Glossary

Ablation A process whereby the atmosphere melts away the surface material of an incoming meteorite

Absolute magnitude Brightness of a star or celestial object if seen from a standard distance of 10 parsecs

Achondrite A stony meteorite lacking chondrules

Albedo The ratio of the light reflected in all directions by a surface to the light incident on it. A perfectly reflecting surface has an albedo of 1, a perfectly absorbing surface has an albedo of 0

Altitude The angular distance between the direction to an object and the horizon. Altitude ranges from 0° for an object on the horizon to 90° for an object directly overhead

Amino acid A carbon-based molecule from which protein molecules are assembled

Amor asteroid A member of a class of asteroids having orbits that cross the orbital distance of Earth

Angular momentum The momentum of a body associated with its rotation or revolution. For a body in a circular orbit, angular momentum is the product of orbital distance, orbital speed, and mass. When two bodies collide or interact, angular momentum is conserved

Annihilation The mutual destruction of a matter-antimatter pair of particles. The charges on the two particles cancel, and the mass of the particles is entirely converted to energy

Annular eclipse A solar eclipse in which the Moon is too far from Earth to block the entire Sun from view and a thin ring of sunlight appears around the Moon

Antimatter A type of matter that annihilates ordinary matter on contact. For every particle, there is a corresponding antimatter particle. For example, the antimatter counterpart of the proton is the antiproton

Aperture The diameter of the main light-gathering lens or mirror, given in inches, centimeters, or meters

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Apex The direction in the sky toward which the Sun is moving. Because of the Sun's motion, nearby stars appear to diverge from the apex

Aphelion The point in the orbit of a Solar System body where it is farthest from the Sun

Apogee The point, in an orbit about Earth, that is furthest from Earth

Apollo asteroid A member of a class of asteroids having orbits that cross the orbital distance of Earth

Apparent magnitude Brightness of a star or celestial object when observed at its great distance from Earth

Asteroid A small, planet-like Solar System body. Most asteroids are rocky in makeup and have orbits of low eccentricity and inclination

Asteroid Belt The region of the Solar System lying between 2.1 and 3.3 astronomical units (AU) from the Sun. The great majority of asteroids are found in the Asteroid Belt

Astronomical unit (AU) The mean Earth-Sun distance, about 150,000,000 km

Aten asteroid An asteroid having an orbit with semi-major axis smaller than 1 AU

Atom A particle consisting of a nucleus and one or more surrounding electrons

Atomic number The number of protons in the nucleus of an atom. Unless the atom is ionized, the atomic number is also the number of electrons orbiting the nucleus of the atom

Aurora Australis Light emitted by atoms and ions in the upper atmosphere near the south magnetic pole. The emission occurs when atoms and ions are struck by energetic particles from the Sun

Aurora Borealis Light emitted by atoms and ions in the upper atmosphere near the north magnetic pole. The emission occurs when atoms and ions are struck by energetic particles from the Sun

Axis The imaginary line that an object, usually a planet, rotates around

Azimuth The angular distance between the north point on the horizon eastward around the horizon to the point on the horizon nearest to the direction to a celestial body

Barred spiral galaxy A spiral galaxy in which the nucleus is crossed by a bar. The spiral arms start at the ends of the bar

Barycenter The center of mass of a system of bodies

Basalt An igneous rock often produced in volcanic eruptions

Big Bang The theory that suggests that the universe was formed from a single point in space during a cataclysmic explosion

Big Crunch The theory that states that the universe will expand to its maximum point, then contract until it explodes

Black hole A region of space from which no matter or radiation can escape. A black hole is a result of the extreme curvature of space by a massive compact body

Bolide A term used to describe an exceptionally bright meteor, possibly accompanied by a sonic boom

Bow shock The region where the solar wind is slowed as it impinges on Earth's magnetosphere

Brightness Intensity of light received by an observer from a celestial object

C-type asteroid One of a class of very dark asteroids whose reflectance spectra show no absorption features due to the presence of minerals

Capture theory The theory of the origin of the Moon that holds that the Moon formed elsewhere in the Solar System and then was captured into orbit around Earth

Carbonaceous chondrite A stony meteorite that contains carbon-rich material. Carbonaceous chondrites are thought to be primitive samples of material from the early Solar System

Cassini's division A conspicuous 1800-km-wide gap between the outermost rings of Saturn

Celestial equator The circle where Earth's equator, if extended outward into space, would intersect the celestial sphere

Celestial horizon The circle on the celestial sphere which is 90° from the zenith. The celestial horizon is approximately the boundary between Earth and the sky

Celestial mechanics The part of physics and astronomy that deals with the motions of celestial bodies under the influence of their mutual gravitational attraction

Celestial pole The celestial poles are imaginary lines that trace Earth's rotation axis in space

Celestial sphere An imaginary sphere surrounding Earth. The celestial bodies appear to carry out their motions on the celestial sphere

Centaurs Small astronomical bodies that generally orbit the Sun between Jupiter and Neptune. Centaurs cross the orbital paths of the major planets

Charge coupled device (CCD) An array of photosensitive electronic elements that can be used to record an image falling upon it. CCD cameras are composed of silicon chips that are light sensitive, changing detected photons of light into electronic signals that in turn can be used to create images of astronomical objects

Chondrite A meteorite containing chondrules

Chondrule A small spherical body embedded in a meteorite. Chondrules are composed of iron, aluminum, and magnesium silicate rock

Chromosphere The part of the Sun's atmosphere between the photosphere and the corona

Circumpolar stars Circumpolar stars never set or go below the horizon for observers from specific latitudes

Close pair A binary system in which the two stars are close enough together that they transfer matter to one another during some stages of their evolution

Cluster of galaxies A group of galaxies held together by their mutual gravitational attraction

Cluster of stars A group of stars held together by their mutual gravitational attraction

Coma A spherical gaseous region that surrounds the nucleus of a comet. The coma of a comet may be 100,000 km or more in diameter

Comet A small, icy body in orbit around the Sun. When a comet is near the Sun, it displays a coma and a tail

Concretions A common geologic phenomenon where hard bodies form in sediments before they become sedimentary rocks

Conjunction The appearance of two celestial bodies, often a planet and the Sun, in approximately the same direction

Constellation One of 88 regions into which the celestial sphere is divided

Continuous spectrum A spectrum containing neither emission nor absorption lines

Convection The process of energy transport in which heat is carried by hot, rising and cool, falling currents or bubbles of liquid or gas

Core The innermost region of the interior of Earth or another planet

Coriolis effect The acceleration which a body experiences when it moves across the surface of a rotating body. The acceleration results in a westward deflection of projectiles and currents of air or water when they move toward Earth's equator and an eastward deflection when they move away from the equator

Corona The outermost layer of the Sun's atmosphere. Gases in the corona are tenuous and hot

Coronal hole A low density, dim region in the Sun's corona. Coronal holes occur in regions of open magnetic field lines where gases can flow freely away from the Sun to form the solar wind

Coronal mass ejection A blast of gas moving outward through the Sun's corona and into interplanetary space following the eruption of a prominence

Cosmic background radiation (CBR) Radiation observed to have almost perfectly uniform brightness in all directions in the sky. The CBR is highly red-shifted radiation produced about a million years after the universe began to expand

Cosmic ray Extremely energetic ions and electrons that travel through space at almost the speed of light. Most cosmic rays come from great distances and may be produced in supernovas and pulsars

Cosmic string A tube-like configuration of energy that is believed to have existed in the early universe

Cosmology The study of the universe as a whole

Crater A roughly circular feature on the surface of a Solar System body caused by the impact of an asteroid or a comet

Crater density The number of craters of a given size per unit area of the surface of a Solar System body

Crescent phase The phase of the Moon at which only a small, crescent-shaped portion of the near side of the Moon is illuminated by sunlight. Crescent phase occurs just before and after a new Moon

Critical density The value that the average density of the universe must equal or exceed if the universe is closed. If the density of the universe is less than the critical density, the universe will continue to expand forever

Crust The outermost layer of a planet or satellite

Dark matter Matter that cannot be detected or has not yet been detected by the radiation it emits. The presence of dark matter can be deduced from its gravitational interaction with other bodies

Declination The angular distance of a celestial body north or south of the celestial equator. Declination is analogous to latitude in the terrestrial coordinate system

Degree A unit used to measured angles. There are 360° in a circle

Density The mass of a body divided by its volume

Differential rotation Rotation in which the rotation period of a body varies with latitude. Differential rotation occurs for gaseous bodies like the Sun or for planets with thick atmospheres

Differentiation The gravitational separation of the interior of a planet into layers according to density. When differentiation occurs inside a molten body, the heavier materials sink to the center and the light materials rise to the surface

Doppler effect The change in the frequency of a wave (such as electromagnetic radiation) caused by the motion of the source and observer toward or away from each other

Dust tail A comet tail that is luminous because it contains dust that reflects sunlight. The dust in a comet tail is expelled from the nucleus of the comet

Eclipse The obscuration of the light from the Sun when the observer enters the Moon's shadow or the Moon when it enters Earth's shadow. Also, the obscuration of a star when it passes behind its binary companion

Ecliptic The plane of Earth's orbit around the Sun. As a result of Earth's motion, the Sun appears to move among the stars, following a path that is also called the ecliptic

Electromagnetic wave A periodic electrical and magnetic disturbance that propagates through space and transparent materials at the speed of light. Light is an example of an electromagnetic wave

Electron A low mass, negatively charged particle that can either orbit a nucleus as part of an atom, or exist independently as part of a plasma

Element A substance that cannot be broken down into a simpler chemical substance. Oxygen, nitrogen, and silicon are examples of the approximately 100 known elements

Ellipse A closed, elongated curve describing the shape of the orbit that one body follows around another

Elliptical galaxy A galaxy having an ellipsoidal shape and lacking spiral arms

Elongation Angular distance of a celestial object from the Sun in the sky

Ephemeris A tabulation of the positions of a celestial object in sequence for a succession of dates

Equator The line around the surface of a rotating body that is midway between the rotational poles. The equator divides the body into northern and southern hemispheres

Equatorial jet The high-speed, eastward, zonal wind in the equatorial region of Jupiter's atmosphere

Equatorial system A coordinate system, using right ascension and declination as coordinates, used to describe the angular location of bodies in the sky

Equinox Either of the two points on the celestial sphere where the ecliptic intersects the celestial equator

Escape velocity The speed that an object must have to achieve a parabolic trajectory and escape from its parent body

Event horizon The boundary of a black hole. No matter or radiation can escape from within the event horizon

Exosphere The outer part of the thermosphere. Atoms and ions can escape from the exosphere directly into space

Eyepiece The lens at the viewing end of a telescope

Fermi paradox The question that given the known size of the universe, why have we not been contacted and are still alone? Named after Italian physicist Enrico Fermi (1901–1954)

Filament A dark line on the Sun's surface when a prominence is seen projected against the solar disk

Fireball An especially bright streak of light in the sky produced when an interplanetary dust particle enters Earth's atmosphere, vaporizing the particle and heating the atmosphere

Focal length The distance between a mirror or lens and the point at which the lens or mirror brings light to a focus

Focal plane The surface where the objective lens or mirror of a telescope forms the image of an extended object

Focal point The spot where parallel beams of light striking a lens or mirror are brought to a focus

Fusion A nuclear reaction in which two nuclei merge to form a more massive nucleus

Galactic bulge A somewhat flattened distribution of stars surrounding the nucleus of the Milky Way

Galactic disk A disk of matter containing most of the stars and interstellar matter in the Milky Way

Galactic equator The great circle around the sky that corresponds approximately to the center of the glowing band of the Milky Way

Galactic halo The roughly spherical outermost component of the Milky Way

Galactic nucleus The central region of the Milky Way

Galaxy A massive system of stars, gas, and dark matter held together by its own gravity

Gamma ray The part of the electromagnetic spectrum having the shortest wavelengths

Geosynchronous orbit An orbit in which a satellite's orbital velocity is matched to the rotational velocity of the planet

Globular cluster A tightly packed, spherically shaped group of thousands to millions of old stars

Granule A bright convective cell or current of gas in the Sun's photosphere. Granules appear bright because they are hotter than the descending gas that separates them

Gravitational lens A massive body that bends light passing near it. A gravitational lens can distort or focus the light of background sources of electromagnetic radiation

Gravity The force of attraction between two bodies generated by their masses

Great Attractor A great concentration of mass toward which everything in our part of the Universe apparently is being pulled

Greenhouse effect The blocking of infrared radiation by a planet's atmospheric gases. Because its atmosphere blocks the outward passage of infrared radiation emitted by the ground and lower atmosphere, the planet cannot cool itself effectively and becomes hotter than it would be without an atmosphere

Habitable zone The range of distances from a star within which liquid water can exist on the surface of an Earth-like planet

Helioseismology A technique used to study the internal structure of the Sun by measuring and analyzing oscillations of the Sun's surface layers

Heliosphere The region of space dominated by the solar wind and the Sun's magnetic field

Hilda asteroids A group of asteroids with a 3:2 orbital resonance with Jupiter

Hubble's law The linear relationship between the recession speeds of galaxies and their distances. The slope of Hubble's law is Hubble's constant

Hyperbola A curved path that does not close on itself. A body moving with a speed greater than escape velocity follows a hyperbola

Igneous rock A rock formed by solidification of molten material
Inclination The tilt of the rotation axis or orbital plane of a body
Inertia The tendency of a body at rest to remain at rest and a body in motion to remain in motion at a constant speed and in a constant direction
Inertial motion Motion in a straight line at constant speed followed by a body when there are no unbalanced forces acting on it
Inferior planet A planet whose orbit lies inside Earth's orbit
Infrared The part of the electromagnetic spectrum having wavelengths longer than visible light but shorter than radio waves
Interferometry The use of two or more telescopes connected together to operate as a single instrument. Interferometers can achieve high angular resolution if the individual telescopes of which they are made are widely separated
Interstellar matter Gas and dust in the space between the stars
Ion An atom from which one or more electrons has been removed
Ionization The removal of one or more electrons from an atom
Inferior conjunction A conjunction of an inferior planet that occurs when the planet is lined up directly between Earth and the Sun
Ionosphere The lower part of the thermosphere of a planet in which many atoms have been ionized by ultraviolet solar photons
Iron meteorite A meteorite composed primarily of iron and nickel
Isotopes Nuclei with the same number of protons but different numbers of neutrons
Jets (comets & galaxies) Venting of gas from weakened areas of a comet's nucleus. Also, a narrow beam of gas ejected from a star or the nucleus of an active galaxy
Kardashev scale A method of measuring a civilization's level of technological advancement, formulated by Russian astronomer Nikolai Kardashev
Kepler's laws of planetary motion Three laws, discovered by Kepler, that describe the motions of the planets around the Sun
Kinetic energy Energy of motion. Kinetic energy is given by one half the product of a body's mass and the square of its speed
Kirkwood gaps Regions in the Asteroid Belt where a decreased number of asteroids are found, possibly the result of gravitational interactions with Jupiter. Named after astronomer Daniel Kirkwood (1814–1895), who first observed these gaps
Kuiper Belt A region beyond Neptune within which a large number of comets are believed to orbit the Sun. Short period comets are thought to originated in the Kuiper Belt
Lagrangian points Positions in an orbital configuration where a small body, under the gravitational influence of two larger ones, will remain approximately at rest relative to them. Named after 18th century

Italian astronomer and mathematician Joseph-Louis Lagrange (1736–1813)

Latitude The angular distance of a point north or south of the equator of a body as measured by a hypothetical observer at the center of a body

Lava Molten rock at the surface of a planet or satellite

Libration points See Lagrangian points

Light The visible form of electromagnetic radiation

Light curve A plot of the brightness of a body versus time

Light year A unit of length equal to the distance that light travels in one year in a vacuum, about 9.46 trillion km

Limb The apparent edge of the disk of a celestial body

Lithosphere The rigid outer layer of a planet or satellite, composed of the crust and upper mantle

Local Group The small cluster of galaxies of which the Milky Way is a member

Longitude The angular distance around the equator of a body from a zero point to the place on the equator nearest a particular point as measured by a hypothetical observer at the center of a body

Luminosity The rate of total radiant energy output of a body

Luminosity class The classification of a star's spectrum according to luminosity for a given spectral type. Luminosity class ranges from 'I' for a supergiant to 'V' for a dwarf (main sequence star)

Luminosity function The distribution of stars or galaxies according to their luminosities. A luminosity function is often expressed as the number of objects per unit volume of space that are brighter than a given absolute magnitude or luminosity

Lunar eclipse The darkening of the Moon that occurs when the Moon enters Earth's shadow

M-type asteroid One of a class of asteroids that have reflectance spectra like those of metallic iron and nickel

Magellanic Clouds Two irregular galaxies that are among the nearest neighbors of the Milky Way

Magma Molten rock within a planet or satellite

Magnetosphere The outermost part of the atmosphere of a planet, within which a very thin plasma is dominated by the planet's magnetic field

Magnitude A number, based on a logarithmic scale, used to describe the brightness of a star or other luminous body. Apparent magnitude describes the brightness of a star as we see it. Absolute magnitude describes the intrinsic brightness of a star

Mantle The part of a planet lying between its crust and its core

Maria A dark, smooth region on the Moon formed by flows of basaltic lava

Mass A measure of the amount of matter a body contains. Mass is also a measure of the inertia of a body

Maunder minimum A period of few sunspots and low solar activity that occurred between 1640 and 1700

Mean solar time Time kept according to the average length of the solar day

Meridian The circle on the celestial sphere that passes through the zenith and both celestial poles

Mesosphere The layer of a planet's atmosphere above the stratosphere. The mesosphere is heated by absorbing solar radiation

Messier Objects List of deep sky objects compiled by Charles Messier (1730–1817)

Metallic hydrogen A form of hydrogen in which the atoms have been forced into a lattice structure typical of metals. In the Solar System, the pressures and temperatures required for metallic hydrogen to exist only occur in the cores of Jupiter and Saturn

Metamorphic rock A rock that has been altered by heat and pressure

Meteor A streak of light produced by a meteoroid moving rapidly through Earth's atmosphere. Friction vaporizes the meteoroid and heats atmospheric gases along the path of the meteoroid

Meteor shower A temporary increase in the normal rate at which meteors occur. Meteor showers last for a few hours or days and occur on about the same date each year

Meteorite The portion of a meteoroid that reaches Earth's surface

Meteoroid A solid interplanetary particle passing through Earth's atmosphere

Microlensing event The temporary brightening of a distant object that occurs because its light is focused on Earth by the gravitational lensing of a nearer body

Micrometeorite A meteoritic particle less than a 50 millionths of a meter in diameter. Micrometeorites are slowed by atmospheric gas before they can be vaporized, so they drift slowly to the ground

Milky Way The galaxy to which the Sun and Earth belong. Seen as a pale, glowing band across the sky

Mineral A solid chemical compound

Minor Planet Another name for asteroid

Molecular cloud A relatively dense, cool interstellar cloud in which molecules are common

Momentum A quantity, equal to the product of a body's mass and velocity, used to describe the motion of the body. When two bodies collide or otherwise interact, the sum of their momenta is conserved

Near Earth Asteroid (NEA) Near Earth Object (NEO) Bodies who orbits come into close proximity with Earth

Neutral gas A gas containing atoms and molecules but essentially no ions or free electrons

Neutrino A particle with no charge and probably no mass that is produced in nuclear reactions. Neutrinos pass freely through matter and travel at or near the speed of light

Neutron A nuclear particle with no electric charge

Neutron star A star composed primarily of neutrons and supported by the degenerate pressure of the neutrons

Neutronization A process by which, during the collapse of the core of a star, protons and electrons are forced together to make neutrons

North celestial pole The point above Earth's North Pole where the polar axis, if extended outward into space, would intersect the celestial sphere

Nova An explosion on the surface of a white dwarf star in which hydrogen is abruptly converted into helium

Nucleus An irregularly shaped, loosely packed lump of dirty ice several kilometers across that is a permanent part of a comet

Objective The main lens or mirror of a telescope

Occultation An event that occurs when one celestial body conceals or obscures another

Oort Cloud The region beyond the planetary system, extending to 100,000 AU or more, within which a vast number of comets orbit the Sun. When comets from the Oort Cloud enter the inner Solar System, they become new comets

Opposition The configuration of a planet or other body when it appears opposite the Sun in the sky

Orbit The elliptical or circular path followed by a body that is bound to another body by the two bodies' mutual gravitational attraction

Organic molecule A molecule containing carbon

Oscillating universe A theory that the universe goes through continual phases of expansion and contraction

Outgassing The release of gas from the interior of a planet or satellite

Ozone A molecule consisting of three oxygen atoms. Ozone molecules are responsible for the absorption of solar ultraviolet radiation in Earth's atmosphere

Parabola A geometric curve followed by a body that moves with a speed exactly equal to escape velocity

Parallax The shift in the direction of a star caused by the change in the position of Earth as it moves around the Sun

Parsec A unit of distance equal to about 3.26 light-years

Penumbra The outer part of the shadow of a body where sunlight is partially blocked by the body

Perigee The point, in an orbit around Earth, that an object is nearest to Earth

Perihelion The point in the orbit of a body when the body is closest to the Sun

Perturbation A deviation of the orbit of a Solar System body from a perfect ellipse due to the gravitational attraction of one of the planets
Photon A massless particle of electromagnetic energy
Photometry The measurement of the light emitting from astronomical objects
Photosphere The visible region of the atmosphere of the Sun or another star
Planetesimal A primordial Solar System body of intermediate size that accreted with other planetesimals to form planets or satellites
Plasma A fully or partially ionized gas
Plasma tail A narrow, ionized comet tail pointing directly away from the Sun
Potentially hazardous asteroid (PHA) Group of asteroids that carry a collision potential with Earth
Precession The slow, periodic conical motion of the rotation axis of Earth or another rotating body
Prominence A region of cool gas embedded in the corona. Prominences are bright when seen above the Sun's limb, but appear as dark filaments when seen against the Sun's disk
Proper motion The rate at which a star appears to move across the celestial sphere with respect to very distant objects
Protein A large molecule, consisting of a chain of amino acids, that make up the bodies of organisms
Proton A positively charged nuclear particle
Protostar A star in the process of formation
Pulsar A rotating neutron star with beams of radiation emerging from its magnetic poles. When the beams sweep past Earth, we see "pulses" of radiation
Quantum mechanics The branch of physics dealing with the structure and behavior of atoms and their interaction with light
Quasar A distant galaxy, seen as it was in the remote past, with a very small, luminous nucleus
Radial Velocity The part of the velocity of a body that is directed toward or away from an observer. The radial velocity of a body can be determined by the Doppler shift of its spectral lines
Radiant The point in the sky from which the meteors in a meteor shower seem to originate
Radio galaxy A galaxy that is a strong source of radio radiation
Radioactivity The spontaneous disintegration of the unstable nucleus of an atom
Reflectivity **The ability of a surface to reflect electromagnetic waves. The reflectivity of a surface ranges from 0% for a surface that reflects no light to 100% for a surface that reflects all the light falling on it**
Reflector **A telescope in which the objective is a mirror**
Refractor A telescope in which the objective is a lens

Regolith The surface layer of dust and fragmented rock, caused by meteoritic impacts, on a planet, a satellite, or an asteroid

Resolution The ability of a telescope to distinguish fine details of an image

Resonance The repetitive gravitational tug of one body on another when the orbital period of one is a multiple of the orbital period of the other

Retrograde motion The westward revolution of a Solar System body around the Sun

Right ascension (RA) The angular distance of a body along the celestial equator from the vernal equinox eastward to the point on the equator nearest the body. Right ascension is analogous to longitude in the terrestrial coordinate system

Roche limit or Roche radius The distance from a planet or other celestial body within which tidal forces from the body would disintegrate a smaller object. Term formulated by French mathematician Édouard Roche (1820-1833)

S-type asteroid One of a class of asteroids whose reflectance spectra show an absorption feature due to the mineral olivine

Sedimentary rock A rock formed by the accumulation of small mineral grains carried by wind, water, or ice to the spot where they were deposited

Search for Extra-Terrestrial Intelligence (SETI) NASA-led project to search for signs of extra-terrestrial intelligence

Seismic wave Wave that travels through the interior of a planet or satellite and is produced by an earthquake or its equivalent

Sidereal clock A clock that marks the local hour angle of the vernal equinox

Silicate A mineral whose crystalline structure is dominated by silicon and oxygen atoms

Solar constant The solar energy received by a square meter of surface oriented at right angles to the direction to the Sun at Earth's average distance (1 AU) from the Sun. The value of the solar constant is 1372 watts per square meter

Solar flare A brief, sudden brightening of a region of the Sun's atmosphere, probably caused by the abrupt release of magnetic energy

Spectral class A categorization, based on the pattern of spectral lines of stars, that groups stars according to their surface temperatures

Spectrograph A device used to produce and record a spectrum

Spectroscopy The recording and analysis of spectra

Spicule A hot jet of gas moving outward through the Sun's chromosphere

Spiral arm A long, narrow feature of a spiral galaxy in which interstellar gas, young stars, and other young objects are found

Spiral galaxy A flattened galaxy in which hot stars, interstellar clouds, and other young objects form a spiral pattern

Star A massive gaseous body that has used, is using, or will use nuclear fusion to produce the bulk of the energy it radiates into space

Starburst galaxy A galaxy in which a very large number of stars have recently formed

Steady state theory A cosmological theory in which the universe always remains the same in its essential features, such as average density. In order to maintain constant density while expanding, the steady state theory required the continual creation of new matter

Stellar occultation The obstruction of the light from a star when a Solar System body passes between the star and the observer

Stellar parallax The shift in the direction of a star caused by the change in the position of Earth as it moves around the Sun

Stellar population A group of stars that are similar in spatial distribution, chemical composition, and age

Stony meteorite A meteorite made of silicate rock

Stony-iron meteorite A meteorite made partially of stone and partially of iron and other metals

Stratosphere The region of the atmosphere of a planet immediately above the troposphere

Sublimation The change of a solid directly into a gaseous state

Sunspot A region of the Sun's photosphere that appears darker than its surroundings because it is cooler

Sunspot cycle The regular waxing and waning of the number of spots on the Sun. The amount of time between one sunspot maximum and the next is about 11 years

Sunspot group A cluster of sunspots

Superior conjunction A conjunction that occurs when a planet passes behind the Sun and is on the opposite side of the Sun from Earth

Supernova An explosion in which a star's brightness temporarily increases by as much as 1 billion times. Type I supernovas are caused by the rapid fusion of carbon and oxygen within a white dwarf. Type II supernovas are produced by the collapse of the core of a star

Synchronous rotation Rotation for which the period of rotation is equal to the period of revolution. An example of synchronous rotation is the Moon, for which the period of rotation and the period of revolution around the Earth are both 1 month

Synodic month The length of time (29.53 days) between successive occurrences of the same phase of the Moon

Synodic period The length of time it takes a Solar System body to return to the same configuration (opposition to opposition, for example) with respect to Earth and the Sun

Tektite A small, glassy material formed by the impact of a large body, usually a meteor or an asteroid

Terminal velocity The speed with which a body falls through the atmosphere of a planet when the force of gravity pulling it downward is balanced by the force of air resistance

Thermosphere The layer of the atmosphere of a planet lying above the mesosphere. The lower thermosphere is the ionosphere. The upper thermosphere is the exosphere

Transverse velocity The part of the orbital speed of a body perpendicular to the Sun between the body and the Sun

Trojan asteroid One of a group of asteroids that orbit the Sun at Jupiter's distance and lie 60° ahead of or behind Jupiter in its orbit

Troposphere The lowest layer of the atmosphere of a planet, within which convection produces weather

Ultraviolet The part of the electromagnetic spectrum with wavelengths longer than X-rays but shorter than visible light

Umbra The inner portion of the shadow of a body, within which sunlight is completely blocked

Universe All matter and space

V-type asteroid The asteroid Vesta, which is unique in having a reflectance spectra resembling those of basaltic lava flows

Van Allen Belts Two doughnut-shaped regions in Earth's magnetosphere within which many energetic ions and electrons are trapped

Velocity A physical quantity that gives the speed of a body and the direction in which it is moving

Visual binary star A pair of stars orbiting a common center of mass in which the images of the components can be distinguished using a telescope and which have detectable orbital motion

Wavelength The distance between crests of a wave. For visible light, wavelength determines color

WIMPS Weakly interacting massive particles, 10–100 times the mass of a proton

Wormhole A speculative feature of a black hole that supposedly connects our universe with another universe

X-ray The part of the electromagnetic spectrum with wavelengths longer than gamma rays but shorter than ultraviolet

X-ray burst Sporadic burst of x-rays originating in the rapid consumption of nuclear fuels on the surface of the neutron star in a binary system

Zenith The point on the celestial sphere directly above an observer

Zodiacal constellations The band of constellations along the ecliptic. The Sun appears to move through the twelve zodiacal constellations during a year

Zodiacal light The faint glow extending away from the Sun caused by the scattering of sunlight by interplanetary dust particles lying in and near the ecliptic

Zonal winds The pattern of winds in the atmosphere of a planet in which the pattern of wind speeds varies with latitude

Zone of convergence According to plate tectonics, a plate boundary at which the crustal plates of a planet are moving toward one another. Crust is destroyed in zones of convergence

Zone of divergence According to plate tectonics, a plate boundary at which the crustal plates of a planet are moving away from one another. Crust is created in zones of divergence

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