

# The Sun

According to nebular theory, the Sun and planets in our solar system formed about 5 billion years ago from a rotating cloud of interstellar gas and dust. The Sun is 150 million km (93 million miles) from Earth. It's diameter is 1,390,000 km (864,000 miles). The Sun orbits the center of the Milky Way Galaxy at a speed of 250 km per second (563,000 miles per hour).

The photosphere is the visible surface of the sun. The temperature is about 5,800 K (10,000°F). The surface is covered with "granules," cells created by the circulating currents of hot gas "bubbling up" from the convection zone. They look like irregularly shaped circles with dark edges, and they can be up to 1,000 km across. The centers of the cells look lighter than the edges because the centers are about 300° hotter. Individual granules last about 5 minutes.

## CORE

Nuclear fusion generates massive amounts of energy. Hydrogen atoms are fused together to form helium atoms. The Sun converts 5 tons of hydrogen into helium per second. The core temperature is about 15 million K (27 million°F). The pressure is 200 billion atmospheres.

It takes 20 million years for energy from the core to reach the surface.

The Sun's outer layers are approximately 73% hydrogen, 20% helium, and 2% other elements (70 other elements).

## RADIATION ZONE

Energy from the core slowly moves out to the radiation zone. In this zone photons are repeatedly absorbed and re-emitted. Photons are energy particles emitted by atoms as their electrons jump back and forth between different energy levels.

Cooler gases sink back down to the radiation zone.

Hotter gases move up to the photosphere and lose heat.

## CONVECTION ZONE

Circulating currents of gas move heat from the radiation zone to the photosphere.

## PHOTOSPHERE

Granules

The chromosphere is a transparent layer about 6,000 km above the photosphere. It is hotter than the photosphere, with a temperature of about 15 million K (26 million°F).

The corona is rarefied hot gas, extending millions of kilometers in space. The temperature of the corona goes up to 2 million K.

## CORONA