

Astro Glossary:

A:

A ring. One of the three prominent rings encircling Saturn.

absolute magnitude. The apparent magnitude that a star would have if it were at a distance of 10 parsecs.

absolute zero. The temperature of -273°C (or 0K). Where all molecular motion stops ; the lowest possible temperature.

absorption line spectrum. Dark lines superimposed on a continuous spectrum.

acceleration. A change in velocity.

accretion. The gradual accumulation of matter in one location, typically due to the action of gravity.

accretion disc. A disc of gas orbiting a star or black hole.

active galactic nucleus (AGN). The centre of an active galaxy.

Active galaxy. A galaxy that is emitting exceptionally large amounts of energy: a Seyfert galaxy or a quasar.

active Sun. The Sun during times of frequent solar activity such as Sun spots, flares and associated phenomena.

adaptive optics. A technique of improving a telescope image by altering the telescope's optics in a way that compensates for the distortion caused by the Earth's atmosphere.

albedo. The fraction of sunlight that a planet, asteroid or satellite reflects.

angle .The opening between two lines that meet at a point.

angstrom (A). A unit of length equal to 10^{-10} meter.

angular diameter. The angle subtended by the diameter of the object.

angular momentum. A measure of the momentum associated with rotation.

angular velocity. The speed with which an object revolves about its axis.

annular eclipse. An eclipse of the Sun in which the Moon is too distant to cover the Sun completely, so that a ring of sunlight is seen around the Moon at mid eclipse.

angular resolution. The angular size of the smallest feature that can be distinguished with a telescope

autumnal equinox. The intersection of the ecliptic and the celestial equator where the Sun crosses the equator from north to south.

antielectron. A positron.

antimatter. Matter containing antiparticles such as anti protons, anti electrons (positrons) and antineutrons.

aperture.

The diameter of an opening; the diameter of the primary lens or mirror of a telescope.

aphelion. The point in its orbit where a planet is farthest from the Sun.

apogee. The point in its orbit where a satellite or Moon is farthest from the Earth.

apparent brightness. The flux of a star's light arriving at the eEarth.

apparent magnitude. A measure of the brightness of light from a star or other object as measured from Earth.

asteroid. One of tens of thousand of small, rocky planet like objects in orbit around the Sun,

asteroid belt. A region between the orbits of Mars and Jupiter that encompasses the orbits of many asteroids.

astronomical Unit (AU). The semimajor axis of the Earth's orbit; the average distance between the Earth and the Sun.

aurora. Light radiated by atoms and ions in the Earth's upper atmosphere, mostly polar regions.

aurora borealis. Arorae seen from northern latitudes

aurora austrailis. Arorae seen from southern latitudes.

B:

Barnard object. A dark nebula discovered by E.E.Barnard.

Barred spiral galaxy. A spiral galaxy in which the spiral arms begin from the end of a "bar" running through the nucleus rather than the nucleus itself.

bazar. A BL Lacertae object.

Big Bang. An explosion of all space, roughly 20 billion years ago, from which the universe emerged.

Big Crunch. The fate of the universe if it is bounded, and ultimately collapses upon itself.

binary star. Two stars revolving about each other.

bolometric correction. The difference between the visual and bolometric magnitudes of a star.

BL Lacertae object. A type of active galaxy whose nucleus does not exhibit spectral lines.

black hole. An object whose gravity is so strong that the escape velocity exceeds the speed of light.

black body. A hypothetical perfect radiator that absorbs and re-emits all radiation falling on it.

blueshift. A decrease in the wavelength of photons emitted by an approaching source of light.

Bode's Law. A numerical sequence that gives to approximate average distances of the planets from the sun in astronomical units (AU).

Bohr atom. A model of the atom, described by Neils Bohr, in which electrons revolve about the nucleus in certain allowed orbits.

Bock globule. A small, roundish, dark nebular.

bounded universe. A universe throughout which the average density exceeds the critical density.

bolometric magnitude. A measure of the brightness of a star or object as detected by a device above the Earth's atmosphere

brown dwarf . A star like object that is not massive enough to ignite hydrogen burning in its core.

butterfly diagram. A plot of Sunspot latitude against time.

C:

Caldera. The crater at the summit of a volcano.

carbon burning. The thermonuclear fusion of carbon to produce heavier nuclei.

carbon star. A peculiar red giant star whose spectrum shows strong absorption by carbon and carbon compounds.

carbonaceous chondrite. A type of meteorite that has a height abundance of carbon and volatile compounds.

Cassegrain focus. An optical arrangement in a reflecting telescope in which the light rays are reflected by a secondary mirror to a focus behind the primary mirror.

Cassini division. An apparent gap between Saturn's A and B rings.

celestial equator. A great circle on the celestial sphere 90° from the celestial poles.

celestial mechanics. The branch of astronomy dealing with the motions and gravitational interactions of objects in the solar system,

celestial poles. Points about which the celestial sphere appears to rotate.

Celestial sphere. A sphere of very large radius centred on the observer; the apparent sphere of the sky.

centre of mass. That point in an isolated system that moves at a constant velocity in accordance with Newton's first law.

central bulge. A spherical distribution of stars around the nucleus of a spiral galaxy.

Cepheid variable. A type of yellow, supergiant, pulsating star.

Ceres. The largest asteroid and the first to be discovered.

Chandrasekhar limit. The maximum mass of a white dwarf.

charged-coupled device (CCD). A type of solid-state silicon wafer designed to detect photons.

chemical element. A substance that cannot be decomposed by chemical means into a simpler substances.

chromatic aberration. An optical defect whereby different colours of light passing through a lens are focused at different locations.

chromosphere. A layer in the solar atmosphere between the photosphere and the corona.

close binary. A double star system in which the stars are separated by a distance roughly comparable to their diameters.

Cluster of galaxies. A collection of galaxies containing a few to several thousand member galaxies.

cold dark matter. Slowly moving, weakly interacting particles presumed to contain the bulk of matter in the universe.

coma (of a comet). The diffuse gaseous component of the head of the comet.

coma (optical). The distortion of off-axis images formed by a parabolic mirror.

conjunction. The geometric arrangement of a planet in the same part of the sky as the Sun, and the earth.

conservation of angular momentum. A law of physics stating that the total amount of angular momentum in an isolated system remains constant.

conservation of energy. A law of physics stating that the total energy in a isolated system remains constant.

conservation of momentum. A law of physics stating that the total momentum in a isolated system remains constant.

constellation. A configuration of stars, often named after an object, person, god or animal.

continuous spectrum. A spectrum of light over a range of wavelengths without any spectral lines.

corona. The Sun's outer atmosphere, which has a high temperature and a low density.

chronograph. An instrument for photographing the solar corona in which a disc inside the telescope produces an artificial eclipse.

cosmic microwave background. An isotropic radiation field with a black body temperature of about 2.7°K that permeates the entire universe.

cosmic particle horizon. An imaginary sphere, centred on the Earth, whose radius equals the distance light has travelled since the Big Bang.

cosmic rays. Atomic nuclei (mostly protons) that strike the Earth with extremely high speeds.

cosmological principal. The assumption that the universe is homogeneous and isotropic on the largest scale.

cosmological redshift. A redshift that is caused by the expansion of the universe.

cosmology. The study of the structure and evolution of the universe.

code focus. A reflecting telescope in which a series of mirrors direct light to a remote focus away from the moving parts of the telescope.

critical density. The average density throughout the universe at which space would be flat and galaxies would just barely continue receding from each other infinitely far into the future.

D:

dark matter. Sub luminous matter that seems to be quite abundant in galaxies and throughout the universe.

dark-matter problem. The enigma that most of the matter in the universe is severely under luminous.

dark nebula. A cloud of interstellar gas and dust that obscures the light of more distant stars.

declination. Angular distance of a celestial body north or south of the celestial equator.

deflagration. A sudden, violent burning.

degree. A basic unit of angular measure, usually designated by the symbol $^{\circ}$.

density. The ratio of the mass of an object to its volume.

density-wave theory. An explanation of spiral arms in galaxies proposed by C.C.Lin and colleagues.

descending node. A point along an orbit where an object crosses a reference plane (usually the ecliptic or celestial equator) from north to south.

deuterium. An isotope of hydrogen whose nucleus contains one proton and one neutron, heavy hydrogen.

diffraction. The spreading out of light passing the edge of an opaque object.

diffraction grating. A piece of glass or metal, containing thousands of closely spaced lines that is used to disperse light into a spectrum

diffuse nebula. A reflection or emission nebula consisting of interstellar gas and dust.

dilation of time. The slowing of time due to relativistic motion.

direct motion. The apparent eastward movement of a planet seen against the background of stars.

disc (of a galaxy). The disc-shaped distribution of population I stars that dominates the appearance of a spiral galaxy.

distance modulus. The difference between the apparent and absolute magnitudes of an object.

diurnal. Daily.

diurnal motion. Motion in one day.

Doppler effect. The apparent change in wavelength of a radiation due to relative motion between the source and the observer along the line of sight.

double star. A pair of stars in orbit about each other and held together by their mutual gravitational attraction; a binary star.

dust tail. The tail of a comet that is composed primarily of dust particles.

dwarf elliptical galaxy. A low-mass galaxy that only contains a few million stars.

E:

eclipse. The cutting off of part or all of the light of one celestial object by another.

eclipse path. The track of the Moon's shadow along the Earth's surface during a total or annular solar eclipse.

eclipse year. The interval between successive passages of the Sun through the same node of the Moon's orbit.

eclipsing binary. A binary system in which, as seen from Earth the stars pass in front of each other.

ecliptic. The apparent annual path of the Sun on the celestial sphere.

Einstein ring. The circular image of a remote light source produced by gravitational lens in which the source, the observer, and the deflecting mass are nearly perfectly aligned.

electromagnetic radiation. Radiation consisting of oscillating electric and magnetic fields including gamma rays, X rays, visible light, ultraviolet and infrared radiation, radio waves, and microwaves.

electromagnetic spectrum. The entire array or family of electromagnetic radiation.

element. A chemical that cannot be broken down into more basic chemicals.

elliptical galaxy. A galaxy with an elliptical shape and no conspicuous interstellar material.

elongation. The angular distance between a planet and the Sun as viewed from Earth.

emission line. A bright spectral line.

emission line spectrum. A spectrum that contains emission lines.

emission nebula. A glowing gaseous nebula whose light comes from a fluorescence caused by a nearby star.

Encke division. A narrow gap in Saturn's A ring.

epoch. A date and time selected as a fixed reference.

equation of time. The difference between apparent and mean solar time.

equinox. One of the intersections of the ecliptic and the celestial equator.

ergosphere. The region of space immediately outside the event horizon of a rotating black hole where it is impossible to remain at rest.

escape speed. The speed needed by one object to achieve a parabolic orbit away from a second object and thereby permanently move away from the second object.

event horizon. The location around a black hole where the escape velocity equals the speed of light; The surface of a black hole .

extragalactic. Beyond our galaxy.

eyepiece. A magnifying lens used to view the image produced at the focus of a telescope.

F:

favourable opposition. A Martian opposition that affords good Earth-based views of the planet.

first quarter moon. The phase of the Moon that occurs when the moon is 90° east of the Sun.

flare. A sudden, temporary outburst of light from an extended region of the solar surface.

flat space. Space that is not curved; space with zero curvature.

flocculant spiral galaxy. A spiral galaxy with fuzzy, poorly defined spiral arms.

flux. The number of particles or the amount of energy flowing across a given area per unit of time.

focal length. The distance from a lens or mirror to the point where converging light rays meet.

focus (optical). The point where light rays converged by a lens or mirror meet.

force. That which can change the momentum of an object.

frequency. The number of wave crests or troughs that cross a given point per unit of time ; the number of vibrations per unit of time.

full moon. A phase of the Moon during which its full daylight hemisphere can be seen from Earth.

G:

galactic cannibalism. A collision between two galaxies of unequal mass and size in which the smaller galaxy seems to be absorbed by the larger galaxy.

galactic cluster. A loose association of young stars in the disc of our galaxy.

galactic equator. The intersection of the principal plane of the Milky Way with the celestial plane.

galactic nucleus. The centre of a galaxy.

galaxy. A large assemblage of stars, nebulae, and interstellar gas and dust.

galaxy merger. A collision between two galaxies that cause them to coalesce.

Galilean satellite. Any one of the four large moons of Jupiter.

gamma rays. The most energetic form of electromagnetic radiation.

general theory of relativity. A description of gravity formulated by Albert Einstein, which explains that gravity affects the geometry of space and the flow of time .

geocentric cosmology. An Earth centred theory of the universe.

giant star. A star whose diameter is typically 10 to 100 times that of the sun and whose luminosity is roughly that of 100 Suns.

giant elliptical galaxy. A large, massive elliptical galaxy containing many billions of stars.

giant molecular cloud. A large cloud of interstellar gas and dust.

gibbous moon. A phase of the Moon in which more than one half , but not all, of the Moon's daylight hemisphere is visible from Earth.

glitch. A sudden speedup in the period of a pulsar.

globular cluster. A large spherical cluster of stars, typically found in the outlying regions of a galaxy.

globule. A small, dense, dark nebula.

gluon. A particle that is exchanged between quarks.

granulation. The rice-grain-like structure of the solar photosphere.

grating. An optical device, consisting of thousands of closely spaced lines etched on glass or metal, that disperses light into a spectrum.

gravitation. The tendency of matter to attract matter.

gravitational lens. The deflection of light from a remote source caused by the presence of an intervening mass.

gravitational radiation/waves. Oscillations of space produced by changes in the distribution of matter.

graviton. The particle that is responsible for the gravitational force.

gravity. The force with which matter attracts matter.

Great Dark Spot. A prominent high-pressure system in Neptune's southern hemisphere.

Great Red Spot. A prominent high-pressure system in Jupiter's southern hemisphere.

greatest elongation. The largest possible angle between the Sun and an inferior planet.

Greenwich meridian. The meridian of longitude that passes through the Old Greenwich Observatory near London; the longitude of 0° .

group (of galaxies). A poor cluster of galaxies.

H:

H I region. A region of neutral hydrogen in interstellar space.

H II region. A region of ionized hydrogen in interstellar space.

hadron. A particle composed of quarks.

halo (of a galaxy). A spherical distribution of globular clusters of population II stars that surround a spiral galaxy.

helio-. A prefix referring to the Sun.

heliocentric cosmology. A Sun centred theory of the universe.

helium burning. The thermonuclear fusion of helium to form carbon and oxygen.

Hertzsprung-Russell (H-R) diagram. A plot of the absolute magnitude (or luminosity) of stars against their spectral type (or surface temperature).

heterogeneous accretion theory. A theory of planetary formation which argues that the composition of planetesimals changed as the planets formed.

homogeneous accretion theory. A theory of planetary formation which argues that the planets formed from planetesimals of generally the same composition.

horizontal branch. A group of stars on the Hertzsprung-Russell diagram of a typical globular cluster near the main sequence and having roughly constant absolute magnitude.

hot dark matter. Dark matter consisting of particles moving at high speeds.

Hubble classification scheme. A method of classifying galaxies as spirals, barred spirals, ellipticals, or irregulars according to their appearance.

Hubble constant (H_0) The constant of proportionality in the relation between the recessional velocities of remote galaxies and their distances.

Hubble flow. The recessional motions of remote galaxies caused by the expansion of the universe.

Hubble law. The empirical relationship stating that the redshifts of remote galaxies are directly proportional to their distances from Earth.

hyperbolic space. Space with a negative curvature.

hypothesis. An idea or collection of ideas that seem to explain a specific phenomenon; a conjecture.

I:

impact crater. A crater formed by the impact of a meteoroid.

inertia. The property of matter that requires a force to act on it to change its state of motion.

inferior conjunction. The configuration when an inferior planet is between the Sun and Earth.

inferior planet. A planet that is closer to the Sun than the Earth is.

inflation. A sudden expansion of space.

inflationary epoch. A brief period shortly after the Big Bang during which the scale of the universe increased very rapidly.

infrared radiation. Electromagnetic radiation of wavelength longer than visible light, yet shorter than radio waves.

inner core. The solid portion of the Earth's iron core.

inner Lagrangian point. The point between two stars comprising a binary star where their Roche lobes touch; the point across which mass transfer can occur.

interferometry. A technique of combining the observations of two or more telescopes to produce images better than one telescope alone could make.

interplanetary medium. The sparse distribution of gas and dust particles in interplanetary space.

interstellar dust. Microscopic solid grains of various compounds in interstellar space.

interstellar extinction. The dimming of starlight passing through the interstellar medium.

interstellar gas. Sparse gas in interstellar space.

interstellar medium. Interstellar gas and dust.

interstellar reddening. The reddening of starlight passing through interstellar medium, caused by the fact that blue light is scattered more than red.

inverse-square law. The statement that the apparent brightness of a light source varies

inversely with the square of the distance from that source.

ion. An atom that has become electrically charged due to the addition or loss of one or more electrons.

ion tail (of a comet). The relatively straight tail of a comet produced by the solar wind acting on ions.

ionisation. The process by which an atom loses electrons.

ionosphere. A layer in the Earth's upper atmosphere in which many of the atoms are ionized.

iron meteorite. A meteorite composed primarily of iron.

irregular cluster (of galaxies). A sprawling collection of galaxies whose overall distribution in space does not exhibit any noticeable spherical symmetry.

irregular galaxy. An asymmetrical galaxy having neither spiral arms nor elliptical shape.

isotope. Any of several forms of the same chemical element whose nuclei all have the same number of protons but different numbers of neutrons.

isotropic. Having the same property in all directions.

J:

joule (J). A unit of energy.

Jovian planet. Any of the four largest planets; Jupiter, Saturn, Uranus, or Neptune.

K:

kelvin (K). A unit of temperature on the Kelvin temperature scale.

Kepler's laws. Three statements, formulated by Johannes Kepler, that describes the motion of the planets.

kilo parsec (kpc). One thousand parsecs; about 3260 light-years.

kinetic energy. The energy possessed by an object because of its motion.

Kirchhoff's laws. Three statements about circumstances that produce absorption lines, emission lines, and continuous spectra.

L:

Lagrangian points. Five points in the orbital plane of two bodies revolving about each other in circular orbits where a third object of negligible mass can remain in equilibrium.

last quarter moon. The phase of the moon that occurs when the Moon is 90° west of the Sun.

law of equal areas. Kepler's second law.

law of inertia. Newton's first law.

law of physics. A set of physical principals with which we can understand natural phenomena and the nature of the universe.

leap year. A calendar year with 366 days.

lenticular galaxy. A galaxy with a central bulge and a disc but no spiral arms.

lepton. Any member of a class of particles that includes the electron and neutrino.

libration. A slight rocking of the Moon in its orbit whereby an Earth-based observer can, over time, see slightly more than one half of the Moon's surface.

light. Electromagnetic radiation.

light curve. A graph that displays variations in the brightness of a star or other astronomical object.

light-gathering power. A measure of the amount of radiation brought to the focus by a telescope.

light year (ly). The distance light travels in a vacuum in one year.

limb (of Sun or Moon). The apparent edge of the Sun or Moon as seen in the sky.

limb darkening. The phenomenon whereby the Sun is darker near its limb than near the centre of its disc.

limiting magnitude. The faintest magnitude that can be observed with a certain telescope under certain conditions.

liquid metallic hydrogen. Hydrogen compressed to such a density that it behaves like a liquid metal.

LMC. The Large Magellanic Cloud.

Local Bubble. A large cavity in the interstellar medium in which the Sun and nearby Stars are located,

Local Group. The cluster of galaxies of which our Galaxy is a member.

long-period comet. A comet that takes hundreds of thousands of years to complete one orbit of the sun.

long-period variable. A variable star with a period longer than about 100 days.

luminosity. The rate at which electromagnetic radiation is emitted from a star or other object.

luminosity class. A classification of a star of a given spectral type according to its luminosity.

luminosity function. The numbers of stars of differing brightness per cubic parsec.

lunar. Referring to the Moon.

lunar eclipse. An eclipse of the Moon by the Earth; a passage of the Moon through the Earth's shadow.

lunar month. The time the Moon takes to complete one cycle of its phases; the synodic month.

lunar phase. The appearance of the illuminated area of the Moon as seen from Earth .

M:

Magellanic clouds. Two nearby galaxies visible to the naked eye from southern latitudes.

magnetosphere. The region around a planet occupied by its magnetic field.

magnification. The factor by which the angular size of an object is apparently increased when viewed through a telescope.

magnifying power. The number of times larger in angular diameter an object appears through a telescope than when viewed with the naked eye.

magnitude. A measure of the amount of light received from a star or other luminous object.

magnitude scale. A system for denoting the brightness of astronomical objects.

main sequence. A grouping of stars on the Hertzsprung-Russell diagram extending diagonally across the graph from the hottest, brightest stars to the dimmest, coolest stars.

main sequence star. A star whose luminosity and surface temperature place it on the main sequence on a H-R diagram; a star that derives its energy from core hydrogen burning.

major axis (of an ellipse). The longest diameter of an ellipse.

Mantle (of a planet). That portion of a terrestrial planet located between the crust and the core.

mare. Latin for “sea”; a large, relatively crater-free plain on the Moon. *plural* maria.

marginally bounded universe. A universe throughout which the average density equals the critical density.

mascon. A localised concentration of dense material beneath the lunar surface.

mass. A measure of the total amount of material in an object.

mass density of radiation. The energy possessed by a radiation field per unit volume divided by the square of the speed of light.

mass function. A numerical relationship involving the masses of the stars in a binary system and the angle of inclination of their orbits in the sky.

mass loss. A process by which a star gently loses matter.

mass-luminosity relation. A relationship between the masses and luminosity of main sequence stars.

mass transfer. The flow of gases from one star in a binary to another.

Maunder butterfly diagram. A plot of sunspot latitude versus time .

Maunder minimum. An interval of about 70 years, starting around 1645, during which very few sun spots were seen.

maximum eastern elongation. The configuration of an inferior planet at its greatest angular distance east of the Sun.

maximum western elongation. The configuration of an inferior planet at its greatest angular distance west of the Sun.

mean solar day. The interval between successive meridian passages of the mean Sun; the average length of a solar day.

mechanics. The branch of physics dealing with the behaviour and motions of objects acted upon by forces.

mega parsec (Mpc). One million parsecs.

meridian (local). The great circle on the celestial sphere that passes through an observer’s zenith and the North and south celestial poles.

metal poor star. A star which, compared with the Sun, is under abundant in elements heavier than helium.

metal rich star. A star whose abundance of heavy elements is roughly comparable to that of the Sun.

meteor. The luminous phenomenon seen when a meteoroid enters the Earth’s atmosphere; a “shooting star” .

meteor shower. Many meteors that seem to radiate from a common point in the sky.

meteorite. A fragment of a meteoroid that has survived passage through the Earth’s atmosphere.

meteoroid. A small rock in interplanetary space.

micrometeorite. A very small meteoroid; a grain of interplanetary dust.

microwaves. Short wavelength radio waves.

Milky Way. Our Galaxy; the band of faint stars seen from the Earth in the plane of our Galaxy’s disc.

minor planet. An asteroid.

minute of arc. One-sixtieth of a degree, designated by the symbol '.

molecule. A combination of two or more atoms.

moving cluster method. A technique for determining the distance of a cluster of stars from the motions of the cluster's members

muon. A subatomic particle that behaves like a heavy electron.

N.

nadir. The point on the local meridian 180° from the zenith.

nanosecond. One-billionth (10^{-9}) second.

nebula. A cloud of interstellar gas and dust.

neutrino, A subatomic particle with no electrical charge and little or no mass, yet one that is important in many nuclear reactions.

neutron. A subatomic particle with no electrical charge and with a mass nearly equal to that of the proton.

neutron star. A very compact, dense star composed almost entirely of neutrons.

New General Catalogue (NGC). A famous nineteenth-century catalogue of nebulae, galaxies, and star clusters.

new moon. The phase of the Moon when the dark hemisphere faces the Earth.

new technology telescope. A telescope whose design incorporates innovative features, such as adaptive optics.

Newtonian focus. An optical arrangement in a reflecting telescope in which a small mirror reflects converging light rays to a focus to one side of the telescope tube.

Newtonian mechanics. The branch of physics based on Newton's law that deals with gravitation.

Newtonian reflector. A reflecting telescope that uses a small mirror to deflect the image to one side of the telescope tube.

Newton's laws of motion. Three statements about the nature of physical reality on which Newtonian mechanics is based.

node. The intersection of an orbit with a reference plane such as the plane of the celestial equator or the ecliptic.

north celestial pole. The point directly above the Earth's north pole where the Earth's axis of rotation, if extended, would intersect the celestial sphere.

northern lights . Aurorae; aurorae borealis.

nova. A star that experiences a sudden outburst of radiant energy, temporarily increasing its luminosity roughly a thousand fold.

nuclear bulge. The central region of our Galaxy; the central bulge.

nuclear fusion. The combining of lighter nuclei to make heavier ones.

nucleus (of an atom). The massive part of an atom, composed of protons and neutrons, about which electrons revolve.

nucleus (of a comet). A collection of ices and dust that constitutes the solid part of a comet.

nucleus (of a galaxy). The concentration of stars and dust at the centre of a galaxy.

mutation. A small periodic wobbling of the Earth's axis superimposed on precession.

O.

OB association. A grouping of hot, young, massive stars, predominantly of spectral type O and B.

OBAFGKM. The temperature sequence of spectral types .

objective lens. The principal lens of a refracting telescope.

oblate. Flattened at the poles.

oblateness. A measure of how much a flattened sphere (or spheroid) differs from a perfect sphere.

Obliquity (of the ecliptic). The angle between the planes of the celestial equator and the ecliptic (about $23\frac{1}{2}^{\circ}$).

obscuration (interstellar). The absorption of starlight by interstellar dust..

observable universe. That portion of the universe inside the cosmic horizon.

Occam's razor. The notion that a straightforward explanation of a phenomenon is more likely to be correct than a convoluted one .

occultation. The eclipsing of an astronomical object by the Moon or planet.

Olber's paradox. The dilemma associated with the fact that the night sky is dark.

Oort cloud. A presumed accumulation of comets and cometary material surrounding the Sun at a distance of roughly 50,000 to 100,000 AU.

opacity. The ability of a material to impede the passage of light.

open cluster. A loose association of young stars in the disc of our Galaxy; a galactic cluster.

opposition . The configuration of a planet when it is at an elongation of 180° and thus appears opposite the Sun in the sky.

optical window. The range of visible wavelengths to which the Earth's atmosphere is transparent.

optics. The branch of physics dealing with the behaviour and properties of light.

orbit. The path of an object that is moving about a second object or point.

outer core. The molten portion of the Earth's core.

plasma. Hot ionised gas.

poor cluster (of Galaxies). A cluster of galaxies with a very few members; a group of galaxies.

population I star. A star whose spectrum exhibits spectral lines of many elements heavier than Helium; a metal rich star.

population II star. A star whose spectrum exhibits comparatively few spectral lines of many elements heavier than Helium; a metal poor star.

population III star. A star virtually devoid of elements heavier than Helium.

positron. An electron with a positive rather than a negative charge; an antielectron.

potential energy. The energy possessed by an object because of its elevated position in a gravitational field.

precession (of the Earth). A slow, conical motion of the Earth's axis of rotation caused by the gravitational pull of the Moon and Sun on the Earth's equatorial bulge.

precession (of the equinoxes). The slow westward motion of the equinoxes along the ecliptic due to the precession of the Earth.

prime focus. The point in a telescope where the objective focuses light.

primordial black hole. A hypothetical black hole that may have been created immediately after the Big Bang.

prism. A wedge shaped piece of glass that is used to disperse white light into a spectrum.

prominence. Flame like protrusions seen near the limb of the Sun and extending into the solar corona.

proper mass. The mass of an object measured at rest.

proper motion. The angular rate of change in the location of a star on the celestial sphere, usually expressed in seconds of arc a year.

proto- A prefix referring to the embryonic stage of a young astronomical object (planet, star etc), that is still in the process of formation.

proton. A heavy, positively charged subatomic particle that is one of two principal constituents of the atomic nuclei.

protoplanetary disc. A disc of material encircling a proto star or a newborn star.

pulsar. A pulsating radio source believed to be associated with a rapidly rotating neutron star.

pulsating variable. A star that pulsates in size and luminosity.

Q.

quantum mechanics. The branch of physics dealing with the structure and behaviour of atoms and their interaction with light

quark. One of several hypothetical particles presumed to be the internal constituents of certain heavy subatomic particles such as protons and neutrons.

quarter moon. A phase of the Moon when it is located 90° from the Sun in the sky, so that one half of its day lit hemisphere is visible from earth.

quasar. A star like object with a very large redshift; a quasi-stellar object or quasi-stellar radio source.

quasi-stellar object. A starlike object with a very large redshift; a quasar.

quasi-stellar radio source. A quasar that emits detectable radio radiation.

R.

radar. A technique of reflecting radio waves from a distant object.

radial velocity. The portion of an object's velocity parallel to the line of sight.

radiant (of a meteor shower). The point in the sky from which meteors of a particular shower seem to originate.

radiation. Electromagnetic energy; photons.

radiation dominated universe. A universe in which the mass density of radiation exceeds the average density of matter.

radio astronomy. That branch of astronomy dealing with observations of radio wavelength.

radio galaxy. A galaxy that emits an unusually large amount of radio waves.

radio telescope. A telescope designed to detect radio waves.

radio waves. The longest wavelength electromagnetic radiation.

radioactivity. The process whereby certain atomic nuclei naturally decompose by spontaneously emitting particles .

ray (lunar). Any one of a system of bright, elongated streaks on the lunar surface.

red giant. A large, cool star of high luminosity

red supergiant. An extremely large, cool star of luminosity class 1.

reddening (interstellar) . The reddening of starlight as it passes through the interstellar medium.

redshift. The shifting to longer wavelengths of the light from remote galaxies and quasars; The doppler shift of light from a receding source.

reflecting telescope. A telescope in which the principal optical component is a concave mirror.

reflection grating. A diffraction grating that produces a spectrum when a light is reflected off it.

reflection nebula. A comparatively dense cloud of dust in interstellar space that is illuminated by a star.

refracting telescope. A telescope in which the principal optical element is a lens.

refraction. The bending of light rays passing from one transparent medium to another.

refractor. A refracting telescope .

regolith. The layer of rock fragments covering the lunar surface.

regular cluster (of Galaxies) . A spherical cluster of galaxies.

regular orbit. An orbit in the plane of a planet's equator along which a satellite travels in the same direction that the planet rotates,

residual polar cap. Ice-covered polar regions on Mars that do not completely evaporate during the Martian summer.

resolution. The degree to which fine details in an optical image can be seen.

resolving power. A measure of the ability of an optical system to distinguish, or resolve, fine details in the image it produces.

retrograde motion. The apparent westward motion of a planet with respect to background stars.

retrograde rotation. The rotation of an object in the direction opposite to which it is revolving about another object.

revolution. The motion of one body about another.

rich cluster (of galaxies) . A cluster of galaxies containing many members.

right ascension. A coordinate for measuring the east-west positions of objects on the celestial sphere.

rille. A trench like depression on the lunar surface

rotation. The turning of a body about an axis passing through the body.

RR lyrae variable . A class of pulsating stars with periods less than one day.

S.

satellite. A body that revolves about a larger one .

Schmit telescope. A reflecting telescope invented by Bernard Schmit that is used to photograph large areas of the sky.

second of arc. One-sixtieth of an arc minute, designated by the symbol “.

self-propagating star formation. The process by which the formation of stars in one location in a galaxy stimulates the formation of stars in a neighbouring location.

Seyfert galaxy. A spiral galaxy with a bright nucleus whose spectrum exhibits emission lines.

shell star. A star, usually of spectral type A to F, that is surrounded by a shell of gas.

Short-period comet. A comet that orbits the Sun with a period of less than about 200 years.

SI. The international System of units based on the meter (m), the second (s), and the kilogram (kg).

sidereal clock. A clock that measures sidereal time .

sidereal day. The interval between successive meridian passages of the vernal equinox .

sidereal month. The period of the Moon's revolution about the Earth with respect to the stars

sidereal period. The orbital period of one object about another with respect to the stars.

sidereal time . Time reckoned by the location of the vernal equinox.

sidereal year. The orbital period of the earth about the Sun with respect to the Sun

singularity. A place of infinite space-time curvature; the centre of a black hole .

SMC. The Small Magellanic Cloud.

solar activity. Phenomena that occur in the solar atmosphere such as sunspots, flares, and so forth.

Solar atmosphere. The outer layers of the Sun, consisting of the photosphere, chromosphere, and corona.

solar constant. The average amount of energy received from the sun per square metre per second, measured just above the earth's atmosphere.

solar corona. Hot faintly glowing gasses seen around the Sun during a total solar eclipse; the uppermost regions of the solar atmosphere

solar cycle. The semiregular 22-year interval between successive appearances of sunspots at the same latitude and with the same magnetic polarity.

solar solar eclipse. An eclipse of the sun by the Moon ; a passage of the Earth through the Moon's shadow.

solar flare. A violent outburst on the Sun's surface.

solar interior. Everything below the solar atmosphere; the inside of the Sun.

solar nebula. The cloud of gas and dust from which the Sun and solar system formed.

solar system . The Sun, planets, and their satellites, asteroids, comets and related objects that orbit the Sun.

solar transient. A short lived eruption that moves rapidly outwards through the solar corona.

solar transit. The passage of an object in front of the Sun.

solar wind. A radial flow of particles (mostly electrons and protons) from the Sun.

solstice. Either of two points along the ecliptic at which the sun reaches its maximum distance north or south of the celestial equator.

south celestial pole. The point directly above the Earth's south pole where the Earth's axis of rotation, if extended, would intersect the celestial sphere.

southern lights. Aurorae; aurorae australis.

space-time. A four dimensional combination of the three dimensions of space and time

special theory of relativity. A description of the mechanics and electromagnetic theory formulated by Albert Einstein, which explains that measurements of distance, time, and mass are affected by the observer's motion.

spectral analysis. The identification of chemical substances from the patterns of lines in their spectra.

spectral class/type. A classification of stars according to the appearance of their spectra.

spectral line. In a spectrum, an absorption or emission feature that is at a particular wavelength.

spectrogram. The photograph of a spectrum.

spectrograph. An instrument for photographing a spectrum.

spectroheliograph. An instrument for photographing the Sun in the monochromatic light of one spectral line .

spectroscope . An instrument for directly viewing a spectrum.

spectroscopic binary. A binary star whose binary nature is deduced from the periodic Doppler shifting of lines in its spectrum.

spectrum. The result of dispersing a beam of electromagnetic radiation so that components with different wavelengths are separated in space.

spiral arms. Lanes of interstellar gas, and dust, and young stars that wind outwards in a plane from the central regions of a galaxy.

spiral galaxy. A flattened, rotating galaxy with pinwheel like spiral arms winding outwards from the galaxy's nucleus.

standard candle. An astronomical object of known intrinsic brightness that can be used to determine extragalactic distances.

Star. A self luminous sphere of gas.

star burst galaxy . A galaxy that is experiencing an exceptionally high rate of star formation.

stellar association. A loose grouping of young stars.

stellar evolution . The changes in size, luminosity, temperature, and so forth that occur as a star ages .

stony iron meteorite. A meteorite composed of both stone and iron.

stony meteorite. A meteorite composed of stone .

summer solstice. The point on the ecliptic where the Sun is farthest north of the celestial equator.

Sun. A star about which the Earth and other planets revolve .

sun-grazing comet. A comet that passes quite near to the Sun.

sun spot. A temporary cool region in the solar photosphere.

sunspot cycle. The semiregular 11 year period with which the number of sunspots fluctuates .

sunspot maximum/minimum. The time during the sun spot cycle when the number of sunspots is highest/lowest.

super cluster. A collection of clusters of galaxies.

super giant. A very large, extremely luminous star; stars of luminosity class 1.

superior conjunction. The configuration of a planet being behind the Sun as viewed from Earth.

superior planet. A planet that is more distant from the sun than the Earth is .

supermassive black hole. A black hole with a mass in the range of a million to a billion solar masses.

supernova. A stellar outburst during which a star suddenly increases its brightness roughly a million fold.

Supernova explosion. The detonation of a supernova.

supernova remnant. The gasses ejected by a super nova.

synchronous rotation The rotation of a body with a period equal to its orbital period .

synodic month. The period of revolution of the Moon with respect to the Sun.; the length of one cycle of lunar phases .

synodic period. The period between successive occurrences of the same configuration of a planet.

T.

tail (of a comet). Gas and dust particles from a comet's nucleus that have been swept away from the comet's head by radiation pressure of sunlight and the solar wind.

tangential velocity. That portion of an object's velocity perpendicular to the line of sight.

tektites. Rounded glassy objects believed to have a meteoritic origin .

telescope. An instrument for viewing remote objects.

temperature Kelvin. Absolute temperature measured in units (kelvin abbreviated "K") equivalent to the degree Celsius.

terminator. The line dividing day and night on the surface of the Moon or a planet; the line of sunset or sunrise .

terra. Cratered lunar highlands.

terrestrial planet. Mercury, Venus, Earth, and Mars; the classification sometimes also includes the Galilian satellites and Pluto.

theory of everything. (TOE). A supergrand unified theory that completely describes all particles and forces as well as the structure of space and time.

thermal energy. The energy associated with heat stemming from the motions of atoms or molecules in a substance.

thermodynamics. The branch of physics dealing with heat and the transfer of heat between bodies.

thermonuclear fusion. The combining of nuclei under conditions of high temperature in a process that release substantial energy.

thermonuclear reaction. A reaction resulting from the high speed collision of nuclear particles that are moving rapidly because they are at a high temperature.

third quarter moon. The phase of the moon that occurs when the Moon is 90° west of the Sun; last quarter Moon.

time zone. A region on the Earth where, by agreement, all clocks have the same time.

total eclipse. A solar eclipse during which the Sun is completely hidden by the Moon, or a lunar eclipse during which the Moon is completely immersed in the Earth's umbra.

total lunar eclipse. A lunar eclipse during which the Moon is completely immersed in the Earth's umbra.

total solar eclipse. A solar eclipse during which the Sun is completely hidden by the Moon.

transit. The passage of a celestial body across the meridian; the passage of a small object in front of a larger object.

transmission grating . A diffraction grating that produces a spectrum when light is shone through it .

Trojan asteroid. One of several asteroids that share Jupiter's orbit about the sun.

Type I Cepheid. A metal rich Cepheid variable .

Type I Seyfert galaxy. A Seyfert galaxy whose Balmer lines are significantly broader than any other of its other emission lines.

Type II Cepheid. A metal poor Cepheid variable .

Type II Seyfert galaxy. A Seyfert galaxy whose Balmer lines have about the same width as its other emission lines.

U.

UBV filters. Three coloured filters that are transparent to ultra violet (U), blue (B), and visible (V) light.

UBV system. A system of stellar magnitude involving measurements of starlight intensity in the ultra violet, blue, and visible spectral regions.

Ultra violet radiation. Electromagnetic radiation of wavelengths shorter than those of visible light but longer than those of X rays.

umbra. The central, completely dark portion of a shadow.

umbra (of a sunspot). The dark, central region of a sunspot.

unbounded universe. A universe throughout which the average density is less than the critical density.

universal law of gravitation. A formula derived by Isaac Newton. That expresses the strength of the force of gravity that two masses exert on each other.

universal time (UT). Local mean time at the prime meridian.

universe. All space, along with all the matter and radiation in space.

V.

Van Allen belts. Two doughnut-shaped regions around the Earth where many charged particles (protons and electrons) are trapped by the Earth's magnetic field..

variable star. A star whose luminosity varies.

velocity. The speed and direction with which an object moves.

vernal equinox. The point on the ecliptic where the sun crosses the celestial equator from south to north.

very-long-baseline interferometry (VLBI). A method of connecting widely separated radio telescopes to make observations of very high resolution.

visible light. Photons detectable by the human eye.

void. A large volume of space, typically 100 to 400 million light years in diameter, that contains few galaxies.

W.

waning crescent moon. The phase of the moon that occurs between third quarter and new Moon..

waning gibbous moon. The phase of the moon that occurs between full moon and third quarter.

wavelength. The distance between two successive wave crests.

waxing crescent moon. The phase of the Moon that occurs between new moon and the first quarter.

waxing gibbous moon. The phase of the moon that occurs between first quarter and full moon.

white dwarf. A low mass star that has exhausted all its thermonuclear fuel and contracted to a size roughly equal to the size of the Earth.

white hole. A black hole from which matter and radiation emerge.

white oval . A round whitish feature usually seen in Jupiter's southern hemisphere.

WIMP. A hypothetical massive particle proposed to explain the low neutrino flux from the sun

Wolf-Rayet star. A class of very hot stars that eject shells of gas at high velocity .

wormhole. A speculative, topological feature of a black hole that connects our universe with another universe.

X.

X rays. Electromagnetic radiation whose wavelength is between that of ultraviolet and gamma rays.

Y.

Year (yr). The period of revolution of the Earth about the sun.

Z.

ZAMS. Zero-age main sequence.

zenith The point on the celestial sphere opposite to the direction of gravity.

Zero-age main sequence. The main sequence of young stars that have just begun to burn hydrogen at their cores.

zodiac. A band of constellations around the sky centred on the ecliptic.

zone. A light coloured band in Jupiter's atmosphere.

The end.

**Prepared by Frank Gear F.R.A.S.
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A GLOSSARY of ASTRONOMICAL TERMS

Or

What every student of astronomy should know.

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