



AMAZING SUN FACTS

PHOENIX ASTRONOMICAL SOCIETY www.pasaz.org

Size

- Our Sun is one of the 200 to 400 billion stars in our galaxy. It is often considered an “ordinary” star because many other stars are similar to it.
- The Sun is the largest object in our Solar System with a diameter of 1,390,000 km (863,000 mi). Approximately 109 Earths would fit side-by-side across the face of the Sun! One million Earth could fit inside.
- The Sun accounts for 99.9% of the mass in the Solar System.

Surface

- The surface of the Sun is called the photosphere. The temperature of the photosphere is about 5800K (9980degrees F).
- Sunspots often form on the surface of the Sun. These sunspots are essentially just knots in the magnetic field, or magnetic storms. They are slightly cooler than the rest of the surface (3800K or 6380 degrees F), so they appear darker. Sunspots can be very large; some have been recorded that are bigger than 50,000km in diameter. The amount of sunspot activity is not constant. A period of very low sunspot activity in the latter half of the 17th century is called the *Maunder Minimum*. This coincides with an abnormally cold period in northern Europe, sometimes called the Little Ice Age.
- The region above the photosphere is broken into two parts. The inner portion, which lies just above the photosphere, is called the chromosphere. The outer part is called the corona. The corona extends millions of kilometers into space but is only visible during a solar eclipse.

Core

- Conditions at the Sun’s core are extreme. The temperature at the core is much hotter than the surface at about 15,000,000K (28,079,540 F).
- The Sun is made mostly of hydrogen (70%) and helium (28%). About 700,000,000 tons of hydrogen gas are converted into 695,000,000 tons of helium gas every second. The remaining 5,000,000 tons of matter are converted into an amount of pure energy that is equivalent to 80 trillion hydrogen bombs per second. The Earth receives less than a billionth of that energy.

Magnetic Field

- The Sun’s magnetic field is very strong (by terrestrial standards) and very complicated. It extends well beyond Pluto. In addition to heat and light, the Sun also emits low density streams of charged particles (mostly electrons and protons) known as solar winds, which propagates throughout the solar system at about 450km/sec. The solar wind and the higher-energy particles ejected by solar flares can have dramatic effects on the Earth, ranging from power line surges to radio interference to the beautiful aurora.

Age and Lifespan

- The Sun is about 4.5 billion years old. Since the formation of the solar system, the Sun's output has increased by about 40%. It has used up about half of the hydrogen in its core.
- The Sun will continue to radiate "peacefully" for another 5 billion years or so, although the amount of light emitted will approximately double in that time. Eventually, it will run out of hydrogen fuel. It will then be forced into radical changes that will result in the total destruction of Earth. This reaction is commonplace by stellar standards and will result in the creation of a planetary nebula with a dense white dwarf at its core.

Eclipses

- The Sun and the Moon appear to be the same size in the sky as viewed from Earth, about the size of a dime. Even though the Sun's diameter is about 400 times that of the Moon, it is also about 400 times farther away from the Earth. Because the plane of the Moon's orbit around the Earth coincides with the Earth's orbit around the Sun, the Moon occasionally comes directly between the Earth and the Sun. This causes a solar eclipse.
- Eclipses of the Sun occur once or twice a year. A partial eclipse occurs when the alignment is slightly off, so the Moon only covers part of the Sun's disk; these are visible from most regions of the Earth. A total eclipse occurs when the entire solar disk is blocked. The region of Earth able to witness a total eclipse is called the path of totality; this band is very narrow, typically just a few kilometers across, but thousands of kilometers long.

Mythology

- Many cultures have stories about the Sun. Some see the Sun as a god; others believe that this is an object used by other gods.
- The ancient Greeks called it Helios, and the Romans called it Sol (hence, Solar System). Both cultures believe that Apollo is the god of the sun. he brought life-giving heat and light to Earth and was the patron god of musicians and poets.
- A Chinese story says that ten suns once appeared in the sky, each taking a turn lighting our world for a day. One day, all the suns decided to appear together in the sky. Their combined heat and light made life on Earth unbearable. The suns father tried to convince them to appear one at a time, but when they refused, an archer shot down nine of the ten suns, leaving only the one that still burns today.
- The Navajo refer to the sun god as Tsohanoai. Each day, Tsohanoai carries the sun on his back across the sky. He then leaves the sun hanging on a peg in his house so that he can rest at night.