

- Ablate**—to remove by cutting, erosion, melting, evaporation, or vaporization.
- Aerosol**—a suspension of insoluble particles in a gas.
- Albedo**—the fraction of incident light or electromagnetic radiation that is reflected by a surface or body.
- Ambient**—the natural condition of an environmental factor.
- Amplitude**—the maximum departure of the value of an alternating wave from the average value.
- Artifact**—a product of artificial character due to an extraneous agent.
- Attenuation**—a reduction in amplitude of electromagnetic energy.
- Beam width**—the angular width of a beam of radiation, measured between the directions in which the power intensity is a specified fraction, usually one-half, of the maximum.
- Bias current**—the electric current applied to a device (e.g., a transistor) to establish a reference level for operation.
- Biota**—the plants and animals of a region.
- Brayton cycle**—a method of driving a turbine in which a gas is compressed and heated. The most familiar use is for aircraft gas turbine engines. An alternative to the Rankine cycle.
- Bremsstrahlung radiation**—radiation from charged particles that are decelerated in a magnetic field.
- British thermal unit**—quantity of heat needed to raise one pound of water one degree Fahrenheit at or near 39.2 °F.
- Circadian**—pertaining to events that occur at approximately 24-hr intervals, such as certain biological rhythms.
- Cloud condensation nuclei (CCN)**—particles on which water vapor condenses to form water droplets, that in turn form clouds and fogs.
- Convection**—circulatory motion that occurs in the atmosphere due to nonuniformity in temperature and density, and the action of gravity.
- Cortical tissues**—tissue from the outer layer of gray matter of the brain.
- Cosmic ray**—atomic nuclei of heterogeneous, extremely penetrating character that enter the Earth's atmosphere from outer space at speeds approaching that of light.
- Coupling**—the mechanism by which electromagnetic energy is delivered to a system or device.
- CW laser**—continuous wave laser, as distinguished from a pulsed laser. A laser emitting for a period in excess of 0.25 second.
- Cytogenetics**—a branch of biology that studies heredity and variation by the methods of both cytology and genetics.
- Cytology**—a branch of biology dealing with the structure, function, multiplication, pathology, and life history of cells.
- Decible**—a unit for expressing the ratio of two amounts of electric or acoustic signal power equal to 10 times the common logarithm of this ratio. A ratio of 10 is 10 dB, a ratio of 100 is 20 dB, a ratio of 1,000 is 30 dB, etc.
- Diffuse reflection**—reflection of a beam incident on a surface over a wide range of angles.
- Dosimeter**—a device for measuring doses of radioactivity.
- Ecliptic**—the circle formed by the apparent yearly path of the Sun through the heavens; inclined by approximately 23.5° to the celestial equator.
- Electromagnetic energy**—energy in the entire range of wavelengths or frequencies of electromagnetic radiation extending from gamma rays to the longest radio waves and including visible light.
- Electron**—a subatomic particle with a negative electrical charge.
- Endocrinology**—a science dealing with the endocrine glands, which produce secretions that are distributed in the body by way of the bloodstream.
- Energy dose**—the quantity of electromagnetic energy (in joules) that is imparted per unit of mass to a biological body.
- Energy dose rate**—the amount of electromagnetic energy that is imparted per unit of mass and per unit of time to a biological body.
- Epidemiology**—a branch of medical science that deals with the incidence, distribution, and control of disease in a population.
- Extended source**—an extended source of radiation that can be resolved into a geometrical image in contrast with a point source of radiation, that cannot be resolved into a geometrical image; a source that subtends an angle greater than one arc min.
- Exosphere**—the outer fringe region of Earth's atmosphere.
- Field intensity**—the magnitude of the electric field in volts per meter or the magnitude of the magnetic field in amperes per meter.
- Flux**—the rate of transfer of particles or energy across a given surface.
- Frequency**—the number of complete oscillations per second of an electromagnetic wave, measured in hertz (Hz). One hertz equals one cycle per second.

- Geostationary Earth orbit (GEO)**— the equatorial orbit at which a satellite takes 24 hr to circle the Earth so that it is stationary as viewed from Earth; altitude approximately 36,000 km.
- Geosynchronous Earth orbit**—the orbit at which a satellite takes 24 hr to circle Earth. (The satellite may or may not appear to be stationary above a point on Earth.)
- Harmonic frequency**—a component frequency of an electromagnetic wave that is a multiple of the fundamental frequency.
- Heliostat**— a mirror device arranged to follow the Sun as it moves through the sky and to reflect the Sun's rays on a stationary collector.
- Hematology**—a branch of biology that deals with the blood and blood-forming organs.
- Heavy-lift launch vehicle (HLLV)**— a proposed launch vehicle used to transport large masses of material from Earth to low- Earth orbit.
- Illuminance**— irradiance; rate of energy per solid angle measured at a given point.
- Immunology**— a science that deals with disease resistance and its causes.
- Intermodulation** —the mixing of the components of a complex wave with each other in a nonlinear circuit. The result is that waves are produced at frequencies related to the sums and differences of the frequencies of the components of the original waves.
- Intrabeam viewing**—viewing the laser source from within the beam. The beam may either be direct or specularly reflected.
- Ion**—an atom or group of atoms that carries a positive or negative electrical charge as a result of having lost or gained one or more electrons.
- Ionizing radiation**— radiation capable of producing ions by adding electrons to, or removing electrons from, an electrically neutral atom, group of atoms, or molecule.
- Ionosphere**—the part of Earth's atmosphere beginning at an altitude of about 5 km extending and outward 500 km or more, containing free electrically charged particles by means of which radio waves are reflected great distances around the Earth.
- Irradiance (E)**— radiant flux density arriving at given surface in units of watts-per-square-centimeter ( $W/cm^2$ ); illuminance (as measured by a detector).
- Joule (J)**— unit of energy (1 watt-see) under the international system. As a thermal unit, 1 joule equals 0.239 calories. Since the calorie is defined as the energy required to heat 1 gram of water from 40 to 50 C, 4.184 joules is the equivalent of one calorie.
- Kapton**— lightweight, tough plastic film.
- Klystron**— an electron tube used to generate and amplify microwave current.
- Laser**— a device for generating coherent light radiation.
- Low-Earth orbit (LEO)** —altitude approximately 500 km.
- Luminance**—brightness on a light source, equal to luminous flux per unit solid angle emitted per unit area of the source.
- Magnetron**— a magnetically control led tube used to generate and amplify microwave radiation; the power sources for microwave ovens.
- Magnetosphere**— a region of Earth's outer atmosphere in which electrically charged particles are trapped and their behavior dominated by Earth's magnetic field.
- Mass driver**— an apparatus for accelerating material in an electromagnetic field.
- Mesoscale**—on or relating to a meteorological phenomenon approximately 1 to 100 km in horizontal extent.
- Mesosphere**— a layer of the atmosphere extending from the top of the stratosphere to an altitude of about 80 km.
- Microwave**— a comparatively short electromagnetic wave, especially one between 100 cm and 1 cm in wavelength or, equivalently, between 0.3 and 30 GHz 'in frequency.
- Modulation**—when a continuous series of waves of electromagnetic energy is modified by pulsing, or by varying its amplitude, frequency, or phase, the waves are said, respectively, to be pulse-, amplitude-, frequency-, or phase-modulated. In order to convey information by radiating electromagnetic energy, it must be modulated,
- Morphology**—a branch of biology that deals with the form and structure of animals and plants.
- Multibiotic**— having or consisting of many plants and animals.
- Multipath radiation**— in contrast with a so-called plane wave, that flows in a straight line through space, an area or volume where electromagnetic waves arrive from different directions because of reflection or multiple sources is said to be the site of multipath radiation.
- Neuroendocrine**—of, relating to, or being a hormonal substance that influences the activity of nerves.
- Neutral particles**— molecules, atoms, or subatomic particles that are not electrically charged.
- Neutron**—an uncharged elementary particle that has a mass nearly equal to that of the proton

- and is present in all known atomic nuclei except the hydrogen nucleus.
- Noctilucent cloud**— a luminous thin cloud seen at night at a height of about 80 km.
- Nonionizing radiation**— radiation of too low an energy to expel an electron from a molecule or atom.
- Ohmic heating**—a heating mechanism in a plasma or other conducting medium. The free electrons in the medium are accelerated by an applied electric field and give up kinetic energy by collision with other particles.
- Phase**—the measure of the progression of a periodic wave in time or space from a chosen instant or position.
- Phased array**— an array of antennas that is aimed as a group by adjusting the phase of the signal it sends or receives.
- Photoionization**— ionization (as in the ionosphere) resulting from Collision of a molecule or atom with a proton.
- Photoklystron** — a device for directly converting visible light to microwave radiation.
- Photon**— a quantum of radiant energy.
- Photoperiod** — the interval in a 24-hr period during which a plant is exposed to light,
- Photovoltaic cell**— a cell composed of materials that generate electricity when exposed to light.
- Plasma**—a collection of charged particles exhibiting some properties of a gas but differing from a gas by being a good conductor of electricity and by being affected by a magnetic field.
- Polarization**—the electric (E) and magnetic (H) fields that comprise a propagating electromagnetic wave may be fixed in relation to Earth's horizon, or they may rotate. By convention, the vector of the E field is related to Earth's horizon: if the two are perpendicular, the wave is said to be vertically polarized; if parallel, horizontally polarized. When the E and H fields are continuously rotating with respect to the horizon, the wave is said to be elliptically polarized.
- Power**—the quantity of energy per unit of time that is generated, transferred, or dissipated. The unit of power, the watt (W), is defined as one joule per second (j/s).
- Power density**—the quantity of electromagnetic energy that flows through a given area per unit of time. Formally, power density is specified in watts per square meter ( $W/m^2$ ), but by tradition in biological effects studies it is usually expressed in milliwatts per square centimeter ( $mW/cm^2$ ).
- Propagation** —the transmission of electromagnetic wave energy from one point to another.
- Proton**— an elementary particle that is identical with the nucleus of the hydrogen atom, that along with neutrons is a constituent of all other atomic nuclei, that carries a positive charge numerically equal to the charge of an electron.
- Pulsed laser**— a laser that delivers its energy in short pulses, as distinct from a CW laser; a laser which emits for less than 0.25s.
- Radiation pressure**— all propagating electromagnetic waves exert a very slight pressure on an absorbing object.
- Rankine cycle**— a liquid gas cycle used often for steam turbines. A working fluid is heated until it expands and drives a turbine.
- Rectenna**— a coined term for the SPS reference system receiving antenna that also converts the microwave power to direct-current electricity.
- Rectification**—the conversion of an alternating current to direct current.
- Refraction**— a deflection from a straight path undergone by a wave in passing obliquely from one medium into another in which its velocity is different.
- Root-mean-square**—for an alternating voltage, current, or field quantity: the square root of the mean of the square of the quantity during a complete cycle.
- Scattered power**— power that is reflected or dispersed as the result of an obstruction in the path of the primary power flow.
- Side lobe**— refers to power radiated from an antenna in a direction other than the desired direction of transmission.
- Slipring**—a metal ring to conduct current in or out of a rotating member of a machine.
- Solar flare**— an explosion on the Sun which generates fast elementary particles.
- Solar wind**—a stream of particles generated by a solarflare.
- Solid-state amplifier**— an amplifier whose operation depends on a combination of electrical effects within solids, e.g., a transistorized amplifier for electromagnetic waves.
- Specific absorption rate (SAR)**—the quantity of electromagnetic energy that is absorbed by a body per unit of mass during each second of time; expressed formally in watts per kilogram ( $W/kg$ ); often, informally as milliwatts or watts per gram ( $mW/g$  or  $W/g$ ). "Specific absorption rate" is being considered by the National Council on Radiation Protection and Measurements as the

- official nomenclature for expressing the dose rate of radio-frequency electromagnetic radiations. Synonymous with energy dose rate.
- Specular or regular reflection**— a mirror-like reflection.
- Spurious power or frequency**—electromagnetic energy produced at frequencies that are not easily related to a specified operating frequency.
- Stratosphere**— an upper portion of the atmosphere above approximately 10 km (depending on latitude, season, and weather) and in which temperature changes little with changing altitude and clouds of water are rare.
- Sun-synchronous orbit**— a near polar orbit which keeps the satellite in full sunlight all the time while Earth rotates beneath it.
- Susceptibility**—the sensitivity of an electromagnetic receiver to undesired electromagnetic waves that may result in interference.
- Symptomatology**— a branch of medical science concerned with symptoms of diseases.
- Teratology**—the study of malformation or serious deviations from the normal development of fetuses.
- Thermosphere**—the part of Earth's atmosphere that begins about 80 km above Earth's surface, extends to outer space, and is characterized by steadily increasing temperature with height.
- Troposphere**— the portion of the atmosphere below the stratosphere, which extends outward about 15 km from Earth's surface, and in which temperature generally decreases rapidly with altitude.
- Van Allen belt**— a belt of intense ionizing radiation that surrounds Earth in the outer atmosphere.
- Wave guide**— a device for transmitting and guiding radio-frequency waves

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