



Sun

- Our Sun is 1,400,000 km in diameter.
- It has a surface temperature of 5,500 degrees Celsius and a core temperature of 15,600,000 degrees Celsius.
- It has a pressure of 250 billion atmospheres.
- Our Sun is the largest object in the solar system and contains 99.8% of its matter.
- The ancient Greeks called it Helios and the Romans called it Sol.
- The Sun rotates once in 25.4 days at its equator and as much as once in 36 days at its poles.
- Nuclear fusion at core converts hydrogen to helium and gamma rays. Gamma rays travel to the surface but are constantly absorbed and re-emitted at lower and lower energies, finally emerging as light at surface.
- The surface of the Sun is called the **photosphere**.
- **Sunspots** are cool regions of about 3500 degrees Celsius and can be several times the size of Earth (50,000 km).
- The **chromosphere** lies above photosphere. It is shallow.
- The Sun's **corona** is a rarefied region above the chromosphere. It can be seen only during a solar

eclipse. It has a temperature of over 1,000,000 degrees Celsius.

- The Sun's **magnetosphere** (or heliosphere) extends well beyond Pluto.
- In addition to heat and light, the sun also emits a low density stream of charged particles (mostly electrons and protons). These travel at around 500-1000 km/sec and are called the **solar wind**. Normally the only effect of the solar wind is to distort Earth's magnetic field from a sphere to a tear-drop shape.
- **Solar prominences** are regions of gas held in the corona by magnetic fields. They are poorly understood but are cooler and denser than the surrounding corona.
- **Solar flares** are huge, localized eruptions or explosions in the low solar atmosphere where hot, ionized gas gets shot into space. They typically occur near sunspots and are related to magnetic fields. Flares actually have little effect on Earth.
- **Coronal mass ejections** are enormous bubbles of magnetized gas which may take several hours to erupt into space. They can be much larger than the sun itself. As the bubble leaves the sun it creates a disturbance in the solar wind and a shockwave. If the CME reaches Earth, there can be significant effects on satellites and communications. They produce radiation that can be harmful to astronauts. When they hit the earth they produce magnetic

storms called geomagnetic storms and can create beautiful aurora displays. The speed of a CME varies but they can typically reach the Earth in 3 or 4 days.

- Ulysses and SOHO are 2 current spacecraft on missions to observe the Sun.