NASA
THESAURUS
SUPPLEMENT
MARCH 1990

A four part cumulative supplement to the 1988 edition of the NASA Thesaurus.
NASA THESaurus Supplement

March 1990

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INTRODUCTION

Contents of the Supplement
The NASA Thesaurus Supplement is a cumulative update of the 1988 edition of the NASA Thesaurus, NASA SP-7064. Supplements are normally published every six months. Users should consult the online thesaurus for complete and up-to-date information.

Part 1 of the Supplement updates Volume 1 of the 1988 NASA Thesaurus, the Hierarchical Listing. Complete hierarchies of all new terms are given. Changes in the hierarchies of terms are not included in order to control the size of the Supplement. New terms to this supplement are indicated by a bullet.

Part 2 updates Volume 2 of the 1988 NASA Thesaurus, the Access Vocabulary. All new terms are listed in alphabetical order along with USE references (permuted forms of posting terms and other cross-references).

Part 3 is a list of supplemental definitions of NASA Thesaurus posting terms, updating Volume 3 of the NASA Thesaurus. New terms are indicated by a bullet.

Part 4 is a list of changes. Users requiring additional information should consult the 1988 NASA Thesaurus. Comments about the NASA Thesaurus and the Supplement should be addressed to: Lexicographer, NASA Scientific and Technical Information Facility, P.O. Box 8757, BWI Airport, MD 21240.

Thesaurus Term Definitions
Publication of NASA Thesaurus definitions began with Supplement 1 to the 1985 NASA Thesaurus. Beginning with the 1988 edition, definitions were published as Volume 3 of the NASA Thesaurus. Succeeding Supplements will contain only new definitions added after the publication of the 1988 edition.

Definitions are given for most terms added since 1976 as well as for many earlier terms. Definitions of more common or general scientific terms are given a NASA slant if one exists. Certain terms are not defined as a matter of policy: common place names, chemical elements, specific models of computers, and non-technical terms. Other terms lack definitions because the NASA Thesaurus predates by a number of years the systematic effort to define terms. Nevertheless, definitions of older terms are continually being added.

The following data are provided for each definition: term in uppercase-lowercase form, definition per se, source, and year the term (not the definition) was added to the NASA Thesaurus. The NASA History Office is the authority for capitalization in satellite and spacecraft names.

Sources of Definitions
Definitions with no source given were constructed by lexicographers at the NASA Scientific and Technical Information (STI) Facility, who rely on the following sources for their information: experts in the field, literature searches from the NASA STI Database, and specialized references.

Definitions come from the following sources:


ASTM. Compilation of ASTM Standard Definitions, 6th edition. Philadelphia, PA, ASTM, 1986. Copyright, the American Society for Testing and Materials (ASTM). All rights reserved. Used with the permission of ASTM. Two ASTM sources are distinguished: standards are identified by an alphanumeric designation with no hyphen; committees are identified by an alphanumeric designation with a hyphen. The original definitions appeared in the Annual Book of ASTM Standards.


In some cases, definitions from these sources have been subjected to minor editorial alterations, for example, to make a definition agree in number with the NASA form of the term.

**Retrospective Indexing**

Since 1984 all new terms are retrospectively assigned to past database records using a method which combines automated search strategies and manual review.

Record updating usually takes place within three months following the addition of a new term to the *NASA Thesaurus* and covers the period from 1968 to date.

**Boldfaced Terms in Definitions**

With the third *NASA Thesaurus Supplement*, *NASA Thesaurus* terms that appear in the main text of a definition and are also defined separately are boldfaced. Such boldfaced terms, including previously defined terms will appear for the most part in the definitions part of the *Supplement*. A new program for computer aided editing of boldfacing uses NASA's existing Machine Aided Indexing (MAI) programs to identify variant forms of terms that can be regularized with NASA Thesaurus terminology and thus provide more extensive cross-referencing through boldfacing. This system of linkages facilitates the use of definitions as they are added and intertwines new definitions with previous material.

**Standardized Geology Definitions Included**

As noted earlier, *NASA Thesaurus* terms that have been defined in the third edition of the American Geological Institute's "Glossary of Geology" are now being added to *NASA Thesaurus Supplements*. The "Glossary of Geology" is a standardized and widely accepted authority in the field of geology terminology. As with previous sources such as ASTM, DOE, IEEE, and SP-7, editorial alterations are sometimes made primarily for plurality and now, with the aid of MAI, of term form for boldfacing.
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NASA THESAURUS SUPPLEMENT

PART 1
HIERARCHICAL LISTING

A

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    . ACOUSTIC COUPLING
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    ENERGY TRANSFER
    SOUND WAVES
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    . SPACE TRANSPORTATION SYSTEM
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    ATMOSPHERIC MODELS
    ATMOSPHERIC GENERAL CIRCULATION MODELS
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    CLIMATOLOGY
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    AMPLITUDE MODULATION
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OXYGEN-HYDROCARBON ROCKET ENGINES

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CRAF Mission
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USE Advanced Very High Resolution Radiometer

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USE SH waves

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USE Tollmien-Schlichting waves

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USE New Zealand space program
A

• abundance
The mean concentration of an element in a geochemical reservoir, e.g., the abundance of Ni in meteorites or the crustal abundance of oxygen. Also used for the relative average content, e.g., the order of abundance of elements in the earth's crust is O, Si, Al, Fe, Ca, etc. Used for element abundance. AGI 1968

AC generators
Generators for the production of alternating-current power. Used for alternating current generators and alternators (generators). IEEE 1968

access control
Hardware or software features, operating procedures, or management procedures designed to permit authorized access to a computer system. IEEE 1980

• adobe flats
Use flats (landforms)

• advancing shorelines
Use beaches

air data systems
Sets of aerodynamic and thermodynamic sensors, and a computer which provide flight parameters such as airspeed, static pressure, air temperature and Mach number. IEEE 1975

• air masses
Large widespread volumes of air having particular characteristics of temperature and moisture content that were acquired at its source region and are modified as they move away from their source. AGI 1968

• air pollution
The presence of unwanted material in the air. The term 'unwanted material' here refers to material in sufficient concentrations, present for a sufficient time, and under circumstances to interfere significantly with comfort, health, or welfare of persons, or with the full use and enjoyment of property. Used for atmospheric impurities. ASTM (D 1356, D-22) 1968

Alfven waves
Use magnetohydrodynamic waves

• algae
Any plants of a group of unicellular and multicellular primitive organisms that include the Chlorella, Scenedesmus, and other genera. Used for algal bloom. SP-7 1968

• algal bloom
Use algae

• alloys
Substances having metallic properties and being composed of two or more chemical elements of which at least one is an elemental metal. SP-7 1968

alphanumeric characters
Characters in a set that contain both letters and digits, but they usually also contain other characters such as punctuation symbols. IEEE 1968

alternating current generators
Use AC generators

alternators (generators)
Use AC generators

anechoic chambers
Enclosures especially designed with boundaries that absorb sufficiently well the sound incident thereon to create an essentially field-free condition in the frequency ranges of interest. IEEE 1968

angels (radar)
Echos of false radar targets caused by atmospheric inhomogeneity, atmospheric refraction, insects, birds, or unknown phenomena. IEEE 1968

• anodes
The positive poles or electrodes of electron emitters, such as electron tubes or electric cells. SP-7 1968

• Antarctic regions
The areas surrounding and including the continent of Antarctica. Used for Antactica. 1968

• Antarctica
Use Antarctic regions

• anthracite
Coal of the highest metamorphic rank, in which fixed-carbon content is between 92% and 98% (on a dry, mineral-matter-free basis). It is hard and black, and has a semimetallic luster and semiconchoidal fracture. Anthracite ignites with difficulty and burns with a short blue flame, without smoke. Used for hard coal. AGI 1973

antireflection coatings
Thin dielectric or metallic films applied to an optical surface to reduce the reflectance and thereby increase the transmittance. Note: The ideal value of the reactive index of a single layered film is the square root of the product of the refractive indices on either side of the film, the ideal optical thickness being one quarter of a wavelength. IEEE 1973

• apatites
Use minerals
apogees
Those orbital points farthest from the earth, when the earth is the center of attraction.

aquatic plants
Plants growing in or on water.

archipelagoes
Seas or areas in seas that contain numerous islands; also the island groups themselves.

aspiration
Use vacuum

astrophysics
A branch of astronomy that treats of the physical properties of celestial bodies, such as luminosity, size, mass, density, temperature, and chemical composition. Used for geoastronomy.

atmospheric electricity
Electrical phenomena, regarded collectively, which occur in the earth's atmosphere. Also the study of electrical processes occurring within the atmosphere.

atmospheric impurities
Use air pollution

atmospheric refraction
Refraction resulting when a ray of radiant energy passes obliquely through an atmosphere.

atmospheric windows
Wavelength intervals at which the atmosphere transmits the most electromagnetic radiation.

atolls
Coral reefs appearing in plan view as roughly circular (though sometimes elliptical or horseshoe-shaped), and surmounted by a chain or ring of closely spaced low coral inlets that encircle a shallow lagoon in which there is no pre-existing land or islands of non coral origin; the reef is surrounded by deep water of the open sea, either oceanic or continental shelves. Atolls range in diameter from 1 km to more than 130 km, and are especially common today in the western and central Pacific Ocean. Atoll is derived from the native name in the Maldives Islands (Indian Ocean) which are typical examples of this structure.

audiometry
The testing and measurement of hearing at various levels.

automatic pattern recognition
Use pattern recognition

azimuth
Horizontal direction or bearing. Used for solar azimuth.

backfire antennas
Antennas consisting of radiating feeds, reflector elements, and reflecting surfaces such that the antennas function as open resonators, with radiation from the open end of the resonator.

backlobes
Radiation lobes whose axes make angles of approximately 180 degrees with respect to the axes of the major lobes of the antennas. By extension radiation lobes in the half-space opposed to the direction of peak activity.

backshores
Use beaches

badlands
Intricately stream-dissected topography, characterized by a very fine drainage network with high drainage densities (77 to 747 miles per square mile) and short steep slopes with narrow interflues. Badlands develop on the surface with little or no vegetative cover, overlying unconsolidated or poorly cemented clays or silts, sometimes with soluble minerals such as gypsum or halite. They may also be induced in humid areas by removal of the vegetative cover through overgrazing, or by air pollution from sulfide smelting. The term was first applied to an area in western South Dakota, which was called 'mauvaises terres' by the early French fur traders.

bajadas
Use fans (landforms)

barriers (landforms)
Elongated offshore ridges or masses, usually of sand, rising above the high-tide level, generally extending parallel to, and at some distance from, the shore, and separated from it by some kind of coastal bay. They are built up by the action of waves and currents.

bars (landforms)
A generic term for any of various elongate offshore ridges, banks, or mounds of sand, gravel, or other unconsolidated material, submerged at least at high tides, and built up by the action of waves or currents on the water bottom, especially at the mouth of a river or estuary, or at a slight distance from the beach. Bars commonly form obstructions to water navigation.

bayous
A term variously applied to many local water features in the lower Mississippi River basin and in the Gulf Coast region of the U.S., especially in Louisiana. Its general meaning is a creek of a secondary watercourse that is tributary to another body of water; especially through alluvial lowlands, coastal swamps or river deltas. The origin of the term is from the American French 'boyau', 'gut'; from the Choctaw 'bayuk', 'small stream'.

bays (topographic features)
Wide, curving open indentations, recedes, or arms of seas or lakes into the land or between two capes or headlands; larger than coves, and usually smaller than, but of the same general character as gulfs. Used for bights and coves.

beaches
Stretches of unconsolidated material that constitute gently sloping zones, typically with concave profiles, extending landward from the low-water line to the place where there is a definite change in material or physiographic form. Used for advancing shorelines, backshores, and inshore zones.

beacons
Lights, groups of lights, electronic apparatus, or other devices that guide, orient, or warn aircraft, spacecraft, etc. in flight.
• bights
  Use bays (topographic features)

• bioregenerative life support systems
  Use closed ecological systems

blazars
  Strongly optical polarized active galactic nuclei objects exhibiting BL Lacertae-like and quasar-like characteristics.

• bonding
  Specifically, a system of connections between all metal parts of an aircraft or other structure forming a continuous electrical unit and preventing jumping or arching of static electricity. Glueing or sementing together for structural strength.

• breakwaters
  Offshore structures (such as moles, walls, or jetties) that by breaking the force of waves, protect harbors, anchorages, beaches, or shore areas. Used for jetties and sea walls.

• cathodes
  In electron tubes, electrodes through which a primary stream of electrons enters the interelectrode space.

• celestial bodies
  Any aggregations of matter in space constituting a unit for astronomical study, as the sun, moon, a planet, comet, star, or nebula. Also called heavenly bodies.

• central processing units
  The units of computing systems that include the circuits controlling the interpretation of instructions and their execution. Used for processors (computers).

• ceramics
  Inorganic compounds or mixtures requiring heat treatment to fuse them into homogeneous masses usually possessing high temperature strength but low ductility. Types and uses range from china for dishes to refractory liners for nozzles.

• Chlorella
  A genus of unicellular green algae to be adapted to converting carbon dioxide into oxygen in a closed ecological system.

• circuits
  Networks providing one or more closed paths. Used for electric circuits, exploding conductor circuits, shunts, and subcircuits.

• closed ecological systems
  Systems that provide for the maintenance of life in an isolated living chamber through complete reutilization of the material available, in particular, by means of a cycle wherein exhaled carbon dioxide, urine, and other waste matter are converted chemically or by photosynthesis into oxygen, water, and food. Used for bioregenerative life support systems.

• coal
  A brown to black combustable sedimentary rock (in the geological sense) composed principally of consolidated and chemically altered plant remains.

COD (cracks)
  Use crack opening displacement

cold cathode tubes
  Electron tubes containing cold cathodes.

• cold cathodes
  Cathodes that function without the application of heat.

• cols
  Use gaps (geology)

• communication satellites
  Satellites designed to reflect or relay electromagnetic signals used for communication.

• compasses
  Instruments for indicating a horizontal reference direction, specifically magnetic compasses.

• continental margins
  Use continental shelves

• continental shelves
  The ocean floor that is between the shoreline and the abyssal ocean floor, including various provinces; the continental shelf; continental borderland; continental slope; and the continental rise. Used for continental margins.

• coves
  Use bays (topographic features)

crack opening displacement
  The displacement at the mouth of a crack in a material. Used for COD (cracks)

• critical mach number
  Use Mach number

• discharge tubes
  Use gas discharge tubes

discontinuity
  A break in sequence or continuity of anything.

• discovering
  Use exploration

disk operating system (DOS)
  A program with which the computer performs such mundane but useful tasks as storing, locating, and retrieving files on disk, reading the keyboard, and issuing display and print information.

displacement
  A vector quantity that specifies the change of position of a body the change of position of a body or particle usually measured from the mean position or position of rest.

ditching (excavation)
  Use excavation
DOPPLER EFFECT

- Doppler effect
  The change in frequency with which energy reaches a receiver when the receiver and the energy source are in motion relative to each other. Used for DOVAP and stellar Doppler shift. SP-7 1968

Doppler radar
Radar which utilizes the Doppler effect to determine the radial component of velocities of relative radar targets or to select targets having particular radial velocities. IEEE 1968

- DOVAP
  Use Doppler effect

- drag
  A retarding force acting upon the direction of motion of the body. It is a component of the total fluid forces acting on the body. Used for drag effect. SP-7 1968

- drag effect
  Use drag

- dullness
  Use luster

- earth figure
  Use geodesy

- earth shape
  Use geodesy

- eddies
  Use vortices

- electric circuits
  Use circuits

electrical conductivity
Use electrical resistivity

electrical resistivity
A factor such that the conduction-current density is equal to the electric field in the material divided by resistivity. IEEE 1968

- electroacoustic transducers
  Transducers for receiving waves from an electric system and delivering waves to an acoustic system, or vice versa. Microphones and earphones are electroacoustic transducers. SP-7 1968

electroconductivity
Use electrical resistivity

- electrodes
  Terminals at which electricity passes from one medium into another. The positive electrodes are called the anodes; the negative electrodes are called the cathodes. SP-7 1968

- electromagnetic radiation
  Energy propagated through space or through material media in the form of an advancing disturbance in electric and magnetic fields existing in space or in media. The term radiation, alone, is used commonly for this type of energy, although it actually has a broader meaning. Used for electromagnetic waves and wave radiation. SP-7 1968

- electromagnetic waves
  Use electromagnetic radiation

- electron tubes
  Devices in which conduction by electrons takes place through a vacuum of gaseous medium within a gastight envelope. SP-7 1968

- element abundance
  Use abundance

energy dissipation
The difference between energy input and output as a result of transfer of energy between two points. Used for energy loss. IEEE 1968

energy loss
Use energy dissipation

equatorial orbits
Inclined orbits with an inclination of zero degrees. The plane of an equatorial orbit contains the equator of the primary body. IEEE 1968

- erosion
  Progressive loss of original material from a solid surface due to mechanical interaction between that surface and a fluid, a multicomponent fluid, or impinging liquid or solid particles. Used for scars (geology). ASTM (G 76, G-2) 1968

error correcting codes
Codes in which each telegraph or data signal conforms to specific rules of construction so that departures from this construction in the received signals can be automatically detected, and permits the automatic correction, at the received terminal, of some or all of the errors. Note: Such codes require more signal elements than are necessary to convey the fundamental information. IEEE 1974

error detection codes
Codes in which each expression conforms to specific rules of construction, so that if certain errors occur in an expression the resulting expression will not conform to the rules of construction and thus the presence of errors is detected. Note: Such codes require more signal elements than are necessary to convey the fundamental information. IEEE 1968

- escarpments
  Long more or less continuous cliffs or relatively steep slopes facing in one general direction, breaking the continuity of the land by separating two level or gently sloping surfaces, and produced by erosion or by faulting. Used for scars. AGI 1972

- eutrophication
  The process by which waters become more eutrophic; especially the artificial or natural enrichment of a lake by an influx of nutrients required for the growth of aquatic plants such as algae that are vital for fish and animal life. AGI 1973

- evaporation
The physical process by which a liquid or solid is transformed into the gaseous state; the opposite of condensation. SP-7 1968

- **evapotranspiration**
  Loss of water from a land area through transpiration of plants and evaporation from the soil and surface-water bodies. Also, the volume of water lost through evapotranspiration. AGI 1973

- **excavation**
  The act or process of removing soil and/or rock materials from one location and transporting them to another. It includes digging, blasting, breaking, loading, and hauling, either at the surface or underground. Also, a pit, cavity, hole, or other uncovered cutting produced by excavation or the material dug out in making a channel or cavity. Used for ditching (excavation) AGI 1968

- **expert systems**
  Computer programs that manipulate symbolic information to produce the same results as human experts would. They deal with uncertain data and make decisions on that data. Input and design relies on human experts. Used for knowledge based systems. 1983

- **exploding conductor circuits**
  Use circuits

- **exploration**
  The search for deposits of useful minerals or fossil fuels; prospecting, including under the oceans. It may include geologic reconnaissance, e.g. remote sensing, photogeology, geophysical and geochemical methods, and both surface and underground investigations. Used for discovering and prospecting. AGI 1968

- **fans (landforms)**
  Gently sloping, fan-shaped masses of detritus forming sections of very low shaped cones commonly at places where there is a notable decrease in gradient; specifically alluvial fans. Also fan-shaped masses of congealed lava that formed on steep slopes by the continual changing direction of flow. Used for bajadas. AGI 1975

FDMA
Use frequency division multiple access

- **feature extraction**
  Use pattern recognition

- **field aligned currents**
  Electric currents aligned along magnetic fields. 1988

- **finite-state machines**
  Use Turing machines

- **flats (landforms)**
  A general term for level or nearly level surfaces or small areas of land marked by little or no relief such as plains. Also, nearly level regions that visibly display lower relief than their surroundings. Used for adobe flats and salt flats. AGI 1974

- **flood control**
  The prevention or reduction of damage caused by flooding, as by containing water in reservoirs removed from areas where it would do damage, improving channel capacity to convey water past or through critical areas with the least amount of damage, and diverting excess water into bypasses or floodways. AGI 1976

- **flood plains**
  The surfaces or strips of relatively smooth land adjacent to river channels, constructed by the present rivers in their existing regimens and covered with water when the rivers overflow. AGI 1973

- **floods**
  Rising bodies of water (as in streams, lakes, or seas, or behind dams) that overtop their natural or artificial confines and that cover land not normally underwater. Especially, any relatively high streamflows that overflow their banks in any reach of the stream, or that are measured by gage height of discharge quantity. AGI 1968

- **fluid transpiration**
  Use transpiration

- **folds (geology)**
  Curves or bends of a planar structure such as rock strata, bedding planes, foliation, or cleavage. Folds are usually a product of deformation, although their definition is descriptive and not genetic and may include primary structures. Used for nappes. AGI 1973

- **fossil fuels**
  A general term for any hydrocarbons that may be used for fuel; chiefly petroleum, natural gas, and coal. AGI 1974

- **free electrons**
  Electrons which are not bound to an atom. SP-7 1968

- **frequency division multiple access**
  A method of providing multiple access to communication satellites in which the transmissions from a particular earth station occupy a particular assigned frequency band. In the satellite the signals are simultaneously amplified and retransposed to a different frequency band and retransmitted. The earth station identifies its receiving channel according to its assigned frequency band in the satellite signal. Used for FDMA. IEEE 1979

- **fronets (meteorology)**
  The contacts at the Earth's surface between two different air masses commonly cold and warm, that generally move in an easterly direction. Used for frontal areas (meteorology) and weather fronts. AGI 1968

- **fronets (meteorology)**
  The contacts at the Earth's surface between two different air masses commonly cold and warm, that generally move in an easterly direction. Used for frontal areas (meteorology) and weather fronts. AGI 1968

- **frontal areas (meteorology)**
  Use fronts (meteorology)

- **fronts (meteorology)**
  The contacts at the Earth's surface between two different air masses commonly cold and warm, that generally move in an easterly direction. Used for frontal areas (meteorology) and weather fronts. AGI 1968

- **gas discharge counters**
  Use gas discharge tubes
GAS DISCHARGE TUBES

Evacuated enclosures containing a gas at low pressure that permits the passage of electricity through the gas upon application of sufficient voltage. Note: The tubes are usually provided with metal electrodes, but one form permits an electrodeless discharge with induced voltage. Used for discharge tubes and gas discharge counters. IEEE 1968

- geoastrophysics
  Use astrophysics

- geoastrophysics
  Use geophysics

- geochemistry
  The study of the distribution of the amounts of the chemical elements in minerals, ores, rocks, soils, water, and the atmosphere. Also, the study of the circulation of the elements in nature, on the basis of the properties of the atom and ions. A major concern of geochemistry is the synoptic evaluation of the abundance of the elements of the Earth's crust and in major classes of rocks and minerals. AGI 1968

- geochronology
  The study of time in relationship to the history of the Earth, especially by the absolute age determination and relative dating systems developed for this purpose. AGI 1968

- geodesy
  The science which deals mathematically with the size and shape of the earth, and the earth's external gravity field, and with surveys of such precision that overall size and shape of the earth must be taken into consideration. Used for earth figure, earth shape, and Izsak ellipsoid. SP-7 1968

- Geodimeters
  Trade name of electronic-optical devices that measure ground distances precisely by electronic timing and phase comparison of modulated light waves that travel from a master unit to a reflector and return to a light-sensitive tube where an electric current is set up. They are normally used at night and are effective with first-order accuracy up to distances or 5-40 km (3-25 miles). The term is derived from GEO detic DI stance METER. AGI 1968

- geoelectricity
  The Earth's natural electric fields and phenomena. It is closely related to geomagnetism. AGI 1968

- geomagnetic field
  Use geomagnetism

- geomagnetism
  The magnetic phenomena, collectively considered, exhibited by the earth and its atmosphere and by extension the magnetic phenomena in interplanetary space. The study of the magnetic field of the earth. Used for geomagnetic field and terrestrial magnetism. SP-7 1968

- geophysics
  The physics of the earth and its environment, i.e., earth, air, and (by extension) space. Classically, geophysics is concerned with the nature of and physical occurrences at and below the surface of the earth including, therefore, geology, oceanography, geodesy, seismology, and hydrology. The trend is to extend the scope of geophysics to include meteorology, geomagnetism, astrophysics, and other sciences concerned with the physical nature of the universe. Used for geoastrophysics. SP-7 1968

GAS DISCHARGE TUBES (NASA THESAURUS SUPPLEMENT (PART 3))

- Glauert coefficient
  Use Mach number

- gypsum
  The mineral consisting primarily of fully hydrated calcium sulfate (calcium sulfate dihydrate). ASTM (C 11, C-11) 1968

- gyrocompasses
  Compasses consisting of a continuously driven Foucault gyroscope whose supporting ring normally confines the spinning axis to a horizontal plane, so that the earth's rotation causes the spinning axis to assume a position in a plane passing through the earth's axis, and thus to point to true north. IEEE 1968

- hard coal
  Use anthracite

- heat treatment
  Heating and cooling a solid metal or alloy in such a way as to obtain desired conditions or properties. SP-7 1968

- hinge moments
  Use torque

- hydromagnetic waves
  Use magnetohydrodynamic waves

- impulse generators

- incoherent scattering
  The phenomena of generating waves with random variations in phase, amplitude, polarization, and direction of propagation when an incident wave encounters matter. IEEE 1968

- indexes (documentation)
  Ordered reference lists of contents of a file or document, together with keys or reference notations for identification or location of those contents. IEEE 1968

- induction heating
  The generation of heat in any conducting material by means of magnetic flux-induced currents. IEEE 1968

- induction motors
  AC motors in which the primary winding on one member (usually the stator) is connected to the power source and a polyphase secondary winding or a squirrel-cage secondary winding on the other member (usually the rotor) carries induced current. IEEE 1971

- inliers (landforms)
  Areas or groups of rocks surrounded by rocks of younger age. AGI 1981

- inshore zones
  Use beaches
• ions
Charged atoms or molecularly bound groups of atoms; sometimes also free electrons or other charged subatomic particles. In atmospheric electricity, any of several types of electrically charged submicroscopic particles normally found in the atmosphere. Atmospheric ions are of two principal types, small ions and large ions, although a class of intermediate ions has occasionally been reported. In chemistry, atoms or specific groupings of atoms which have gained or lost one or more electrons, as the chloride ion or ammonium ion. Such ions exist in aqueous solutions and in certain crystal structures. SP-7 1968

• islands
Tracts of land smaller than a continent, surrounded by the water of oceans, seas, lakes, or streams. The term has been loosely applied to land-tied and submerged areas, and to land cut off on two or more sides by water, such as peninsulas. AGI 1968

• Izsak ellipsoid
Use geodesy

• jetties
Use breakwaters

• klippen
Use outliers (landforms)

• knowledge based systems
Use expert systems

• lakes
Inland bodies of standing water occupying depressions in the Earth’s surface, generally of appreciable size (larger than a pond) and too deep to permit vegetation (excluding sub aqueous vegetation) to take root completely across the expanse of water; the water may be fresh or saline. The term includes expanded parts of rivers, reservoirs behind dams, or lake basins intermittently or formerly covered by water. AGI 1968

• laminated materials
Use laminates

• laminates
Products made by bonding together two or more layers of material or materials. Used for laminated materials, laminations, and multilayer structures. ASTM (C 582, C-3) 1968

• laminations
Use laminates

• lava
A general term for a molten extrusive; also, for the rock that is solidified from it. DOE 1968

LED (diodes)
Use light emitting diodes light emitting diodes
PN junction semiconductor devices that emit incoherent optical radiation when biased in the forward direction. Used for LED (diodes). IEEE 1971

• luster
The appearance characteristic of a specimen due to pronounced changes in intensity of light reflected from elemental areas of the specimen when the angle of illumination or view is changed. Used for dullness. ASTM (E 284, E-12) 1968

• Mach number
A number expressing the ratio of the speed of a body or a point on a body with respect to the surrounding air or other fluid, or the speed of a flow, to the speed of sound in the medium; the speed represented by this number. Used for critical Mach number and Glauert coefficient. SP-7 1968

• macromolecules
Use molecules

• magnetic field intensity
Use magnetic flux

• magnetic fields
Regions of space wherein magnetic dipoles would experience a magnetic force or torque; often represented as the geometric array of the imaginary magnetic lines of force that exist in relation to magnetic poles. SP-7 1968

• magnetic flux
The magnetic force exerted on an imaginary unit magnetic pole placed at any specified point of space. It is a vector quantity. Its direction is taken as the direction toward which a north magnetic pole would tend to move under the influence of the field. If the force is measured in dynes and the unit pole is a cgs unit pole, the field intensity is given in oersteds. Used for magnetic field intensity. SP-7 1968

• magnetic poles
Either of the two places on the surface of the earth where the magnetic dip is 90 deg., that in the Northern Hemisphere (at, approximately, latitude 73 deg. N, longitude 101 deg. E in 1955) being designated north magnetic pole, and that in the Southern Hemisphere (at, approximately, latitude, 68 deg. S, longitude 144 deg. E in 1955) being designated south magnetic pole. Either of those two points of a magnet where the magnetic force is the greatest. In magnetic theory, a fictitious entity analogous to a unit charge of electrostatic theory, in nature only dipoles, not isolate magnetic poles exist. SP-7 1968

magnetohydrodynamic waves
Low frequency waves in an electrically highly conducting fluid (such as a plasma) permeated by static magnetic fields. The restoring forces of the waves are, in general, the combination of a magnetic tensile stress along the magnetic field lines and the comprehensive stress between the field lines and the fluid pressure. Used for Alfvén waves, hydromagnetic waves, and plasma sound waves. IEEE 1968

• man tended free flyers
Intermittently manned spacecraft or platforms designed primarily to carry out experiments in reduced gravity and life science
research. They also serve as annexes or components of space stations. Used for MTTF (space station).

mass drivers
Electromagnetic devices for the linear acceleration of projectiles or payloads. Applications include orbital insertion and transfer, propulsion systems, and hypervelocity accelerators.

matter-antimatter propulsion
Spacecraft propulsion by use of matter-antimatter annihilation reactions.

microphones
Electroacoustic transducers which receive acoustic signals and deliver corresponding electric signals.

minerals
Naturally occurring inorganic elements or compounds having an orderly internal structure and characteristic chemical compositions, crystal forms, and physical properties.

minimization
Use optimization

mixing layers (fluids)
Fluid layers in which multicomponent mixing occurs.

molecular flow
The flow of gas through a duct under conditions such that the mean free path is greater than the largest dimension of a transverse section of the duct.

molecular weight
The weight of a given molecule expressed in atomic weight units.

molecules
Aggregates of two or more atoms of a substance that exists as a unit. Used for macromolecules.

MS DOS (operating system)
Use disk operating system (DOS)

MTFF (space station)
Use man tended free flyers

multilayer structures
Use laminates

multiple access
The allocation of communication system resources (output) among multiple users by means of power, bandwidth, and power assignment singly or in combination.

nappes
Use folds (geology)

navigation
The practice or art of directing the movement of a craft from one point to another. Navigation usually implies the presence of a human, a navigator, aboard the craft.

NASA THESAURUS SUPPLEMENT (PART 3)

O

optical depth
Use optical thickness

optical thickness
Specifically, in calculations of the transfer of radiant energy, the mass of a given absorbing or emitting material lying in a vertical column of unit cross sectional area and extending between two specific levels. Used for optical depth.

optimization
The procedure used in the design of a system to maximize or minimize some performance index. May entail the selection of a component, a principle of operation, or a technique.

optoelectronic devices
Electronic devices combining optic and electric ports.

ores
Use minerals

outliers (landforms)
Areas or groups of rocks surrounded by rocks of older age. Used for klippen.

P

parametric amplifiers
Inverting parametric devices used to amplify a signal without frequency translation from input to output. Used for parametric oscillators and reactance amplifiers.

parametric oscillations
Use parametric amplifiers

passes
Use gaps (geology)

pattern recognition
The identification of shapes, forms and configurations by automatic means.

payload stations
The locations in the Space Shuttles' flight decks and cargo bay at which payloads are mounted.

payloads
Originally, the revenue producing portions of an aircraft's load, e.g., passengers, cargo, and mail. By extension, that which an aircraft, rocket, or spacecraft carries over and above which is necessary for the operation of the vehicle for its flight.

peninsulas
Elongated bodies or stretches of land nearly surrounded by water and connected with a larger land area, usually by a neck or an isthmus. The term is derived from the Latin 'paeninsula' 'almost island'.

perveance
The quotient of the space-charge-limited cathode current by the three-halves power of the anode voltage in a diode. Note: Perveance is the constant G appearing in the Child-Langmuir-Schottky equation.
Petri nets
Abstract, formal models of the information flow in systems with discrete sequential or parallel events. The major use has been the modeling of hardware systems and software concepts of computers. 1979

• Phase modulation
Angle modulation in which the angle of a sine wave carrier is caused to depart from the carrier angle by an amount proportional to the instantaneous value of the modulation wave. Combinations of phase and frequency modulation are commonly referred to as frequency modulation. SP-7 1968

Phase shift keying
The form of phase modulation in which the modulating function shifts the instantaneous phase of the modulated wave among predetermined discrete values. IEEE 1968

Photocathodes
Electrodes used for obtaining a photoelectric emission when irradiated. Used for photoelectric cathodes. IEEE 1968

Photoconductivity
The conductivity increase exhibited by some nonmetallic materials, resulting from the free carriers generated when photon energy is absorbed in electronic transitions. The rate at which free carriers are generated, the mobility of the carriers, and the length of time they persist in conducting states (their lifetime) are some of the factors that determine the amount of conductivity change. Used for photoresistivity IEEE 1968

• Photocurrents
Use photoelectric emission

Photodiodes
Diodes designed to produce photocurrent by absorbing light. Photodiodes are used for the conversion of optical power to electrical power. IEEE 1968

Photoelectric cathodes
Use photocathodes

• Photoelectric emission
The emission of electrons from atoms or molecules. Used for photocurrents, photoemission, and photoemissivity. ASTM (E 673, E-42) 1968

• Photoemission
Use photoelectric emission

• Photoemissivity
Use photoelectric emission

Photographic emulsions
The light-sensitive coatings on photographic film consisting usually of silver halide. IEEE 1968

Photoresistivity
Use photoconductivity

Photovoltaic effect
The production of a voltage difference across a pn junction resulting from the absorption of photon energy. The voltage difference is caused by the internal drift of holes and electrons. IEEE 1968

Piezoelectric transducers
Transducers that depend for their operation on the interaction between electric charge and the deformation of certain materials having piezoelectric properties. Note: Some crystals and specially processed ceramics have piezoelectric properties. IEEE 1968

• Piezoelectricity
The property exhibited by some asymmetrical crystalline materials which when subjected to strain in suitable directions develop polarization proportional to the strain. SP-7 1968

Plan position indicators
Display devices on which target blips are shown in plan position, thus forming a map-like display, with radial distance from the center representing range and with the angle of the radius vector representing azimuth angle. Used for PPI (position indicators)

Plasma sound waves
Use magnetohydrodynamic waves

• Plastics
Materials that contain as an essential ingredient one or more organic polymeric substances of large molecular weight, are solid in their finished state, and at some stage in their manufacture or processing into finished articles can be shaped by flow. ASTM (F 412, F-17; D 883, D-20) 1968

PPI (position indicators)
Use plan position indicators

Processors (computers)
Use central processing units

• Prospecting
Use exploration

• Radar targets
Objects which reflect a sufficient amount of a radar signal to produce an echo signal on the radar screen. SP-7 1968

• Radio frequency radiation
Use radio waves

• Radio propagation
Use radio transmission

Radio sources (astronomy)
Celestial objects that emit radio waves. IEEE 1968

• Radio transmission
The transmission of signals by means of radiated electromagnetic waves other than light or heat waves. Used for radio propagation and radio signal propagation. IEEE 1968

Radio transmitters
Devices for producing radio-frequency power, for purposes of radio transmission. IEEE 1968

• Radio waves
Waves produced by oscillation of an electric charge at a frequency useful for radio communication. Used for radio frequency radiation. SP-7 1968

Reactance amplifiers
Use parametric amplifiers
receivers
Initial components or sensing elements of measuring systems. For example, the receiver of a thermoelectric thermometer is the measuring thermocouple. Instruments used to detect the presence and to determine the information carried by electromagnetic radiation. Receivers include circuits designed to detect, amplify, rectify, and shape the incoming radio frequency signals received at the antenna in such a manner that the information containing component of the received energy can be delivered to the desired indicating of recording equipment. Used for receiving systems. 

SP-7 1968

receivers
Use receivers

reduction (mathematics)
Use optimization

reefs
Chains of rocks, sand ridges, or coral at or near the surface of water.

DOE 1973

reflectance
The ratio of the radiant flux reflected by a body to that incident upon it. Used for reflection coefficient and reflectivity.

SP-7 1968

reflection
The process whereby a surface of discontinuity turns back a portion of the incident radiation into the medium through which the radiation approached.

SP-7 1968

reflection coefficient
Use reflectance

reflectivity
Use reflectance

reinforced plastics
Plastics with some strength properties greatly superior to those of the base resin, resulting from the presence of high-strength fillers imbedded in the composition. Note: The reinforcing fillers are usually fibers, fabrics, or mats made of fibers. The plastic laminates are the most common and strongest.

IEEE 1968

reluctance
The ratio of the magnetomotive force to the magnetic flux through any cross section of the magnetic circuit.

IEEE 1968

reluctivity
Use reluctance

remote sensing
The collection of information about an object by a recording device that is not in physical contact with it. The term is usually restricted to mean methods that record reflected of radiated electromagnetic energy, rather than methods that involve significant penetration into the Earth. The technique employs such devices as cameras, infrared detectors, microwave frequency receivers, and radar systems.

AGI 1980

resistivity
Use electrical resistivity

resonators
In radio and radar applications, circuits which will resonate at a given frequency, or over a range of frequencies, when properly excited.

SP-7 1968

responders
Use transponders

riblets
Longitudinal striations forming V-shaped grooves on aerodynamic and hydrodynamic surfaces. The riblet devices act to reduce large-scale disturbances near the boundary layer. These grooves are dimensional on the order of the wall vortices and turbulent dimensions.

1988

rocks
Naturally formed aggregates of mineral matter occurring in large masses or fragments. Used for stones (rocks).

ASTM (D 653, D-18) 1968

rotational flow
Use vortices

salt flats
Use flats (landforms)

scarps
Use escarpments

scars (geology)
Use erosion

sea walls
Use breakwaters

secondary radar
A radar technique or mode of operation in which the return signals are obtained from beacons, transponders, or repeaters carried by the targets, contrasted with primary radar in which the return signals are obtained by reflection from the targets.

IEEE 1968

sediments
Solid fragmental materials that originate from weathering of rocks and are transported or deposited by air, water, or ice, or that accumulate by other natural agents, such as chemical precipitation from solution or secretion by organisms, and that form in layers on the Earth's surface at ordinary temperatures in a loose, unconsolidated form; e.g. sand, gravel, silt, mud, till, loess, and alluvium.

AGI 1988

seismology
The study of earthquakes, by extension, the structure of the interior of the Earth via both natural and artificially generated seismic signals.

DOE 1968

shunts
Use circuits

silt
Use sediments

SOHO Mission
One of the joint NASA/ESA missions comprising the International Solar Terrestrial Program. The SOHO Mission will investigate the physical processes in the solar corona and solar wind and the structure and dynamics of the solar interior.

1989

Solar and Heliospheric Observatory
Use SOHO Mission
**NASA THESAURUS SUPPLEMENT (PART 3)**

- **solar azimuth**
  Use azimuth

- **solar plasma (radiation)**
  Use solar wind

- **solar wind**
  Streams of plasma flowing approximately radially outward from the sun. Used for solar plasma (radiation).  
  [SP-7 1968]

- **stellar Doppler shift**
  Use Doppler effect

- **stones (rocks)**
  Use rocks

- **stratospheric warming**
  A temperature rise in the global stratosphere.  
  [1988]

- **streams**
  Bodies of flowing water, great or small, contained within channels as well as uncontained fluids such as air.  
  [DOE 1968]

- **subcircuits**
  Use circuits

- **T**

  - **tensile stress**
    Normal stress tending to lengthen the body in the direction in which it acts.  
    [ASTM (D 653, D-18) 1968]

  - **terrestrial magnetism**
    Use geomagnetism

  - **thermocouples**
    Devices which convert thermal energy directly into electrical energy. In its basic form it consists of two dissimilar metallic electrical conductors connected in a closed loop. Each junction forms a thermocouple.  
    [SP-7 1968]

  - **tombolos**
    Use bars (landforms)

  - **torque**
    About an axis, the product of a force and the distance of its line of action from the axis. Used for hinge moments.  
    [SP-7 1968]

- **transconductance**
  The real part of the transadmittance. Note: Transconductance is, as most commonly used, the interelectrode transconductance between the control grid and the plate. At low frequencies, transconductance is the slope of the control-grid-to-plate transfer characteristic.  
  [IEEE 1986]

- **transducers**
  Devices capable of being actuated by energy from one or more other transmission systems or media and of supplying related energy to one or more other transmission systems or media as microphones or thermocouples.  
  [SP-7 1968]

- **transmittance**
  The ratio of the radiant flux transmitted by a medium or a body to the incident flux.  
  [SP-7 1968]

**V**

- **transpiration**
  The passage of gas or liquid through a porous solid (usually under conditions of molecular flow). Used for fluid transpiration.  
  [SP-7 1968]

- **transponders**
  Combined receiver and transmitter whose function is to transmit signals automatically when triggered by a interrogator. Used for responders.  
  [SP-7 1968]

- **trapped vortices**
  Air flow in rotary motion but trapped relative to leading edge vortex separation, which increases not only lift but also drag. The trapped vortices result in thrust and reduced drag. Used for vortex traps.  
  [1980]

- **trend analysis**
  A management tool for evaluating variation in data with the ultimate objective of forecasting future events based upon an examination of past results.  
  [1989]

- **trigger circuits**
  Circuits that have two conditions of stability, with means for passing from one to the other when certain conditions are satisfied, either spontaneously or through application of an external stimulus.  
  [IEEE 1968]

- **Turing machines**
  Mathematical models of devices that change their internal states and read from, write on, and move potentially infinite tapes, all in accordance with their present states, thereby constituting models for computerlike behavior. Invented in the 1930's, they are named after their inventor, A.M. Turing. Used for finite-state machines.  
  [IEEE 1968]

- **vacuum**
  A given space filled with gas at pressures below atmospheric pressure. Used for aspiration.  
  [SP-7 1968]

- **vortex columns**
  Use vortices

- **vortex disturbances**
  Use vortices

- **vortex flow**
  Use vortices

- **vortex traps**
  Use trapped vortices

- **vortex tubes**
  Use vortices

- **vortices**
  In fluids, circulations drawing their energy from flows of much larger scale and brought about by pressure irregularities. Used for eddies, rotational flow, vortex columns, vortex disturbances, vortex flow, and vortex tubes.  
  [SP-7 1968]
W

• water
  Dihydrogen oxide (molecular formula H2O). The word is used ambiguously to refer to the chemical compound in general and to its liquid phase; when the former is meant, the term water substance is often used.  

  wattmeters
  Instruments for measuring the magnitude of the active power in an electric circuit. They are provided with a scale usually graduated in either watts, kilowatts, or megawatts. If the scale is graduated in kilowatts or megawatts, the instruments are usually designated as kilowattmeters or megawattmeters.  

• wave radiation
  Use electromagnetic radiation  

• weather fronts
  Use fronts (meteorology)  

• weathering
  The process of disintegration and decomposition as a consequence of exposure to the atmosphere, to chemical action, and to the action of frost water and heat.  

  whip antennas
  Thin flexible monopole antennas.  

  whispering gallery modes
  Electromagnetic (or elastic) waves that differ in frequency by more than an order of magnitude.
ACCESS CONTROL
Definition replaced by IEEE definition

CHAOS
Scope note deleted

COMMUTER AIRCRAFT
USE GENERAL AVIATION AIRCRAFT
Deleted, term made postable

COMMUTER AIRCRAFT
USE PASSENGER AIRCRAFT
Deleted, term made postable

DOPPLER RADAR
Definition replaced by IEEE definition

LEARNING MACHINES
Transferred to MACHINE LEARNING

MAGNETOHYDRODYNAMIC WAVES
Definition replaced by IEEE definition

MASS DRIVERS (PAYLOAD DELIVERY)
Transferred to MASS DRIVERS

SATELLITE POWER TRANSMISSION (TO EARTH)
Transferred to SATELLITE POWER TRANSMISSION

TOLMEIN-SCHLICHTING WAVES
Transferred to TOLLMIEN-SCHLICHTING WAVES

TRAPPED VORTEXES
Transferred to TRAPPED VORTICES