Visible Features of the Sun

SDO self updating and current videos of the sun's activity:

http://sdo.gsfc.nasa.gov/data/SDO_self_updating_6.htm

Current solar activity and more:

http://www.spaceweather.com

Excellent explanation for the solar process:

http://www.oswego.edu/~kanbur/a100/lecture10.html

Following is an excerpt from this web site:

http://www.astronomyknowhow.com/sun.htm

You can view the sun as a projection, through a white light filter, or through a Hydrogen Alpha telescope or filter.

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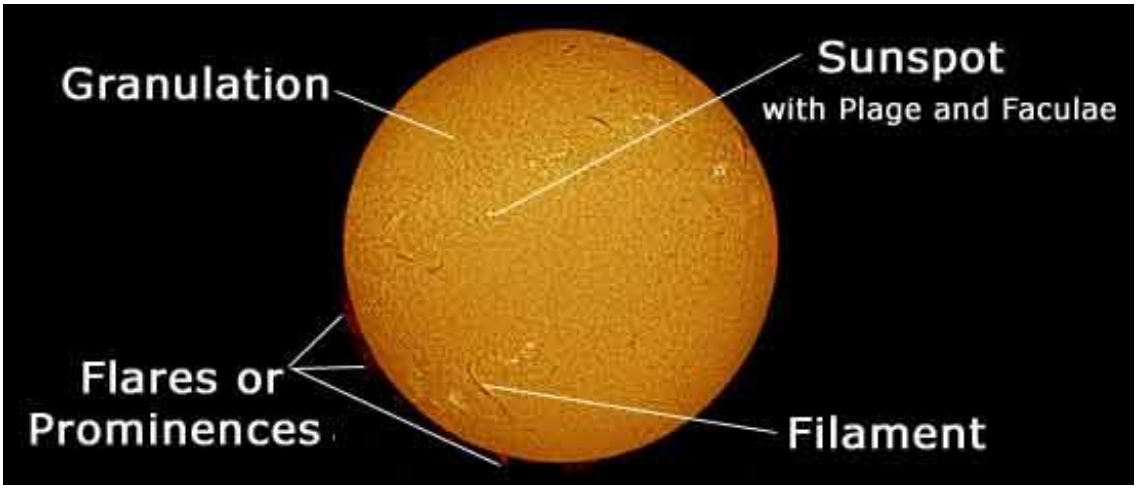
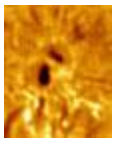
NEVER NEVER look directly at the sun with your eyes or through any magnifying equipment (telescope, binoculars) that has not been correctly protected!
It could be the last thing you see!



A full disc image of the sun taken by Jack Newton on a Solarview 50 Telescope, showing the main features that are visible in hydrogen alpha. Sunspots are the only features readily visible in white light, but you can occasionally see faculae and flares.

Sunspots

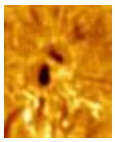


Sunspots are the dark spots you can see when you look at the sun in white light (through an appropriate filter) or when you project an image of the sun on to a screen. The picture shows sunspots on the surface of the sun as viewed in hydrogen alpha.

These spots are dark because they are cooler than their surroundings (a mere 4000K or so, compared to the 5780K of the surrounding photosphere - K is degrees Kelvin. IK = 1°C and 0K = 273°C, so to convert K to °C just add 273.)

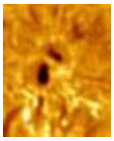
The sun generates very strong magnetic fields, and it is a localised concentration of these magnetic fields that causes the cooling that we see as sunspots. Sunspots usually occur in pairs or groups of opposite magnetic polarity that move in unison across the face of the sun as it rotates. They can last anything from a few hours to a few weeks, or even months for the very biggest. Interestingly sunspot activity exhibits an 11 year cycle in terms of the position and number of spots.

Plages



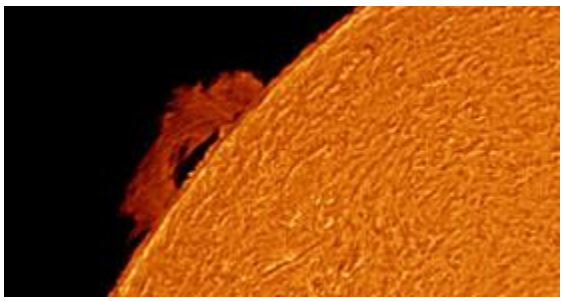
The glowing region around the sunspot (seen in the picture above) is called Plage (from the French for beach). They always appear with a sunspot but can outlive them. They are bright dense regions of the chromosphere.

Faculae



Faculae are bright areas in the photosphere that are visible near the limb, or edge, of the solar disk. They appear a few hours before a sunspot that arises in the same place and can remain for months after the sunspots have gone. They are also the result of the magnetic fields produced by the sun, being areas where the magnetic field is concentrated in much smaller bundles than in sunspots. While the sunspots tend to make the Sun look darker, the faculae make it look brighter. The word facula comes from the Latin for 'Little Torch'.

Prominences



A Prominence is an elongated structure full of material hundreds of times cooler and denser than the surrounding corona. They are held up and insulated by huge magnetic structures and are seen as prominences at the edge of the sun against the black background of space. They can stay suspended above the photosphere for weeks and even months, but eventually become unstable. Surprisingly, rather then collapse at that point, they actually erupt!

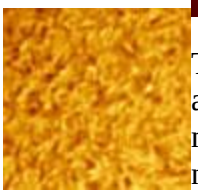
Filaments

Filaments are prominences that are within the disc of the sun as we view it, and so are seen as dark lines of cool matter and against the hotter bright chromosphere behind.

Flares

Solar flares are huge explosions on the surface of the sun, throwing out massive amount of material as matter is heated to millions of degrees in a few minutes. It can last from minutes to hours.

Granulation



A collection of granules - a bright region or cell (about 1000 km across), which cover the entire Sun except for those areas covered by sunspots. They are formed by hot gases rising to the photosphere, spreading and cooling and falling back again - hence the bright centre and darker edges. Individual granules last for only about 20 minutes so the pattern of granulation is continually changing as old granules are pushed aside by newly emerging ones. The flow within the granules can reach supersonic speeds of more than 7 km/s (15,000 mph) and produce sonic "booms" and other noise. Shown on the right in H-Alpha, granulation can be seen in white light as well.

Coronal Mass Ejection

Often associated with flares and prominences, a coronal mass ejection (CME) is the release of a huge amount of coronal material - measured in billions of tons and traveling at supersonic speeds.