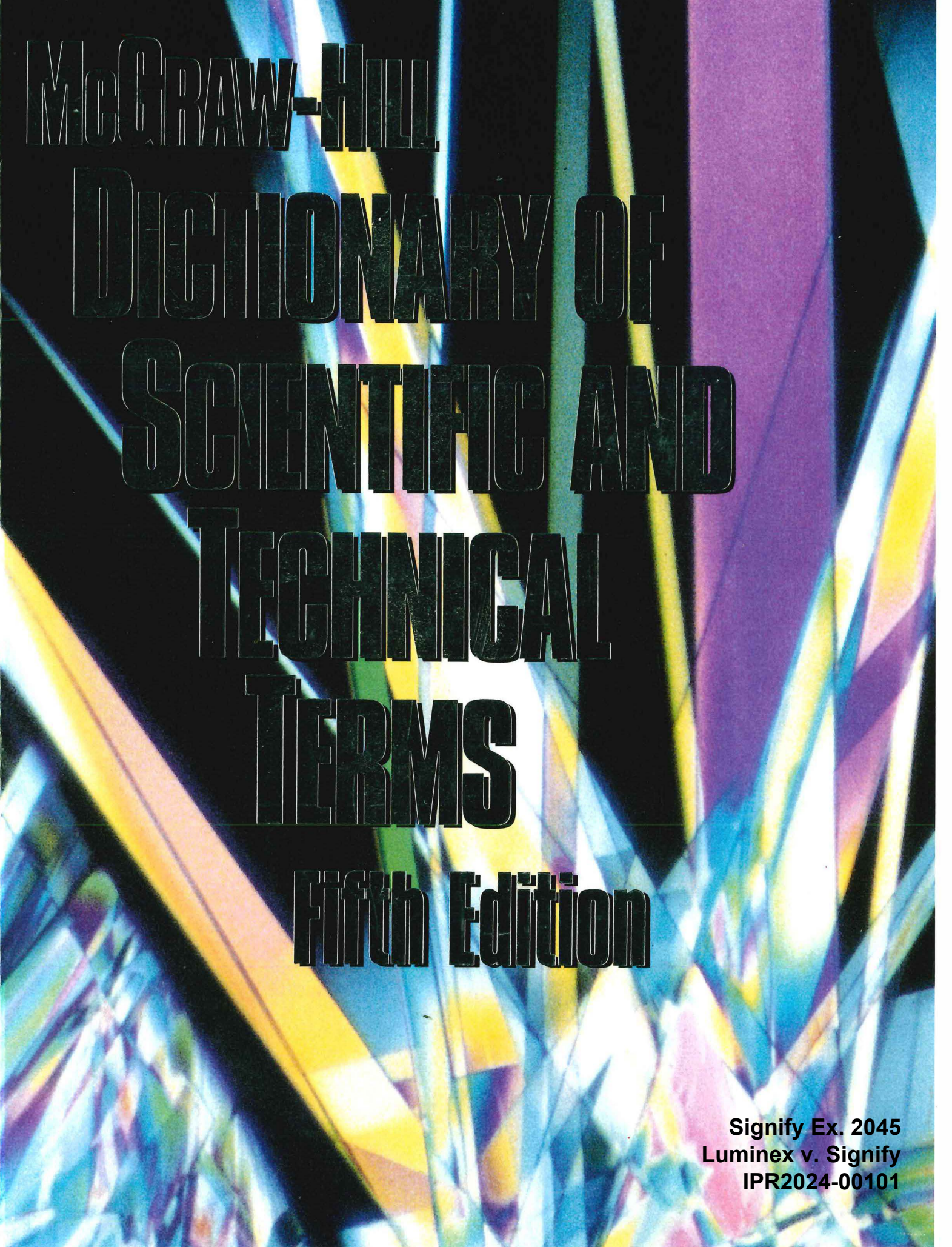




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McGraw-Hill Dictionary of Scientific and Technical Terms

Fifth Edition

Sybil P. Parker

Editor in Chief

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**On the cover: Photomicrograph of crystals of vitamin B₁.
(Dennis Kunkel, University of Hawaii)**

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planar linkage [MECH ENG] A linkage that involves motion in only two dimensions. { 'plā-nər 'liŋ-kij }

planar map [MATH] A plane or sphere divided into connected regions by a topological graph. { 'plā-nər ,map }

planar photodiode [ELECTR] A vacuum photodiode consisting simply of a photocathode and an anode; light enters through a window sealed into the base, behind the photocathode. { 'plā-nər 'fōd-ō 'dī-ōd }

planar point [MATH] A point on a surface at which the curvatures of all the normal sections vanish. { 'plā-nər or 'plā-nār ,point }

planar process [ENG] A silicon-transistor manufacturing process in which a fractional-micrometer-thick oxide layer is grown on a silicon substrate; a series of etching and diffusion steps is then used to produce the transistor inside the silicon substrate. { 'plā-nər ,prə-sēs }

planar transistor [ELECTR] A transistor constructed by an etching and diffusion technique in which the junction is never exposed during processing, and the junctions reach the surface in one plane; characterized by very low leakage current and relatively high gain. { 'plā-nər tran'zist-ər }

planate [GEOL] Referring to a surface that has been flattened or leveled by planation. { 'plā,nāt }

planation [GEOL] Erosion resulting in flat surfaces, caused by meandering streams, waves, ocean currents, wind, or glaciers. { plā'nā-shən }

planation stream piracy [HYD] Capture effected by the lateral planation of a stream invading and diverting the upper part of a smaller stream. { plā'nā-shən 'strēm ,pī-rə-sē }

planchet [ENG] A small metal container or sample holder; usually used to hold radioactive materials that are being checked for the degree of radioactivity in a proportional counter or scintillation detector. [MATER] A milled metal disk ready for coining. { 'plan-çet }

Planck [PHYS] A unit of action equal to the product of an energy of 1 joule and a time of 1 second. { plāŋk }

Planck distribution law See Planck radiation formula. { 'plāŋk ,dī-strə'byū-shən ,lō }

Planck era [ASTRON] The epoch in the early universe when the gravitational interaction between particles was as strong as the other interactions. { 'plāŋk ,ī-rə }

Planck function [THERMO] The negative of the Gibbs free energy divided by the absolute temperature. { 'plāŋk ,fəŋk-shən }

Planckian locus [OPTICS] The locus of points on a chromaticity diagram that represents blackbody radiators at various temperatures. { 'plāŋk-ē-ən 'lō-kəs }

Planck length [PHYS] The length $\sqrt{Gh/2\pi c^3}$ (where G is the gravitational constant, h is Planck's constant, and c is the speed of light) at which quantum fluctuations are believed to dominate the geometry of space-time; it is equal to 1.616×10^{-35} m. { 'plāŋk ,lɛŋkth }

Planck mass [PHYS] The mass $\sqrt{hc/2\pi G}$, where h is Planck's constant, c is the speed of light, and G is the gravitational constant; equivalently, the mass of a particle whose reduced Compton wavelength equals the Planck length; it is equal to 21.77 micrograms or 1.221×10^{19} GeV/ c^2 . { 'plāŋk ,mas }

Planck oscillator [QUANT MECH] An oscillator which can absorb or emit energy only in amounts which are integral multiples of Planck's constant times the frequency of the oscillator. Also known as radiation oscillator. { 'plāŋk ,ās-ə ,lād-ər }

Planck radiation formula [STAT MECH] A formula for the intensity of radiation emitted by a blackbody within a narrow band of frequencies (or wavelengths), as a function of frequency, and of the body's temperature. Also known as Planck distribution law; Planck's law. { 'plāŋk ,rād-ē'ā-shən ,fōr-myə-lə }

Planck's constant [QUANT MECH] A fundamental physical constant, the elementary quantum of action; the ratio of the energy of a photon to its frequency, it is equal to $6.626075 \pm 0.000004 \times 10^{-34}$ joule-second. Symbolized h . Also known as quantum of action. { 'plāŋks ,kän-stənt }

Planck's law [QUANT MECH] A fundamental law of quantum theory stating that energy associated with electromagnetic radiation is emitted or absorbed in discrete amounts which are proportional to the frequency of radiation. [STAT MECH] See Planck radiation formula. { 'plāŋks ,lō }

Planck time [PHYS] The constant $(Gh/c^5)^{1/2}$ with dimensions

of "time" formed from Planck's constant h , the gravitational constant G , and the speed of light c ; approximately 10^{-43} sec. { 'plāŋk ,tīm }

Planctomyces [MICROBIO] A genus of appendaged bacteria; spherical, oblong, or pear-shaped cells with long, slender stalks; reproduce by budding. { ,plāŋk-tə'mī-sēz }

plane [ELECTR] Screen of magnetic cores; planes are combined to form stacks. [DES ENG] A tool consisting of a smooth-soled stock from the face of which extends a wide-edged cutting blade for smoothing and shaping wood. [MATH] 1. A surface such that a straight line that joins any two of its points lies entirely in that surface. 2. In projective geometry, a triple of sets (P, L, I) where P denotes the set of points, L the set of lines, and I the incidence relation on points and lines, such that (1) P and L are disjoint sets, (2) the union of P and L is nonnull, and (3) I is a subset of $P \times L$, the cartesian product of P and L . { plān }

plane angle [MATH] An angle between lines in the euclidean plane. { 'plān ,aŋ-gəl }

plane atmospheric wave [METEOROL] An atmospheric wave represented in two-dimensional rectangular cartesian coordinates, in contrast to a wave considered on the spherical earth. { 'plān ,at-mə'sfīr-ik 'wāv }

plane bed [GEOL] A sedimentary bed without elevations or depressions larger than the maximum size of the bed material. { 'plān ,bed }

plane correction [ENG] A correction applied to observed surveying data to reduce them to a common reference plane. { 'plān kə ,rɛk-shən }

plane curve [MATH] Any curve lying entirely within a plane. { 'plān ,kərv }

plane cyclic curve See cyclic curve. { 'plān 'sīk-lik ,kərv }

plane defect [CRYSTAL] A type of crystal defect that occurs along the boundary plane of two regions of a crystal, or between two grains. { 'plān dī ,fekt }

plane dendrite See plane-dendritic crystal. { 'plān ,den ,drit }

plane-dendritic crystal [CRYSTAL] An ice crystal exhibiting an elaborately branched (dendritic) structure of hexagonal symmetry, with its much larger dimension lying perpendicular to the principal (c -axis) of the crystal. Also known as plane dendrite; stellar crystal. { 'plān den ,drid-ik 'ləst-əl }

plane earth [ELECTROMAG] Earth that is considered to be a plane surface as used in ground-wave calculations. { 'plān ,ərth }

plane-earth attenuation [ELECTROMAG] Attenuation of an electromagnetic wave over an imperfectly conducting plane earth in excess of that over a perfectly conducting plane. { 'plān ,ərth ə ,ten-yə'wā-shən }

plane field See field of planes on a manifold. { 'plān ,fēld }

plane geometry [MATH] The geometric study of the figures in the euclidean plane such as lines, triangles, and polygons. { 'plān jē'ām-ə'trē }

plane group [CRYSTAL] The group of operations (rotations, reflections, translations, and combinations of these) which leave a regular, periodic structure in a plane unchanged. [MATH] One of 17 two-dimensional patterns which can be produced by one asymmetric motif that is repeated by symmetry operations to produce a pattern unit which then is repeated by translation to build up an ordered pattern that fills any two-dimensional area. Also known as plane symmetry group. { 'plān ,gru:p }

plane jet [HYD] A stream flow pattern characteristic of hypersonic inflow, in which the inflowing water spreads as a parabola whose width is about three times the square root of the distance downstream from the mouth. { 'plān jet }

plane lamina [MECH] A body whose mass is concentrated in a single plane. { 'plān 'lam-ə-nə }

plane lattice [CRYSTAL] A regular, periodic array of points in a plane. { 'plān 'lad-əs }

plane mirror [OPTICS] A mirror whose surface lies in a plane; it forms an image of an object such that the mirror surface is perpendicular to and bisects the line joining all corresponding object-image points. { 'plān 'mir-ər }

plane of departure [MECH] Vertical plane containing the path of a projectile as it leaves the muzzle of the gun. { 'plān əv dī'pār-çər }

plane of fire [MECH] Vertical plane containing the gun and the target, or containing a line of site. { 'plān əv 'fir }

plane of flotation [FL MECH] The plane in which the surface