Astronomical terminology explained

Annular solar eclipse: This is a total eclipse of the Sun when the disk of the moon is smaller than the disk of the Sun. As a consequence, at the time of totality, the disk of the Sun is not completely masked by the moon resulting in a bright annular ring (sometimes referred to as a 'ring of fire'). Annular eclipses occur when the moon is at or near its greatest distance from the Earth – the apogee of its orbit around the Earth.

Apogee: For an object in an elliptic orbit around the Earth, the apogee is the point on the orbit which is at greatest distance from the Earth.

Astronomical night: Astronomical night occurs when the centre of the Sun is 18° or more below the horizon. The sky can then be considered to be truly dark, and conditions are suitable for observation of deep sky objects such as faint stars, nebulae and galaxies.

Astronomical Twilight: Astronomical twilight occurs when the centre of the Sun is 18° or less below the horizon. When this happens the Sun brightens the sky, and it becomes difficult to observe deep sky objects.

British Summer Time (BST): Time adopted in the UK summer time when the clocks go forward in March. BST = UT + 1.

Conjunction: There are three types of planetary conjunction (refer to Figure 1).

For a planet closer to the Sun than the Earth (an inner planet), it is said to be at **Superior Conjunction** when it is located on the other side of the Sun. In other words, the Earth, Sun and planet lie on a line with the Sun in the middle. An inner planet at superior conjunction cannot be seen from the Earth.

An inner planet is said to be at **Inferior Conjunction** when it lies precisely between the Earth and the Sun.

Finally, for a planet further away from the Sun than the Earth (an outer planet), it is said to be at **Conjunction** when it is located in its orbit on the other side of the Sun. The Earth, Sun and planet lie on a line, with the Sun in the middle, so again the planet cannot be seen from Earth.

Deep Sky Objects (DSOs): These are faint, distant objects such as nebulae (e.g. the Orion Nebulae) and galaxies (e.g. the Milky Way galaxy, the Andromeda galaxy). They can only be seen in clear, dark skies (in the absence of twilight, moonlight, and adverse weather conditions).

First Quarter: The phase of the moon when half the moon is illuminated 7 days after New moon. The few days around First Quarter give the best observing opportunities to see lunar surface features (craters, mountains, canyons, etc.).

Full moon: The phase of the moon when the illuminated side is towards the Earth (i.e. a full illuminated disk can be seen). Full moon is not the best time to observe the lunar surface features through a telescope.

Gibbous moon: This refers to phases of the moon which are between half moon and full moon.

Last Quarter: The phase of the moon when half the moon is illuminated, approximately 3 weeks after New moon. Also good for observing lunar surface features, but you'll have to get up in the early hours of the morning to see it!

Light Year: This is a unit of distance commonly used by the astronomical community. It is the distance travelled by light (propagating at a speed of 186,000 miles per second, or 300,000 km per sec) during the period of one year. It is a long way (about 5,870,000,000,000 miles or 9,470,000,000,000 km)! The nearest star to us (apart from the Sun) is about 4 light years distant.

Magnitude: This is a measure of the brightness of an object. It is measured on a weird scale that scientists call a 'logarithmic scale'. The brightest objects have negative magnitudes (e.g. Venus -4, Jupiter -3, the brightest star (apart from the Sun) Sirius -1.46). The brightest stars in the sky are around mag. 0 to -1, and those very faint stars that can just be seen with the unaided eye are around mag. +6.

Messier Objects: These are Deep Sky Objects (DSOs) that appear in the Messier Catalogue, and are given an 'M number' (e.g. the Andromeda galaxy is also known as M31). The catalogue was compiled by Charles Messier, a french comet hunter who was constantly annoyed by confusing DSOs (star clusters, nebulae, galaxies, etc.) with comets, and so drew up his list.

Milky Way Galaxy: Our home galaxy. The Sun is one of about 100 billion stars that populate this huge disk-shaped structure, which is about 100,000 light years across. It can be seen as a milky band stretching across the sky on a clear, dark night.

Moon rise/set times for Lee Abbey, Lynton: Note that these times do not take account of the local topography – for example, if you stand at the front of the house the sky is obscured by hills to the

South and North, so the moon will rise over these at a later time to that given in the Table. However, the data in the Table is relevant as it does give the times when the moon will begin to illuminate the sky, and so cause difficulty in observing Deep Sky Objects.

Nebulae: These are distant clouds of gas which can be seen on a clear dark night (e.g. M42 the Orion Nebula).

New moon: The phase of the moon when the dark side is towards the Earth (i.e. it cannot be seen).

NGC Objects: NGC is an acronym for '**New General Catalogue** of Nebulae and Clusters of Stars'. This is a catalogue of DSOs compiled by John L.E. Dreyer in 1888, originally containing 7,840 objects. It contains all types of DSO including galaxies. It has been supplemented and amended in more recent times. Many DSOs will have a NGC number – for example, the double cluster NGC 869 and NGC 884 in Perseus.

Occultation: The passage of the moon or a planet in front of a star.

Opposition: This terminology applies to the outer planets (those at greater distance from the Sun than the Earth). An outer planet is said to be at Opposition when the Sun, Earth and planet lie on a line, with the Earth in the middle (refer to Figure 1). When at opposition, a planet is at closest approach to the Earth. It will also rise at sunset and set at sunrise and so is visible throughout the night. It will also be at its highest in the sky due South at midnight UT.

Perigee: For an object in an elliptic orbit around the Earth, the perigee is the point on the orbit which is least distance from the Earth.

Radiant: The point on the sky from where meteors belonging to a particular shower appear to radiate. The location is usually specified in terms of a particular star, or constellation (e.g. the meteors associated with the Leonid shower appear to radiate from the constellation of Leo).

Solstice: Summer solstice occurs on or around the 21 June each year, and corresponds to the time when the day is longest and the night shortest. Winter solstice occurs on or around the 21 December each year, and corresponds to the time when the day is shortest and the night longest.

Supernova: An explosion of huge scale at the end of life of a star. Not all stars end their life in this way – generally whether they go out with a bang or a whimper depends on their mass. Large stars tend to suffer this kind of cataclysmic end. A supernova event can be so bright that a single star can briefly (for a few weeks) outshine the whole of its home galaxy.

Universal Time (UT): Universal Time (the same as Greenwich Mean Time (GMT)) is the time adopted globally by the professional astronomy community. It also corresponds to the normal local time in UK winter.

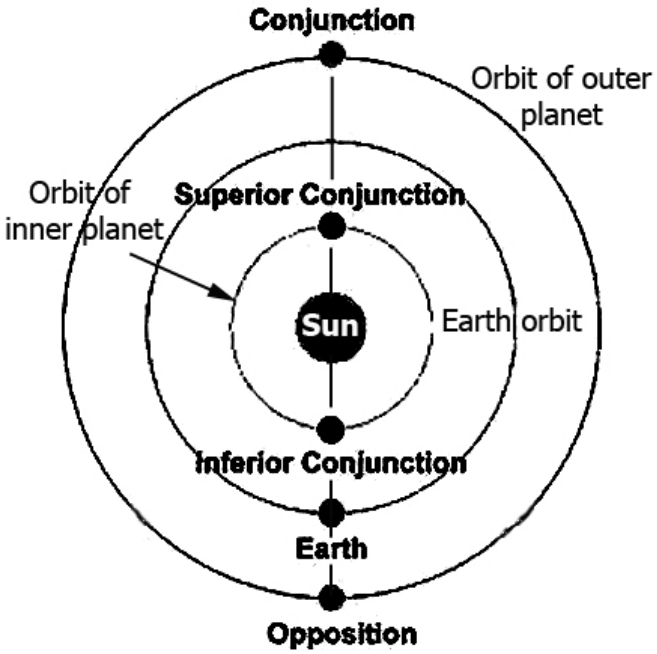

Figure 1: Planetary alignment terminology