NASA THESAURUS SUPPLEMENT

A three-part cumulative update of the 1998 edition of the *NASA Thesaurus*

January 2001
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NASA THESAURUS SUPPLEMENT

A three-part cumulative update of the 1998 edition of the NASA Thesaurus

National Aeronautics and Space Administration

January 2001
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Introduction


Part 1 (Hierarchical Listing) contains the full hierarchical structure for each new term along with all new cross references and term definitions.

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For a fuller explanation, see the Introduction (pages viii–xi) in the printed version of the 1998 NASA Thesaurus, Volume 1.

Part 2 (Rotated Term Display) is a ready reference tool which provides additional ‘access points’ to the thesaurus terminology. It contains the postable terms and nonpostable cross references found in the Hierarchical Listing (Part 1) arranged in a KWIC (key-word-in-context) index.

Part 3 (Changes) is a listing of deletions or changes to postable terms or USE references made since the 1998 edition of the NASA Thesaurus. To control the size of the Supplement, only significant changes in term hierarchies and related term lists are presented.

NOTE: Other resources and products related to the NASA Thesaurus can be found at the following URL: http://www.sti.nasa.gov/thesfrml.htm.

In addition to the above mentioned resources, a thesaurus listserv has been set up for submitting candidate terms and discussion of related lexicographical issues. A listing of candidate and accepted new terms is posted monthly. To subscribe to this listserv, send an e-mail message to listserv@sti.nasa.gov. Leave the subject line blank and in the message section, type SUBSCRIBE THESAURUS-L <Your name>. (Should you wish to cancel your subscription, send a message to the same address with UNSUBSCRIBE in the message section.)

Comments and suggestions regarding the NASA Thesaurus should be directed to:

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E-mail: help@sti.nasa.gov
Fax: (301) 621–0134
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NASA THESAURUS SUPPLEMENT

PART 1
HIERARCHICAL LISTING

A

ACE satellite
USE Advanced Composition Explorer

Advanced Composition Explorer
(added December 1998)
DEF Explorer spacecraft (launched August 25, 1997) carrying six high-resolution sensors and three monitoring instruments for sampling low-energy particles of solar origin and high-energy galactic particles. From a vantage point approximately 1/100 of the distance from the Earth to the Sun, the Advanced Composition Explorer (ACE) can perform measurements over a wide range of energy and nuclear mass, under all solar wind flow conditions and during both large and small particle events including solar flares. When reporting space weather ACE can provide an advance warning of geomagnetic storms.

Use ACE satellite
Explorer 71 satellite

GS artificial satellites
. scientific satellites
. Explorer satellites
. . Advanced Composition Explorer

RT energetic particles
galactic cosmic rays
interplanetary medium
solar corpuscular radiation
solar cosmic rays
solar wind
space weather

aeroshells
(added May 1999)
DEF Aerodynamic structural shells that attach to, or comprise a portion of, the exterior of an aerospace vehicle or space probe; especially such structures that support atmospheric entry, aerobraking, aeroassist, or hypersonic flight.

GS aerodynamic configurations
. aeroshells
RT aeromaneuvering
nose cones
reentry vehicles
spacecraft design
spacecraft shielding
spacecraft structures

Alpha Magnetic Spectrometer
(added June 1998)
UF AMS (spectrometer)
GS measuring instruments
. spectrometers
. . Alpha Magnetic Spectrometer
RT antimatter
Cosmic ray counters
cosmic rays
dark matter
International Space Station
interstellar matter
magnetic spectroscopy
space station payloads
spacelborne astronomy

AM–1 (EOS) spacecraft
USE Terra spacecraft

AMS (spectrometer)
USE Alpha Magnetic Spectrometer

anisoplanatism
(added May 1999)
DEF In adaptive optics (AO) systems, a performance-degrading effect that arises whenever light from the wave-front sensor beacon and light from the target object sample different volumes of optical turbulence. This effect results in an increased value of the aperture-averaged residual phase variance after AO compensation, which causes an exponential decrease in system performance.

RT aberration
adaptive optics
atmospheric correction
atmospheric optics
image resolution
optical correction procedure
phase error
telescopes

antenna gain
(added June 1998)
GS amplification
. antenna gain
RT antennas
automatic gain control
directional antennas
effectiveness
high gain
signal reception

anticoincidence detectors
(added August 2000)
DEF Detectors and related systems that differentiate ambient background noise from signals of interest by identifying unwanted input signals that co-occur in time with other signals. Often used with gamma-ray detection systems.

UF anticoincidence shields
RT background radiation
coincidence circuits
comparators
counting circuits
detectors
. discriminators
. gamma ray spectrometers
. hodoscopes
. particle telescopes
. proportional counters
. radiation counters
. scintillation counters
. signal detectors
. trigger circuits

anticoincidence shields
USE anticoincidence detectors

antiphase boundaries
(added March 1998)
DEF A method or device for data storage in which data is identified by a par_ or properties of its content, rather than by an address or relative position.

UF associative storage
content-addressable memory
GS memory (computers)
RT associative memory

USE associative memory

archaeomagnetism
USE paleomagnetism

associative memory
(added December 1998)
DEF A method or device for data storage in which data is identified by a par_ or properties of its content, rather than by an address or relative position.

UF associative storage
content-addressable memory
GS memory (computers)
RT associative memory

USE associative memory

automatic indexing
USE indexing (information science)
bevel gears

(added May 1998)

GS bevel gears
- spiral bevel gears
RT gear teeth

biomass burning
(added December 1999)

DEF Burning of vegetation in forests, grasslands, and agricultural lands usually carried out to clear the land and change its use, a significant contributor to the global budgets of many radiatively and chemically active gases and particulates in the atmosphere.

GS combustion
- biomass burning
RT air pollution
- climate change
- combustion products
- contaminants
deforestation
- environment pollution
- forest fires
- man environment interactions
- smoke

biomimetics
(added October 2000)

DEF The study of biological systems as models for the development of synthetic materials, devices, sensors, and processes.

RT biochemistry
- biomimetic devices
- bioengineering
- biological models (mathematics)
∞ biology
- bionics
cybernetics
- smart materials
- smart structures

Biot–Savart law
(added August 1998)

DEF Law describing the intensity of a magnetic field produced by a current carrying wire. Also applied in fluid dynamics to describe the flow-velocity field induced by a vortex.

GS laws
- Biot–Savart law
RT electromagnetism
- flow velocity
- magnetic fields
- Maxwell equation
- vortices

Boeing 717 aircraft
(added October 1998)

GS Boeing aircraft
- Boeing 717 aircraft
- commercial aircraft
- Boeing 717 aircraft
- jet aircraft
- turbofan aircraft
- Boeing 717 aircraft
- monoplanes
- Boeing 717 aircraft
- passenger aircraft
- Boeing 717 aircraft
- transport aircraft
- Boeing 717 aircraft
RT oo aircraft

bohrium
(added May 1998)

GS chemical elements
- bohrium
RT hassium
- seaborgium

Bond number
(added December 1999)

DEF Dimensionless number representing the ratio between gravitational force and the surface tension of a bubble, drop, or meniscus.

GS dimensionless numbers
Bond number
RT drops (liquids)
- gravitational effects
- interfacial tension
- menisci

carrier sense multiple access
(added April 2000)

DEF A data transmission protocol for multi-access networks where each node in the network senses traffic and waits for it to clear before transmitting; if two or more nodes transmit simultaneously, they wait a random interval before attempting to re-transmit.

GS protocol (computers)
- carrier sense multiple access
- telecommunication
- multiple accesses
- carrier sense multiple access
- transmission
- signal transmission
- data transmission
- multiple accesses
- ... carrier sense multiple access
RT communication networks
- computer networks
- Ethernet
- local area networks
- packet transmission

cascase devices
(added August 1998)

DEF Amplifier devices consisting of a common grounded-emitter (cathode) or source stage that drives a grounded-base output stage, resulting in high-impedance, high-gain, and low-noise.

GS amplifiers
- cascade devices
- electronic equipment
- solid state devices
- semiconductor devices
- ... cascade devices
RT CMOS
- field effect transistors
- high electron mobility transistors
- switching circuits
- transistor amplifiers
- transistor circuits
- transistors

cellular manufacturing
USE group technology (manufacturing)

chain reactions (chemistry)
(added May 1999)

GS chemical reactions
- chain reactions (chemistry)

chain reactions (nuclear physics)
(added May 1999)

GS nuclear reactions
- chain reactions (nuclear physics)
RT fission products
- neutrons

Chandra X Ray Astrophysics Facility
USE X Ray Astrophysics Facility

clampered structures
(added February 1998)

RT beams (supports)
- clamps
composite structures
- joints (junctions)
laminates
- plates (structural members)
- shells (structural forms)
structural members
- structural vibration
∞ structures

clinorotation
(added July 2000)

DEF Rotational motion of a test subject about one or more axes that are inclined with respect to the gravitational vector, often applied to simulate a microgravity environment.

UF clinostat rotation
clinostating
GS gyration
- rotation
- ... clinorotation
RT centrifuging
- clinostats
- gravitational effects
- gravitational physiology
- microgravity
- rotating environments
- space environment simulation
- weightlessness
- weightlessness simulation
clinostat rotation
USE clinorotation

clinostating
USE clinorotation

clinostats
(added July 2000)

DEF Devices for producing vector-averaged gravitational environments which mimic microgravity.

UF random positioning machines
GS simulators
- environment simulators
- ... space simulators
- clinostats
RT bioreactors
- centrifuges
clinorotation
- gravitational effects
- gravitational physiology
- microgravity
- rotating environments
- space environment simulation
tissue engineering
- weightlessness simulation
cloud-to-cloud discharges
(added August 1999)

GS electric current
. electric discharges
. lightning
. cloud-to-cloud discharges

cloud-to-ground discharges
(added August 1999)

GS electric current
. electric discharges
. lightning
. cloud-to-ground discharges
RT elves
spires (atmospheric physics)

CMBR (astronomy)
USE cosmic microwave background radiation
cochastic interference
(added April 2000)
DEF Interference caused by multiple, simultaneous transmissions occurring in the same communication channel.
GS electromagnetic interference
. radio frequency interference
. cochannel interference
RT channel capacity
. channel noise
. intersymbolic interference
. phase shift keying

Comet Nucleus Tour
(added February 1999)
DEF A NASA Discovery-class mission to acquire imagery and comparative spectral maps of comet nuclei and analyze comet dust flows. The mission spacecraft will fly to within 100 kilometers of at least three near-Earth comets including Comet Encke, Comet Schwassmann–Wachmann, and Comet d’Arrest.

UF CONTOUR (mission)
GS space missions
. flyby missions
. . Comet Nucleus Tour
RT comet nuclei
. Encke comet
. Schwassmann–Wachmann comet
. swingby technique

content–addressable memory
USE associative memory
CONTOUR (mission)
USE Comet Nucleus Tour

Cooper–Harper ratings
(added August 1999)

GS flight characteristics
. pilot ratings
. Cooper–Harper ratings
ratings
. . pilot ratings
. Cooper–Harper ratings
RT aircraft performance
helicopter performance
corrugated waveguides
(added February 1998)

GS waveguides
. corrugated waveguides
RT gratings (spectra)
optical waveguides
waveguide antennas

cosmic microwave background radiation
(added July 2000)
USE CMBR (astronomy)
GS electromagnetic radiation
. radio waves
. extraterrestrial radio waves
. cosmic microwave background radiation
. short wave radiation
. microwaves
. cosmic microwave background radiation
. extraterrestrial radiation
. extraterrestrial radio waves
. cosmic microwave background radiation
RT cosmology
radio astronomy
relativistic radio
Sunyaev–Zeldovich effect
cosmions
USE weakly interacting massive particles
cost benefit analysis
USE cost analysis
cost effectiveness
critical current
(added December 1999)
DEF A current value in a superconductive material, at a particular constant temperature and in the absence of a magnetic field, below which the material is superconducting and above which the material behaves normally.
GS electric current
. critical current
RT critical temperature
current density
superconductivity
superconductors (materials)
cuprates
(added April 1999)
GS copper compounds
cuprates
RT BSCCO superconductors
copper oxides
YBCO superconductors
cycloadDITION
(added June 1999)
DEF Pericyclic chemical reaction in which unsaturated molecules combine to form a cyclic compound under the influence of heat or light.
GS chemical reactions
cycloadDITION
. Diels–Alder reactions
RT cyclic compounds
photochemical reactions
polymerization
synthesis (chemistry)
dendrimers
(added October 2000)
DEF A class of polymeric macromolecules characterized by a regular highly-branched molecular architecture resembling a spherical starburst and a synthesis process that permits nearly complete control over critical molecular design parameters, such as size, shape, surface/interior chemistry, flexibility, and topology.
Because of these characteristics, dendrimers are seen as important elements in the manufacture of nanoscale materials and devices.

UF dendritic polymers
hyperbranched polymers
GS molecules
. macromolecules
dendrimers
RT conducting polymers
dendritic crystals
nanostructure (characteristics)
deflectable mirrors
(added May 1998)
GS mirrors
deflectable mirrors
RT adaptive optics
light modulation
phase modulation
segmented mirrors
Delta 3 launch vehicle
(added October 1998)
GS launch vehicles
. Delta launch vehicle
. . Delta 3 launch vehicle

Delta 4 launch vehicle
(added October 1998)
GS launch vehicles
. Delta launch vehicle
. . Delta 4 launch vehicle
darkstar unmanned aerial vehicle
USE piloted aircraft
reconnaissance aircraft
data mining
(added April 2000)
DEF The extraction of patterns from large data sets in order to discover previously unknown and potentially useful information.

UF knowledge discovery
knowledge extraction
GS data processing
data mining
information analysis
data mining
RT cluster analysis
data retrieval
machine learning
trend analysis
Deep Space 1 Mission
(added October 1998)
DEF First of several technology demonstration missions supporting the NASA New Millennium Program. Advanced technologies include an ion propulsion system, solar concentrator arrays, autonomous navigation and control systems, an integrated camera and imaging spectrometer, and several telecommunications and microelectronics devices. The mission plan includes a flyby of Asteroid 1992 KD.

UF DESt (space mission)
GS space missions
Deep Space 1 Mission
RT asteroid missions
autonomous navigation
flyby missions
interplanetary spacecraft
ion propulsion
NASA space programs
solar electric propulsion
dendritic crystals
nanostructure (characteristics)
dielectric loss

organometallic polymers
- polymers
- synthetic metals

dendritic polymers

USE dendrimers
dielectric loss

(added April 2000)
DEF The electric energy that is converted into heat in a dielectric material subjected to a changing electric field.
GS electrical properties
- dielectric properties
- dielectric loss
- dielectric loss
RT dielectrics
- energy dissipation
- permittivity
dielectric waveguides

(added February 1998)
GS waveguides
- dielectric waveguides
RT dielectric
- microwave transmission
- optical waveguides
- waveguide antennas
- waveguide filters
differential games

(added October 1998)
GS games
- differential games
RT minimax technique
- optimal control
- pursuit–evasion games
- stochastic processes
- zero sum games
digital cameras

(added July 1998)
GS optical equipment
- digital cameras
- photographic equipment
- cameras
- digital cameras
RT CCD cameras
- digital systems
- digital techniques
- photogrammetry
- television cameras
- video equipment
document indexing

USE indexing (information science)
DS1 (space mission)

USE Deep Space 1 Mission
dubnium

(added May 1998)
GS chemical elements
- dubnium
RT rutherfordium
- seaborgium
- E

EAM (physical chemistry)

USE embedded atom method
electroactive polymers

(added June 2000)
UF EAP (polymers)
RT actuators
- conducting polymers
- electromechanical devices
- electroreological fluids
- electrostriction
- microelectromechanical systems
- polymers
- robot arms
electrochemical synthesis

(added January 2000)
DEF A chemical synthesis reaction that is induced by an electric current.
UF electrochemistry
- electrochemical synthesis
RT electrochemistry
- electrosynthesis
- electrolysis
- polymerization
electronic commerce

(added April 2000)
DEF The buying and selling of goods and services via the Internet or other computer communications network.
UF e-commerce
GS commerce
- electronic commerce
RT computer information security
- electronic mail
- Internet resources
World Wide Web
electrochemical synthesis

(added April 1999)
SN (THE TERM 'ATOMIC STRUCTURE' WAS USED FOR THIS CONCEPT PRIOR TO MAY 1999)
RT atomic structure
- band structure of solids
- electron energy
- electron orbitals
- electron states
- energy bands
- energy gaps (solid state)
- energy levels
- Fermi liquids
electrolysis

USE electrochemical synthesis
electrosynthesis

USE electrochemical synthesis
elves

(added January 2000)
DEF Transient air glow events observed near 90 km, nearly simultaneously with a strong cloud–to-ground lightning stroke. They often precede sprites, which may occur at lower altitudes a few milliseconds later. It is believed that elves are the result of wave heating by very low frequency (VLF) radio pulses emitted by the lightning discharge current.
GS atmospheric radiation
- sky radiation
- elves
- electromagnetic radiation
- light (visible radiation)
- sky radiation
- elves
- atmospheric electricity
- atmospheric ionization
- cloud–to-ground discharges
- lightning
- sprites (atmospheric physics)
- thunderstorms
e-mail

USE electronic mail
embedded atom method

(added February 1998)
DEF A semiempirical calculation method developed by Daw and Baskes for determining the energetics of atoms in a bulk environment. The original form of the method was based on density functional theory and was intended primarily for tight–packed transition metals. More recent modifications have extended the applicability of the method to a large number of elements in the periodic table.
UF EAM (physical chemistry)
MEAM (physical chemistry)
modified embedded atom method
RT alloys
- crystal defects
- grain boundaries
- interatomic forces
- metals
- methodology
- molecular dynamics
- potential energy
enantiomeric compounds

USE enantiomers
enantiomers

(added August 1998)
DEF Isomeric pairs whose crystalline forms or molecular structures are non-superimposable mirror images.
UF enantiomeric compounds
enantiomorphs
GS isomers
enantiomers
RT chirality
- crystal structure
- isomorphism
- molecular structure
- stereochemistry
- symmetry
enantiomorphs
USE enantiomers
environmental cleanup

(added February 1999)
GS cleaning
RT environmental cleanup
- decontamination
- environment management
- environment protection
- hazardous wastes
- oil pollution
- oil slicks
- pollution control
- reclamation
- soil pollution
- waste disposal
- water pollution
- water treatment
Envisat-1 satellite
(addded August 2000)
DEF Polar-orbiting Earth observation satellite designed to provide continuous global measurements including high- and medium-resolution radar and optical images from its Advanced Synthetic Aperture Radar (ASAR) and Medium-Resolution Imaging Spectrometer (MERIS). Acquired data will support Earth science research and allow monitoring of environmental and climatic changes.

GS artificial satellites
. ESA satellites
. Envisat-1 satellite
ESA spacecraft
. ESA satellites
. Envisat-1 satellite

RT ERS-2 (esa satellite) imaging spectrometers remote sensing satellite observation satellite-based radar synthetic aperture radar

EOS AM-1 spacecraft
USE Terra spacecraft

Ethernet
(addded January 2000)

DEF Computer network protocol originally developed in the 1970s for local area network technology; uses carrier sense multiple access with collision detection (CSMA/CD), coaxial cable, and broadcast transmission.

GS protocol (computers)
. Ethernet

RT carrier sense multiple access computer networks local area networks

Euler-Bernoulli beam theory
USE Euler-Bernoulli beams

Euler-Bernoulli beams
(addded April 1998)

USE Euler-Bernoulli beam theory

GS structural members
. beams (supports)
. . Euler-Bernoulli beams

RT axial strain
bending bending vibration dynamic structural analysis elastic properties mathematical models partial differential equations structural analysis Timoshenko beams

evanescence waves
(addded March 1998)

GS surface waves evanescent waves acoustic impedance evanescent fiber optics internal waves plane waves propagation modes reflected waves wave propagation

∞ waves

exergy
USE exergy

(exenergy
(addded December 2000)

DEF The maximum amount of external-energy that could be drawn from a system or form of energy in relation to a certain reference environment. Exergy is not considered to be a form of energy but a designation of the quality of energy.

UF exergic energy

RT ∞ energy

energy budgets energy conservation energy conversion efficiency energy dissipation entropy power efficiency thermodynamic efficiency thermodynamic properties thermodynamics waste energy utilization

Explorer 71 satellite
USE Advanced Composition Explorer

Explorer 73 satellite
USE Transition Region and Coronal Explorer

Explorer 74 satellite
USE Submillimeter Wave Astronomy Satellite

Explorer 77 satellite
USE Far UV Spectroscopic Explorer

Explorer 78 satellite
USE IMAGE satellite

field programmable gate arrays
(addded April 2000)

GS circuits
. . field-programmable gate arrays
. integrated circuits
. field-programmable gate arrays programmable logic devices
. field-programmable gate arrays

finite difference time domain method
(addded April 1999)

UF FDTD (mathematics)

GS analysis (mathematics)
. . numerical analysis
. . approximation
. . finite difference theory
. . finite difference time domain method
. . time domain analysis
. . finite difference time domain method

RT computational electromagnetics electromagnetic scattering

flow noise
(addded March 2000)

DEF Noise produced by the flow of fluids around or through a body; the pressure variations associated with a turbulent flow field.

GS elastic waves
. sound waves
. noise (sound)
. flow noise
. . aeroacoustic noise
. . . blade slap noise
. . . propeller noise
. . . sreech tones

RT aeroacoustics
ducted flow
nozzle flow
pipe flow
underwater acoustics

free-space optical communication
(addded June 1998)

GS telecommunication
. . optical communication
. . free-space optical communication

RT high power lasers
laser beams
satellite communication
space communication
free-space optical interconnects

free-space optical interconnects
(added June 1998)
UF FSOI (integrated optics)
GS optical interconnects
RT integrated optics
frequency domain analysis
(added April 1999)
GS frequency domain analysis
RT control systems design
games
(added October 1998)
GS games
RT control theory
Genesis mission
(added February 1999)
DEF A space mission to collect solar wind samples from a halo orbit about the sun–Earth L1 point for two years, returning those samples to Earth in 2003 for analysis and examination. Analysis of the samples collected by the mission will contribute to an understanding of the origins of the solar system.
GS space missions
RT solar system evolution
solar wind
glucocorticoids
(added December 1999)
DEF Adrenocortical steroid hormones that are involved in the metabolism of fats, proteins, and carbohydrates, and have anti-inflammatory properties.
GS organic compounds
RT adrenal gland
glucocorticoids
secretions
endocrine secretions
hormones
corticosteroids
adrenal gland
atrophy

Godunov method
(added February 1998)
DEF Non-oscillatory finite-volume scheme that incorporates the exact or approximate solution to the Riemann initial-value problem, or a generalization of it.
GS analysis (mathematics)
RT advection
atmospheric flows
Godunov method
procedures
finite volume method
Godunov method
approximation
Cauchy problem
Cauchy–Riemann equations
computational fluid dynamics
Euler equations of motion
finite differences theory
shock wave interaction
supersonic flow

GOES 10
(added March 2000)
GS artificial satellites
RT graph theory
heuristic methods
optimization

Greedy algorithms
(added March 2000)
DEF Any algorithm characterized by a procedure that selects the most extreme element from a set to satisfy a given goal. A recursive procedure for constructing a set of objects from the smallest possible elements.
GS mathematical logic
RT game theory
heuristic methods
optimization

Group technology (manufacturing)
(added April 2000)
DEF A manufacturing methodology where production processes are organized into groups or cells based on similarities in the manufacturing requirements of product parts or production equipment capabilities.
GS manufacturing
RT group technology (manufacturing)

H

H-2 control
(added February 1998)
GS automatic control
RT control systems design
optimization
suboptimal control

Hale–Bopp comet
(added July 1999)
GS celestial bodies
RT Hale–Bopp comet

Hall resistance
(added July 2000)
DEF For a current-carrying conductor within a magnetic field, the ratio of the transverse voltage
induced by the Hall effect, to the conductor current.

**GS**
- electrical properties
- electrical impedance
- Hall resistance
- Hall accelerators
- Hall engines
- Hall thrusters
- Hall effect

**RT**
- electric propulsion
- ion engines
- plasma engines
- spacecraft propulsion

**halon**
- (added January 2000)
  - A bromofluorocarbon compound that was widely used as an agent for fire suppression and explosion protection. After being recognized as an ozone-depleting substance, the U.S. production and import of halons was banned in 1994.

**GS**
- carbon compounds
- halocarbons
- halogen compounds
- bromine compounds
- halon
- hexachlorofluorocarbons
- RT
- fire extinguishers
- flame retardants
- fluorocarbons

**hardware-in-the-loop simulation**
- (added February 1999)
- UF
- hardware-in-the-loop tests
- GS
- simulation
- RT
- computerized simulation
- control simulation
- performance tests
- systems simulation

**hardware-in-the-loop tests**
- USE
- hardware-in-the-loop simulation

**hasium**
- (added May 1998)
- GS
- chemical elements
- hasium
- RT
- bohrium
- meitnerium

**head up tilt**
- (added March 1998)
- DEF
- Body posture while lying on a tilt table with the head higher than the rest of the body.

**UF**
- HUT (physiology)
- GS
- posture

**RT**
- aerospace medicine
- bed rest
- biorobotics
- cardiovascular system
- gravitational physiology
- head down tilt
- hemodynamic responses
- lower body negative pressure
- orthostatic tolerance
- physiological responses
- supine position
- weightlessness simulation

**heavy fermion superconductors**
- (added April 1999)
- GS
- conductors
- superconductors (materials)
- heavy fermion superconductors
  - intermetallics
  - heavy fermion systems
  - heavy fermion superconductors

**heavy fermion systems**
- (added April 1999)
- GS
- intermetallics
- heavy fermion systems
- heavy fermion superconductors
- RT
- fermions
- superconductors (materials)

**heavy metals**
- (added July 1999)
- DEF
- Metals or alloys having a high specific gravity, usually ones with a density greater than 5 grams per cubic centimeter.

**hindcasting**
- (added July 1999)
- DEF
- The process of reconstructing the time and space evolution of an atmospheric or oceanic phenomenon that has occurred in the past, through an analysis of historical data, a mathematical–model simulation of the processes involved, or a combination of data analysis and modeling.

**IMAGE satellite**
- (added November 2000)
- DEF
- A medium class Explorer (MIDEX) mission to study the global response of the Earth’s magnetosphere to changes in the solar wind. IMAGE (Imager for Magnetopause–to–Aurora Global Exploration) will use neutral atom, ultraviolet, and radio imaging techniques to: (a) identify the dominant mechanisms for injecting plasma into the magnetosphere on substorm and magnetic storm time scales, (b) determine the directly driven response of the magnetosphere to solar wind changes, and (c) discover how and where magnetospheric plasmas are energized, transported, and subsequently lost during substorms and magnetic storms.

**hydrophobicity**
- (added June 2000)
- DEF
- The degree to which a substance is insoluble in water, or resists wetting or hydration.

**hypothesized particles**
- (added November 1998)
- GS
- particles
  - elementary particles
  - hypothetical particles
  - quarks
  - tachyons
  - weakly interacting massive particles

**hypothesized planets**
- (added June 1998)
- UF
- Phaethon (hypothesized planet)
- planet X
- transplutonic planets
- GS
- celestial bodies
- planets
- hypothetical planets
- RT
- comets
- extrasolar planets
- planetary orbits

**hypothesis**
- USE
- dendrimers
- hyperbranched polymers

**hygroscopicity**
- USE
- hygral properties
- moisture resistance

**hydrargyrum**
- USE
- heavy metals

**hydrargyrous**
- USE
- heavy metals

**hydrargyrous**
- USE
- heavy metals

**hyperbranched polymers**
- USE
- dendrimers

**hyperbranched polymers**
- USE
- dendrimers

**imagery**
- USE
- Earth observation

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- Earth observation
In vitro methods and tests

**IMAGE satellite**

RT auroral zones  
Earth magnetosphere  
magnetic storms  
magnetopauses  
plasmasphere  
space plasmas

Imager for Magnetopause-to–Aurora Global Explorer  
USE IMAGE satellite

**in vitro methods and tests**  
(added May 1999)  
DEF Tests of, or methods related to, biological or biochemical processes occurring in an artificial environment or outside of a living cell or organism.

RT bioassay  
biochemistry  
culture techniques  
cytology  
fertilization  
histology  
in vivo methods and tests  
intravenous procedures  
methodology  
tests

**in vivo methods and tests**  
(added May 1999)  
DEF Tests of, or methods related to, biological or biochemical processes occurring within a living cell or organism.

RT bioassay  
biochemistry  
culture techniques  
cytology  
fertilization  
histology  
in vitro methods and tests  
intravenous procedures  
methodology  
tests

**indexing (information science)**  
(added April 2000)  
DEF The representation of document content in a systematic, organized form to support information location, retrieval, or analysis.

UF automatic indexing  
document indexing  
machine aided indexing

GS information analysis  
Indexing (information science)

RT indexes (documentation)  
information management  
information retrieval  
terminology  
terms  
thesauri

**in flight simulation**  
USE in-flight simulation

**in-flight simulation**  
(added October 1998)  
DEF The use of a specialized test aircraft to simulate the flight characteristics of another vehicle. The test aircraft is typically capable of duplicating the computed responses of the simulated vehicle through special aerodynamic and control system features.

UF in-flight simulation  
GS simulation  
flight simulation

**Information analysis**  
(added April 2000)  
DEF The representation of document content in a systematic, organized form to support information location, retrieval, or analysis.

GS information analysis  
. data mining  
. indexing (information science)  
. scientific visualization  
. numerical flow visualization  
. trend analysis

RT information resources management  
information retrieval  
natural language processing

**Integrated Truss Structure Z1**  
(added June 2000)  
DEF An early exterior framework for the International Space Station to allow the first U.S. solar arrays to be temporarily installed on the Unity module for early power.

UF Z1 truss structure  
space station structures  
Integrated Truss Structure Z1  
International Space Station  
structures  
Unity connecting module

**Intelligent materials**

USE smart materials

**Interruption variations**

USE annual variations

**Intercalibration**  
(added January 1999)  
DEF Calibration between two or more data sources, including (1) the comparison of data sets acquired by different types of measurement systems for the purpose of deducing the calibration values for one of the measurement systems; (2) the mutual calibration of data from different measurement systems through the comparison of the data with model calculations; and (3) the calibration of multiple detectors on a single instrument through the comparison of data from each detector.

GS calibrating  
. intercalibration  
RT comparison  
correction  
multisensor applications  
standardization

**Intracloud discharges**  
(added August 1999)  
DEF Lightning discharges occurring within a cloud.

GS electric current  
electric discharges  
lightning  
. . . intracloud discharges

**Intrasessional oscillations**

USE intrasessional variations

**Intrasessional variations**  
(added September 2000)  
DEF Variations in atmospheric circulation resulting from changes in the sun-earth position on an annual cycle.

GS variations  
. periodic variations  
. . . intrasessional variations  
. . . Madden–Julian Oscillation

RT annual variations  
atmospheric circulation

**Iodine optics**  
(added June 1998)  
RT beam waveguides  
beamforming  
electron optics  
ion beams  
ion engines  
ion propulsion  
mass spectrometers  
. . . optics

**Iridium network**  
(added December 1998)  
DEF A 66-satellite wireless personal telecommunications network designed to provide worldwide telephone, paging, facsimile and data services to handheld or mobile equipment.

UF Iridium satellites  
GS networks  
. . . satellite networks

RT communication satellites  
satellite communication systems  
telephony  
wireless communication

**Iridium satellites**

USE communication satellites  
Iridium network

**Iron aluminides**  
(added December 2000)  
DEF Iron containing aluminum intermetallics.

GS iron compounds  
. . . iron aluminides  
iron compounds  
iron aluminides

RT aluminum alloys  
intermetallics  
iron alloys

**ISS (space station)**

USE International Space Station

**Java (programming language)**  
(added December 1998)  
DEF A high-level general-purpose, class-based, object-oriented programming language.

GS languages  
. . . high level languages

RT C++ (programming language)  
client server systems  
internets  
object-oriented programming  
World Wide Web

**Josephson effect**  
(added April 1999)  
DEF A quantum phenomenon whereby superconducting devices jump to a higher energy level when a magnetic field is applied.

UF Josephson tunneling

RT electron tunneling  
Josephson junctions  
SIS (superconductors)  
superconducting devices  
superconductors (materials)
magnetorheological fluids

DEF Fluids comprised of magnetically soft particles dispersed in liquids and possessing rheological properties that can be rapidly and reversibly altered by the application of a magnetic field.

RT electrorheological fluids
ferrofluids
ferromagnetic materials


classic reference sources.

magnetorheological fluids

DEF Fluids comprised of magnetically soft particles dispersed in liquids and possessing rheological properties that can be rapidly and reversibly altered by the application of a magnetic field.

RT electrorheological fluids
ferrofluids
ferromagnetic materials


kinking
(added April 1998)
RT bending
buckling
compression loads
cracking (fracturing)
deflection
failure modes
fiber composites
folding
heaving
twisting
wrinkling

knowledge discovery
USE data mining

knowledge extraction
USE data mining

L

Laser Interferometer Gravitational–Wave Observatory
USE LIGO (observatory)

Laser Interferometer Space Antenna
USE LISA (observatory)

Laves phases
(added August 1998)
GS solid phases
Laves phases
RT alloys
crystal lattices
crystal structure
cubic lattices
interstititals
microstructure
phase transformations

leaders (meteorology)
(added August 1999)
GS electric current
electric discharges
lightning
leaders (meteorology)
stepped leaders

LIGO (observatory)
(added December 2000)
UF Laser Interferometer Gravitational–Wave Observatory
GS antennas

. gravitational wave antennas
. LIGO (observatory)

observatories
astronomical observatories
LIGO (observatory)

RT astronomical interferometry
gravitational waves
laser interferometry

LISA (observatory)
(added December 2000)
UF Laser Interferometer Space Antenna
GS antennas
. gravitational wave antennas
. LISA (observatory)

artificial satellites
scientific satellites
astronomical satellites
LISA (observatory)

observatories
astronomical observatories
astronomical satellites
LISA (observatory)

RT astronomical interferometry
gravitational waves
laser interferometry
spaceborne astronomy

Lithium batteries
(added December 1999)
GS electrochemical cells
electric batteries
. lithium batteries
lithium sulfur batteries

RT storage batteries

Long March launch vehicles
(added January 1999)
GS launch vehicles
. Long March launch vehicles
RT Chinese space program
Chinese spacecraft
heavy lift launch vehicles

Lunar Prospector
(added February 1998)
GS artificial satellites
. lunar satellites
. Lunar Prospector
lunar spacecraft
. lunar satellites
. Lunar Prospector

RT lunar composition
lunar exploration
lunar programs
lunar resources
lunar surface

machine aided indexing
USE indexing (information science)

MACHOs (astronomy)
USE massive compact halo objects

Madden–Julian Oscillation
(added September 2000)
DEF The most dominant and coherent component of the intraseasonal variability in the tropical atmosphere; characterized by a strong eastward propagation of atmospheric features, with a typical period of 30–60 days. The Madden–Julian Oscillation (MJO) may influence the tropical climate and its short-term variability by modulating the timing and strength of El Nino – Southern Oscillation (ENSO) events, contributing to the mean heat budget of the western Pacific, and regulating the annual cycle of the tropical western Pacific, especially the Australian summer monsoon.

UF MJO (meteorology)
GS oscillations
. periodic variations
. intraseasonal variations
. Madden–Julian Oscillation

RT air water interactions
annual variations
atmospheric circulation
atmospheric models
climatology
el Nino
monsoons
Southern Oscillation
tropical meteorology
zonal flow (meteorology)

magnetars
(added January 2000)
DEF Highly magnetized neutron stars believed to emit quasi-steady x-rays along with bursts of soft gamma rays—emissions powered by their magnetic energy. According to the magnetar theory, these stars form in some fraction of all supernovae. When they are young (with ages less than about 10,000 years) magnetars may be observed as soft gamma repeaters (SGRs) or anomalous X-ray pulsars.

GS celestial bodies
. stars
. magnetic stars
. magnetars
. . neutron stars
. . magnetars

RT pulsars
soft gamma repeaters
supernova remnants
x-ray sources

magnetic nozzles
(added September 1999)
DEF Nozzle devices used in some nuclear and plasma propulsion systems that utilize magnetic fields to direct and accelerate plasma flows, thereby providing thrust for propulsion.

RT coaxial plasma accelerators
electric rocket engines
. . nozzles
. . nuclear propulsion
. . nuclear rocket engines
. . plasma acceleration
. . plasma engines
. . plasma propulsion
. . rocket nozzles
. spacecraft propulsion
. VASIMR (propulsion system)

magnetorheological fluids
(added September 2000)
DEF Fluids comprised of magnetically soft particles dispersed in liquids and possessing rheological properties that can be rapidly and reversibly altered by the application of a magnetic field.

RT electrorheological fluids
ferrofluids
ferromagnetic materials
. fluids
magnetostratigraphy
magnetic materials
electrolysis
smart materials
vibration damping

magnetostratigraphy
(added April 1989)
GS stratigraphy
RT geochronology
paleomagnetism

markup languages
USE document markup languages

Mars Climate Orbiter
(added March 1999)
DEF One of two spacecraft comprising the Mars Surveyor 98 program; launched December 1998. After obtaining a polar, nearly circular orbit around Mars, the Orbiter will serve as a radio relay during the Lander surface mission, then begin monitoring the atmosphere, surface, and polar caps for a complete Martian year. The Orbiter carries two science instruments: the Pressure Modulated Infrared Radiometer and the Mars Color Imager.
UF Mars Surveyor 98 Orbiter
GS interplanetary spacecraft
RT Mars atmosphere
USE Mars Climate Orbiter

Mars Global Surveyor
(added March 1999)
DEF Spacecraft and related mission designed to orbit Mars over a two year period and collect data on the surface morphology, topography, composition, gravity, atmospheric dynamics, and magnetic field. Launched November 1996.
UF MGS (spacecraft)
GS interplanetary spacecraft
RT Mars atmosphere
USE Mars Global Surveyor

Mars missions
(added February 1999)
GS space missions
RT Earth–Mars trajectories
USE Mars missions

Mars Polar Lander
(added March 1999)
DEF One of two spacecraft comprising the Mars Surveyor 98 program; launched January 1999. After a soft landing near the Martian south pole, the Lander will search for near-surface ice and possible surface records of cyclic climate change, and characterize physical processes key to the seasonal cycles of water, carbon dioxide and dust on Mars. Prior to landing, the Deep Space 2 microprobes will be released as part of a technology-validation mission related to multiple–lander spacecraft.
UF Mars Surveyor 98 Lander
GS Mars Polar Lander
RT Mars atmosphere
USE Mars Climate Orbiter

Mars Surveyor 98 Program
(added March 1999)
DEF Mars exploration program consisting of two mission spacecraft—the Mars Climate Orbiter and the Mars Polar Lander. Two surface penetrating microprobes (part of the associated Deep Space 2 mission) for detecting water ice are also piggybacking on the Lander.
GS Mars Surveyor 98 Program
RT Mars atmosphere
USE Mars Surveyor 98 Program

Mars Surveyor 2001 Mission
(added July 1999)
GS Mars Surveyor 2001 Mission
RT Mars environment
USE Martian meteorites

MARS meteoroids
DEF Objects, such as brown dwarfs, black holes, and massive planets, hypothesized to account for the dark matter in the halo of the Milky Way. The signature of these objects is the occasional amplification of the light from extragalactic stars by the gravitational lens effect.
UF MACHOs (astronomy)
GS compact halo objects
RT brown dwarf stars

MEAM (physical chemistry)
USE embedded atom method

meltnerium
(added May 1998)
GS chemical elements
UF meltnerium
RT hassium

membership functions
(added December 2000)
DEF Characteristic functions of a fuzzy set, which assign a value indicating the degree of membership for each element in a universal set.
GS membership functions
RT fuzzy sets

MEMS (electromechanical devices)
USE microelectromechanical systems

MGS (spacecraft)
USE Mars Global Surveyor

microelectromechanical systems
(added October 1998)
UF MEMS (electromechanical devices)
GS microelectromechanical systems
RT microelectromechanical systems

microsats
(added October 1998)
DEF Satellites with a total mass between 10 and 100 kg often incorporating miniaturized electronic and mechanical systems.
UF microsats
GS artificial satellites
RT microsats

nanotechnology
USE microsats

massive compact halo objects
(added November 1999)
DEF Objects, such as brown dwarfs, black holes, and massive planets, hypothesized to...
Mindlin plate theory
USE Mindlin plates

Mindlin plates
(added April 1998)
UF Mindlin plate theory
Reissner–Mindlin plates
structural members
plates (structural members)
Mindlin plates
RT dynamic structural analysis
finite element method
free vibration
plate theory
Reissner theory
shear strain
structural analysis
structural vibration
thick plates

mischmetal
(added June 1998)
DEF An alloy consisting of a natural mixture of rare-earth metals, used in electrode materials and hydrogen-storage alloys, as a general alloy addition, and in the production of some aluminum alloys and steels.

GS alloys
rare earth alloys
mischmetal
RT alloying
aluminum alloys
cathodic coatings
cerium
desorption
electrode materials
intermetallics
steels

MJO (meteorology)
USE Madden–Julian Oscillation
modified embedded atom method
USE embedded atom method
mutagenesis
(added June 2000)
DEF Induction or development of a genetic mutation via a natural environmental mutagen or through the methods of genetic engineering.

RT deoxynucleic acid
gene expression
genes
mutagens
mutations
radiation effects

nacelle wing configurations
USE wing nacelle configurations

nanocomposites
(added December 2000)
GS composite materials
nanocomposites
RT aluminum oxides
ceramic matrix composites
grain size
nanocrystals
nanostructure (characteristics)
particulate reinforced composites
polymer matrix composites
silicon carbides
silicon nitrides

nanosatellites
(added October 1998)
DEF Satellites with a total mass smaller than 10 kg incorporating miniaturized electronic and mechanical systems.

UF nanosats
GS artificial satellites
nanosatellites
RT microelectromechanical systems
microminiaturization
microminiaturized electronic devices
nanostructures
nanotechnology
nanosatellite operations
nanosatellite experiments
nanosatellite small
nano satellites
nanosatellite

nanotechnology
(added June 2000)
DEF The creation of functional materials, devices, and systems through control of matter on the nanometer-length scale; exploitation of novel phenomena and properties at the nanometer scale.

GS technologies
nanotechnology
RT microelectromechanical systems
microminiaturization
microminiaturized electronic devices
nanostructures (characteristics)
nanostructures (devices)
nanotubes
quantum dots
quantum electronics
quantum wires
self assembly

nanotubes
(added June 2000)
DEF Nanostructures having a closed, tubular morphology that can be single-walled or multi-walled. The structures are believed to be defect free, leading to high strength despite their low density; and can be either electrically conductive or semiconductive, depending on their helicity.

UF nanotubes
GS microstructure
nanostructure (characteristics)
nanotubes
RT fullerenes
graphite
nanostructures (devices)
nanotechnology
∞ tubes

nanotubes
USE nanotubes

necrosis
(added October 2000)
DEF One of the two mechanisms by which cell death occurs (the other being the physiological process of apoptosis). A pathological process caused by the progressive degenerative action of enzymes that is generally associated with severe cellular trauma. It is characterized by mitochondrial swelling, nuclear fociulation, uncontrolled cell lysis, and ultimately cell death. In general, cell or tissue death caused by disease or injury.

UF pathology
nanostructure
pathological cell death
pathological effects
necrosis
RT apoptosis
cells (biology)

cytopathology
degenres
hypoxia
injuries
myocardial infarction
pathology
tissues (biology)

Next Generation Space Telescope project
(added December 1999)
DEF Project in the NASA Origins program with the goal of developing a spaceborne observatory to succeed the Hubble Space Telescope after 2005. The telescope is foresen to have an aperture of 8 meters and be optimized for near infrared wavelengths (0.5–10+ microns) in order to enable the exploration of the most remote high-redshift universe.

UF NGST project
GS programs
projects
Next Generation Space Telescope project
RT astronomical observatories
infrared telescopes
NASA space programs
spaceborne telescopes

NGST project
USE Next Generation Space Telescope project

Nozomi Mars Orbiter
(added August 1998)
DEF A Japanese Mars mission spacecraft designed to study the Martian upper atmosphere and its interaction with the solar wind, and to develop technologies for use in future planetary missions. Specifically, instruments on the spacecraft enable the measurement of the structure, composition and dynamics of the ionosphere, aeronomy effects of the solar wind, the escape of atmospheric constituents, the intrinsic magnetic field, and dust in the upper atmosphere and in-orbit around Mars.

UF Planet-B spacecraft
GS interplanetary spacecraft
Mars probes
Nozomi Mars Orbiter
Japanese spacecraft
Nozomi Mars Orbiter
unmanned spacecraft
space probes
Mars probes
Nozomi Mars Orbiter
RT aeronomy
Delmos
Phobos
planetary atmospheres
solar planetary interactions

optical interconnects
(added June 1998)
GS optical interconnects
RT connectors
electric connectors
integrated optics
optical computers
optical switching
optoelectronic devices
photronics
orbit determination

(added December 1998)

GS orbit determination
airborne range and orbit determination
orbit calculation...minimum variance orbit determination...orbital position estimation

RT Global Positioning System position errors
satellite tracking
space navigation
spacecraft control
spacecraft position indicators

pathological cell death
USE necrosis

PDS (spectroscopy)
USE photothermal deflection spectroscopy

perfectly matched layers
(added July 1998)

DEF In the area of computational electromagnetism, an absorbing boundary condition used for terminating infinite domain calculations in the finite-difference time-domain (FDTD) or finite element methods. The approach has also been extended to the analysis of some problems in acoustics.

UF PML (electromagnetism)
GS conditions
boundary conditions...perfectly matched layers
RT computational electromagnetics
computational grids
electromagnetic absorption
electromagnetic scattering
finite difference theory
finite element method
Maxwell equation

Phaethon (hypothetical planet)
USE hypothetical planets

Phobos spacecraft
(added August 1998)

DEF Two Soviet spacecraft (Phobos 1 and 2, both launched in July 1988) designed to study the plasma environment in the Martian vicinity, the surface and atmosphere of Mars, and the surface composition of the Martian satellite Phobos. Other mission objectives included the study of the interplanetary environment and solar observations.

GS interplanetary spacecraft
Mars probes
Phobos spacecraft
Soviet spacecraft
Phobos spacecraft unmanned spacecraft
space probes...Mars probes
Phobos spacecraft
RT Mars atmosphere
Mars environment
Phobos

photothermal deflection spectroscopy
(added November 1998)

UF PDS (spectroscopy)
GS spectroscopy
photothermal deflection spectroscopy
RT optical measurement
photothermal spectroscopy
thermal diffusivity
thermal lensing

piezoelectrics
USE piezoelectric actuators

piezoelectric actuators
(added January 2001)

DEF Any actuator that uses the piezoelectric effect as a basis for its function.

UF piezoelectric actuators
GS actuators
piezoelectric actuators
electromechanical devices
piezoelectric actuators
electromechanical systems
piezoelectric motors
piezoelectric transducers
smart materials
structures
ultrasonic wave transducers
vibration damping

piezoelectric motors
(added January 2001)

DEF Any motor that uses the piezoelectric effect to produce its mechanical output.

UF piezomotors
GS electromechanical devices
electric motors
piezoelectric motors
Piezoelectric motors
RT microelectromechanical systems
micromotors
piezoelectric actuators
piezoelectric transducers
ultrasonic wave transducers

piezomotors
USE piezoelectric motors

pilot opinion ratings
USE pilot ratings

pilot ratings
(added August 1999)

DEF Subjective assessment of the handling and stability characteristics of an aircraft or other flight vehicle.

UF pilot opinion ratings
GS flight characteristics

Polar/GGS spacecraft
(added January 2001)

DEF One of two NASA spacecraft in the Global Geospace Science (GGS) initiative and part of the International Solar Terrestrial Physics (ISTP) program. Polars (Polar Plasma Laboratory) measures solar wind entry, ionospheric output, and the depositions of energy into the neutral atmosphere at high latitudes. Imaging instruments make possible the measurement of visible, ultraviolet, and X-ray spectra of the polar caps. The spacecraft was launched in February 1996.

UF Polar Plasma Laboratory
GS artificial satellites
geophysical satellites
Polar/GGS spacecraft
RT auroras
Earth ionosphere
Earth magnetosphere
gemagnetism
plasma waves
space plasmas
space weather
Wind/GGS spacecraft

Population III stars
(added July 1999)

UF primordial stars
GS celestial bodies
stars
Population III stars
RT cosmology
dark matter
relic radiation
stellar evolution
supermassive stars

preventive maintenance
(added June 2000)

GS maintenance
preventive maintenance prevention
preventive maintenance
RT aircraft maintenance
detection failure analysis
inspection
nondestructive tests
reliability analysis

PDS (spectroscopy)
USE photothermal deflection spectroscopy

Planet X
USE hypothetical planets

Planet–B spacecraft
USE Nozomi Mars Orbiter

PML (electromagnetism)
USE perfectly matched layers

Polar/GGS spacecraft
USE Polar/GGS spacecraft

Population III stars
(added July 1999)

UF primordial stars
GS celestial bodies
stars
Population III stars
RT cosmology
dark matter
relic radiation
stellar evolution
supermassive stars

preventive maintenance
(added June 2000)

GS maintenance
preventive maintenance prevention
preventive maintenance
RT aircraft maintenance
detection failure analysis
inspection
nondestructive tests
reliability analysis
quantum computers
(added March 2000)
DEF Devices capable of performing quantum computations. There are many proposals for the physical basis of quantum computers. The 0 and 1 of a quantum bit (i.e., qubit) could be the ground and excited states of an atom in a linear ion trap; the polarizations of photons interacting in an optical cavity; or the excess of one nuclear spin state over another in a liquid sample in an NMR machine.
GS data processing equipment
RT quantum computers
quantum cryptography
(added March 2000)
DEF Any form of cryptography that depends for its security on coherent quantum–mechanical effects (quantum interference or quantum entanglement).
GS cryptography
RT quantum cryptography
quantum Hall effect
(added July 2000)
DEF Phenomenon where the Hall resistance of a two-dimensional electron system at low temperature and high magnetic fields, becomes quantized as h/(e-squared), where h is Planck’s constant, e is the electronic charge, and j is either an integer or a rational fraction.
UF QHE (electronics)
GS galvansomagnetic effects
RT quantum Hall effect
random positioning machines
USE clinostats
Rayleigh fading
(added June 2000)
DEF Rapid-fluctuation, small-scale fading resulting from multipath effects, and typically occurring in non-line-of-sight (NLOS) environments.
GS fading
RT Rayleigh fading
Rideal engines
USE RBCC engines
rocket–based combined–cycle engines
(added August 1999)
DEF Launch vehicle engines that integrate a high specific impulse, low thrust-to-weight, airbreathing engine with a low–impulse, high thrust-to-weight rocket. The engines are often defined by four modes of operation in a single-stage-to-orbit configuration. In the first mode, the engine functions as a rocket-driven ejector. When the rocket engine is switched off, subsonic combustion (mode 2) is present in the ramjet mode. As the vehicle continues to accelerate, supersonic combustion (mode 3) occurs in the ramjet mode. Finally as the edge of the atmosphere is approached and the engine inlet is closed off, the rocket is reignited and the final ascent to orbit is undertaken in an all-rocket mode (mode 4).
scarf joints

DEF A joint in which the overlapping parts are tapered to form a continuous length, with no increase in dimension at the joint.

GS joints (junctions)
RT bolted joints
bonded joints
lap joints
metal joints
scarfing

Sea-viewing seaborgium

DEF Coordinated action of independent units to produce a larger structure or to achieve a desired group effect. A strategy for nanofabrication that involves designing molecules and supramolecular entities so that shape-complementarity or other properties cause them to aggregate into desired structures.

GS assembling
RT abiotogenesis

Service Module (ISS)

DEF Primary Russian component of the International Space Station providing an early station living quarters and life support system functions to all early elements. Also provides propulsive attitude control and reboost capability for the early station.

GS modules
RT International Space Station

SeaWiFS

USE Sea-viewing Wide Field-of-view Sensor

self assembly

DEF Engineered materials capable of responding to their environment to a significant degree, by virtue of intrinsic properties and/or built-in sensor/actuator elements. Applications of these materials include vibration suppression/isolation, precision positioning, damage detection, and tunable devices.

US green chemistry
RT aeroacoustics

SeaWiFS

USE Sea-viewing Wide Field-of-view Sensor

self assembly

USE Sea-viewing Wide Field-of-view Sensor

slenderness ratio

USE aspect ratio

SNC meteorites

DEF Meteorites with petrologic characteristics, isotopic signatures, trapped gas compositions, and relatively young crystallization ages (less than 1.3 billion years), which together point to a Martian origin. The name of these meteorites is derived from three known examples—Shergotty, Nakhla, and Chassigny.

GS celestial bodies
RT meteorites

seaborgium

DEF A joint with Bohrium as a component.

GS chemical elements
RT seaborgium

dubium

Sea-viewing Wide Field-of-view Sensor

USE SeaWiFS

SLWT (propellant tank)

DEF Electron beam sources of x-ray astronomy. These sources are capable of producing x-rays in a wide variety of photon energies and have been used to study the temperature and pressure structure of stellar atmospheres, the evolution of neutron stars, and the distribution of heavy elements in the universe.

GS modules

SMA (image analysis)

USE spectral mixture analysis
space station modules
- Kvant modules
- Proton module
- Service Module (ISS)
- Unity connecting module
- Zarya control module
- RT airlocks
- compartments
- International Space Station
- Mir space station
- orbital assembly
- space erectable structures
- space station structures
- spacecraft modules

space tourism
(added April 1999)
GS space industrialization
space tourism
RT space commercialization
space transportation

space weather
(added June 1999)
SN (FOR METEOROLOGICAL CONDITIONS RELATED TO THE MIDDLE AND LOWER ATMOSPHERES OF NON-EARTH PLANETS USE ‘PLANETARY METEOROLOGY’
DEF The dynamic, highly variable conditions of the geospace environment that encompasses the sun, the interplanetary medium, and the Earth magnetosphere-ionosphere-thermosphere system. Major contributing factors include variations in the solar wind, solar flares, and solar mass ejections. Effects of space weather phenomena include performance degradation of communication, navigation, and power systems on both spacecraft and ground-based systems; and potential health hazards during extravehicular activity
RT Advanced Composition Explorer
aerospace environments
aerospace safety
Earth ionosphere
Earth magnetosphere
Earth orbital environments
geomagnetism
ionospheric disturbances
magnetic disturbances
magnetic storms
Polar/GIS spacecraft
radiation hazards
solar activity effects
solar terrestrial interactions
space plasmas
weather

spectral mixture analysis
(added July 2000)
DEF Linear algebraic method for defining subpixel fractions for each of the spectral endmembers (e.g., ground cover categories) that constitute a mixed-pixel spectral signature
UF SMA (image analysis)
GS discrimination
spectral mixture analysis
image analysis
spectral mixture analysis
spectrum analysis
spectral mixture analysis
RT image processing
pixels
principal components analysis
remote sensing
spectral reflectance

spectral response
USE spectral sensitivity

spiral bevel gears
(added May 1999)
GS gears
- bevel gears
- spiral bevel gears

SPRITE detectors
USE infrared detectors

sprites (atmospheric physics)
(added January 2000)
DEF Short-lived luminosities observed at high altitudes above thunderstorms, apparently associated with upward discharges of thunderstorm electricity. They appear as columnar diffuse reddish glows between 30 km and 80 km above ground, lasting tens of milliseconds, following large positive cloud-to-ground lightning strokes.
UF red sprites
GS atmospheric radiation
- sky radiation
- sprites (atmospheric physics)
- electromagnetic radiation
- light (visible radiation)
- sky radiation
- sprites (atmospheric physics)
RT atmospheric electricity
- atmospheric ionization
- cloud-to-ground discharges
- elves
- lightning
- thunderstorms

Stardust Mission
(added March 1999)
DEF First U.S. mission launched to robotically obtain samples in deep space and return them to Earth. The NASA Discovery-class mission will return dust samples collected from the debris cloud surrounding the nucleus of Comet Wild 2. Interstellar dust will also be collected. The mission spacecraft takes advantage of an Earth gravity-assist maneuver to reach the comet, and uses an aerogel-based dust collector.
GS space missions
- flyby missions
- Stardust Mission
RT comet nuclei
interstellar matter
Wild 2 comet

stepped leaders
(added August 1999)
GS electric current
- electric discharges
- lighting
- leaders (meteorology)
- stepped leaders

Submillimeter Wave Astronomy Satellite
(added November 2000)
DEF A NASA Small Explorer Project (SMEX) satellite designed to study the chemical composition, energy balance, and structure of interstellar gas clouds and the processes that lead to the formation of stars and planets. Its primary objective is to survey water, molecular oxygen, carbon, and isotopic carbon monoxide emission in a variety of galactic star forming regions.
UF Explorer 74 satellite
SWAS (satellite)
GS artificial satellites
- scientific satellites

Sunyaev-Zeldovich effect
(added July 2000)
DEF Compton scattering of microwave radiation in the vicinity of galaxy clusters resulting in fluctuations in the cosmic microwave background radiation (CMBR).
UF S-Z effect
RT anisotropy
Compton effect
cosmic gases
microwave scattering
radio astronomy
relic radiation

superhumps (astronomy)
(added October 1998)
RT accretion disks
astronomical photometry
binary stars
cataclysmic variables
dwarf novae
ediphasic binary stars
stellar spectrophotometry

SWAS (satellite)
USE Submillimeter Wave Astronomy Satellite

S-Z effect
USE Sunyaev–Zeldovich effect

Taguchi methods
(added September 2000)
DEF Quality engineering methodology, developed by Genichi Taguchi, for minimizing a product’s sensitivity to uncontrollable system disturbances by simultaneously varying both design and disturbance parameters. The method incorporates a special set of arrays called orthogonal arrays that define the minimal number of experiments that would provide the full information for all factors that affect the performance parameter•
GS quality control
Taguchi methods
RT design analysis
experiment design
tensegrity structures

multi-disciplinary design optimization
optimization
parameter identification
reliability engineering
statistical analysis
total quality management
tensegric structures
USE tensegrity structures

(added January 2001)

DEF A class of prestressed structures whose shape is guaranteed by the interaction between a continuous network of members in tension and a discontinuous network of members in compression. These members can serve simultaneously as sensors, actuators, and load carrying elements. The word tensegrity is a contraction of "tensile integrity".

UF tensegric structures
tensile-integrity structures
RT isotensoid structures
prestressing
smart structures
structural design

○ structures

tensile-integrity structures
USE tensegrity structures

Terra spacecraft

(added June 1999)

DEF First in a series of EOS (Earth Observing System) spacecraft developed to advance the understanding of the ways that the Earth’s lands, oceans, air, ice, and life function as a total environmental system. The spacecraft carries five high-resolution instruments: the Advanced Spaceborne Thermal Emission Radiometer (ASTER), the Clouds and the Earth Radiant Energy System (CERES), the Multi-Angle Imaging Spectroradiometer (ASTER), the Clouds and the Earth Radiant Spaceborne Thermal Emission Radiometer (ASTER), and the Measurements of Pollution in the Troposphere (MOPITT) instrument.

UF AM-1 (EOS) spacecraft
EOS AM-1 spacecraft
GS artificial satellites
Terra spacecraft
Earth Observing System (EOS)
Terra spacecraft
RT Earth observations (from space)
remote sensing

thermal lenses
USE thermal lensing

thermal lensing

(added November 1998)

UF thermal lenses
GS thermal lensing
. thermal blooming
RT atmospheric optics
. focusing
laser beams
photothermal deflection spectroscopy
wave front deformation

thermoacoustic effects

(added May 2000)

DEF Phenomena associated with the combination of temperature, pressure and displacement oscillations caused by acoustic waves interacting with solid boundaries, such as the walls of a tube or a "stack".

RT acoustic excitation


acoustic instability
acoustics
acousto-optics
combustion stability
∞ effects
heat transfer
sound waves
thermoacoustic refrigerators
thermophysical properties

thermoacoustic refrigerators

(added May 2000)

DEF Devices in which intense sound waves in pressurized resonant cavities are used to generate temperature gradients in an array of parallel plates in the interior of a tube that serves as a heat exchanger and in which heat is drawn away by a heat sink.

GS refrigerating machinery
. refrigerators
. thermoacoustic refrigerators
RT cooling systems
. refrigerating
. thermoacoustic effects

thermocapillary migration

(added September 1999)

DEF Phenomenon where droplets (or bubbles) in a host fluid with a uniform temperature gradient migrate to the hot end of the host fluid because of the temperature dependence of the interfacial energy of the droplets.

RT bubbles
capillary flow
drops (liquids)
electromigration
interfacial tension
Marrangoni convection
microgravity
space processing
temperature gradients
thermomigration

Time domain analysis

(added April 1999)

GS analysis (mathematics)
. time domain analysis
RT finite difference time domain method
dynamic response
parameter identification
signal processing
∞ time response

Time synchronization

(added December 1998)

GS synchronism
RT clocks
frequency standards
frequency synchronization
Global Positioning System
time measurement
time signals
universal time

Tissue engineering

(added October 2000)

DEF Discipline for the in vitro growth and maintenance of tissue, organ primordia, or the whole or part of an organ so as to preserve its architecture and/or function. In terms of application, the primary goal of this technology is the replacement of deficient organs.

GS bioengineering
. tissue engineering
. technologies

biotechnology
. . bioreactors
cells (biology)
clinostats
culture techniques
cytology
growth
histology
in vitro methods and tests
∞ microgravity applications
organs
. . . tissues (biology)

Titan 4B launch vehicle

(added October 1999)

GS launch vehicles
. Titan launch vehicles
. Titan 4B launch vehicle
. rocket vehicles
multistage rocket vehicles
. Titan launch vehicles
. Titan 4 launch vehicle
. Titan 4B launch vehicle
RT Cassini mission
laser gyroscopes
total impulse

(added March 2000)

DEF The integral of thrust over a given interval of time; the product of thrust and duration expressed in force-seconds; the total thrust produced by a rocket engine or motor over the entire time that its fuel is burning.

GS impulses
total impulse
RT propulsion system performance
propulsive efficiency
spacecraft propulsion
specific impulse
thrust
tourism

(added April 1999)

GS tourism
RT industries
. recreation
transportation
∞ travel

TRACE satellite

USE Transition Region and Coronal Explorer

transition elements (chemistry)
USE transition metals

Transition Region and Coronal Explorer

(added May 1998)

DEF Small Explorer Mission satellite supporting the investigation of the relationships between fine-scale magnetic fields and their associated plasma structures in the transition region and lower corona of the Sun.

UF Explorer 73 satellite
TRACE satellite
GS artificial satellites
. scientific satellites
. Explorer satellites
. Transition Region and Coronal Explorer
. small scientific satellites
. Transition Region and Coronal Explorer
RT chromosphere
Trojan asteroids

Trojan asteroids (added August 2000)

DEF Any asteroid that orbits in the Lagrange points of another (larger) body. In particular, those asteroids with a revolution period approximately equal to that of Jupiter (1:1 resonance) and clustered at either of the two Lagrange points—60 degrees ahead of or behind the Jupiter. Most asteroids of this group are named after the heroes of the Trojan War.

GS celestial bodies

... Trojan asteroids

RT Jupiter (planet)

Lagrangian equilibrium points

Tropical Rainfall Measuring Mission sat

USE TRMM satellite

U

Ukrainian space program

(added January 1999)

GS programs

... space programs

RT Ukraine

Zenit launch vehicles

ultrasonic processing

(added June 1998)

DEF The use of ultrasonic radiation to synthesize a compound or material, or alter the structure, properties, or form of a material.

UF sonochemistry

ultrasound treatment

RT processing

ultrasonic cleaning

ultrasonics

undercooling

USE supercooling

Unity connecting module

(added November 1998)

DEF Component of the International Space Station providing six ports that serve as connecting points for other station modules and framework elements.

GS modules

... space station modules

. Unity connecting module

RT Integrated Truss Structure Z1

International Space Station

spacecraft docking

Variable Specific Impulse Magnetoplasma Rocket

USE VASIMR (propulsion system)

VASIMR (propulsion system)

(added November 2000)

DEF A high-power, RF-driven magnetoplasma rocket system capable of (sp) thrust modulation at constant power. The VASIMR utilizes radiofrequency (RF) power both to generate a high-density plasma in a helicon source and to accelerate the plasma ions to high velocity by ion cyclotron resonance heating (ICRH). The system features a magnetic nozzle, which accelerates the plasma particles by converting their azimuthal energy into directed momentum.

UF Variable Specific Impulse Magnetoplasma Rocket

GS engines

. rocket engines

. . electric rocket engines

. . electrothermal engines

. . . plasma engines

. . . . VASIMR (propulsion system)

GS plasma power sources

GS plasma engines

RT magnetic nozzles

GS plasma heating

GS plasma propulsion

GS radio frequency heating

GS spacecraft propulsion

VentureStar launch vehicle

(added June 1999)

DEF Reusable single–stage–to–orbit launch vehicle employing linear aerospace engines, and having a payload capacity roughly equivalent to that of the Space Shuttle; developed in coordination with the X–33 advanced technology demonstrator vehicle.

GS aerospace vehicles

. aerospace planes

. . VentureStar launch vehicle

GS aerospace planes

. . . VentureStar launch vehicle

GS reentry vehicles

. recoverable spacecraft

. . reusable spacecraft

. . . aerospace planes

. . . . VentureStar launch vehicle

GS soft landing spacecraft

. . . . . . . VentureStar launch vehicle

GS aerospace planes

. . . . . . . . VentureStar launch vehicle

GS rocket engines

. . . . . . . . . . VentureStar launch vehicle

GS very large transport aircraft

. . . . . . . . . . . VentureStar launch vehicle

GS transport aircraft

GS cargo aircraft

. . . . . . . . . . . . . . . . . VentureStar launch vehicle

GS passenger aircraft

very large transport aircraft

(added November 1998)

DEF Aircraft capable of a maximum takeoff weight greater than 400 metric tons (881,600 lbs) or having a seating capacity greater than 660.

UF VLTA (aircraft)

GS transport aircraft

. very large transport aircraft

RT cargo aircraft

. passenger aircraft

video conferencing

(added August 2000)

UF video teleconferencing

GS telecommunication

. video conferencing

. . video conferencing

. . . video conferencing

RT communication networks

. conferences

. video data

video teleconferencing

USE video conferencing

VLTA (aircraft)

USE very large transport aircraft
volatile organic compounds

VOC (organic chemistry)
USE volatile organic compounds

volatile organic compounds
(added March 2000)
DEF Any compounds of carbon (excluding carbon oxides, carbonic acid, metallic carbonates and carbides, and carbon-nitrogen compounds) that are readily vaporizable, any of such compounds that participate in atmospheric photochemical reactions, or that are considered indoor, local, regional, or global contaminants.

UF VOC (organic chemistry)
GS organic compounds
RT volatile organic compounds

weakly interacting massive particles
(added November 1999)
DEF Hypothetical elementary particles predicted by supersymmetry theories, that interact only through gravity and weak-type interactions; postulated to account for dark matter in the Universe.

UF cosmions
WIMP (astronomy)
USE

geometry
grid generation (mathematics)
image analysis
partitions (mathematics)
spatial distribution

trajectory planning

Voronoi diagrams
(added October 2000)
DEF In computational geometry, a partitioning of a space containing a finite set of points, P, in such a way that each partition contains a single point in P and the subspace for which it is the nearest point from the set. Some applications include regional planning, image analysis, and robot path planning.

GS diagrams
RT computational geometry

water sampling
(added March 1998)
DEF The process of obtaining a representative sample of water from any natural or artificial environment.

GS sampling
RT environmental monitoring
ground water
pollution monitoring
sea water
surface water
water
water pollution
water quality

wave rotors
(added March 1998)
DEF Rotor devices that use gasdynamic waves to transfer energy rather than the motion of solid surfaces. Typically, they consist of a series of passages arranged on a drum which rotates about an axis. Through rotation, the ends of the passages are periodically exposed to various circumferentially arranged ports which initiate the traveling expansion or compression waves within the passages. The particular circumferential location of the ports determines the thermodynamic cycle of the working fluid.
maneuverable spacecraft
    • aerospace planes
    ... X-37 vehicle
reentry vehicles
    • recoverable spacecraft
    • reusable spacecraft
    • aerospace planes
    ... X-37 vehicle
research vehicles
    X-37 vehicle
soft landing spacecraft
    • aerospace planes
    X-37 vehicle
RT reusable launch vehicles
  spacecraft

X-43 vehicle
    (added September 1999)
DEF The experimental research vehicle of the
NASA Hyper-X program designed to flight validate
key propulsion and related technologies for
air-breathing hypersonic aircraft.
GS aerospace vehicles
    X-43 vehicle
    hypersonic vehicles
    X-43 vehicle
research vehicles
    X-43 vehicle
RT hypersonic flight
Pegasus air-launched booster
supersonic combustion ramjet engines

XMM (telescope)
USE XMM–Newton telescope

XMM–Newton telescope
    (added August 2000)
DEF Spaceborne x-ray telescope, launched
in December 1999, providing simultaneous,
high-throughput non-dispersive spectroscopic
imaging (EPIC instrument), medium–resolution
dispersive spectroscopy (Reflection Grating
Spectrometer), and optical/UV imaging and timing
from a co–aligned instrument (Optical Monitor).
UF X Ray Multi–Mirror Mission
GS artificial satellites
    • ESA satellites
    ... XMM–Newton telescope
    scientific satellites
    ... XMM–Newton telescope
ESA spacecraft
    • ESA satellites
    ... XMM–Newton telescope
observatories
    • astronomical observatories
    ... XMM–Newton telescope
telescopes
    • spaceborne telescopes
    ... XMM–Newton telescope	x ray telescopes
    ... XMM–Newton telescope
RT x ray astronomy
X Ray Astrophysics Facility

Z

Z1 truss structure
USE Integrated Truss Structure Z1

Zarya control module
    (added November 1998)
DEF Component of the International Space
Station providing propulsion, steering, and
communications during the early assembly stages
of the station; later serving as a docking port and
fuel tank. Zarya was built by Russia under contract
to the U.S. and is owned by the U.S.
GS modules
    ... Zarya control module
RT International Space Station

Zenit launch vehicles
    (added January 1999)
GS launch vehicles
    ... Zenit launch vehicles
RT sea launching
Ukrainian space program

zero sum games
    (added October 1998)
GS games
    ... zero sum games
RT differential games
    Markov processes
    optimal control
        pursuit–evasion games
    saddle points (game theory)

Zvezda Service Module
USE Service Module (ISS)
B

- Planet-B spacecraft
- cosmic microwave background radiation
- kink background bands
- rocket-based combined-cycle engines
- batteries Euler-Bernoulli beam theory
- use Euler-Bernoulli beams
- cost benefit analysis
- cost effectiveness
- Euler-Bernoulli beam theory
- use Euler-Bernoulli beams
- bevel gears
- bevel gears
- biomass burning
- biomimetics Blot-Savart law
- wing-body and tail configurations
- use body-wing and tail configurations
- wing-body configurations
- use body-wing configurations
- Boeing 717 aircraft
- bohrium Bond number
- Bopp comet
- Hale-Bopp boundaries
- biomass

C

digital cameras
carrier sense multiple access
cascade devices
pathological cell death
use necrosis
programmed cell death
use apoptosis
cellular manufacturing
use group technology
(manufacturing)
chain reactions (chemistry)
chain reactions (nuclear physics)
Chandra X Ray Astrophysics Facility
use X Ray Astrophysics Facility
Shergotty Nakhla Chassigny meteorites
use SNC meteorites
chain reactions (chemistry)
EAM (physical)
MEAM (physical)
transition elements
VOC (organic)
chemistry
use volatile organic compounds
clamped structures
environmental Mars
Climate Orbiter
clinorotation
clinostat rotation
use clinorotation
clinostating
use clinorotation
clinostats
cloud-to-ground discharges
CMBR (astronomy)
use cosmic microwave background radiation
cochannel interference
rocket-based combined-cycle engines
comet Comet
comet Comet Nucleus Tour
e-commerce
use electronic commerce
commerce
communication
communication
communication
compact halo objects
Composition Explorer
compounds use enantiomers
volatile organic compounds
quantum
massive
Advanced enantiomeric Composition Explorer
computing
use quantum computation
video conferencing
nacelle wing
configurations
use wing nacelle configurations
wing-body configurations
use body-wing configurations
configurations
use body-wing and tail configurations
Unity connecting module
content-addressable memory
use associative memory
CONTOUR (mission)
use Comet Nucleus Tour
H-2 control
Zarya control module
Cooper-Harper ratings
Transition Region and Coronal Explorer
corrugated waveguides
cosmic microwave background radiation
cosmions
use weakly interacting massive particles
cost benefit analysis
use cost analysis
cost effectiveness
critical current
cryptography
cuprates
quantum
current
cycle engines
cycloaddition

D

Darkstar unmanned aerial vehicle
use pilotless aircraft
reconnaissance aircraft
data mining
pathological cell death
use necrosis
optical interconnects
cochannel interference
Laser Interferometer Gravitational-Wave
Observatory
use LIGO (observatory)
Laser Interferometer Space Antenna
use LISA (observatory)
intraculink discharges
intraseasonal oscillations
use intraseasonal variations
ion optics
iridium network
iridium satellites
use communication satellites
Iridium network
iron aluminides
Service Module
(ISS)
ISS (space station)
use International Space Station
Java (programming language)
scarf joints
Josephson effect
Josephson tunneling
use Josephson effect
Madden-Julian Oscillation

kink bends
kinking
knowledge discovery
use data mining
knowledge extraction
use data mining

Polar Plasma Laboratory
use Polar/GGS spacecraft
Mars Polar Lander
use Mars Polar Lander
Java (programming language)
language
use document markup languages
very large transport aircraft
Laser Interferometer
Gravitational-Wave Observatory
use LIGO (observatory)
Laser Interferometer Space Antenna
use LISA (observatory)

weakly interacting
use finite difference time domain

Laves phases
Biot-Savart
perfectly matched
stepped layers
leaders

data mining
use data mining

machine aided indexing
use indexing (information science)

MACHOs (astronomy)
use massive compact halo objects
Madden-Julian Oscillation
magnets
magnetic nozzles
Magnetic Spectrometer
Magnetopause-to-Aurora Global Explorer
use IMAE satellite
Variable Specific Impulse
Magnetoplasma Rocket
use VASIMR (propulsion system)
magnetorheological fluids
magnetostratigraphy

e-mail
use electronic mail

preventive maintenance
use group technology

Long March launch vehicles
use group technology

March 2001 Mission
use SNC meteorites

massive compact halo objects

finite difference time domain

matched layers
use antiphase boundaries

ferroelastic materials
use smart materials

finite difference time domain

intraseasonal oscillations
use intraseasonal variations

P

hypothetical particles
use massless particles

weakly interacting massive particles

pathological cell death
use necrosis

PDS (spectroscopy)
use photothermal deflection spectroscopy

perfectly matched layers

Phaethon (hypothetical planet)
use hypothetical planets

Laves phases

Phobos spacecraft

photoresists

photothermal deflection spectroscopy

EAM (physical chemistry)
use embedded atom method

MEAM (physical chemistry)
use embedded atom method

chain reactions (nuclear physics)

sprites (atmospheric physics)

HUT (physiology)
use head-up tilt

piezoelectric actuators

use piezoelectric actuators

piezoelectric motors

piezomotors

use piezoelectric motors

pilot opinion ratings

use pilot ratings

pilot ratings

planet)

use hypothetical planets

Planet-B spacecraft

use Nozomi Mars Orbiter

planet x

use hypothetical planets

hypothetical planets

use hypothetical planets

Polar

Plasma Laboratory

use Polar/GGS spacecraft

Mindlin plate theory

use Mindlin plates

Mindlin plates

use Mindlin plates

PML (electromagnetism)

use perfectly matched layers

Polar/GGS spacecraft

Mars

Polar Lander

Polar Plasma Laboratory

use Polar/GGS spacecraft

dendritic polymers

use dendrimers

EAP (polymers)

use electroactive polymers

electroactive polymers

use dendrimers

Population III stars

random positioning machines

use clinostats

preventive maintenance

primordial stars

use Population III stars

processing signal

Mars Surveyor 98

Ukrainian spacecraft

field

Next Generation Space Telescope

NGST

Java

use Next Generation Space Telescope project

SLWT (propellant tank)

use external tanks

propellant tanks

fusion

VASIMR

Lunar

Prospector

proton–antiproton interactions

pursuit–evasion games

fiber pushout

Q

QHE (electronics)

use quantum Hall effect

quantum communication

quantum computers

quantum computing

use quantum computation

quantum cryptography

quantum Hall effect

R

cosmic microwave background

Tropical Rainfall Measuring Mission

use TRMM satellite

random positioning machines

use clinostats

Cooper–Harper ratings

use pilot ratings

slenderness ratio

use aspect ratio

Chandra X

Ray Astrophysics Facility

use X Ray Astrophysics Facility

X

Ray Multi-Mirror Mission

use XMM-Newton telescope

Rossi X

Ray Timing Explorer

use X Ray Timing Explorer

Rayleigh fading

RBCC engines

use rocket-based combined-cycle engines

chain reactions (chemistry)

chain reactions (nuclear physics)

red sprites

use sprites (atmospheric physics)
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<td>Rossi X Ray Timing Explorer</td>
<td>Use SNC meteontes</td>
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<tr>
<td>Use X Ray Timing Explorer</td>
<td>Anticoincidence detectors</td>
</tr>
<tr>
<td>Clinostat</td>
<td>Use anticoincidence detectors</td>
</tr>
<tr>
<td>Rotation</td>
<td>Shuttle Superlightweight Tank</td>
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<tr>
<td>Use clinorotation</td>
<td>Use external tanks</td>
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<tr>
<td>Wave</td>
<td>Propellant tanks</td>
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<tr>
<td>RXTE (satellite)</td>
<td>Signal−processing-in-the-element</td>
</tr>
<tr>
<td>Use X Ray Timing Explorer</td>
<td>Detectors</td>
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<tr>
<td>Hardware-in-the-loop</td>
<td>Use infrared detectors</td>
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<tr>
<td>In−flight</td>
<td>Simulation</td>
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<tr>
<td>In−flight</td>
<td>Use in−flight simulation</td>
</tr>
<tr>
<td>Simulation</td>
<td>Slenderness ratio</td>
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<tr>
<td>Use aspect ratio</td>
<td>Shells</td>
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<td>Use anti coincidence detectors</td>
<td>Use ultrasonic processing</td>
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<tr>
<td>Savart law</td>
<td>Space 1 Mission</td>
</tr>
<tr>
<td>Use Sunyaev−Zeldovich effect</td>
<td>Deep LISA (observatory)</td>
</tr>
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<td>Water sampling</td>
<td>Space Antenna</td>
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<tr>
<td>Use TRMM satellite</td>
<td>Use Deep Space 1 Mission</td>
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<td>ACE satellite</td>
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<td>Use Advanced Composition Explorer</td>
<td>Use optical interconnects</td>
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<tr>
<td>Envisat−1 satellite</td>
<td>Ukrainian ISS</td>
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<td>Explorer 71 satellite</td>
<td>Space station modules</td>
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<tr>
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<tr>
<td>Use Transition Region and Coronal</td>
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<td>Explorer 74 satellite</td>
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<tr>
<td>Use Submillimeter Wave Astronomy</td>
<td>Next Generation Space Telescope project</td>
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<tr>
<td>Satellite</td>
<td>Space tourism</td>
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<tr>
<td>Use Submillimeter Wave Astronomy</td>
<td>Space weather</td>
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<tr>
<td>Submillimeter Wave Astronomy</td>
<td>AM−1 (EOS) spacecraft</td>
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<tr>
<td>SWAS</td>
<td>Use Terra spacecraft</td>
</tr>
<tr>
<td>Satellite (satellite)</td>
<td>Use Terra spacecraft</td>
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<tr>
<td>Use X Ray Timing Explorer</td>
<td>MGS (spacecraft)</td>
</tr>
<tr>
<td>FUSE satellite</td>
<td>Use Mars Global Surveyor</td>
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<tr>
<td>Use Far UV Spectroscopic Explorer</td>
<td>Phobos spacecraft</td>
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<tr>
<td>Satellite (satellite)</td>
<td>Use Nozomi Mars Orbiter</td>
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<tr>
<td>Use Far UV Spectroscopic Explorer</td>
<td>Planet−B spacecraft</td>
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<td>TRACE satellite</td>
<td>Use Polar/GGS spacecraft</td>
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<td>Use Transition Region and Coronal</td>
<td>Use Terra spacecraft</td>
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<tr>
<td>Explorer 77 satellite</td>
<td>Terra (spacecraft)</td>
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<tr>
<td>Use Submillimeter Wave Astronomy</td>
<td>Use Terra spacecraft</td>
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<tr>
<td>Satellite (satellite)</td>
<td>Wind/GGS spacecraft</td>
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<td>Use X Ray Timing Explorer</td>
<td>Use Terra spacecraft</td>
</tr>
<tr>
<td>NEXT Generation Space Telescope project</td>
<td>Use International Space Station</td>
</tr>
</tbody>
</table>
Variable Specific Impulse Magnetoplasma Rocket
use VASIMR (propulsion system)
spectral mixture analysis
spectral response
use spectral sensitivity

Alpha Magnetic Spectrometer (AMS)
use Alpha Magnetic Spectrometer

PDS photothermal deflection spectroscopy

Population III stars

ISS (space station)
use International Space Station

space station modules
stepped leaders

associative storage
use associative memory

fuselage-wing stores
use wing-fuselage stores
electronic structure
Z1 truss
use Integrated Truss Structure Z1

Integrated Truss Structure Z1

stairs
use Population III stars

station
use International Space Station

space station modules
stepped leaders

associative storage
use associative memory

fuselage-wing stores
use wing-fuselage stores
electronic structure
Z1 truss
use Integrated Truss Structure Z1

Terra spacecraft

field tests
use hardware-in-the-loop simulation

in vitro methods and in vivo methods
use Euler-Bernoulli beam theory

Mindlin plate theory
use Mindlin plates
thermal lenses
use thermal lensing

Rossi X Ray
use X Ray Timing Explorer
tissue engineering

Titan 4B launch vehicle
tones
total impulse
tourism
tourism
tourism

Comet Nucleus

Space Shuttle
use external tanks
propellant tanks

Surgeon

Regolith

Surveyor
use Mars Polar Lander

Surgeon Orbiter
use Mars Climate Orbiter

Surgeon Program

Surveyor 2001 Mission

SVAS (satellite)
use Submillimeter Wave Astronomy Satellite

time synchronization

synthesis

system

systems

Ultrasound treatment

ultrasonic treatment
use ultrasonic processing
**Trefftz finite element method**
- use finite element method
- Trefftz method

**Trefftz method**
- TRMM satellite
- Trojan asteroids
- Tropical Rainfall Measuring Mission sat
- use TRMM satellite

**Z1 truss structure**
- use Integrated Truss Structure Z1

**Integrative Josephson tunneling**
- use Josephson effect

**U**
- Ukrainian space program
- ultrasonic processing
- ultrasonic treatment
- use ultrasonic processing
- uncertain systems
- undercooling
- use undercooling
- Unity connecting module
- unmanned aerial vehicle
- use pilotless aircraft
- reconnaissance aircraft
- head
  - up
  - tilt

**V**
- Variable Specific Impulse Magnetoplasma Rocket
- use VASIMR (propulsion system)
- interannual variations
- use annual variations
- intraseasonal variations
- use VASIMR (propulsion system)
- vehicle
  - use pilotless aircraft
  - reconnaissance aircraft
- Delta 3 launch
  - vehicle
- Delta 4 launch
  - vehicle
- Titan 4B launch
  - vehicle
- VentureStar launch
  - vehicle
- X-37
  - vehicle
- X-43
  - vehicle
- Long March launch
  - vehicles
- WIG launch
  - vehicles
- wing-in-ground effect
- Zenit launch
  - vehicles
  - VentureStar launch vehicle
  - very large transport aircraft
  - video conferencing
  - use video conferencing
  - view Sensor
  - viewing Wide Field-of-view Sensor
  - in vitro methods and tests
  - in vivo methods and tests
  - VLTA (aircraft)
  - use very large transport aircraft VOC (organic chemistry)
  - use volatile organic compounds

**Z**
- Z effect
- use Sunyaev-Zeldovich effect

**Integrated Truss Structure Z1**
- use Integrated Truss Structure Z1

**Zarya control module**
- Zenit launch vehicles
- zero sum games
- Zvezda Service Module
- use Service Module (ISS)
NASA THESAURUS SUPPLEMENT

PART 3

CHANGES

No term changes or deletions were made during this period.
The NASA Thesaurus Supplement is a cumulative update to the 1998 edition of the NASA Thesaurus (NASA/SP–1998–7501). The Supplement, published every 6 months, includes all new terms and associated hierarchies added since the cutoff for the 1998 edition (December 1997). Parts 1 and 2 (Hierarchical Listing and Rotated Term Display) correspond to Volumes 1 and 2 of the 1998 printed edition of the NASA Thesaurus. Definitions are included in Part 1; uppercase/lowercase forms are provided in both Parts 1 and 2. Part 3 is a list of deletions or changes to valid terms.