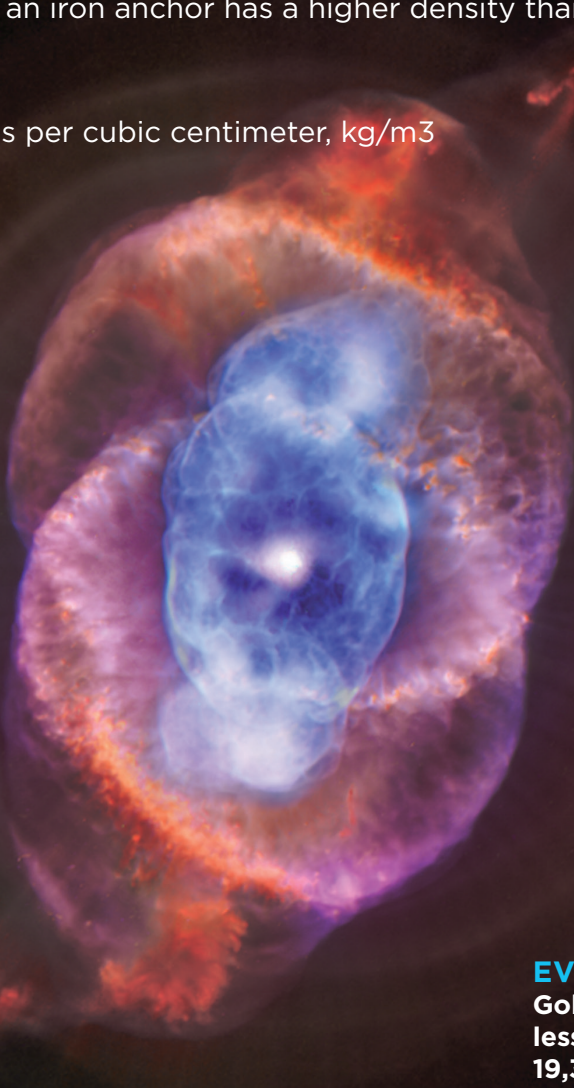
The density of an object or a substance is the amount of mass it contains in a volume. Density is derived from the mass of the atoms and molecules that make up a material and how tightly packed these are in a certain space. It can be determined for various states of matter, including solids, liquids, and gases. One common way to use density is to compare two objects. A piece of driftwood floats on top of water because it has a lower density than the sea below; on the other hand, an iron anchor has a higher density than the salt water so it sinks to the bottom.

Units: kilograms per cubic meter; grams per cubic centimeter, kg/m³

COSMIC EXAMPLE

Neutron star: These stellar cores, which often emit X-rays that Chandra can detect, are some of the densest objects in the Universe. 1×10^{18} kg/m³ (1,000,000,000, 000,000,000 kg/m³)

The Cat's Eye Nebula shows a phase that Sun-like stars undergo at the end of their lives. Material from the star's outer layers puffs off, and a hot core is left behind.



EVERYDAY EXAMPLE
Gold is denser than lead, but less dense than platinum.
19,320 kg/m³



OLYMPIC EXAMPLE

Density expresses the relationship of the amount of mass to a certain volume.

Ice: 917 kg/m³ ; Snow: 100-800 kg/m³



ASTROLYMPICS *winter*