NASA THESAURUS SUPPLEMENT

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

July 2001
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A three-part cumulative update of the 1998 edition of the NASA Thesaurus

National Aeronautics and Space Administration

July 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/thesfrm1.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:

Lexicographer
NASA Center for AeroSpace Information
7121 Standard Drive
Hanover, MD 21076–1320

E-mail: help@sti.nasa.gov
Fax: (301) 621–0134
Telephone: (301) 621–0114
Aeroshells

2001 Mars Odyssey

DEF Mars orbiter mission designed to make global observations of Mars to improve our understanding of the Martian climate and geologic history, including the search for liquid water and evidence of past life. The three primary instruments carried onboard are THEMIS (Thermal Emission Imaging System), GRS (Gamma Ray Spectrometer), and MARIE (Mars Radiation Environment Experiment). Launched April 2001.

GS space missions

- 2001 Mars Odyssey

RT gamma ray spectrometers

ACE satellite

USE Advanced Composition Explorer

Advanced Composition Explorer

(added December 1999)

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.

UF ACE satellite

- Explorer 71 satellite

GS artificial 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, aerostat, or hypersonic flight.

GS aerodynamic configurations

Aeroshells

RT aeromaneuvering

- nose cones

- reentry vehicles

Alpha Magnetic Spectrometer

(added June 1999)

DEF AMS (spectrometer)

GS measuring instruments

RT antimatter

- Cerenkov counters

- cosmic rays

- dark matter

- International Space Station

- interstellar matter

- magnetic spectroscope

- space station payloads

- spaceborne astronomy

AM-1 (EOS) spacecraft

USE Terra spacecraft

AMS (spectrometer)

USE Alpha Magnetic Spectrometer

anticoincidence detectors

USE anticoincidence shields

antiphase boundaries

(added March 1998)

DEF One of the two mechanisms by which cell death occurs (the other being the pathological process of NECROSIS) Apoptosis is the mechanism responsible for the physiological deletion of cells and appears to be intrinsically programmed. It is characterized by distinctive morphologic changes in the nucleus and cytoplasm, chromatin cleavage at regularly spaced sites, and the endonucleolytic cleavage of genomic DNA at internucleosomal sites. This mode of cell death serves as a balance to mitosis in regulating the size of animal tissues and in mediating pathologic processes associated with tumor growth.

UF programmed cell death

GS physiological effects

RT biological effects

- cells (biology)

- cytology

- death

- deoxyribonucleic acid

- necrosis

- radiation effects

April 2001

GS Mars missions

- 2001 Mars Odyssey

RT gamma ray spectrometers

Mars (planet)

Mars exploration

Mars surface

Mars Surveyor 2001 Mission

ACE satellite

USE Advanced Composition Explorer

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(added December 1999)

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RT aeromaneuvering

- nose cones

- reentry vehicles
archaeomagnetism
USE paleomagnetism

associative memory
(added December 1999)
DEF A method or device for data storage in which data is identified by a set or properties of its content, rather than by an address or relative position.
UF associative storage
content-addressable memory
GS memory (computers)
associative memory
RT associative processing (computers)
computer storage devices
neural nets
optical memory (data storage)

astereoseismology
(added March 2001)
DEF Study of stellar oscillations as a means to probing the internal structure and dynamics of stars.
UF stellar seismology
GS seismology
astroseismology
heliaseismology
RT astrometry
astrophysical photometry
astrophysics
starquakes
stellar evolution
stellar interiors
stellar oscillations
stellar physics

automatic indexing
USE indexing (information science)

baroreceptor reflexes
USE baroreflexes

baroreflexes
(added March 2001)
DEF A negative feedback system that buffers short-term changes in blood pressure. Increased pressure stretches blood vessels, which activates pressoreceptors (baroreceptors) in the vessel walls. The central nervous system's net response is a reduction of central sympathetic outflow. This reduces blood pressure by decreasing peripheral vascular resistance and by lowering cardiac output. Because the baroreceptors are tonically active, the baroreflex can compensate rapidly for both increases and decreases in blood pressure.
UF baroreceptor reflexes
pressoreceptor reflexes
GS reflexes
baroreflexes
carotid sinus reflex
RT baroreceptors
blood pressure
cardiovascular system
heart rate
hemodynamic responses
physiological responses

bevel gears
(added May 1999)
GS gears
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 combustion
air pollution
climate change
combustion products
contaminants
deforestation
environmental 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
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

blended-wing-body configurations
(added April 2001)
DEF Flight vehicle configurations that maximize overall efficiency by integrating the engines, wings, and the body into a single lifting surface. Sometimes referred to as flying-wing configurations.
UF blended-wing-fuselage
BWB configurations
RT flying wing configurations
GS aerodynamic configurations
body-wing configurations
blended-wing-body configurations
RT aircraft configurations
aircraft design
SR-71 aircraft
tailless aircraft

Boeing 717 aircraft
(added October 1999)
GS Boeing aircraft
Boeing 717 aircraft
commercial aircraft
Boeing 717 aircraft
turboprop aircraft
Boeing 717 aircraft
turbofan aircraft
Boeing 717 aircraft
generic aircraft
Boeing 717 aircraft
transport aircraft
Boeing 717 aircraft
passenger aircraft
RT Boeing 717 aircraft

bond number
(added December 1999)
DEF Dimensionless number representing the ratio between gravitational force and the surface tension of a bubble, droplet, or meniscus.
GS dimensionless numbers
Bond number
RT drops (liquids)
gravitational effects
interfacial tension
menisci

BWB configurations
USE blended-wing-body configurations

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
RT communication networks
local area networks
Ethernet
carrier sense multiple access
transmission
signal transmission
data transmission
multiple access
RT communication multiple access
transmission
GS electronic equipment
carrier sense multiple access

cascode 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
cascode devices
GS electronic equipment
cascode devices
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
. lighting
. . cloud-to-cloud discharges

cloud-to-ground discharges
(added August 1999)

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

cochannel interference
(added April 2000)

DEF Interferences 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

colloidal suspensions
USE colloids

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

commercial off-the-shelf products
(added March 2001)

DEF Readily-available, commercially-developed products; often referring to commercial products that can be used as an alternative to in-house or customized product development.

UF COTS products
GS products
. commercial off-the-shelf products
RT commercialization
cost effectiveness
government procurement
procurement management
product development

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 cosmic microwave background radiation

CMBR (astronomy)
USE microwave background radiation

cochannel interference
USE cochannel interference

CMBR (astronomy)
USE microwave background radiation

cosmions
USE weakly interacting massive particles

cost benefit analysis
USE cost analysis
cost effectiveness

COTS products
USE commercial off-the-shelf products

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
cuprates

- the material is superconducting and above which the material behaves normally
  - GS electric current
  - critical current
  - RT critical temperature
  - current density
  - superconductivity
  - superconductors (materials)

- deformable mirrors
  - GS mirrors
  - deformable mirrors
  - RT adaptive optics
  - light modulation
  - phase modulation
  - segmented mirrors

- Delta 3 launch vehicle
  - GS launch vehicles
  - Delta launch vehicle
  - Delta 3 launch vehicle

- Delta 4 launch vehicle
  - GS launch vehicles
  - Delta launch vehicle
  - Delta 4 launch vehicle

- dendrimers
  - GS 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
  - macrocyclics
  - dendrimers
  - RT conducting polymers
  - dendritic crystals
  - nanostructure (characteristics)
  - organometallic polymers
  - polymers
  - synthetic metals

- design optimization
  - GS optimization
  - design optimization
  - shape optimization
  - RT aircraft design
  - computer aided design
  - design analysis
  - genetic algorithms
  - sensitivity analysis
  - structural analysis
  - structural design
  - structural design criteria
  - systems engineering

- Destiny Laboratory Module
  - GS laboratories
  - space laboratories
  - manned orbital laboratories
  - Destiny Laboratory Module

- dielectric loss
  - GS electric current
  - dielectric properties
  - losses
  - dielectric loss
  - RT dielectrics
  - energy dissipation
  - permittivity

- dielectric waveguides
  - GS waveguides
  - dielectric waveguides
  - RT dielectrics
  - microwave transmission
  - optical waveguides
  - waveguide antennas
  - waveguide filters

- differential games
  - GS games
differential games
  - RT minimax technique
  - optimal control
  - pursuit-evasion games
  - stochastic processes
  - zero sum games

- digital cameras
  - GS 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
  - GS chemical elements
dubnium
  - RT rutherfordium
  - seaborgium

- dusty plasmas
  - GS plasma
dusty plasmas
  - RT ionized gases containing small particles of solid matter, which are charged and interact through a Coulomb repulsion. They behave much like a colloidal suspension, exhibiting for example
crystalline, liquid, and gas phases, and a melting/freezing phase transition.

- **GS**
  - charged particles
  - energetic particles
  - plasmas (physics)
  - dusty plasmas
  - corpuscular radiation
  - energetic particles
  - plasmas (physics)
  - dusty plasmas

**RT**
- dust
- planetary rings
- plasma clouds
- plasma composition
- plasma–particle interactions
- space plasmas
- strongly coupled plasmas

**E**

**EAM (physical chemistry)**
- USE embedded atom method

**EAP (polymers)**
- USE electroactive polymers

**e-commerce**
- USE electronic commerce

**e-kranoceans**
- USE wing-in-ground effect vehicles

**electroactive polymers**
- added June 2000
- UF EAP (polymers)
- RT actuators
- conducting polymers
- electrorheological fluids
- electrostriction
- microelectromechanical systems
- polymers
- robot arms

**electrochemical synthesis**
- added January 2000
- UF electrochemistry
- GS synthesis (chemistry)
- electrochemical synthesis
- RT electrochemistry
- electrolysis
- polymerization

**electromagnetic rocket engines**
- USE plasma engines

**electronic commerce**
- added April 2000
- UF e-commerce
- GS commerce
- RT computer information security
- electronic mail
- Internet resources
- websites
- World Wide Web

**electronic structure**
- 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

**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 electricity
  - 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
  - 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

**environmental cleanup**
- added February 1999
- GS cleaning
- RT environmental cleanup
  - decontamination
  - environment management
  - hazardous wastes
  - oil pollution
  - slicks
  - pollution control
  - reclaim
  - soil pollution
  - waste disposal
  - water treatment

**Envisat–1 satellite**
- added 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
  - ENVISAT-1 spacecraft
  - ESA satellites
  - Envisat–1 spacecraft
  - ERS-2 (esa satellite)
  - imaging spectrometers
  - remote sensing
  - satellite observation
  - satellite–borne radar
  - synthetic aperture radar

**EOS AM–1 spacecraft**
- USE Terra spacecraft

**Ethernet**
- added 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

Euler–Bernoulli beams
(added April 1998)

UF Euler–Bernoulli beam theory
GS structural members
  beams (supports)
RT Euler–Bernoulli beams
  axial strain
  bending
  bending vibration
dynamic structural analysis
elastic properties
mathematical models
partial differential equations
structural analysis
Timoshenko beams
evenant waves
(added March 1998)
GS surface waves
evenant waves
RT acoustic impedance
evenant waves
fiber optics
internal waves
plane waves
propagation modes
reflected waves
wave propagation
∞ waves
exergic energy
USE exergy

exergy
(added 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
exoplanets
USE extrasolar planets
exosolar planets
USE extrasolar planets
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
Explorer 77 satellite
USE IMAGE satellite
extremerrestrial oceans
(added June 2001)
SN (EXCLUDES MAGMA OCEANS)
DEF Extensive bodies of water on planets and moons.
UF planetary oceans
scenario oceans
GS oceans
∞ extraterrestrial oceans
RT Europa
planetary surfaces
satellite surfaces
F
FDTD (mathematics)
USE finite difference time domain method
ferroelastic materials
(added June 1998)
GS ferroelastic materials
∞ shape memory alloys
RT ceramics
ferroelasticity
ferroelectric materials
∞ materials
smart materials
ferroelasticity
(added June 1998)
GS mechanical properties
∞ elastic properties
RT ferroelasticity
crystal structure
domain wall
ferroelastic materials
ferroelectricity
phase transformations
shape memory alloys
smart materials
fiber pushout
(added September 1999)
GS releasing
∞ fiber pushout
RT ceramic matrix composites
composite materials
debonding (materials)
destructive tests
failure modes
fiber composites
fiber pullout
fiber-matrix interfaces
fibers
interfacial energy
∞ materials tests
metal matrix composites
reinforcing fibers
field tests
(added November 1999)
SN (EXCLUDES TESTS OF ELECTRIC, MAGNETIC, OR ELECTROMAGNETIC FIELDS)
DEF Tests carried out in the actual setting in which the subject device is intended to operate
RT environmental tests
performance tests
∞ tests
field–programmable gate arrays
(added April 2000)
GS circuits
finite difference time domain method
(added 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
(added 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
flow noise
∞ aeroacoustic noise
∞ blade flap noise
∞ propeller noise
∞ siren tones
RT aeroacoustics
ducted flow
nozzle flow
pipe flow
underwater acoustics
flying wing configurations
USE blended-wing-body configurations
free–space optical communication
(added June 1998)
GS telecommunication
∞ communication
optical communication
∞ free–space optical communication
RT high power lasers
laser beams
satellite communication
space communication
free–space optical interconnects
(added June 1998)
UF FSOI (integrated optics)
GS optical interconnects
∞ free–space optical interconnects
RT integrated optical
interprocessor communication
optical computers
optical switching
optoelectronic devices
photonic
frequency domain analysis
(added April 1999)
GS analysis (mathematical)
frequency domain analysis
RT control systems design
dynamic response
frequency response
parameter identification
signal processing
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

**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 lipids
RT steroids
RT corticosteroids
RT glucocorticoids
RT secretions
RT endocrine secretions
RT hormones
RT corticosteroids
RT glucocorticoids

**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 numerical analysis
RT finite volume method
RT Godunov method
RT procedures
RT finite volume method
RT Godunov method
RT approximation
RT Cauchy problem
RT Cauchy-Riemann equations
RT computational fluid dynamics
RT Euler equations of motion
RT finite difference theory
RT shock wave interaction
RT supersonic flow

**GOES 10**

*added March 2000*

GS artificial satellites
RT GOES satellites
RT GOES 10
RT synchronous satellites
RT GOES satellites
RT GOES 10

**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 algorithms
RT greedy algorithms
RT heuristic methods

**Hall thrusters**

*added June 2000*

DEF Gridless ion engines that produce thrust by electrostatically accelerating plasma ions out of an annular discharge chamber.

GS engines
RT rocket engines
halon

(added January 2000)
DEF 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 metals
- carbon compounds
  - halocarbons
  - halogen compounds
- bromine compounds
- halon
- hardware-in-the-loop
RT fire extinguishers
flame retardants
fluorocarbons

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

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

hassium
(added May 1998)
GS chemical elements
- hassium
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
- head up tilt
RT aerospace medicine
bed rest
bioastronautics
cardiovascular system
gravitational physiology
head down tilt
hemodynamic responses
hindlimb suspension
lower body negative pressure
orthostatic tolerance
physiological responses
supine position
weightlessness simulation

health and usage monitoring systems
USE systems health monitoring

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
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.
GS metals
- cadmium
- chromium
- copper
- industrial wastes
- lead (metal)
- mercury (metal)
- soil pollution
- toxic hazards
- zirconium

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.
GS predictions
- hindcasting
RT forecasting
meteorological parameters
nowcasting
oceanographic parameters
weather forecasting

hindlimb suspension
(added June 2001)
DEF Technique for limiting use, activity, or movement by immobilizing or restraining animal by suspending from hindlimbs or tails. This immobilization is used to simulate some effects of reduced gravity and study weightlessness physiology.
UF hindlimb unloading
GS immobilization
- hindlimb suspension
RT aerospace medicine
atrophy
bioastronautics
bone demineralization
gravitational physiology
head down tilt
head up tilt
hindlimb suspension
hemodynamic responses
hypokinesia
limbs (anatomy)
weightlessness simulation

holocene epoch
(added May 2001)
DEF Most recent geologic epoch of the Quaternary period extending from about 10,000 years ago to, and including, the present.
GS Cenozoic Era
Quaternary period

hydropaticity
(added June 2000)
DEF The degree to which a substance is insoluble in water, or resists wetting or hydration.
GS hygral properties
- hydrophobicity
RT adsorption
chemical properties
hydration
hydroscopicity
moisture resistance
surface properties
solubility
waterproofing
wettability
wettabilit

hyperbranched polymers
USE dendrimers

hypergravity
USE high gravity environments

hypogravity
USE microgravity

hypothetical particles
(added November 1999)
GS particles
- hypothetical particles
  - elementary particles
    - hypothetical particles
  - diquons
  - gravitinos
  - gravitons
  - photons
  - quarks
  - tachyons
  - weakly interacting massive particles

hypothetical planets
(added June 1998)
UF Phaethon (hypothetical planet)
planet X
rogue planets
transplutonic planets
GS celestial bodies
- planets
  - hypothetical planets
RT comets
extrasolar planets
planetary orbits
transported, and subsequently lost during.

where magnetospheric plasmas are energized,

or biochemical processes occurring within a living

in vivo

environment or outside of a living cell or organism.

or biochemical processes occurring in an artificial

in vitro

Imager for Magnetopause-to-Aurora Global

Explorer (MIDEX) 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.

**USE**

**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.

**UF** Explorer 78 satellite

**GS** artificial satellites

- scien- tific satellites
- Explorer satellites

**RT** auroral zones

Earth magnetosphere

magnetic storms

magnetopause

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

- biotechnology
- condi- tions
- culture techniques
- cytology
- fertilization
- histology

- in vivo methods and tests

- oo methodology

- oo tests

- tissue engineering

**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

- biotechnology
- conditions
- culture techniques
- cytology
- histology

- in vitro methods and tests

- intravenous procedures

- oo methodology

- oo 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

- thesauri

**Inductively coupled plasma mass spectrometry**

**(added March 2001)**

*DEF* Multi-element analytical technique that uses high temperature plasma, commonly argon, to dissociate molecules and ionize atoms, which are passed into a vacuum, and sorted based on their atomic mass-to-charge ratios. **UF** ICP-MS (spectrometry)

- LA-ICP-MS (spectrometry)

**GS** spectrometry

- mass spectrometry

- inductively coupled plasma mass spectrometry

**RT** chemical analysis

- microanalysis

- qualitative analysis

- spectroscopic analysis

- vacuum spectroscopy

**Inflight 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** Inflight simulation

**GS** simulation

- flight simulation

- in-flight simulation

**RT** aircraft control

- flight characteristics

- flight control

- flight simulators

- flight tests

- training simulators

**Information analysis**

**(added April 2000)**

*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

**GS** space station structures

- Integrated Truss Structure Z1

**RT** International Space Station

- Unity connecting module

**intelligent materials**

**USE** **smart materials**

**Interannual 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

- correlation

- multisensor applications

- standardization

**Interccloud discharges**

**(added August 1999)**

**GS** electric current

- electric discharges

- lightning

- intracloud discharges

**intraseasonal oscillations**

**USE** **intraseasonal variations**

**intraseasonal variations**

**(added September 2000)**

*UF** intraseasonal oscillations

**GS** variations

- periodic variations

- intraseasonal variations

- Madden–Julian Oscillation

**RT** annual variations

- atmospheric circulation

- atmospheric models

- climatology

- tropical meteorology

**Ion optics**

**(added June 1998)**

**RT** beam waveguides

- beamforming

- electron optics

- ion beams

- ion engines

- ion propulsion

- mass spectrometers

- oo 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
Iron aluminides

- communication networks
- Iridium network
- satellite networks
- satellite constellations
- Iridium network

RT communication satellites
facsimile communication
mobile communication systems
satellite communication
telephony
wireless communication

Iridium satellites
USE communication satellites
Iridium network

Iron aluminides
(added December 2000)
GS aluminum compounds
- alumina
- iron alumina
- iron compounds
- iron alloys
RT aluminum alloys
intermetallics
iron alloys

ISS (space station)
USE International Space Station

Java (programming language)
(added December 1998)
GS languages
- programming languages
- high level languages
- Java (programming language)
RT C++ (programming language)
client server systems
internets
object-oriented programming
World Wide Web

Josephson effect
(added April 1999)
UF Josephson tunneling
RT electron tunneling
Josephson junctions
SIS (superconductors)
superconducting devices
superconductors (materials)

Josephson tunneling
USE Josephson effect

K

Kinking
(added April 1998)
RT bending
- buckling
compression loads
-cracking (fracturing)
dehoration
-displacement
-failure modes
-fiber composites
-folding
-heaving
-twisting
-wrinkling

Knowledge discovery
USE data mining

Knowledge extraction
USE data mining

L

LA-ICP-MS (spectrometry)
USE inductively coupled plasma mass spectrometry

Langmuir monolayers
USE monomolecular films

Laser Interferometer Gravitational-Wave Observatory
USE LIGO (observatory)

Laser Interferometer Space Antenna
USE LISA (observatory)

Laser spark spectroscopy
USE laser-induced breakdown spectroscopy

Laser–induced breakdown spectroscopy
(added June 2001)
DEF A non-intrusive, spectroscopic technique wherein a laser pulse is focused on the target sample to form a laser spark or plasma. The emitted light from the spark is then used to identify elemental constituents and quantify abundances of measured species.

UF laser spark spectroscopy
LASS (spectroscopy)
LIBS (spectroscopy)
GS spectroscopy
- laser-induced breakdown spectroscopy
RT absorption spectroscopy
emission spectra
laser applications
laser plasmas
laser spectroscopy
plasma diagnostics
Raman spectroscopy
spectroscopic analysis

LASS (spectroscopy)
USE laser-induced breakdown spectroscopy

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

Lorentz force accelerator thrusters
USE magnetoplasmadynamic thrusters

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

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

LLA thrusters
USE magnetoplasmadynamic thrusters

LISA (observatory)
(added December 2000)
UF Laser Interferometer Space Antenna
GS antennas
- gravitational wave antennas
- LIGO (observatory)
RT astronomical observatories
- astronomical satellites
- LIGO (observatory)
- LISA (observatory)
- LISA (observatory)
- laser interferometry
- gravitational waves
- LISA (observatory)
- LIGO (observatory)
- gravitational wave antennas
- 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

Lorentz force accelerator thrusters
USE magnetoplasmadynamic thrusters

Lunar Prospector
(added February 1998)
GS artificial satellites
- Luna satellites
- Lunar Prospector
lunar spacecraft
lunar satellites
Luna satellites
Luna spacecraft
magnetic fields to direct and accelerate plasma flows, thereby providing thrust for propulsion.

magnetoplasma dynamic thrusters

Mars Global Surveyor

Mars landing sites

Mars missions

Mars Polar Lander
Mars Surveyor 98 Program

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 massive planets, hypothesized to exist 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** Interplanetary spacecraft

- Mars probes
- Mars Polar Lander
- unmanned spacecraft
- probes
- Mars probes
- Mars Polar Lander

**RT** Mars atmosphere

- Mars Climate Orbiter
- Mars missions
- Mars surface
- Mars Surveyor 98 Program

Mars Surveyor 98 Lander

**USE** Mars Polar Lander

Mars Surveyor 98 Orbiter

**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**

- NASA programs
- NASA space programs
- Mars Surveyor 98 Lander
- Mars Surveyor 98 Program

**RT** Mars atmosphere

- Mars Climate Orbiter
- Mars missions
- Mars Polar Lander
- Mars Surveyor 98 Program

Mars Surveyor 2001 Mission

*(added July 1999)*

**DEF** Mars exploration mission including an orbiter with a gamma ray spectrometer and a multispectral thermal imager, and a lander with an extensive set of instrumentation, a robotic arm, and the Marie Curie Rover. (In March 2000, the lander portion of the mission was cancelled; the orbiter mission was superseded by the 2001 Mars Odyssey mission.)

**GS** space missions

- Mars missions
- Mars Surveyor 2001 Mission

**RT** 2001 Mars Odyssey

- Mars environment
- Mars surface
- Mars surface samples
- NASA space programs

Mariner meteorites

**USE** SNC meteorites

**RT**

- 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**

- massive compact halo objects
- dark matter
- galactic halos
- gravitational lenses
- Milky Way Galaxy
- missing mass (astrophysics)
- red dwarf stars

**MEAM** (physical chemistry)

**USE** embedded atom method

**muonium**

*(added May 1998)*

**GS** chemical elements

- muon

**RT**

- anti-fermions

**MEMS** (electromechanical devices)

**USE** microelectromechanical systems

**MGs** (spacecraft)

**USE** Mars Global Surveyor

**micelles**

*(added June 2001)*

**DEF** Electrically charged colloidal particles or ions consisting of oriented molecules, aggregates of a number of molecules held loosely together by secondary bonds.

**GS**

- molecular clusters
- micelles
- aggregates
- block copolymers
- block copolymerization
- colloids
- flocculating
- nanostructure (characteristics)
- self assembly

**microelectromechanical systems**

*(added October 1998)*

**USE** embedded atom method

**MMH** (chemistry)

**USE** monomethylhydrazines

**modified embedded atom method**

**USE** embedded atom method

**monomethylhydrazines**

*(added February 2001)*

**USE**

- methylhydrazine
- . monomethylhydrazines

**miscachmetal**

*(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**

- rare earth alloys
- mischmetal
- sputtering alloys
- cathodic coatings
- cerium
- desorption
- electrode materials
- intermetallics
- steels

**MJD** (meteorology)

**USE** Madden-Julian Oscillation

**MMH** (chemistry)

**USE** monomethylhydrazines

**modified embedded atom method**

**USE** embedded atom method

**monomethylhydrazines**

*(added February 2001)*

**USE**

- methylhydrazine
- . monomethylhydrazines
nanocomposites

nanosatellites

nanotubes

NGST project

Next Generation Space Telescope project

NDVI (remote sensing)

normalized difference vegetation index

optical interconnects

orbit determination

orbit determination
osteoblasts

... orbit calculation
... minimum variance orbit determination
... orbital position estimation
RT Global Positioning System position errors
satellite tracking
space navigation
spacecraft control
spacecraft position indicators

osteoblasts

(added June 2001)
DEF Bone-forming cells that secrete an extracellular matrix. Hydroxyapatite crystals are then deposited into the matrix to form bone.
GS cells (biology)
osteoblasts
RT bone demineralization bone mineral content bones cytogenesis fibroblasts osteoporosis

pathological cell death
USE necrosis
PDE (engines)
USE pulse detonation engines
PDRE (engines)
USE pulse detonation engines
PDS (spectroscopy)
USE photothermal deflection spectroscopy
PDW (engines)
USE pulse detonation engines

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

photoresists

(added June 2000)
DEF Photosensitive substances that are either rendered soluble or insoluble to chemical etchants when exposed to light, and are used in transferring circuit patterns in the production of integrated circuits.
RT etching integrated circuits microelectronics photolithography photomasks polymers photosensitivity

photothermal deflection spectroscopy

(added November 1998)
UF PDS (spectroscopy)
GS spectroscopy
... photothermal deflection spectroscopy
RT optical measurement photoacoustic spectroscopy thermal diffusivity thermal lensing

piezoelectric actuators
USE piezoelectric actuators

piezoelectric actuators

(added January 2001)
DEF Any actuator that uses the piezoelectric effect as a basis for its function.
UF piezoelectric motors GS actuators
... piezoelectric actuators
electromechanical devices
... piezoelectric actuators RT active control microelectromechanical systems piezoelectric motors piezoelectric transducers smart materials smart 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 RT microelectromechanical systems micromotors piezoelectric actuators piezoelectric transducers ultrasonic wave transducers
development of pulse detonation engines

Pleistocene epoch

(added May 2001)
DEF Geologic epoch of the Quaternary period extending from about two million years ago to about 10,000 years ago and covering the last ice age.
GS Cenozoic Era
... Quaternary period Pleistocene epoch
RT geochronology Holocene epoch

PML (electromagnetism)
USE perfectly matched layers

Polar Plasma Laboratory
USE Polar/GGS spacecraft

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. Polar (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 scientific satellites

Polar/GGS spacecraft

RT auroras Earth ionosphere Earth magnetosphere geomagnetism

PIIT (rocket engines)
USE pulsed inductive thrusters

planet X
USE hypothetical planets

planetary oceans
USE extraterrestrial oceans

Planet-B spacecraft
USE Nozomi Mars Orbiter

Pleistocene epoch

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. Polar (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 scientific satellites

Polar/GGS spacecraft

RT auroras Earth ionosphere Earth magnetosphere geomagnetism
plasma waves
polar cusps
solar terrestrial interactions
solar wind
space plasmas
space weather
Wind/GSS spacecraft

Population III stars 
(added July 1999)
UF primordial stars
GS celestial bodies
stars
Population III stars
RT cosmology
dark matter
radiation
stellar evolution
supernova stars

PPT (rocket engines)
USE pulsed plasma thrusters

pressure receptors
USE baroreceptors

pressure sensitive paints
USE baroreceptors

prevention
USE Population III stars

programmed cell death
USE apoptosis

proportional navigation
(added 1998)
GS navigation
proportional navigation
RT homing
interception
line of sight

proportional control
proportional control
rendezvous guidance
terminal guidance

proton-antiproton interactions
(added June 1999)
GS particle interactions
elementary particle interactions
proton-antiproton interactions
RT annihilation reactions
antiprotons
high energy interactions
magnetic-matter propulsion

protoplanetary disks
(added March 2001)
DEF Circumstellar disks from which planetary systems are created during star formation.
RT accretion disks
planetary evolution
planets
protoplanets
solar system evolution
stellar envelopes
stellar evolution

pulsed plasma thrusters
(added April 2001)
DEF Electromagnetic propulsion devices in which electrical power is used to ablative, ionize, and electromagnetically accelerate plasma and molecules from a block of solid propellant material.
UF PPT (rocket engines)
GS engines
rocket engines
electric rocket engines
plasma engines
pulsed plasma thrusters
RT electromagnetic propulsion
plasma propulsion
spacecraft propulsion

pursuit-evasion games
(added October 1999)
GS games
pursuit-evasion games
RT differential games
evasive actions
interception
optimal control
pursuit tracking
trajectory optimization
zero sum games

quantum computers

quantum communication
(added March 2000)
DEF Any form of communication that depends on coherent quantum-mechanical effects (quantum interference or quantum entanglement) to transmit, protect or authenticate information, or to perform distributed computational tasks.
UF quantum computing
GS communication
RT quantum communication

quantum computation
(added March 2000)
DEF Any form of information processing that depends on coherent quantum-mechanical effects (quantum interference or quantum entanglement) to perform computational tasks.
UF quantum computing
GS computation
RT quantum computation

quantum mechanics
DEF Elementary particle interactions

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GS computation
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quantum mechanics
DEF Elementary particle interactions

quantum mechanics
DEF Any form of communication that depends on coherent quantum-mechanical effects (quantum interference or quantu
quantum cryptography

state over another in a liquid sample in an NMR machine.
GS data processing equipment
RT quantum computers

quantum computing
USE quantum computation

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 computer information security
quantum computation

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 \( h^2/4\pi e^2 \), 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 galvanomagnetic effects
RT electron gas
Hall effect
quantum Hall effect

quasi-biennial oscillation (added May 2001)
DEF A natural, quasi-periodic (2-2.5 years) oscillation of the zonal (east-west) stratospheric winds over the equatorial region. The quasi-biennial oscillation (QBO) affects stratospheric temperatures and trace gases (including ozone) and influences the response of the stratosphere to volcanic eruptions.
UF QBO (climatology)
GS oscillations
quasi-biennial oscillation
periodic variations
quasi-biennial oscillation
RT annual variations
atmospheric circulation
atmospheric temperature
climatology
El Nino
equatorial atmosphere
ozone
Southern Oscillation
tropical meteorology
zonal flow (meteorology)

Quaternary period (added May 2001)
DEF A period (sub-era) within the Cenozoic era, beginning about two million years ago and extending to the present. It is divided into two epochs—Holocene and Pleistocene.
GS Cenozoic Era
Quaternary period
Holocene epoch

R
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
Rayleigh fading
RT channels (data transmission)
mobile communication systems
multipath transmission
phase shift keying
radio signals
reception diversity

RBCC engines
USE rocket-based combined-cycle engines

red sprites
USE sprites (atmospheric physics)

Reissner-Mindlin plates
USE Mindlin plates

renewable energy (added December 1998)
GS renewable energy
geothermal energy utilization
hydroelectricity
tidepower
wind energy
windpower utilization
RT biocconversion
biomass energy production
clean energy
energy policy
energy sources
energy technology
geothermal energy conversion
hydrogen-based energy
ocean thermal energy conversion
solar energy conversion
waste utilization
waterwave energy conversion

Ringleb flow (added July 1998)
GS fluid flow
compressible flow
Ringleb flow
steady flow
Ringleb flow
two dimensional flow
Ringleb flow
RT critical flow
subsonic flow
transonic flow

rocket-based combined-cycle engines (added August 1999)
DEF A class of vehicles 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).
UF RBCC engines
GS engines
rocket engines
rocket-based combined-cycle engines
RT air breathing boosters
air breathing engines
hybrid propulsion
integral rocket ramjets
ramjet engines
single stage to orbit vehicles
spacecraft propulsion
supersonic combustion ramjet engines

goate planets
USE hypothetical planets

Rossi X Ray Timing Explorer
USE X Ray Timing Explorer

RXTE (satellite)
USE X Ray Timing Explorer

sample return missions (added March 2001)
DEF Space missions to collect material samples from interplanetary space, a planet, or other body and return the samples to Earth.
GS space missions
sample return missions
Mars sample return missions
Stardust Mission
RT samples
space exploration

satellite oceans
USE extraterrestrial oceans

scarf joints
(added March 1998)
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)
scarf joints
RT bolted joints
bonded joints
lap joints
metal joints
scarfing

scene generation (added July 1998)
GS imaging techniques
scene generation
RT computer graphics
flight simulation
image reconstruction
scientific visualization
target simulators
**screech tones**  
*(added March 1998)*  
DEF Discrete acoustic tones produced by imperfectly expanded supersonic jets. The phenomenon is a result of a resonant feedback condition involving downstream traveling shear-layer disturbances and upstream traveling acoustic waves.

**GS**
- elastic waves
- sound waves
- noise (sound)
- flow noise
- aerodynamic noise
- *screech tones*
- frequencies
- acoustic frequencies
- *screech tones*

**RT**
- aeroacoustics
- feedback
- jet aircraft noise
- jet mixing flow
- nozzle flow
- shear layers
- supersonic jet flow
- supersonic nozzles

**seaborgium**  
*(added May 1998)*  
GS chemical elements  
RT bohrium  
dubnium

**Sea-viewing Wide Field-of-view Sensor**  
*(added December 1998)*  
**UF SeaWiFS**  
**GS**
- ocean color scanner  
- *Sea-viewing Wide Field-of-view Sensor*

**RT**
- chlorophylls
- Coastal Zone Color Scanner
- ocean surface
- phytoplankton
- remote sensors
- satellite-borne instruments
- water color

**SeaWiFS**  
**USE Sea-viewing Wide Field-of-view Sensor**

**self assembly**  
*(added January 2001)*  
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
- *self assembly*

**RT**
- abiogenesis
- *assembly*
- chemical evolution
- fabrication
- micelles
- molecular biology
- molecular structure
- monomolecular films
- nanostructure (characteristics)
- nanotechnology
- synthesis (chemistry)

**sensitivity analysis**  
*(added February 2001)*  
DEF Study of how the variation in the output of a system model can be qualitatively or quantitatively apportioned to different input parameters, model structures, or calibration data.  
RT or analyzing
- design analysis
- design optimization
- error analysis
- factorial design
- optimization
- parameter identification
- parameterization
- shape optimization
- systems analysis

**Service Module (ISS)**  
*(added March 1998)*  
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 propulsion attitude control and reboost capability for the early station.

**UF**
- Zvezda Service Module

**GS**
- modules
- space station modules
- *Service Module (ISS)*

**RT**
- International Space Station
- life support systems

**SGR** *(astronomy)*

**USE** soft gamma repeaters

**shape optimization**  
*(added February 2001)*  
DEF Process of, or techniques for, determining values of shape design variables that minimize or maximize a selected object function while satisfying limiting constraints.

**GS**
- optimization
- design optimization
- *shape optimization*

**RT**
- aircraft design
- airfoil profiles
- design
- design analysis
- fineness ratio
- sensitivity analysis
- shape functions
- structural analysis
- structural design
- structural design criteria

**Shergotty Nakhlia Chassigny meteorites**

**USE**  
**SNC meteorites**

**Shuttle Superlightweight Tank**

**USE**  
**external tanks**

**propellant tanks**

**signal-processing-in-the-element detectors**

**USE**  
**infrared detectors**

**slenderness ratio**

**USE**  
**aspect ratio**

**SLWT** *(propellant tank)*

**USE**  
**external tanks**

**propellant tanks**

**SMARTS** *(image analysis)*

**USE**  
**spectral mixture analysis**

**soft gamma repeaters**

**smart materials**  
*(added March 1998)*  
DEF Engineered materials capable of responding to their environment to a significant degree, by virtue of intrinsic properties and/or built-in sensors/actuators. Applications of these materials include vibration suppression, isolation, precision positioning, damage detection, and tunable devices.

**UF** intelligent materials

**RT**
- actuators
- biomimetics
- composite materials
- electrorheological fluids
- electrostriction
- ferroelastic materials
- ferromagnetic materials
- magnetorheological fluids
- piezoelectric actuators
- piezoelectric ceramics
- sensors
- shape memory alloys
- smart structures
- vibration damping

**SNC meteorites**  
*(added March 1998)*  
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 first three known examples—Shergotty, Nakhlia, and Chassigny.

**UF**
- Martian meteorites

**GS**
- Shergotty Nakhlia Chassigny meteorites

**RT**
- chassignites
- Mars (planet)
- Mars surface
- nakhlites
- shergottites

**SOAC** *(electronics)*

**USE** systems-on-a-chip

**soft gamma repeaters**

**smart materials**  
*(added January 2000)*

DEF A class of x-ray source which emits repeating bright bursts of 'soft' or low-energy gamma rays, along with steady x-ray pulsations. By the end of 1999 only a handful of these sources had been identified in our galaxy and in the Large Magellanic Cloud. They are associated with supernova remnants and are thus apparently some kind of young neutron star. One theory holds that these stars are young magnetars (magnetically-powered neutron stars) Bright bursts occur when the evolving, ultra-strong magnetic field stresses the neutron star's solid crust to breaking, in a sudden starquake. X-ray pulsations are due to the rotation of the star, with its hot surface bright in x-rays.

**UF**
- SGR (astronomy)

**GS**
- celestial bodies
- stars
- neutron stars
- soft gamma repeaters
- x-ray stars

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17
solar nebula

(added June 2001)

DEF Clouds of gas and dust from which the Sun, planets, and other solar system bodies formed.

GS solar nebula

RT meteoritic composition
planetary evolution
protoplanets
protostars
solar system
stellar evolution

solar wind

solar flares

solar mass ejections

solar activity effects
space terrestrial interactions
space plasmas
weather

spacewalks

spectral mixture analysis

spectral response

spiral bevel gears

space station modules

space station structures
spacecraft modules

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 orbit environments
geomagnetism
ionospheric disturbances
magnetic disturbances
magnetic storms
Polar/GIS spacecraft radiation hazards
solar activity effects
solar terrestrial interactions
space plasmas
weather

spectraN

spectral mixture analysis

spectral sensitivity

sprites (atmospheric physics)

SPRITE detectors

stardust mission

starry chemistry

stellar evolution

solar nebula

(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 glow between 30 km and 80 km above ground, lasting tens of milliseconds, following large positive cloud-to-ground lightning strokes.

sprites (atmospheric physics)

spreadsheets

space shuttle

space tourism

space transportation

step leaders

(added August 1999)

GS electric current

... electric discharges
... lightning
... leaders (meteorology)
... stepped leaders

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

stellar matter

... Wild 2 comet

stellar seismology

stellar wind

stellar wind

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.

GS SWAS (satellite)

observatories
... astronomical observatories

... astronomical satellites

... Submillimeter Wave Astronomy Satellite

RT interstellar chemistry

... interstellar matter

... molecular clouds
spaceborne astronomy
star formation
submillimeter waves

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 Compton effect

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

SWAS (satellite)
USE Submillimeter Wave Astronomy Satellite
systems-on-a-chip
(added May 2001)
DEF Single electronic chips that incorporate the multiple functional elements comprising a complete system, usually including processor core, I/O subsystems, and memory elements, and may include mixed-signal and mixed-technology subsystems.
UF SOAC (electronics)
GS chips (electronics)
systems-on-a-chip
RT application specific integrated circuits
large scale integration
microworlds
microminiaturized electronic devices
RISC processors
systems integration

T
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

expensive design
multidisciplinary design optimization
optimization
parameter identification
reliability engineering
statistical analysis
total quality management
tensile structures
USE tensile structures

thermal lenses
USE thermal lensing
thermal lensing
(added November 1998)
UF thermal lenses
GS thermal lensing
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
teffects
heat transfer
sound waves
thermoacoustic refrigerators
thermophysical properties

thermoacoustic refrigerators
(added May 2000)
DEF Cooling 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 refrigeration 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 (liquid)
electromigration
interfacial tension
Marangoni convection
microgravity
space processing
temperature gradients
thermography

time domain analysis
(added April 1999)
GS analysis (mathematics)
time domain analysis
. . . finite difference time domain method
RT control systems design
dynamic response
parameter identification
signal processing
time response

time synchronization
(added December 1998)
GS synchronism
time synchronization
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
Titan 4B launch vehicle

application, the primary goal of this technology is the replacement of deficient organs.

GS bioengineering
tissue engineering
technologies
biotechnology

RT bioreactors
cells (biology)
cellstats
culture techniques
cytology
growth
histology
in vitro methods and tests
microgravity applications
organs
tissues (biology)

Titan 4B launch vehicle
(added October 1998)
GS launch vehicles
Titan launch vehicles
Titan 4 launch vehicle
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
space 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 Mission
TRACE satellite
GS artificial satellites
scientific satellites
Explorer satellites

Transition Region and Coronal Explorer
GS
small scientific satellites

GS

Transition Region and Coronal Explorer

RT chromosphere
SOHO Mission
solar atmosphere
solar corona
solar magnetic field
solar observatories
solar physics
solar transition region

transplutonic planets
USE hypothetical planets

transverse momentum
(added June 1999)
GS
momentum

RT
transverse momentum
angular momentum
elementary particle interactions
particle motion
transverse acceleration

Treffitz method
(added July 1998)
DEF Boundary-type approximation scheme for the solution of boundary value problems for partial differential equations.

UF Trefftz finite element method
GS analysis (mathematics)
numerical analysis
approximation
boundary element method

Treffitz method
RT bending theory
boundary conditions
boundary value problems
finite element method
partial differential equations
plate theory
structural analysis

TRMM satellite
(added May 1998)
DEF Satellite supporting the joint US–Japanese Tropical Rainfall Measuring Mission (TRMM) to explore tropical rainfall and its effects on the Earth energy budget, general circulation, and climate. The TRMM satellite represents the first dual deployment of a precipitation radar and passive microwave radiometer on an Earth–viewing satellite.

UF Tropical Rainfall Measuring Mission satellite
GS artificial satellites
meteorological satellites
TRMM satellite
scientific satellites
TRMM satellite

RT atmospheric circulation
Earth radiation budget
equatorial atmosphere
rain
Tropical Rainfall Measuring Mission satellite

Tropical Rainfall Measuring Mission

Transit Region and Coronal Explorer
GS

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
asteroids
Trojan asteroids
Jupiter (planet)
Lagrangian equilibrium points
three body problem
Trojan orbits

Tropical Rainfall Measuring Mission sat
USE TRMM satellite

U

Ukrainian space program
(added January 1999)
GS programs
space programs

RT Ukraine

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
sonic treatment
RT processing
ultrasonic treatment
ultrasonic cleaning
ultrasonics

ultrasonic treatment
USE ultrasonic processing

uncertain systems
(added June 2000)
DEF control systems design
control theory
fuzzy systems
linear systems
nonlinear systems
probability theory
systems

undercooking
USE supercooking

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

RT Integrated Truss Structure
International Space Station
spacecraft docking

US Laboratory Module (ISS)
USE Destiny Laboratory Module

V

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 hollow 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.

**VentureStar launch vehicle** *(added June 1999)*

**DEF** Reusable single-stage-to-orbit launch vehicle employing linear aerospike 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**
- maneuverable spacecraft
- aerospace planes
- **VentureStar launch vehicle**
- reusable spacecraft
- aerospace planes
- **VentureStar launch vehicle**
- soft landing spacecraft
- aerospace planes
- **VentureStar launch vehicle**
- commercial spacecraft
- X-33 reusable launch vehicle

**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

- teleconferencing
- **video conferencing**

**video communication**

**video teleconferencing**

**USE** video conferencing

**VLTA *(aircraft)***

**USE** very large transport aircraft

**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.

**GS** organic compounds

- volatile organic compounds

**RT** air pollution

- air quality
- contaminants
- exhaust emission
- indoor air pollution
- ozone
- photochemical reactions

**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

- Voronoi diagrams

**RT** computational geometry

- geometry
- grid generation (mathematics)
- image analysis
- partitions (mathematics)
- spatial distribution
- topology
- trajectory planning

**water sampling** *(added March 1998)*

**DEF** The process of obtaining a representative sample of water from any natural or artificial environment.

**GS** sampling

- water sampling

**RT** environmental monitoring

- ground water
- pollution monitoring
- sea water
- surface water
- water
- water pollution
- water quality

**wave generation**

**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.

**GS** rotating bodies

- rotors

**RT** wave rotors

- compression waves
- energy transfer
- engine parts
- gas dynamics
- gas generators
- gas turbine engines
- topping cycle engines
turbomachinery
- turbochafts

**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

**GS** particles

- elementary particles
- hypothetical particles

- weakly interacting massive particles

**RT** dark matter

- missing mass (astrophysics)
solar neutrinos

**web sites**

**USE** websites

**websites** *(added March 2001)*

**DEF** Locations on the World Wide Web providing a collection of linked resources, usually including a homepage, and prepared and maintained as a collection of information by a person, group, or organization.

**UF** web sites

**GS** resources

- Internet resources
- websites

**RT** electronic bulletin boards
electronic commerce
information dissemination
information resources management
information systems
internet
on-line systems
World Wide Web

**WG vehicles**

**USE** wing-in-ground effect vehicles

**Wild 2 comet** *(added March 1999)*

**DEF** Periodic comet, discovered January 1978, relatively new to the inner Solar System due
Wind/GGS spacecraft

Two of one NASA spacecraft in the Global Geospace Science (GGS) initiative and part of the International Solar Terrestrial Physics (ISTP) program. The main purpose of the Wind spacecraft is to measure the incoming solar wind, magnetic fields and particles, although early in its mission Wind observed the Earth foreshock region. The spacecraft was launched in November 1994. GS artificial satellites - geophysical satellites. . Wind/GGS spacecraft - scientific satellites. . Wind/GGS spacecraft - scientific satellites. . Wind/GGS spacecraft - scientific satellites.


wing-body configurations

USE body-wing and tail configurations.

wing-body configurations

USE body-wing configurations.

wing–in–ground effect vehicles

(added December 1999) DEF Vehicles designed to fly about half their mean chord above the surface, taking advantage of the reduced drag and increased lift caused by ground effect. These vehicles, also known as WIGs or WIGEs, normally operate above a water surface. UF ekranoplanes. WIG vehicles. GS ground effect machines. wing–in–ground effect vehicles.

RT ground effect (aerodynamics). Surface effect ships.

X

X Ray Multi–Mirror Mission

USE XMM–Newton telescope.

X–32 aircraft

(added October 1998) DEF Experimental supersonic strike fighter developed to be configured as a conventional or short takeoff/vertical landing vehicle. Developed as part of the Joint Strike Fighter (JSF) program. GS Boeing aircraft.

- X–32 aircraft
- jet aircraft.
- X–32 aircraft
- research vehicles.
- research aircraft.
- X–32 aircraft
- supersonic aircraft.

X–35 aircraft

VSTOL aircraft.

X–32 aircraft

X–35 aircraft

(added October 1999) DEF Experimental strike fighter incorporating a vertical lift fan for short takeoff/vertical landing capability. Developed as part of the Joint Strike Fighter (JSF) program. GS jet aircraft.

- X–35 aircraft
- Lockheed aircraft.
- X–35 aircraft
- research vehicles.
- research aircraft.
- X–35 aircraft
- VSTOL aircraft.

X–35 aircraft

X–37 vehicle

(added March 2000) DEF NASA/Boeing experimental space plane developed to demonstrate airframe, propulsion, and operations technologies for reduced–cost reusable launch vehicles. The unflown X–37 can be carried into orbit by the Space Shuttle or launched by an expendable rocket, and flies in both orbital and reentry environments, operating at speeds up to 25 times the speed of sound.

GS aerospace vehicles.

- aerospace planes.
- X–37 vehicle.
- hypersonic vehicles.
- X–37 vehicle.
- maneuverable spacecraft.
- aerospace planes.
- X–37 vehicle.
- reentry vehicles.
- recoverable spacecraft.
- reusable spacecraft.
- aerospace planes.
- X–37 vehicle.
- research vehicles.

RT reusable launch vehicles.

spacecraft.

X–43 vehicle

(added September 1999) DEF The experimental research vehicle of the NASA hyper–M 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.
- hypersonic flight.

RT Pegasus air-launched booster. X–43 vehicle.

super sonic 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.

XMM (telescope).

GS artificial satellites.

- ESA satellites.
- XMM–Newton telescope.
- scientific satellites.
- astronomical satellites.
- XMM–Newton telescope.

ESA spacecraft.

- ESA satellites.
- XMM–Newton telescope.

observatories.

- astronomical observatories.
- astronomical satellites.
- XMM–Newton telescope.

telescopes.

- spaceborne telescopes.
- XMM–Newton telescope.

x ray telescopes.

- 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 Ukraine under contract to the U.S. and is owned by the U.S.

GS modules.

- space station 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).

X–32 aircraft

VSTOL aircraft.

X–32 aircraft

VSTOL aircraft.

X–32 aircraft

VSTOL aircraft.
NASA THESAURUS SUPPLEMENT

PART 2
ROTATED TERM DISPLAY

A

systems-on-a-chip
Lorentz force
access
ACE satellite
use Advanced Composition Explorer
piezoelectric actuators
carrier sense multiple access
concurrent memory
use associative memory
Darkstar unmanned aerial vehicle
use pilotless aircraft
reconnaissance aircraft
machine aided indexing
Boeing 717 aircraft
use very large transport aircraft
VLTA X-32 aircraft
Euler-Bernoulli beams
aluminum iron
AM-1 (EOS) spacecraft
use Terra spacecraft
EOS AM-1 spacecraft
use Terra spacecraft
AMS (spectrometer)
use Alpha Magnetic Spectrometer
Boeing 717 airplane
very large transport aircraft
VeGA (astronomy)
use Submillimeter Wave Astronomer Satellite
Chandra X Ray satellite
use X Ray Astrophysics Facility
Large Antenna
Cosmic Microwave Background
use cosmic microwave background radiation
BaroReceptor
reflex
use baroreflexes
baroreceptors
Based Combined-Cycle Engines
use barocycle engines
beam theory
use Euler-bernoulli beams
Euler-Bernoulli beams
beams
use Euler-Bernoulli beams
Euler-Bernoulli beam
theory
use Euler-Bernoulli beams
Euler-Bernoulli beams
bevel gears
bevel gears
biennial oscillation
biomass burning
biomimetics
Blot-Savart law
blended-wing-body configurations

B

Planet- B spacecraft
use Nozomi Mars Orbiter
Cosmic Microwave Background
radiation
use cosmic microwave background radiation
kink
baroReceptor
reflex
use baroreflexes
baroreceptors
rocket lithium
batteries
Euler-Bernoulli beam
theory
use Euler-Bernoulli beams
Euler-Bernoulli beams
beams
use Euler-Bernoulli beams
Euler-Bernoulli beam
theory
use Euler-Bernoulli beams
Euler-Bernoulli beams
bevel gears
bevel gears
biennial oscillation
biomass burning
biomimetics
Blot-Savart law
blended-wing-body configurations
**D**

Darkstar unmanned aerial vehicle
- use pilotless aircraft
- reconnaissance aircraft

Data mining
- death
- use necrosis

Deep Space 1 Mission
- programmed cell death
- use apoptosis
- Delta 3 launch vehicle
- Delta 4 launch vehicle
- dendrimers
- dendritic polymers
- use dendrimers
- design optimization
- Destiny Laboratory Module
- detectors
- use infrared detectors

SPRITE
- detectors
- use infrared detectors
- orbit determination
- pulse detonation engines
- pulse detonation wave engines
- use pulse detonation engines
- cascade devices
- MEMS (electromechanical devices)
- use microelectromechanical systems
- Voronoi diagrams
- dielectric loss
- dielectric waveguides
- finite difference time domain method
- differential games
- digital cameras
- cloud-to-cloud discharges
- cloud-to-ground discharges
- intracloud discharges
- knowledge discovery
- use data mining
- disks
- document indexing
- use indexing (information science)
- frequency domain analysis
- domain analysis
- finite difference time domain method
- use antiphase boundaries
- DS1 (space mission)
- use Deep Space 1 Mission
- dubnium
- dusty plasmas

**E**

E-commerce
- use electronic commerce
- e-mail
- use electronic mail
- EAM (physical chemistry)
- use embedded atom method
- EAP (polymers)
- use electroactive polymers

Josephson effect
- quantum Hall effect
- S-Z effect
- use Sunyaev-Zeldovich effect
- wing-in-ground thermoacoustic effect vehicles
- effects
- use wing-in-ground effect vehicles
- electroactive polymers
- electrochemical synthesis
- electromagnetic rocket engines
- use plasma engines
- PML (electromagnetism)
- use perfectly matched layers
- MEMS (electromechanical devices)
- use microelectromechanical systems
- electronic commerce
- electronic structure
- QHE (electronics)
- use quantum Hall effect
- SOAC (electronics)
- use systems-on-a-chip
- electroosynthesis
- use electrochemical synthesis
- signal-processing-in-the-element
- element detectors
- element method
- use finite element method
- Trefftz method
- transition elements (chemistry)
- use transition metals
- elves
- embedded atom method
- modified embedded atom method
- use embedded atom method
- enantiomeric compounds
- use enantiomers
- enantiomorphs
- use enantiomers
- exergetic energy
- use exergy
- renewable energy
- tissue engineering
- electromagnetic rocket engines
- use plasma engines
- FDE (engines)
- use pulse detonation engines
- PDRE (engines)
- use pulse detonation engines
- PDWE (engines)
- use pulse detonation engines
- PIT (rocket engines)
- use pulsed inductive thrusters
- PPT (rocket engines)
- use pulsed plasma thrusters
- pulse detonation engines
- pulse detonation wave engines
- use pulse detonation engines
- pulsed arcjet engines
- use pulsed jet engines
- RBCC engines
- use rocket-based combined-cycle engines
- rocket-based combined-cycle engines
- environmental cleanup
- Envisat-1 satellite
AM-1 (EOS) spacecraft
use Terra spacecraft
EOS AM-1 spacecraft
use Terra spacecraft
Holocene epoch
Pleistocene epoch
Ethernet
Euler–Bernoulli beam theory
use Euler–Bernoulli beams
evenant waves
pursuit-evasion games
exergic energy
use exergy
exoplanets
use extrasolar planets
exosolar planets
use extrasolar planets
Advanced Composition Imager for Magnetopause-to-Aurora Global Explorer
use IMAGE satellite
Rossi X Ray Timing Explorer
use X Ray Timing Explorer
Transition Region and Coronal Explorer
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
knowledge extraction
use data mining
extraterrestrial oceans
Chandra X Ray Astrophysics Facility
use X Ray Astrophysics Facility
Rayleigh fading
FDTD (mathematics)
use finite difference time domain method
heavy fermion superconductors
heavy fermion systems
ferroelastic materials
ferroelasticity
fiber pushout
Sea-viewing Wide Field-of-view Sensor
field-programmable gate arrays
field tests
Gabor filters
finite difference time domain method
hybrid-Trefftz
finite element method
use finite element method
Trefftz method
in-flight simulation
flow
flow noise
magnetorheological fluids
flying wing configurations
use blended-wing-body configurations
Lorentz force accelerator thrusters
use magnetoplasmadynamic thrusters
free-space optical communication
free-space optical interconnects
frequency domain analysis
FSOI (integrated optics)
use free-space optical interconnects
fullerides
membership functions
FUSE (satellite)
use Far UV Spectroscopic Explorer
blended-wing-body fuselage
fuselage-wing stores
use wing-fuselage stores
fusion propulsion
Gabor filters
Gabor transformation
antenna gain differential games games games
differential games games
soft gamma repeaters
gate arrays
gears
gears
generation
Next Generation Space Telescope project
Genesis mission
Polar/GPS spacecraft
GGS spacecraft
Gravitational-Wave Observatory
use LIGO (observatory)
greedy algorithms
ground discharges
ground effect vehicles
group technology (manufacturing)
H-2 control
Hale-Bopp comet
quantum Hall effect
Hall resistance
Hall thrusters
massive compact halo objects
halon
hardware-in-the-loop simulation
hardware-in-the-loop tests
use hardware-in-the-loop simulation
Harper ratings
hassium
head up tilt
health and usage monitoring systems
use systems health monitoring
heavy fermion superconductors
heavy fermion systems
heavy metals
hindcasting
hindlimb suspension
hindlimb unloading
use hindlimb suspension
Holocene epoch
HUT (physiology)
use head up tilt
hybrid–Trefftz finite element method
use finite element method
Trefftz method
hydrophobicity
hyperbranched polymers
use dendrimers
hypergravity
use high gravity environments
hypogravity
use microgravity
hypothetical particles
(hypothetical planet)
use hypothetical planets
hypothetical planets
ICP-MS (spectrometry)
use inductively coupled plasma mass spectrometry
LA-ICP-MS (spectrometry)
III stars
(image analysis)
use spectral mixture analysis
IMAGe satellite
Image for Magnetopause-to-Aurora Global Explorer
use IMAGe satellite
total population
Variable Specific
normalized difference vegetation
automatic
indexing
use indexing (information science)
document indexing
use indexing (information science)
machine aided
indexing
use indexing (information science)
laser-pulsed
indexing
use indexing (information science)
laser-pulsed
induced breakdown spectroscopy
inductive thrusters
inductively coupled plasma mass spectrometry
inflight simulation
use in-flight simulation
information analysis
(Information science)
(integrated optics)
use free-space optical interconnects
Integrated Truss Structure Z1
intensity structures
use tensegrity structures
intelligent materials
use smart materials
interacting massive particles
interactions
interannual variations
use annual variations
intercalibration
interconnects
interconnects
interference
Laser
Interferometer Gravitational-Wave Observatory
use LIGO (observatory)
Laser
Interferometer Space Antenna
use LISA (observatory)
intracloud discharges
intrasessional oscillations
use intraseasonal variations
intrasessional variations
ion optics
Iridium network
Iridium satellites
use communication satellites
Iridium network
iron aluminides
Service Module
US Laboratory Module
ISS (space station)
use International Space Station
Java (programming language)
scafe
Josephson effect
Josephson tunneling
use Josephson effect
Madden–Julian Oscillation
kink bands
kinking
knowledge discovery
use data mining
knowledge extraction
use data mining
LA-ICP-MS (spectrometry)
use inductively coupled plasma mass spectrometry
Polar Plasma Laboratory
use Polar/GGS spacecraft
Destiny Laboratory Module
use Destiny Laboratory Module
Mars Polar Lander
use Mars Polar Lander
Lander
landing sites
Langmuir monolayers
use monomolecular films
Java (programming language)
mark up
languages
use document markup languages
very large transport aircraft
laser-induced breakdown spectroscopy
Laser

Laser Interferometer
Gravitational-Wave Observatory
use LIGO (observatory)

Laser Interferometer Space Antenna
use LISA (observatory)

laser spark spectroscopy
use laser-induced breakdown spectroscopy

LASS (spectroscopy)
use laser-induced breakdown spectroscopy

Delta 3 launch vehicle
Delta 4 launch vehicle
Titan 4B launch vehicle
VentureStar launch vehicle
Long March launch vehicles
Zenit launch vehicles

Laves phases

Biot-Savart law
perfectly matched stepped thermal lens

thermal lensing
use thermal lensing

thermal LFA thrusters
use magnetoplasmadynamic thrusters

LIBS (spectroscopy)
use laser-induced breakdown spectroscopy

LIGO (observatory)
LISA (observatory)
lithium batteries
Long March launch vehicles
loop simulation
loop tests

Lorentz force accelerator thrusters
use magnetoplasmadynamic thrusters
dielectric loss
Lunar Prospector

M

machine aided indexing
use indexing (information science)

machines
use clinostats

MACHOs (astronomy)
use massive compact halo objects

Madden–Julian Oscillation
magnetars
magnetic nozzles

Alpha Imager for Shergotty Nakhla Chassigny

Magnetoplasma Rocket
use VASIMR (propulsion system)
magnetoplasmadynamic thrusters
magnetotheriological fluids
magnetostratigraphy

e-mail
use electronic mail

maintenance

Mars Odyssey
Mars Orbiter
Mars Polar Lander
Mars Surveyor 98 Lander
Mars Surveyor 98 Orbiter
Mars Surveyor 98 Program
Mars Surveyor 2001 Mission
Martian meteorites

mass spectrometry
massive compact halo objects
massive particles
matched layers

APB (materials)
use antiphase boundaries

ferroelastic materials
intelligent materials
use smart materials

smart materials

FDTD (mathematics)
use finite difference time domain method

MEAM (physical chemistry)
use embedded atom method

Measuring Mission sat
use TRMM satellite

meitnerium

memory
use associative memory

MEMS (electromechanical devices)
use microelectromechanical systems

heavy metals
use SNC meteorites

Shergotty Nakhla Chassigny meteorites

SNC meteorites

MJO (meteorology)
use Madden-Julian Oscillation method

finite difference time domain method

Godunov method
hybrid-Trefftz finite element method

modified embedded atom method
use embedded atom method

TREfftz methods
methods and tests
MGS (spacecraft)
use Mars Global Surveyor
micelles
microfluidic
microelectromechanical systems
microsats
microsatellites
micosats
use microsatellites
cosmic microwave background radiation
thermocapillary
migration
Mindlin plate theory
Mindlin plates
Reissner-
Mindlin plates
use Mindlin plates
data mining
X Ray Multi-
Mirror Mission
use XMM-Newton telescope
deformable mirrors
mischmetal
CONTOUR (mission)
use Comet Nucleus Tour
Deep Space 1
Mission
use Deep Space 1 Mission
Genesis
Mission
use XMM-Newton telescope
Mars Surveyor 2001
Mission
use XMM-Newton telescope
Stardust
Mission
use XMM-Newton telescope
Tropical Rainfall Measuring
Mission
sat
use TRMM satellite
Mars
missions
missions
mixture analysis
MJO (meteorology)
use Madden-Julian Oscillation
MMH (chemistry)
use monomethylhydrazines
modified embedded atom method
use embedded atom method
Destiny Laboratory Module
use Service Module (ISS)
Service Module (ISS)
use Destiny Laboratory Module
space station modules
momentum monitoring systems
use systems health monitoring
Langmuir monolayers
use monomolecular films
monomethylhydrazines
piezoelectric motors
use magnetoplasmadynamic thrusters
ICP-Ion MS (spectrometry)
use inductively coupled plasma mass spectrometry
LA-ICP-MS (spectrometry)
use XMM-Newton telescope
carrier sense multiple access
mutagenesis
N
nacelle wing configurations
use wing nacelle configurations
Shergotty
Nakhla Chassigny meteorites
use SNC meteorites
nanocomposites
nanosatellites
nanosats
use nanosatellites
nanotechnology
nanotubes
nanotubules
use nanotubes
proportional navigation
NDVI (remote sensing)
use normalized difference vegetation index
protosolar nebulae
use solar nebulae
solar nebulae
necrosis
bindium
XMM-Newton telescope
Next Generation Space Telescope project
NGST project
use Next Generation Space Telescope project
flow noise
normalized difference vegetation index
Nozomi Mars Orbiter
nozzles
magnetic chain reactions
Comet
Nucleus Tour
number

massive compact halo
Laser Interferometer Gravitational-Wave Observatory
use LIGO (observatory)
LIGO (observatory)
extraterrestrial planetary oceans
use extraterrestrial oceans
oceans
use extraterrestrial oceans
2001 Mars Odyssey
commercial systems
on-a-chip
opinion ratings
use pilot ratings
free-space optical communication
free-space optical interconnects
FSOI (integrated circuit design)
use free-space optical interconnects
optics
optimization
optimization
orbit determination
Orbiter
Orbiter
use Mars Climate Orbiter
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orbiter</td>
<td>(organic chemistry) use volatile organic compounds</td>
</tr>
<tr>
<td>Nozomi Mars VOC</td>
<td></td>
</tr>
<tr>
<td>Volatile</td>
<td></td>
</tr>
<tr>
<td>Madden-Julian Quasi-biennial Intraseasonal</td>
<td>use intraseasonal variations</td>
</tr>
<tr>
<td>Oscillation</td>
<td></td>
</tr>
<tr>
<td>Oscillation</td>
<td></td>
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<tr>
<td>Oscillations</td>
<td>use intraseasonal variations</td>
</tr>
<tr>
<td>Organic</td>
<td></td>
</tr>
<tr>
<td>compounds</td>
<td></td>
</tr>
<tr>
<td>Pressure sensitive paints</td>
<td>use pressure sensitive paints</td>
</tr>
<tr>
<td>PSP</td>
<td></td>
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<tr>
<td>Hypothetical</td>
<td>weakly interacting massive</td>
</tr>
<tr>
<td>Veins</td>
<td></td>
</tr>
<tr>
<td>Quaternary</td>
<td></td>
</tr>
<tr>
<td>Phaethon</td>
<td>Use hypothetical planets</td>
</tr>
<tr>
<td>Phobos spacecraft</td>
<td></td>
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<tr>
<td>Photoresists</td>
<td></td>
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<tr>
<td>Photothermal deflection spectroscopy</td>
<td></td>
</tr>
<tr>
<td>EAM</td>
<td>(physical chemistry) use embedded atom method</td>
</tr>
<tr>
<td>MEAM</td>
<td>(physical chemistry) use embedded atom method</td>
</tr>
<tr>
<td>Chain reactions</td>
<td>(nuclear)</td>
</tr>
<tr>
<td>Sprites</td>
<td>(atmospheric)</td>
</tr>
<tr>
<td>HUT</td>
<td>Use head up tilt</td>
</tr>
<tr>
<td>Piezoelectric actuators</td>
<td>use piezoelectric actuators</td>
</tr>
<tr>
<td>Piezoelectric motors</td>
<td></td>
</tr>
<tr>
<td>Piezomotors</td>
<td>use piezomotors</td>
</tr>
<tr>
<td>Pilot opinion ratings</td>
<td>use pilot ratings</td>
</tr>
<tr>
<td>Pilot ratings</td>
<td></td>
</tr>
<tr>
<td>PIT</td>
<td>(rocket engines) use pulsed inductive thrusters</td>
</tr>
<tr>
<td>Mars Surveyor 98</td>
<td>Ukrainian space field</td>
</tr>
<tr>
<td>SLW</td>
<td>(propellant tank) use external tanks.propellant tanks</td>
</tr>
<tr>
<td>Java</td>
<td>(programming language)</td>
</tr>
<tr>
<td>Next Generation Space Telescope</td>
<td>Next Generation Space Telescope project</td>
</tr>
<tr>
<td>NGST</td>
<td></td>
</tr>
<tr>
<td>COTS</td>
<td>use commercial off-the-shelf products</td>
</tr>
<tr>
<td>Program</td>
<td></td>
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<tr>
<td>Programmable gate arrays</td>
<td></td>
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<td>Mars Prospector</td>
<td></td>
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<td>Proton-antiproton interactions</td>
<td></td>
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<tr>
<td>Prospector</td>
<td></td>
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<tr>
<td>Protoplanetary disks</td>
<td></td>
</tr>
<tr>
<td>Protosolar nebula</td>
<td>use solar nebula</td>
</tr>
</tbody>
</table>
PSP (paints) use pressure sensitive paints
pulse detonation engines
pulse detonation wave engines use pulse detonation engines
pulsed arcjet engines use pulsed jet engines
pulsed inductive thrusters
pulsed plasma thrusters
pursuit-evasion games

Q
QBO (climatology) use quasi-biennial oscillation
QHE (electronics) use quantum Hall effect
quantum communication
quantum computation
quantum computers
quantum computing
use quantum computation
quantum cryptography
quantum Hall effect
quasi-biennial oscillation
Quaternary period

R
cosmic microwave background
Rainfall Measuring Mission sat use TRMM satellite
random positioning machines use clinostats
Cooper-Harper pilot ratings
Cooper-Harper pilot opinion
slenderness ratio
radiation
Rayleigh fading
RBCC engines use rocket-based combined-cycle engines
chain reactions (chemistry)
chain reactions (nuclear physics)
red sprites
use sprites (atmospheric physics)
baroreceptor reflexes
use baroreflexes
thermoelectric refrigerators
Transition Region and Coronal Explorer
Reissner-Mindlin plates use Mindlin plates
NDVI (remote sensing) use normalized difference vegetation index

S
S-Z effect use Sunyaev-Zeldovich effect
sampling
water
Tropical Rainfall Measuring Mission sat use TRMM satellite
ACE sat
Envisat-1 sat
Explorer 71 sat
Explorer 73 sat
Explorer 74 sat
Explorer 77 sat
Explorer 78 sat
Explorer 79 sat
FUSE (satellite) use Far UV Spectroscopic Explorer
IMAGE (satellite) use Far UV Spectroscopic Explorer
RXTE (satellite) use X Ray Timing Explorer
Submillimeter Wave Astronomy Satellite use Submillimeter Wave Astronomy Satellite
TRACE sat
TRMM sat
satellite oceans use extraterrestrial oceans
Iridium satellites use communication satellites Iridium network

Biot- Savart law

indexing (information science)

Sea-viewing Wide-Field-of-view Sensor

seaborgium

SeaWiFS use Sea-viewing Wide-Field-of-view Sensor

stellar seismology use asteroseismology self assembly

carrier sense multiple access

NDVI (remote sensing) use normalized difference vegetation index

pressure sensitive paints sensitivity analysis

Sea-viewing Wide-Field-of-view Sensor Service Module (ISS) use Service Module (ISS) SGR (astronomy) use soft gamma repeaters shape optimization

commercial off-the-shelf products

Shergotty Nakhlia Chassigny meteorites use SNC meteorites shields use anticoincidence detectors

Shuttle Superlightweight Tank use external tanks propellant tanks signal-processing-in-the-element detectors use infrared detectors

hardware-in-the-loop simulation in-flight

simulation in-flight use in-flight simulation

Mars landing site use websites slenderness ratio use aspect ratio

SLWT (propellant tank) use external tanks propellant tanks

SMA (image analysis) use spectral mixture analysis smart materials

SNC meteorites SOAC (electronics) use systems-on-a-chip soft gamma repeaters solar nebula sonochemistry use ultrasonic processing

Deep Laser Interferometer use LISA (observatory) DS1 (space mission) use Deep Space 1 Mission

free-space optical communication free-space optical interconnects

Ukrainian space program ISS (space station) use International Space Station space station modules

Next Generation Space Telescope project AM-1 (EOS) spacecraft use Terra spacecraft EOS AM-1 spacecraft use Terra spacecraft

MGS (spacecraft) use Mars Global Surveyor Phobos spacecraft Planet-B spacecraft use Nocnzi Mars Orbiter Polar/GGS spacecraft Terra spacecraft Wind/GGS spacecraft spacewalks use extravehicular activity laser spark spectroscopy use laser-induced breakdown spectroscopy Variable Specific Impulse Magnetoplasma Rocket use VASIMR (propulsion system) spectral mixture analysis spectral response use spectral sensitivity

Alpha Magnetic Spectrometer AMS (spectrometer) use Alpha Magnetic Spectrometer ICP-MS (spectrometry) use inductively coupled plasma mass spectrometry inductively coupled plasma mass spectrometry LA-ICP-MS (spectrometry) use inductively coupled plasma mass spectrometry

laser spark spectroscopy use laser-induced breakdown spectroscopy

laser-induced breakdown spectroscopy LASS (spectroscopy) use laser-induced breakdown spectroscopy LIBS (spectroscopy) use laser-induced breakdown spectroscopy

PDS (spectroscopy) use photothermal deflection spectroscopy photothermal deflection spectroscopy

spiral bevel gears spreadsheets SPRITE detectors use infrared detectors

red sprites use sprites (atmospheric physics) sprites (atmospheric physics) Stardust Mission Population III stars
Trefftz hybrid-

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
Integrated Josephson tunneling
use Josephson effect

U

Ukrainian space program
ultrasonic processing
ultrasonic treatment
use ultrasonic processing
uncertain systems
undercooling
use supercooling
Unity connecting module
hindlimb unloading
use hindlimb suspension
Darkstar unmanned aerial vehicle
use piloted aircraft
reconnaissance aircraft
head up tilt
US Laboratory Module (ISS)
use Destiny Laboratory Module
health and usage monitoring systems
use systems health monitoring

V

Variable Specific Impulse
Magnetoplasma Rocket
use VASIMR (propulsion system)
interannual variations
use annual variations
intraseasonal variations
VASIMR (propulsion system)
normalized difference
Darkstar unmanned aerial vehicle
use piloted aircraft
reconnaissance aircraft

Vehicle

Delta 3 launch
Delta 4 launch
Titan 4B launch
VentureStar launch
X-37
X-43
Long March launch
WIG

Wing-in-ground effect
Zenit launch

Sea-viewing Wide Field-of-

W

water sampling
Wave Astronomy Satellite
wave engines
use pulse detonation engines
Laser Interferometer Gravitational-
corrugated dielectric
evanescent waves
weakly interacting massive particles
space
web sites
Wide Field-of-view Sensor
WIG vehicles
use wing-in-ground effect vehicles
Wild 2 comet
WIMPs (astronomy)
use weakly interacting massive particles
Wind/GGS spacecraft
wing-body and tail configurations
use body-wing and tail configurations
wing-body configurations
use body-wing configurations
blended-wing configurations
use blended-wing-body configurations
nacelle wing configurations
use wing nacelle configurations
blended-wing-fuselage
wing-in-ground effect vehicles
fuselage wing stores
use wing-fuselage stores

X

planet X
use hypothetical planets
X-32 aircraft
X-35 aircraft
X-37 vehicle
X-43 vehicle
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
XMM-Newton telescope
XMM (telescope)
use XMM-Newton telescope
Z

S-

Integrated Truss Structure

Z

Z effect
use Sunyaev-Zeldovich effect

Z1

Z1 truss structure
use Integrated Truss Structure Z1

Zarya control module

Sunyaev-Zeldovich effect

Zenit launch vehicles

zero sum games

Zvezda Service Module
use Service Module (ISS)
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.