

GILGANDRA OBSERVATORY

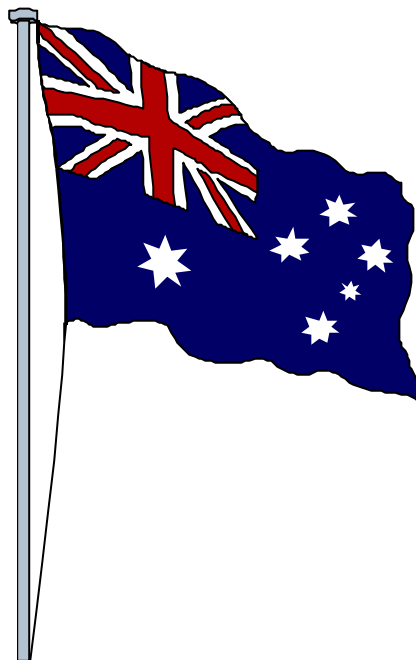
FACTS SHEET

SCIENCE & TECHNOLOGY

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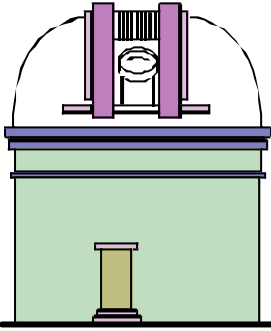
AURORA AUSTRALIS.

At night in the more southerly latitudes, one may frequently see a luminous, shimmering display of red and green light. This display, first reported by Captain Cook in 1773, is known as the *Aurora Australis*, or the “Southern Lights”. The northern counterpart is known as the *Aurora Borealis*. The aurorae are not constant, but depend on the strength of, of “gusts” in, the solar wind. At these times the incoming charged particles, such as electrons and protons, spiral around the lines of the Earth’s magnetic field, and radiate visible light energy in regions known as the *auroral zones*. These zones are some 80 – 600 kilometres above the Earth’s surface near the poles, where the magnetic influence is stronger. Collisions with molecules of atmospheric gases also contribute to the aurora. It is rare for places as far north as Sydney to see the Aurora Australis but it may be possible at times of increased solar activity.



COMETS.

Unlike the first eight planets which are confined to the one orbital plane, comets enter the solar system from all directions. As a comet moves towards the Sun and the nucleus of the comet warms, it leaves a glowing trail of plasma and dust called the tail. Comets have been known since ancient times and our ancestors regarded them with fear and superstition. That they were a natural phenomenon was shown when, in the early 1700’s, Edmund Halley predicted correctly the 1759 return of what was to become known as *Halley’s Comet*. On average, Halley’s Comet returns every 76.8 years, spending much of this time beyond Neptune. During its 1985/86 passage through the inner solar system, it was the target of much astronomical research. The GIOTTO spacecraft penetrated the coma of Halley’s Comet and photographed its nucleus, revealing it to be only about 15 kilometres long. It also surprised astronomers by being black, and a warm 30° C.



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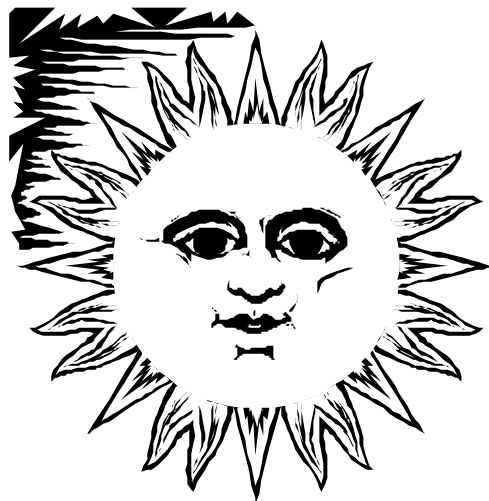
SUN

Astronomers believe the Sun to be about 5 thousand million years old. The source of the Sun's energy was a great mystery until the notion of nuclear fusion was developed in the 1930's. The Sun is a massive body of gas mostly hydrogen, held together by its own gravity but prevented from collapsing by the outward radiation pressure, and other forces that result from the release of enormous energies in its interior. The Sun has an atmosphere, called the *corona*, from which a flow of particles, called the *solar wind*, escapes at high speed. This solar wind can disrupt radio communications on Earth, through its effect on the Earth's ionosphere. At times of increased solar activity, large groups of sunspots can be seen on the surface of the Sun. This image shows the groups of sunspots, and a partial eclipse of the Sun by the Moon. An eclipse of the Sun will look different when observed from different parts of the world. In some places, observers witness a total eclipse of the Sun. Melbourne experienced a total eclipse of the Sun in the afternoon of the 23rd October, 1976. For a few minutes it was just like night time: dark, cold – and starry!

Mass: 1.99×10^{30} kg

Diameter: 1 392 000 km

Surface temp: 5 500°C



MOON

The Moon appears in the sky some three quarters of an hour later each day. This is due to a combination of the Earth's rotation and the motion of the Moon around the Earth once every 27.29 days. The Moon's rotation period is the same as its orbital period about the Earth, with the result that very nearly the same side of the Moon is always presented towards Earth. At any moment, an exact, but changing, half of the lunar body is illuminated by the Sun, and the other side away from the Sun is in darkness. Observers on Earth will see only their half of the Moon, some of which may be lit, some of which may not. Hence they see phases of the Moon, as it progresses around the Earth. A lunar eclipse can only be seen during a full Moon when the shadow of the Earth falls on the sunlit side of the Moon. Note that all observers on Earth see the same view of the lunar eclipse. Our eyes strongly suggest that the Moon is larger when on the horizon, but photographs can show that this is not so. Astronauts from Apollo 11 landed on the Moon on the 21st July, 1969.

Mass: 1/81 of Earth

Diameter: 3 476 km Time between full moons: 29.53 days