



## Facts about the Regions of the Sun

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### ABOUT THE STUDY

The sun lies in the center of the solar system and accounts for 99.8 percent of the solar system's mass. Owing to the outcomes of gravity, everything in the solar system—the 8 planets, the five (for now) dwarf planets, the moons of these planets and dwarf planets, the asteroids, and different minor elements including comets—revolves around the sun. The planet Mercury takes 88 Earth days to finish one trip around the sun, while Neptune takes nearly one hundred sixty-five Earth years. The sun, further to function as a gigantic furnace, also has a sturdy internal electric-powered current. Electric currents generate magnetic fields, and the sun has a large magnetic field that propagates through the solar system as the solar wind—an electrically charged gas that flies outward from the sun in each direction.

The sun can be divided into 4 spatial regions, such as the core, radiative zone, convective zone, and photosphere. The core of the sun is in which everything that observers on Earth can measure as light and heat originate. This region extends outward to approximately 1/4 of the way from the center of the sun. The heat in the core is generated through a regular barrage of nuclear-fusion reactions, in which molecules of hydrogen integrate with enough force to cause them to join together into helium. The radiative zone of the sun is so named because it's far on this spherical shell—an area beginning approximately one-fourth of the way from the middle of the sun, in which the core ends, and increasing outward approximately three-quarters of the way to the sun's surface where it meets the convective zone—that the energy released from the fusion in the core travels outward in all directions, or radiates. Surprisingly, it takes a very long time for radiating energy to travel throughout the thickness of the radiative region. The convective zone takes up most of the outermost one-fourth of the sun's volume. At the beginning of this zone (that is, on the inside) the temperature is about 2,000,000 K and dropping. As a result, the plasma-like material forming the sun's interior is, believe it or not, too cool and opaque to permit heat and light to maintain to travel towards the solar surface with inside the form of radiation. In contrast to the long period of time, it takes energy to navigate the radiative zone, energy movements

through the convection zone relatively quickly. The photosphere includes a zone in which the sun's layers change from being completely opaque. The photosphere is therefore is the layer of the sun from which light visible to the unaided human eye is emitted. This layer is only 500 km thick. As noted, the sun's core, radiative zone, convective zone, and photosphere are considered regions, however, each can also be categorized as one of the layers of the sun, of which there are six in a number. External to the photosphere is the sun environment, which incorporates layers: the chromosphere and the corona. The chromosphere extends approximately 2,000 to 10,000 km above the sun's surface (that is, the outermost part of the photosphere), relying on what source you consult. Curiously enough, the temperature fairly predictably drops with increasing distance from the photosphere at first, however then begins to rise again, possibly owing to the effects of the sun's magnetic field. The corona extends above the chromosphere to a distance of numerous times the sun's radius and reaches temperatures as high as 2,000,000 K, similar to the interior of the convection zone. This solar layer could be very tenuous, and it is heavily crisscrossed by magnetic field lines. "Streamers" and plumes of the gas form along those magnetic field lines and are blown outward by the solar wind, giving the sun its characteristic look of having tendrils of light when the main part of the sun is obscured. As noted, the outermost parts of the sun are the photosphere, which is a part of the sun proper, and the chromosphere and the corona, which are a part of the sun's environment.

Thus the sun can be pictured as having 3 internal parts (the core, the radiative zone, and the convective zone) and three outer parts (the photosphere, the chromosphere, and the corona). A number of interesting events unfold at or just above the surface of the sun. One of those is sunspots, which shape in the photosphere in relatively cool areas. Another is solar flares, which are explosive events at the surface marked by very extreme brightening of regions of the solar atmosphere inside the form of x-rays, ultraviolet, and visible light. These unfold over periods lasting for a few minutes and then fade over a somewhat longer time frame of an hour.

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