

## Glossary 2010

ablation	erosion of an object (generally a meteorite) by the friction generated when it passes through the Earth's atmosphere
achromatic lens	a compound lens whose elements differ in refractive constant in order to minimize chromatic aberration
albedo	the ratio of the amount of light reflected from a surface to the amount of incident light
alignment	the adjustment of an object in relation with other objects
altitude	the angular distance of a celestial body above or below the horizon
annular eclipse	a penumbral eclipse of the Moon
aphelion	the point on its orbit where the Earth is farthest from the Sun
arcminute	one sixtieth of a degree of angular measure
arcsecond	one sixtieth of an arcminute, or 1/3600 of a degree
ascending node	in the orbit of a Solar System body, the point where the body crosses the ecliptic from south to north
asteroid	a small rocky body that orbits a star — in the Solar System, most asteroids lie between the orbits of Mars and Jupiter
astronomical unit	mean distance between the Earth and the Sun
asynchronous	in connection with orbital mechanics, refers to objects that pass overhead at different times of the day; does not move at the same speed as Earth's rotation
axis	theoretical straight line through a celestial body, around which it rotates
azimuth	the direction of a celestial body from the observer, usually measured in degrees from north
bandpass filter	a device for suppressing unwanted frequencies without appreciably affecting the desired frequencies
binary star	two stars forming a physically bound pair under their mutual gravitational attraction — the stars move in elliptical orbits about their common centre of mass
black hole	a region of space-time that cannot be seen by distant observers because light is trapped by a strong gravitational field
candela	the SI base unit of luminous intensity
Cassegrain telescope	a telescope devised by Cassegrain in which an auxiliary convex mirror reflects the magnified image, upside down, through a hole in the centre of the main objective mirror
cataclysmic variable	a star in which the brightness increases suddenly because of an explosive event
celestial equator	projection of the Earth's equator as a line across the sky (for an observer on the equator, such a line would pass through the zenith)
celestial poles	the two points at which the Earth's axis of rotation, if extended, would intersect the celestial sphere
Charge	the fundamental property of a particle that causes it to be affected by the electromagnetic force
chromatic aberration	introduction of spurious colors by a lens, attenuated by the introduction of corrective elements into a compound lens
conjunction	the phenomenon in which two bodies have the same apparent celestial longitude or right ascension as viewed from a third body
contrast	the difference in visual properties that makes an object distinguishable from other objects and the background
constellation	a group of celestial bodies (usually stars) that appear to form a pattern in the sky or appear visibly related to each other
coordinates	quantities that provide references for locations in space and time

corona	outermost atmosphere of the Sun
cosmic rays	high-speed particles that reach the Earth from outside the Solar System
culminate	to reach the highest point above an observer's horizon
declination	angular distance above or below the celestial equator — one of the coordinates, with right ascension, that defines the position of a heavenly body.
deferent	in the Ptolemaic system, the planets are assumed to move in a small circle, called an epicycle, which in turn moves along a larger circle called a deferent.
descending node	in the orbit of a Solar System body, the point where the body crosses the ecliptic from north to south
ecliptic	the apparent path that the Sun traces out in the sky during the year, so named because eclipses occur when the full or new Moon is very close to this path of the Sun
elongation	a planet's elongation is the angle between the Sun and the planet, as viewed from Earth
ephemeris	a table of values that gives the positions of astronomical objects in the sky at a given time or times; plural = ephemerides
epicycle	in the Ptolemaic system, the planets are assumed to move in a small circle, called an epicycle (see <i>deferent</i> )
exit pupil	a virtual aperture in an optical system; an image of the objective element(s) as produced by a binocular or telescope eyepiece
flux	in magnetism, the total number of lines of magnetic force passing through a specified loop; a measure of the amount of power or radiation received per unit time per unit area;
galaxy	vast system of celestial objects, typically consisting of between $10^6$ and $10^{12}$ stars, plus interstellar gas and dust
gegenschein	a faint oval patch of light visible from Earth only at certain times of the year, opposite the Sun
geocentric	with reference to, or pertaining to, the centre of the Earth
geodesic	a path or line of shortest distance joining two points in space (or space-time)
gravity (gravitation)	the universal ability of all material objects to attract each other; its force is directly proportional to the mass of each object, and decreases by the square of the distance separating the objects involved
Gregorian calendar	the calendar introduced by Pope Gregory XIII in 1582 to replace the Julian calendar; the calendar now used as the civil calendar in most countries.
heiligschien	an optical phenomenon that creates a bright spot around the shadow of the viewer's head
heliocentric	a cosmological system in which the Sun is at (or near) the central point
Hertzsprung-Russell Diagram	a plot of stellar color, temperature, or spectral type versus stellar luminosity
illuminance	the total luminous flux incident on a surface, per unit area, i.e. one lux is an illumination of one lumen per square metre
immersion	the disappearance of a celestial body due to eclipse or occultation
inclination	the angle between one plane and another; the (equatorial) inclination of a planet is the angle between the plane of its equator and that of its orbit; the inclination of the orbit of a planet in the Solar System other than Earth is the angle between the plane of that orbit and the ecliptic
Lagrangian points	five points in the orbital plane of two massive objects in orbits around a common centre of gravity, where a third body of negligible mass can remain in equilibrium
latitude	angular distance on the celestial sphere measured north or south of the ecliptic along the great circle passing through the poles of the ecliptic and the celestial

	object
light-year	distance travelled at the speed of light after one Earth-year: 9.46 million million km
longitude	angular distance measured along the Earth's equator from the Greenwich meridian to the meridian of a geographic location
lumen	the SI unit of luminous flux, equal to the luminous flux emitted by a point source of one candela in a solid angle of one steradian
lunation	the period of time between two successive new Moons
Lyman-alpha line	the characteristic spectral line of atomic hydrogen associated with its lowest excited state
magnitude	a logarithmic brightness scale for astronomical objects; the measured brightness of a celestial body; dim objects have magnitudes of high numbers, bright objects have magnitudes of low or (sometimes) negative numbers
main sequence	a band that runs from top left to bottom right on the Hertzsprung-Russell diagram representing the majority of stars
nebula	indistinct, non-terrestrial objects visible in the night sky. "Bright" nebulae glow with light emitted by the gas of which they are composed ("emission" nebulae) or by reflected starlight ("reflection" nebulae) or both. "Dark" nebulae consist of clouds of gas and dust that are not so illuminated. "Planetary" nebulae are shells of gas ejected by stars. Spiral nebulae are galaxies
Newtonian telescope	a class of reflecting telescope developed by Sir Isaac Newton with a paraboloidal primary mirror and a small, plane secondary mirror at 45° to deflect the focus of the primary to a position outside the tube near the top of the telescope
nutatation	a small, irregular oscillation in the precessional motion of Earth's rotational axis, caused primarily by lunar perturbations
occultation	the cut-off of the light from a star caused by its passage behind another celestial body; strictly speaking, a solar "eclipse" is a solar occultation
opposition	when the Earth comes directly between a planet and the Sun
osculating elements	a set of parameters that specifies the instantaneous position and velocity of a celestial body in its perturbed orbit
parallax	the angle subtended by the apparent difference in a star's position when viewed from the Earth either simultaneously from opposite sides of the planet, or half such an angle, measured after a gap of six months from opposite sides of the planet's orbit; the nearer the celestial body, the greater the parallax
periastron	the point in the orbit of one component of a binary system where it is nearest the other component
perihelion	the point on its orbit where the Earth is closest to the Sun
position angle (PA)	the convention for measuring angles on the sky, defined as the angle measured relative to the north celestial pole (NCP), usually measured from north through east.
precession	the slow (once-per-26 000 years) gyration of the Earth's axis
prograde	motion in the same direction as the prevailing direction of motion
quadrature	elongation of a planet when it makes a 90° angle with the Sun as seen from Earth
quasi-conjunction	a planet in retrograde motion — always either Mercury or Venus — will "drop back" in right ascension until another planet <u>almost</u> overtakes it
radial velocity	velocity along the line of sight toward (-) or away from (+) the observer
radiant	the point in the sky from which a meteor shower appears to emanate

redshift	the shift of spectral lines toward longer wavelengths in the spectrum of a receding source of radiation
refraction	the change in direction of travel (bending) of a light ray as it passes obliquely through the atmosphere; in the case of a lens, any ray as it passes from one medium into another of greater or lesser density
relativity	the theory of how motion and gravity affect the properties of time and space
retrograde	in a backwards direction; in astronomy, an east-to-west direction
resonance	when two orbiting bodies exert a regular, periodic gravitational influence on each other
right ascension	angular distance on the celestial sphere measured eastward along the celestial equator from the equinox to the hour circle passing through the celestial object
semi-major axis	half of the longest diameter of an ellipse; equal to the distance from the centre to one end of an ellipse; equivalent to the mean distance of a planet from the Sun
Seyfert galaxy	a type of spiral galaxy first discovered by Karl Seyfert in the 1940s; the central region of a Seyfert galaxy is distinguished by powerful radiation, much of it focused into narrow frequencies
SI	abbreviation taken from <i>Système international d'unités</i> — the modern form of the metric system
sidereal	relating to the period of time based on the apparent rotation of the stars, and therefore equivalent to the rotation of the body from which the observation is made
spacetime	the three physical dimensions of space are combined with time, treated as a fourth dimension, to constitute the space-time continuum that is used as the fundamental framework of the theory of relativity
spectrum	the breakdown of light into a rainbow of colors; a good spectrum reveals a star's spectral type, radial velocity (from the spectrum's Doppler shift), and metallicity
steradian	a unit of solid (three-dimensional) angular measure; one steradian is equal to the angle subtended at the centre of a sphere by an area of surface equal to the square of the radius
subtend	an angle subtended by an arc is one whose two rays pass through the endpoints of the arc
synchronous	rotation whose period is equal to the orbital period
synodic	time between one opposition and the next, of any superior planet or asteroid; the period of revolution of one body about another with respect to the Earth
twilight	the interval of time preceding sunrise and following sunset during which the sky is partially illuminated
umbra	the portion of a shadow cone in which none of the light from an extended light source (ignoring refraction) can be observed