Glossary

absolute temperature scale
A temperature scale which has the same divisions as the Celsius (centigrade) scale, but where 0° lies at absolute zero (*q.v.*). Degrees on this scale are written K, short for degrees Kelvin, after Lord Kelvin, the physicist who devised the scale.

absolute zero
The point at 0K or −273·16°C at which all motion of atoms and molecules ceases, and no heat is radiated.

age gradient
A graduation in age from young to old.

Ångstrom
A unit of wavelength often used in astronomy: $1\text{Å} = 10^{-10}$ metres $= 0·1$ nanometres.

angular momentum
The property of a system due to its revolution or spin. The angular momentum of a body may be found by multiplying its mass by its velocity times its distance from the point of revolution.

angular resolution
The angular distance between the closest details which a telescope can pick out or resolve.

antapex
The point in the sky opposite the solar apex. It lies at right ascension 6 hours and declination −30°, in the constellation of Columba.

apex, solar
The point in the sky to which the Sun appears to be moving. It lies at right ascension 18 hours and declination +30°, in the constellation of Hercules.

atmosphere
A unit of pressure. One atmosphere is the normal pressure of air at sea-level on Earth.

bolometric magnitude
A measure of the total energy emitted by a celestial body, taking into account all wavelengths radiated. Since a celestial body always emits other radiation besides light, the bolometric magnitude is always a smaller number than that expressing the visual magnitude. Thus the absolute visual magnitude of the Sun is +4·83, and its absolute bolometric magnitude is +4·72. The bolometric and visual magnitudes of very blue and very red stars may differ by 4 or 5 magnitudes, indicating that in these stars most of the radiation is non-visual.

catalyst
A substance which assists a reaction to proceed but does not appear in the final product and is found to be unchanged at the end of the reaction.

continuum
A continuous spectrum, or a set of points which form a line, a plane, or some other surface.

dynamo action
The action of a moving electric field, which generates a magnetic field.

electromagnetic spectrum
The full range of electromagnetic radiation, from wavelengths of one hundred million millionths of a metre (10^{-14} metre) to ten thousand (10^4) metres.

electron (e⁻)
A stable atomic particle with a negative electric charge ($1·60219 \times 10^{-19}$ coulombs). In a simple model of the atom, the electron is conceived of as orbiting the atomic nucleus in certain specific orbits. The rest mass of the electron is $9·108 \times 10^{-32}$ kg.

electrostatic unit
A unit of electric charge of such magnitude that it exerts a force of 1×10^{-5} newtons (or 1 gm per cm per sec every sec) on a charge of equal magnitude at a distance of 1 cm (or 10^{-2} m).

electron volt (eV)
A unit in nuclear, atomic and high-energy physics. It is the kinetic energy acquired by one electron passing through a potential difference of 1 volt. ($1 \text{ eV} = 1·60 \times 10^{-19}$ joules).

eccentricity
A quantity indicating the shape of an ellipse or other similar figure. Mathematically, for an elliptical orbit, $e = d/a$ where d is the distance from the centre of the ellipse to one of the foci, and a is half the length of the major axis,

ellipsoid
A solid shape generated by rotating an ellipse around either its major axis (prolate ellipsoid) or its minor axis (oblate ellipsoid).

flux density
A term much used in radio astronomy, it is defined as the amount of power (watts) per unit of frequency (Hertz) falling on a unit area (square metre) of the receiving equipment. Where the source is an extended one spread over an area of sky, the flux density is then taken to describe the power per unit solid angle (steradian).

frequency
The frequency with which a wave fluctuates between crest and crest. Frequency and wavelength are connected since, if a wave is travelling with a fixed speed, then the longer it is, the less frequently its crests will impinge on the observer. In electromagnetic radiation which travels with the speed of light (*c*), the frequency (*f*) is equal to *c* divided by the wavelength λ (i.e. $f = c/\lambda$).

gamma-rays (γ-rays)
Electromagnetic waves of the shortest wavelengths below about 0·1 nm.

gauss
A unit of measurement of the strength of a magnetic field, and often used in astronomy. One gauss is defined as the magnetic field strength which will induce 1×10^{-8} volts in a line of wire 1 centimetre long moving sideways at right-angles through the field at a rate of 1 cm per second. The Earth's magnetic field is about 1 gauss.

gravitational potential energy
The energy possessed by a body due to its shape and size. It may be regarded as the energy required to separate all the particles of the body to infinity. Because the reverse process must have taken place for the body to

form, it can then be said to possess a certain amount of energy. It is called potential because the energy can only be released when for instance the size of the body alters, i.e. if the body shrinks then energy is liberated which may go into heating it. Energy must be supplied to expand the body.

great circle
Any circle on a sphere which passes through the ends of a diameter.

ground state
That condition of the atom in which all electrons are in their lowest possible energy state.

half-life
For a disintegrating atom or nuclear particle, the average length of time required for half the members of a sample to disintegrate.

hydrostatic equilibrium
Hydrostatic equilibrium in a star is the internal balance between the inward directed gravitational force and the outward gas and radiative forces.

hyperbolic orbit
An open orbit where the eccentricity is greater than 1. The path followed by any body which escapes from the gravitational field of a larger body is an hyperbolic orbit.

igneous rock
Any rock which has formed by cooling from a molten state either on, or beneath, the surface. Distinct from rocks which are metamorphic (altered by heat or pressure) or sedimentary.

isotope
An atomic nucleus having the same atomic number as another nucleus, but a different mass number. Because the mass number, A, is the number of protons plus the number of neutrons, isotopes of the same element have the same number of protons (Z), but different numbers of neutrons (A–Z); e.g. deuterium is an isotope of hydrogen as both have a single proton (Z = 1) but deuterium has a single neutron whereas hydrogen has none.

joule
An internationally adopted unit of energy and corresponds to the work done when a force of one newton moves through a distance of one metre. It is also equivalent to 0·24 calories and $6·25 \times 10^{18}$ electron volts.

Kelvin temperature scale
See absolute temperature scale.

kinetic motions
The small-scale local motions of, for example, stars within a galaxy, as distinct from large-scale bodily motion of the galaxy itself through space or in its overall rotation.

laser
A maser (*q.v.*) which emits its energy at visible wavelengths.

lines of force *See* magnetic lines of force.

logarithmic
Increasing by a 'power' series instead of by adding equal increments, which gives a 'linear' scale. Thus 0, 10, 20, 30, 40, etc. is a linear scale formed by adding tens, while 0, 10, 10^2, 10^3, 10^4, etc. is a logarithmic scale, rising in this case in ascending powers of ten.