

## Spotting Sunspots

### Solar viewing at the Royal Observatory Greenwich

We are using a Coronado telescope to view the Sun, our nearest star. The telescope is fitted with a special filter which blocks most of the heat and light from the Sun and lets us view safely.

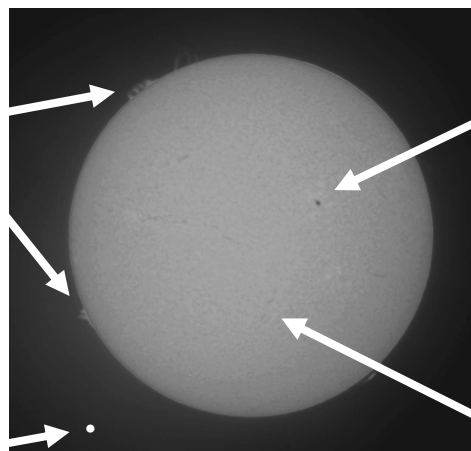
Never look directly at the Sun, or through binoculars, or a telescope without a proper filter

In the telescope eye-piece you will see a red ball — it is the face of the Sun. The red colour is from the telescope's filter which is only letting through that colour light.

1. Look carefully around the edge of the ball — you may see small bright whiskers or spikes. These are **prominences**.

They look small but in reality they're huge jets of super-hot gas bursting from the Sun's surface. Each one is larger than the Earth.

The size of the Earth for comparison



picture by Tony Sizer 2005-03-17 © NMM

2. Look carefully on the face of the Sun — you may see small black specks, like specks of dust. These are **sunspots**.

They are areas of the Sun kept cooler by whirls in the Sun's magnetic field. Again, each is typically as big as the Earth, or much bigger!

3. You may also see faint dark lines like small threads. These are called **filaments**. They are prominences seen against the face of the Sun

- The Sun is about 4.5 billion (4,500 million) years old and will last another 5 billion years or so in its present form.
- It is about 150 million km (93 million miles) from the Earth — 400 times further than the Moon
- Light from the Sun takes 8½ minutes to reach Earth
- The diameter of the Sun is 1.4 million km (870,000 miles)
- More than 100 Earths would fit across the Sun's diameter
- The Sun rotates in around 30 days on average but only 26 at the equator and nearly 35 near the poles.
- At the centre of the Sun the temperature is 15 million degrees K. and hydrogen is being converted to helium by nuclear fusion (like a hydrogen bomb). The Sun is held together by the force of gravity that arises from its enormous mass — more than 300,000 times the mass of the Earth
- On the surface of the Sun the temperature is around 5,800 degrees K. Sunspots look dark because they're relatively cool — about 4,000 degrees K.
- There are sometimes large bursts of very hot gas from the Sun, called flares and "CMEs" (coronal mass ejections). Matter from these bursts takes a couple of days to reach Earth. Really big flares and CMEs are dangerous to astronauts in space and can cause havoc with power and communication systems.
- The Coronado telescope has a 'hydrogen-alpha' filter — so-called because it only lets through the red colour light named after the line in the solar spectrum, emitted by hot hydrogen gas on the Sun.

For more information see [www.rog.nmm.ac.uk](http://www.rog.nmm.ac.uk) and the 'Public Solar Viewing' section of the Flamsteed Astronomy Society website at [www.flamsteed.info](http://www.flamsteed.info) for links to the SOHO space solar observatory etc.