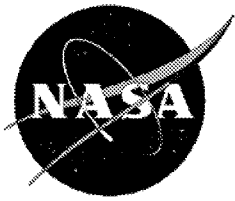


NASA/SP—2001-7501/SUPPL7



NASA THESAURUS SUPPLEMENT

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

July 2001

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NASA/SP—2001–7501/SUPPL7

NASA THESAURUS SUPPLEMENT

A three-part cumulative update of the
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**National Aeronautics and
Space Administration**

July 2001

Available from:

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Introduction

This Supplement is a cumulative update to the 1998 edition of the *NASA Thesaurus* (NASA/SP—1998–7501). The update includes all new terms and associated hierarchies added between the cut-off for the 1998 edition (December 1997) through June 30, 2001. Parts 1 and 2 of this *Supplement* correspond to Volumes 1 and 2 of the printed edition of the *NASA Thesaurus*. Supplements are normally published every six months.

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

Display elements comprising the hierarchical listing are as follows:

Display Element	Notation
Generic Structure	GS
Related Term	RT
Use	USE
Use For	UF
Scope Note	SN
Definition	DEF
Array Terms	∞

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

NASA THESAURUS SUPPLEMENT

PART 1 HIERARCHICAL LISTING

A

2001 Mars Odyssey

(added May 2001)

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
 - . 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**

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
 - . scientific satellites
 - . . . Explorer satellites
 - . . . **Advanced Composition Explorer**
- RT energetic particles
 - galactic cosmic rays
 - interplanetary medium
 - solar corpuscular radiation
 - solar cosmic rays
 - solar wind
 - space weather

aeroshells

(added May 1999)

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

- GS aerodynamic configurations
 - . **aeroshells**
- RT aeromaneuvering
 - nose cones
 - reentry vehicles

spacecraft design
spacecraft shielding
spacecraft structures

Alpha Magnetic Spectrometer

(added June 1998)

- UF *AMS (spectrometer)*
- GS measuring instruments
 - . spectrometers
 - . . . **Alpha Magnetic Spectrometer**
- RT antimatter
 - Cerenkov counters
 - cosmic rays
 - dark matter
 - International Space Station
 - interstellar matter
 - magnetic spectroscopy
 - space station payloads
 - spaceborne astronomy

AM-1 (EOS) spacecraft

USE **Terra spacecraft**

AMS (spectrometer)

USE **Alpha Magnetic Spectrometer**

anisoplanatism

(added May 1999)

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

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

antenna gain

(added June 1998)

- GS amplification
 - . **antenna gain**
- RT antennas
 - automatic gain control
 - directional antennas
 - effectiveness
 - high gain
 - signal reception

anticoincidence detectors

(added August 2000)

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

- UF *anticoincidence shields*
- RT background radiation
 - coincidence circuits
 - comparators

counting circuits
∞ detectors

- discriminators
- gamma ray spectrometers
- hodoscopes
- particle telescopes
- proportional counters
- radiation counters
- scintillation counters
- signal detectors
- trigger circuits

anticoincidence shields

USE **anticoincidence detectors**

antiphase boundaries

(added March 1998)

- UF *antiphase domains*
 - APB (materials)*
- GS boundaries
 - . **antiphase boundaries**
- RT binary alloys
 - crystal dislocations
 - crystal lattices
 - crystal structure
 - grain boundaries
 - interfacial energy
 - intermetallics
 - microstructure
 - order-disorder transformations
 - solid solutions
 - solid-solid interfaces
 - superlattices
 - ternary alloys

antiphase domains

USE **antiphase boundaries**

APB (materials)

USE **antiphase boundaries**

apoptosis

(added October 2000)

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
 - . **apoptosis**
- RT biological effects
 - cells (biology)
 - cytology
 - death
 - deoxyribonucleic acid
 - necrosis
 - radiation effects

associative memory

archaeomagnetism

USE **paleomagnetism**

associative memory

(added December 1999)

DEF A method or device for data storage in which data is identified by a part 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)

associative storage

USE **associative memory**

asteroseismology

(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
. **asteroseismology**
. . . helioseismology

RT astrometry
astronomical photometry
astrophysics
starquakes
stellar evolution
stellar interiors
stellar oscillations
stellar physics

automatic indexing

USE **indexing (information science)**

B

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 air pollution
climate change
combustion products
contaminants
deforestation
environment pollution
forest fires
man environment interactions
smoke

biomimetics

(added October 2000)

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

RT biochemistry
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
flying wing configurations

GS aerodynamic configurations
. body-wing configurations
. . **blended-wing-body configurations**

RT aircraft configurations
aircraft design
SR-71 aircraft
tailless aircraft

blended-wing-fuselage

USE **blended-wing-body configurations**

Boeing 717 aircraft

(added October 1998)

GS Boeing aircraft
. **Boeing 717 aircraft**
commercial aircraft
. **Boeing 717 aircraft**
jet aircraft
. turbofan aircraft
. . **Boeing 717 aircraft**
monoplanes
. **Boeing 717 aircraft**
passenger aircraft
. **Boeing 717 aircraft**
transport aircraft
. **Boeing 717 aircraft**

RT[∞] aircraft

bohrium

(added May 1998)

GS chemical elements
. **bohrium**

RT hassium
seaborgium

Bond number

(added December 1999)

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

GS dimensionless numbers
. **Bond number**

RT drops (liquids)
gravitational effects
interfacial tension
menisci

BWB configurations

USE **blended-wing-body configurations**

C

carrier sense multiple access

(added April 2000)

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

GS protocol (computers)
. **carrier sense multiple access**
telecommunication
. multiple access
. . **carrier sense multiple access**
transmission
. signal transmission
. . data transmission
. . . multiple access
. . . . **carrier sense multiple access**

RT communication networks
computer networks
Ethernet
local area networks
packet transmission

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**
electronic equipment

- . solid state devices
- . . . semiconductor devices
- **cascode devices**
- RT CMOS
 - field effect transistors
 - high electron mobility transistors
 - switching circuits
 - transistor amplifiers
 - transistor circuits
 - transistors

cellular manufacturing

USE **group technology (manufacturing)**

chain reactions (chemistry)

(added May 1999)

GS chemical reactions

- . **chain reactions (chemistry)**

RT chemical lasers

- combustion chemistry

chain reactions (nuclear physics)

(added May 1999)

GS nuclear reactions

- . nuclear fission
- . . . **chain reactions (nuclear physics)**

RT fission products

- neutrons

Chandra X Ray Astrophysics Facility

USE **X Ray Astrophysics Facility**

clamped structures

(added February 1998)

RT beams (supports)

- clamps
- composite structures
- joints (junctions)
- laminates
- plates (structural members)
- shells (structural forms)
- structural members
- structural vibration

∞ structures

clinorotation

(added July 2000)

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

UF *clinostat rotation*

- clinostating*

GS gyration

- . rotation

. . . **clinorotation**

RT centrifuging

- clinostats
- gravitational effects
- gravitational physiology
- microgravity
- rotating environments
- space environment simulation
- weightlessness
- weightlessness simulation

clinostat rotation

USE **clinorotation**

clinostating

USE **clinorotation**

clinostats

(added July 2000)

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

UF *random positioning machines*

- simulators

. environment simulators

- . . . space simulators

. . . **clinostats**

RT bioreactors

- centrifuges
- clinorotation
- gravitational effects
- gravitational physiology
- microgravity
- rotating environments
- space environment simulation
- tissue engineering
- weightlessness simulation

cloud-to-cloud discharges

(added August 1999)

GS electric current

- . electric discharges
- . . . lightning
- **cloud-to-cloud discharges**

cloud-to-ground discharges

(added August 1999)

GS electric current

- . electric discharges
- . . . lightning
- **cloud-to-ground discharges**

RT elves

- sprites (atmospheric physics)

CMBR (astronomy)

USE **cosmic microwave background radiation**

cochannel interference

(added April 2000)

DEF interference caused by multiple, simultaneous transmissions occurring in the same communication channel.

GS electromagnetic interference

- . radio frequency interference
- . . . **cochannel interference**

RT channel capacity

- channel noise
- intersymbolic interference
- phase shift keying

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)

UF *CMBR (astronomy)*

GS electromagnetic radiation

- . radio waves
- . . . extraterrestrial radio waves
- **cosmic microwave background radiation**
- . . . short wave radiation
- microwaves
- **cosmic microwave background radiation**
- extraterrestrial radiation
- . extraterrestrial radio waves
- . . **cosmic microwave background radiation**

RT cosmology

- radio astronomy
- relic radiation
- Sunyaev-Zeldovich effect

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)

cuprates

(added April 1999)

- GS copper compounds
 - . **cuprates**
- RT BSCCO superconductors
 - copper oxides
 - YBCO superconductors

cycloaddition

(added June 1998)

DEF Pericyclic chemical reaction in which unsaturated molecules combine to form a cyclic compound under the influence of heat or light.

- GS chemical reactions
 - . **cycloaddition**
 - ... Diels–Alder reactions
- RT cyclic compounds
 - photochemical reactions
 - polymerization
 - synthesis (chemistry)

Darkstar unmanned aerial vehicle

- USE **pitotless aircraft**
 - reconnaissance aircraft**

D

data mining

(added April 2000)

DEF The extraction of patterns from large data sets in order to discover previously unknown and potentially useful information.

- UF *knowledge discovery*
 - knowledge extraction*
- GS data processing
 - . **data mining**
 - information analysis
 - . **data mining**
- RT cluster analysis
 - data retrieval
 - machine learning
 - trend analysis

Deep Space 1 Mission

(added October 1998)

DEF First of several technology demonstration missions supporting the NASA New Millennium Program. Advanced technologies include an ion propulsion system, solar concentrator arrays, autonomous navigation and control systems, an integrated camera and imaging spectrometer, and several telecommunications and microelectronics devices. The mission plan includes a flyby of Asteroid 1992 KD.

- UF *DS1 (space mission)*
 - space missions
 - . **Deep Space 1 Mission**
- RT asteroid missions
 - autonomous navigation
 - flyby missions
 - interplanetary spacecraft
 - ion propulsion
 - NASA space programs
 - solar electric propulsion

deformable mirrors

(added May 1998)

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

Delta 3 launch vehicle

(added October 1998)

- GS launch vehicles
 - Delta launch vehicle
 - ... **Delta 3 launch vehicle**

Delta 4 launch vehicle

(added October 1998)

- GS launch vehicles
 - Delta launch vehicle
 - ... **Delta 4 launch vehicle**

dendrimers

(added October 2000)

DEF A class of polymeric macromolecules characterized by a regular highly-branched molecular architecture resembling a spherical starburst, and a synthesis process that permits nearly complete control over critical molecular design parameters, such as size, shape, surface/interior chemistry, flexibility, and topology. Because of these characteristics, dendrimers are seen as important elements in the manufacture of nanoscale materials and devices.

- UF *dendritic polymers*
 - hyperbranched polymers*
- GS molecules
 - . macromolecules
 - ... **dendrimers**
- RT conducting polymers
 - dendritic crystals
 - nanoscale (characteristics)
 - organometallic polymers
- ∞ polymers
 - synthetic metals

dendritic polymers

USE **dendrimers**

design optimization

(added February 2001)

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

Destiny Laboratory Module

(added February 2001)

DEF Component of the International Space Station providing equipment and support systems for research and technology development. Also provides support and control for the US segment of the Space Station.

- UF *US Laboratory Module (ISS)*
 - laboratories
 - . space laboratories
 - ... manned orbital laboratories
 - ... **Destiny Laboratory Module**

- manned spacecraft
 - . manned orbital laboratories
 - ... **Destiny Laboratory Module**
- modules
 - . space station modules
 - ... **Destiny Laboratory Module**
- RT International Space Station
 - spaceborne experiments

dielectric loss

(added April 2000)

DEF The electric energy that is converted into heat in a dielectric material subjected to a changing electric field.

- GS electrical properties
 - . dielectric properties
 - ... **dielectric loss**
 - losses
 - . **dielectric loss**
- RT dielectrics
 - energy dissipation
 - permittivity

dielectric waveguides

(added February 1998)

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

differential games

(added October 1998)

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

digital cameras

(added July 1998)

- GS optical equipment
 - . cameras
 - ... **digital cameras**
 - photographic equipment
 - . cameras
 - ... **digital cameras**
- RT CCD cameras
 - digital systems
 - digital techniques
 - photogrammetry
 - television cameras
 - video equipment

document indexing

USE **indexing (information science)**

DS1 (space mission)

USE **Deep Space 1 Mission**

dubnium

(added May 1998)

- GS chemical elements
 - . **dubnium**
- RT rutherfordium
 - seaborgium

dusty plasmas

(added May 2001)

DEF 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 particles
 - . 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**

ekranoplanes

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

electroactive polymers

(added June 2000)

UF *EAP (polymers)*

- RT actuators
 - conducting polymers
 - electromechanical devices
 - electrorheological fluids
 - electrostriction
 - microelectromechanical systems
- ∞ polymers
 - robot arms

electrochemical synthesis

(added January 2000)

DEF A chemical synthesis reaction that is induced by an electric current.

UF *electrosynthesis*

GS synthesis (chemistry)

. **electrochemical synthesis**

- RT electrochemistry
- electrolysis
- polymerization

electromagnetic rocket engines

USE **plasma engines**

electronic commerce

(added April 2000)

DEF The buying and selling of goods and services via the Internet or other computer communications network.

UF *e-commerce*

GS commerce

. **electronic commerce**

- RT computer information security
- electronic mail
- Internet resources
- 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 radiation
 - . sky radiation
 - . . **elves**
 - electromagnetic radiation
 - . light (visible radiation)
 - . . sky radiation
 - . . . **elves**

- RT atmospheric electricity
- atmospheric ionization
- cloud-to-ground discharges
- lightning
- sprites (atmospheric physics)
- thunderstorms

e-mail

USE **electronic mail**

embedded atom method

(added February 1998)

DEF A semiempirical calculation method developed by Daw and Baskes for determining the energetics of atoms in a bulk environment. The original form of the method was based on density functional theory and was intended primarily for tight-packed transition metals. More recent modifications have extended the applicability of the method to a large number of elements in the periodic table.

UF *EAM (physical chemistry)*
MEAM (physical chemistry)
modified embedded atom method

- RT alloys
 - crystal defects
 - grain boundaries
 - interatomic forces
 - metals
- ∞ methodology
 - molecular dynamics
 - potential energy

enantiomeric compounds

USE **enantiomers**

enantiomers

(added August 1998)

DEF Isomeric pairs whose crystalline forms or molecular structures are non-superimposable mirror images.

UF *enantiomeric compounds*

enantiomorphs

- GS isomers
 - . **enantiomers**
- RT chirality
- crystal structure
- isomorphism
- molecular structure
- stereochemistry
- symmetry

enantiomorphs

USE **enantiomers**

environmental cleanup

(added February 1999)

- GS cleaning
 - . **environmental cleanup**
- RT decontamination
- environment management
- environment protection
- hazardous wastes
- oil pollution
- oil slicks
- pollution control
- reclamation
- soil pollution
- waste disposal
- waste treatment
- water pollution
- 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**
 - ESA spacecraft
 - . ESA satellites
 - . . **Envisat-1 satellite**

- RT 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)
 - . . . **Euler–Bernoulli beams**
- RT axial strain
 - bending
 - bending vibration
 - dynamic structural analysis
 - elastic properties
 - mathematical models
 - partial differential equations
 - structural analysis
 - Timoshenko beams

evanescent waves

(added March 1998)

- GS surface waves
 - . **evanescent waves**
- RT acoustic impedance
 - evanescence
 - 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**

extraterrestrial oceans

(added June 2001)

- SN (EXCLUDES MAGMA OCEANS)
- DEF Extensive bodies of water on planets and moons.
 - UF *planetary oceans*
 - satellite oceans*
- GS oceans
 - . **extraterrestrial oceans**
- RT Callisto
 - 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
 - . . nitinol alloys
- RT ceramics
 - ferroelasticity
 - ferroelectric materials
- ∞ materials
 - smart materials

ferroelasticity

(added June 1998)

- GS mechanical properties
 - . elastic properties
 - . . **ferroelasticity**
- RT 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 1998)

- 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
 - . gates (circuits)
 - . . **field–programmable gate arrays**
 - . . . integrated circuits
 - . . . **field–programmable gate arrays**
 - . . . programmable logic devices
 - . . . **field–programmable gate arrays**

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
 - . . noise (sound)
 - . . . **flow noise**
 - aerodynamic noise
 - blade slap noise
 - propeller noise
 - screech 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 optics
 - interprocessor communication
 - optical computers
 - optical switching
 - optoelectronic devices
 - photonics

frequency domain analysis

(added April 1999)

- GS analysis (mathematics)
 - . **frequency domain analysis**
- RT control systems design
 - dynamic response
 - frequency response
 - parameter identification
 - signal processing

*FSOI (integrated optics)*USE **free-space optical interconnects****fullerides***(added February 1998)*GS carbon compounds
. **fullerides**RT ∞ alkali metal compounds
∞ chemical compounds
doped crystals
fullerenes
superconductors (materials)*FUSE (satellite)*USE **Far UV Spectroscopic Explorer***fuselage-wing stores*USE **wing-fuselage stores****fusion propulsion***(added September 1999)*GS propulsion
. nuclear propulsion
. . **fusion propulsion**
RT inertial confinement fusion
nuclear electric propulsion
nuclear fusion
nuclear rocket engines
plasma propulsion
spacecraft propulsion**G****Gabor filters***(added February 1998)*GS image filters
. **Gabor filters**
RT computer vision
∞ filters
Gabor transformation
image analysis
image processing
low pass filters
neural nets
spatial filtering
textures**Gabor transformation***(added February 1998)*GS transformations (mathematics)
. **Gabor transformation**
RT Fourier transformation
Gabor filters
holography
image processing
signal analysis
wavelet analysis**games***(added October 1998)*GS **games**
. differential games
. pursuit-evasion games
. war games
. zero sum games
RT control theory
game theory
optimization**Genesis mission***(added February 1999)*

DEF A space mission to collect solar wind samples from a halo orbit about the sun-Earth L1 point for two years, returning those samples to Earth in 2003 for analysis and examination.

Analysis of the samples collected by the mission will contribute to an understanding of the origins of the solar system.

GS space missions
. **Genesis mission**
RT solar system evolution
solar wind**glucocorticoids***(added December 1999)*

DEF Adrenocortical steroid hormones that are involved in the metabolism of fats, proteins, and carbohydrates, and have anti-inflammatory properties.

GS organic compounds
. lipids
. . . steroids
. . . corticosteroids
. . . . **glucocorticoids**
secretions
. endocrine secretions
. . . hormones
. . . corticosteroids
. . . . **glucocorticoids**
RT adrenal gland
atrophy
carbohydrate metabolism
hormone metabolisms
hypokinesia
lipid metabolism
muscles
protein metabolism**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)
. numerical analysis
. . finite volume method
. . . **Godunov method**
procedures
. finite volume method
. . **Godunov method**
RT approximation
Cauchy problem
Cauchy-Riemann equations
computational fluid dynamics
Euler equations of motion
finite difference theory
shock wave interaction
supersonic flow**GOES 10***(added March 2000)*GS artificial satellites
. meteorological satellites
. . GOES satellites
. . . **GOES 10**
. synchronous satellites
. . GOES satellites
. . . **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
. algorithms
. . **greedy algorithms**
RT graph theory
heuristic methodsminimax technique
optimization**group technology (manufacturing)***(added April 2000)*

DEF A manufacturing methodology where production processes are organized into groups or cells based on similarities in the manufacturing requirements of product parts or production equipment capabilities.

UF *cellular manufacturing*
GS manufacturing
. **group technology (manufacturing)**
production engineering
. **group technology (manufacturing)**
RT computer aided manufacturing
industrial management
operations research
process control (industry)
production management**H****H-2 control***(added February 1998)*GS automatic control
. optimal control
. . **H-2 control**
optimization
. optimal control
. . **H-2 control**
RT control systems design
control theory
controllers
feedback control
H-infinity control
linear quadratic Gaussian control**Hale-Bopp comet***(added July 1998)*

DEF Long-period comet discovered July 23, 1995; designated C/1995 O1.

GS celestial bodies
. comets
. . **Hale-Bopp comet**
RT Oort cloud**Hall resistance***(added July 2000)*

DEF For a current-carrying conductor within a magnetic field, the ratio of the transverse voltage induced by the Hall effect, to the conductor current.

GS electrical properties
. electrical impedance
. . electrical resistance
. . . **Hall resistance**
impedance
. electrical impedance
. . electrical resistance
. . . **Hall resistance**
RT electrical resistivity
Hall effect
magnetoresistivity
quantum Hall effect
∞ resistance
transport properties**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
. rocket engines

halon

- . . . electric rocket engines
- . . . electrostatic engines
- . . . ion engines
- **Hall thrusters**
- RT electric propulsion
- Hall accelerators
- plasma engines
- spacecraft propulsion

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 carbon compounds
- . halocarbons
- . . . **halon**
- halogen compounds
- . bromine compounds
- . . . **halon**
- . halocarbons
- . . . **halon**
- 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**
- . . . heavy fermion superconductors
- RT fermions
- superconductors (materials)

heavy metals

(added July 1999)

- DEF Metals or alloys having a high specific gravity; usually ones with a density greater than 5 grams per cubic centimeter.
- GS metals
- . **heavy metals**
- RT cadmium
- chromium
- contaminants
- copper
- industrial wastes
- lead (metal)
- mercury (metal)
- soil pollution
- toxic hazards
- zinc

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**
- suspending (hanging)
- . **hindlimb suspension**
- RT aerospace medicine
- atrophy
- bioastronautics
- bone demineralization
- gravitational physiology
- head down tilt
- head up tilt
- hypodynamia
- hypokinesia
- limbs (anatomy)
- weightlessness simulation

hindlimb unloading

- USE **hindlimb suspension**

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
- . . . **Holocene epoch**
- RT geochronology
- Pleistocene epoch

HUT (physiology)

- USE **head up tilt**

hybrid-Treffitz finite element method

- USE **finite element method**
- Treffitz method**

hydrophobicity

(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
- hygroscopicity
- moisture resistance
- ∞ properties
- solubility
- sorption
- surface properties
- surfactants
- waterproofing
- wettability
- wetting

hyperbranched polymers

- USE **dendrimers**

hypergravity

- USE **high gravity environments**

hypogravity

- USE **microgravity**

hypothetical particles

(added November 1999)

- GS particles
- . elementary particles
- . . . **hypothetical particles**
- . . . gluons
- . . . gravitinos
- . . . gravitons
- . . . partons
- . . . 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

ICP-MS (spectrometry)

USE **Inductively coupled plasma mass spectrometry**

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*
Imager for Magnetopause-to-Aurora Global Explorer

GS artificial satellites
 scientific satellites
 ... Explorer satellites
 ... **IMAGE satellite**

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
conditions
culture techniques
cytology
fertilization
histology
in vivo methods and tests
∞ methodology
∞ 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
∞ methodology
∞ tests

indexing (information science)

(added April 2000)

DEF The representation of document content in a systematic, organized form to support information location, retrieval, or analysis.

UF *automatic indexing*
document indexing
machine aided indexing

GS information analysis

indexing (information science)

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

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 spectroscopy
 mass spectroscopy
 ... **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
trusses
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
correction
multisensor applications
standardization

intracloud 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
∞ 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
- . aluminides
- . . **iron aluminides**
- . iron compounds
- . **iron aluminides**
- RT aluminum alloys
- intermetallics
- iron alloys

ISS (space station)

- USE **International Space Station**

J

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

kink bands

- (*added March 1998*)
- RT buckling
- compression loads
- edge dislocations
- failure modes
- fiber composites
- microstructure
- plastic deformation
- reinforcing fibers
- single crystals

kinking

- (*added April 1998*)
- RT bending
- buckling

- compression loads
- cracking (fracturing)
- deformation
- 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

. **Laves phases**

RT alloys

crystal lattices

crystal structure

cubic lattices

interstitials

microstructure

phase transformations

leaders (meteorology)

(*added August 1999*)

- GS electric current
- . electric discharges
- . lightning
- . . . **leaders (meteorology)**
- stepped leaders

LFA thrusters

- USE **magnetoplasmadynamic thrusters**

LIBS (spectroscopy)

- USE **laser-induced breakdown spectroscopy**

LIGO (observatory)

(*added December 2000*)

UF **Laser Interferometer Gravitational-Wave Observatory**

GS antennas

. gravitational wave antennas

. . **LIGO (observatory)**

observatories

. astronomical observatories

. . **LIGO (observatory)**

RT astronomical interferometry

gravitational waves

laser interferometry

LISA (observatory)

(*added December 2000*)

UF **Laser Interferometer Space Antenna**

GS antennas

. gravitational wave antennas

. . **LISA (observatory)**

artificial satellites

. scientific satellites

. . astronomical satellites

. . . **LISA (observatory)**

observatories

. astronomical observatories

. . astronomical satellites

. . . **LISA (observatory)**

RT astronomical interferometry

gravitational waves

laser interferometry

spaceborne astronomy

lithium batteries

(*added December 1999*)

GS electrochemical cells

. electric batteries

. . **lithium batteries**

. . . lithium sulfur batteries

RT storage batteries

Long March launch vehicles

(*added January 1999*)

GS launch vehicles

. **Long March launch vehicles**

RT Chinese space program

Chinese spacecraft

heavy lift launch vehicles

Lorentz force accelerator thrusters

- USE **magnetoplasmadynamic thrusters**

Lunar Prospector

(*added February 1998*)

GS artificial satellites

. lunar satellites

. . **Lunar Prospector**

lunar spacecraft

. lunar satellites

. . **Lunar Prospector**

RT lunar composition
lunar exploration
lunar programs
lunar resources
lunar surface

M

machine aided indexing

USE **indexing (information science)**

MACHOs (astronomy)

USE **massive compact halo objects**

Madden-Julian Oscillation

(added September 2000)

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

UF *MJO (meteorology)*

GS oscillations

Madden-Julian Oscillation
 variations

 . periodic variations
 . . . intraseasonal variations

 . . . **Madden-Julian Oscillation**

RT air water interactions

 annual variations
 atmospheric circulation
 atmospheric models
 climatology
 el Niño
 monsoons
 Southern Oscillation
 tropical meteorology
 zonal flow (meteorology)

magnetars

(added January 2000)

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

GS celestial bodies

 . stars
 . . . magnetic stars
 . . . **magnetars**
 . . . neutron stars
 . . . **magnetars**

RT pulsars

 soft gamma repeaters
 supernova remnants
 x ray sources

magnetic nozzles

(added September 1999)

DEF Nozzle devices used in some nuclear and plasma propulsion systems that utilize

magnetic fields to direct and accelerate plasma flows, thereby providing thrust for propulsion.

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

magnetoplasmadynamic thrusters

(added April 2001)

DEF Electromagnetic rocket engines that produce thrust via the Lorentz body force ejecting a high velocity plasma stream. The thrusters can be operated in either steady-state or pulsed mode, and typically have an axisymmetric geometry (annular anode surrounding a central cathode).

UF *LFA thrusters*
 Lorentz force accelerator thrusters
 MPD thrusters

GS engines
 . rocket engines
 . . . electric rocket engines
 . . . plasma engines
 **magnetoplasmadynamic thrusters**

RT arc jet engines
 electromagnetic propulsion

 magnetoplasmadynamics
 plasma accelerators
 plasma propulsion
 spacecraft propulsion
 ∞ thrusters

magnetorheological fluids

(added September 2000)

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

RT electrorheological fluids
 ferrofluids
 ferromagnetic materials

∞ fluids
 magnetic materials
 rheology
 smart materials
 vibration damping

magnetostratigraphy

(added April 1999)

GS stratigraphy
 . **magnetostratigraphy**

RT geochronology
 paleomagnetism

markup languages

USE **document markup languages**

Mars Climate Orbiter

(added March 1999)

DEF One of two spacecraft comprising the Mars Surveyor 98 program; launched December 1998. After obtaining a polar, nearly circular orbit around Mars, the Orbiter will serve as a radio relay during the Lander surface mission, then begin monitoring the atmosphere, surface, and polar caps for a complete Martian year. The Orbiter carries two science instruments: the Pressure

Modulated Infrared Radiometer and the Mars Color Imager.

UF *Mars Surveyor 98 Orbiter*

GS interplanetary spacecraft
 . Mars probes
 . . . **Mars Climate Orbiter**
 unmanned spacecraft
 . space probes
 . . . Mars probes
 **Mars Climate Orbiter**

RT Mars atmosphere
 Mars missions
 Mars Polar Lander
 Mars surface
 Mars Surveyor 98 Program

Mars Global Surveyor

(added March 1999)

DEF Spacecraft and related mission designed to orbit Mars over a two year period and collect data on the surface morphology, topography, composition, gravity, atmospheric dynamics, and magnetic field. Launched November 1996.

UF *MGS (spacecraft)*

GS interplanetary spacecraft
 . Mars probes
 . . . **Mars Global Surveyor**
 unmanned spacecraft
 . space probes
 . . . Mars probes
 **Mars Global Surveyor**

RT Mars atmosphere

 Mars missions
 Mars Observer
 Mars surface

Mars landing sites

(added February 2001)

DEF Areas on the Martian surface selected for spacecraft landing, or areas where spacecraft have actually landed.

GS sites

 . landing sites
 . . . **Mars landing sites**

RT Mars exploration

 Mars landing
 Mars missions
 Mars surface
 site selection

Mars missions

(added February 1999)

GS space missions
 . **Mars missions**
 . . . 2001 Mars Odyssey
 . . . manned Mars missions
 . . . Mars sample return missions
 . . . Mars Surveyor 2001 Mission

RT Earth–Mars trajectories

 Mars Climate Orbiter
 Mars exploration
 Mars Global Surveyor
 Mars landing
 Mars landing sites
 Mars Observer
 Mars Pathfinder
 Mars Polar Lander
 Mars probes
 Mars surface samples
 Mars Surveyor 98 Program
 ∞ missions
 return to Earth space flight

Mars Polar Lander

(added March 1999)

DEF One of two spacecraft comprising the Mars Surveyor 98 program; launched January

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 dust on Mars. Prior to landing, the Deep Space 2 microprobes will be released as part of a technology-validation mission related to multiple-lander spacecraft.

UF *Mars Surveyor 98 Lander*

GS interplanetary spacecraft

. Mars probes

. . **Mars Polar Lander**

unmanned spacecraft

. space 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 programs

. NASA programs

. . NASA space programs

. . . **Mars Surveyor 98 Program**

. space programs

. . NASA space programs

. . . **Mars Surveyor 98 Program**

RT Mars atmosphere

Mars Climate Orbiter

Mars missions

Mars Polar Lander

Mars surface

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

Martian meteorites

USE **SNC meteorites**

massive compact halo objects

(added November 1999)

DEF Objects, such as brown dwarfs, black holes, and massive planets, hypothesized to account for the dark matter in the halo of the Milky

Way. The signature of these objects is the occasional amplification of the light from extragalactic stars by the gravitational lens effect.

UF *MACHOs (astronomy)*

GS celestial bodies

. **massive compact halo objects**

RT brown dwarf stars

dark matter

galactic halos

gravitational lenses

Milky Way Galaxy

missing mass (astrophysics)

red dwarf stars

MEAM (physical chemistry)

USE **embedded atom method**

meitnerium

(added May 1998)

GS chemical elements

. **meitnerium**

RT hassium

membership functions

(added December 2000)

DEF Characteristic functions of a fuzzy set, which assign a value indicating the degree of membership for each element in a universal set.

GS functions (mathematics)

. **membership functions**

RT control systems design

fuzzy sets

fuzzy systems

machine learning

neural nets

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**

RT agglomeration

aggregates

block copolymers

∞ clusters

colloids

flocculating

nanosurface (characteristics)

self assembly

microelectromechanical systems

(added October 1998)

UF *MEMS (electromechanical devices)*

GS electromechanical devices

. **microelectromechanical systems**

RT electroactive polymers

microinstrumentation

microminiaturization

microminiaturized electronic devices

microsatellites

nanosatellites

nanotechnology

piezoelectric actuators

piezoelectric motors

microsatellites

(added October 1998)

DEF Satellites with a total mass between 10 and 100 kg often incorporating miniaturized electronic and mechanical systems.

UF *microsats*

GS artificial satellites

. **microsatellites**

RT microelectromechanical systems

microminiaturization

microminiaturized electronic devices

nanosatellites

satellite constellations

satellite design

small satellite technology

small scientific satellites

microsats

USE **microsatellites**

Mindlin plate theory

USE **Mindlin plates**

Mindlin plates

(added April 1998)

UF *Mindlin plate theory*

Reissner-Mindlin plates

GS structural members

. plates (structural members)

. . **Mindlin plates**

RT dynamic structural analysis

finite element method

free vibration

plate theory

Reissner theory

shear strain

structural analysis

structural vibration

thick plates

mischmetal

(added June 1998)

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

GS alloys

. rare earth alloys

. . **mischmetal**

RT alloying

aluminum alloys

cathodic coatings

cerium

desorption

electrode materials

intermetallics

steels

MJO (meteorology)

USE **Madden-Julian Oscillation**

MMH (chemistry)

USE **monomethylhydrazines**

modified embedded atom method

USE **embedded atom method**

monomethylhydrazines

(added February 2001)

UF *MMH (chemistry)*

GS hydrazines

. methylhydrazine

. . **monomethylhydrazines**

RT dimethylhydrazines
hydrazine engines
hypergolic rocket propellants
liquid rocket propellants

MPD thrusters

USE **magnetoplasmadynamic thrusters**

mutagenesis

(added June 2000)

DEF Induction or development of a genetic mutation via a natural environmental mutagen or through the methods of genetic engineering.

RT deoxyribonucleic acid
gene expression
genes
mutagens
mutations
radiation effects

N

nacelle wing configurations

USE **wing nacelle configurations**

nanocomposites

(added December 2000)

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

nanosatellites

(added October 1998)

DEF Satellites with a total mass smaller than 10 kg incorporating miniaturized electronic and mechanical systems.

UF *nanosats*
GS artificial satellites
. **nanosatellites**
RT microelectromechanical systems
microminiaturization
microminiaturized electronic devices
microsatellites
satellite constellations
satellite design
small satellite technology
small scientific satellites

nanosats

USE **nanosatellites**

nanotechnology

(added June 2000)

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

GS technologies
. **nanotechnology**
RT microelectromechanical systems
microelectronics
nanostructure (characteristics)
nanostructures (devices)
nanotubes
quantum dots
quantum electronics

quantum wires
self assembly

nanotubes

(added June 2000)

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

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

nanotubules

USE **nanotubes**

NDVI (remote sensing)

USE **normalized difference vegetation index**

necrosis

(added October 2000)

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

UF *pathological cell death*
GS pathological effects
. **necrosis**
RT apoptosis
cells (biology)
cytology
death
diseases
hypoxia
injuries
myocardial infarction
pathology
tissues (biology)

Next Generation Space Telescope project

(added December 1999)

DEF Project in the NASA Origins program with the goal of developing a spaceborne observatory to succeed the Hubble Space Telescope after 2005. The telescope is foreseen to have an aperture of 8 meters and be optimized for near infrared wavelengths (0.6–10+ microns) in order to enable the exploration of the most remote high redshift universe.

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

NGST project

USE **Next Generation Space Telescope project**

normalized difference vegetation index

(added June 2001)

DEF A transformation of satellite-based measurements computed as the ratio of reflectance in the red and near-infrared portions of the spectrum. Reflectance in the red region decreases with increasing chlorophyll content of the plant canopy, while reflectance in the infrared increases with increasing wet plant biomass. The index value represents greenness, density, and vigor of vegetation.

UF *NDVI (remote sensing)*
GS ratios
. indexes (ratios)
. . . vegetative index
. . . **normalized difference vegetation index**
RT crop vigor
image classification
remote sensing
satellite imagery
vegetation

Nozomi Mars Orbiter

(added August 1998)

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

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

optical interconnects

(added June 1998)

GS **optical interconnects**
. free-space optical interconnects
RT connectors
electric connectors
integrated optics
optical computers
optical switching
optoelectronic devices
photonics

O

orbit determination

(added December 1998)

GS **orbit determination**
. airborne range and 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

P

pathological cell death

USE **necrosis**

PDE (engines)

USE **pulse detonation engines**

PDRE (engines)

USE **pulse detonation engines**

PDS (spectroscopy)

USE **photothermal deflection spectroscopy**

PDWE (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
- photopolymers
- photosensitivity

photothermal deflection spectroscopy

(added November 1998)

UF *PDS (spectroscopy)*

GS spectroscopy

- . **photothermal deflection spectroscopy**

- RT optical measurement
- photoacoustic spectroscopy
- thermal diffusivity
- thermal lensing

piezoactuators

USE **piezoelectric actuators**

piezoelectric actuators

(added January 2001)

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

- UF *piezoactuators*
- 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**
- motors
- . . . electric motors
- . . . **piezoelectric motors**
- RT microelectromechanical systems
- micromotors
- piezoelectric actuators
- piezoelectric transducers
- ultrasonic wave transducers

piezomotors

USE **piezoelectric motors**

pilot opinion ratings

USE **pilot ratings**

pilot ratings

(added August 1999)

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

- UF *pilot opinion ratings*
- GS flight characteristics
- . **pilot ratings**
- . . . Cooper-Harper ratings
- ratings
- . **pilot ratings**
- . . . Cooper-Harper ratings
- RT aircraft performance
- assessments
- controllability
- helicopter performance

PIT (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

(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**
- . . . 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/GGS spacecraft

Population III stars

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

PPT (rocket engines)

USE **pulsed plasma thrusters**

pressoreceptor reflexes

USE **baroreflexes**

pressoreceptors

USE **baroreceptors**

pressure sensitive paints

(added March 2001)
 DEF Luminescent paints used for the non-intrusive optical measurement of static and transient pressure fields. These paints are typically organic luminophores or dyes dispersed in an oxygen permeable polymeric binder. The luminescence is induced by the excitation of the dye with an appropriate wavelength light. The emitted intensity or brightness of the paint is inversely proportional to the partial pressure of oxygen because the luminescence is quenched by oxygen.

UF *PSP (paints)*
 GS coatings
 . paints
 . . **pressure sensitive paints**
 RT flow measurement
 flow visualization
 nonintrusive measurement
 optical measurement
 pressure measurement

preventive maintenance

(added June 2000)
 GS maintenance
 . **preventive maintenance**
 prevention
 . **preventive maintenance**
 RT aircraft maintenance
 failure analysis
 inspection
 nondestructive tests
 reliability analysis

primordial stars

USE **Population III stars**

programmed cell death

USE **apoptosis**

proportional navigation

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

missile 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
 matter-antimatter 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

protosolar nebula

USE **solar nebula**

PSP (paints)

USE **pressure sensitive paints**

pulse detonation engines

(added March 2001)
 DEF Rocket engines that operate by injecting fuel and oxidizer into long chambers and igniting the mixture with a spark plug or similar device. Quasi-steady thrust levels can be achieved by repeating this cycle at relatively high frequency and/or using more than one combustion chamber operating out of phase.

UF *PDE (engines)*
PDRE (engines)
PDWE (engines)
pulse detonation wave engines
 GS engines
 . rocket engines
 . . liquid propellant rocket engines
 . . . **pulse detonation engines**
 RT air breathing engines
 detonation

pulse detonation wave engines

USE **pulse detonation engines**

pulsed arcjet engines

USE **pulsed jet engines**

pulsed inductive thrusters

(added April 2001)
 DEF Electromagnetic propulsion devices that accelerate a plasma propellant by the JxB Lorentz force, and in which the driving current in the plasma is induced, rather than being introduced through electrodes.

UF *PIT (rocket engines)*
 GS engines
 . rocket engines
 . . electric rocket engines
 . . . plasma engines
 **pulsed inductive thrusters**
 RT electromagnetic propulsion
 plasma propulsion
 spacecraft propulsion
 ∞ thrusters

pulsed plasma thrusters

(added April 2001)
 DEF Electromagnetic propulsion devices in which electrical power is used to ablate, ionize, and electromagnetically accelerate atoms 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
 ∞ thrusters

pursuit-evasion games

(added October 1998)
 GS games
 . **pursuit-evasion games**
 RT differential games
 evasive actions
 interception
 optimal control
 pursuit tracking
 trajectory optimization
 zero sum games

Q

QBO (climatology)

USE **quasi-biennial oscillation**

QHE (electronics)

USE **quantum Hall effect**

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.
 GS telecommunication
 . communication
 . . **quantum communication**
 RT communication theory
 optical communication
 quantum computation

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
 . **quantum computation**
 RT quantum communication
 quantum computers
 quantum cryptography
 quantum mechanics
 Turing machines

quantum computers

(added March 2000)
 DEF Devices capable of performing quantum computations. There are many proposals for the physical basis of quantum computers. The 0 and 1 of a quantum bit (i.e., qubit) could be the ground and excited states of an atom in a linear ion trap; the polarizations of photons interacting in an optical cavity; or the excess of one nuclear spin

quantum cryptography

state over another in a liquid sample in an NMR machine.

- GS data processing equipment
 - . computers
 - . . . **quantum computers**
- RT quantum computation

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
 - . **quantum 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 $h/(e^2j)$, 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
 - . Hall effect
 - . . . **quantum Hall effect**
- RT electron gas
 - Hall resistance
 - magnetic effects
 - quantum electronics
 - semiconductor devices
 - superlattices

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**
 - variations
 - . 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

- . . . Pleistocene epoch
- RT geochronology
 - Tertiary Period

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
 - . signal 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
 - . waterwave energy
 - . windpower utilization
- RT bioconversion
 - 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 Launch vehicle engines that integrate a high specific impulse, low thrust-to-weight, airbreathing engine with a low-impulse, high thrust-to-weight rocket. The engines are often defined by four modes of operation in a

single-stage-to-orbit configuration. In the first mode, the engine functions as a rocket-driven ejector. When the rocket engine is switched off, subsonic combustion (mode 2) is present in the ramjet mode. As the vehicle continues to accelerate, supersonic combustion (mode 3) occurs in the ramjet mode. Finally, as the edge of the atmosphere is approached and the engine inlet is closed off, the rocket is reignited and the final ascent to orbit is undertaken in an all-rocket mode (mode 4).

- 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

rogue planets

- USE **hypothetical planets**

Rossi X Ray Timing Explorer

- USE **X Ray Timing Explorer**

RXTE (satellite)

- USE **X Ray Timing Explorer**

S

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**
 - simulation
 - . **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
 - . **seaborgium**
- RT bohrium
 - dubnium

Sea-viewing Wide Field-of-view Sensor

(added December 1998)

- UF *SeaWiFS*
- GS scanners
 - . 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 supra-molecular entities so that shape-complementarity or other properties causes 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 ∞ analyzing
 - . design analysis
 - . design optimization
 - . error analysis
 - . factorial design
 - . optimization
 - . parameter identification
 - . parameterization
 - . shape optimization
 - . systems analysis

Service Module (ISS)

(added March 1999)

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

- 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 Nakhla 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

SMA (image analysis)

USE **spectral mixture analysis**

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 sensor/actuator elements. 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
 - . ferroelasticity
 - . ferroelectric materials
 - . ferromagnetic materials
 - . magnetorheological fluids
- ∞ materials
 - . 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, Nakhla, and Chassigny.

- UF *Martian meteorites*
 - . *Shergotty Nakhla Chassigny meteorites*
- GS celestial bodies
 - . meteorites
 - . . stony meteorites
 - . . . achondrites
 - **SNC meteorites**
- RT chassignites
 - Mars (planet)
 - Mars surface
 - nakhilites
 - shergottites

SOAC (electronics)

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

soft gamma repeaters

(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 it's hot surface bright in x-rays.

- UF *SGR (astronomy)*
- GS celestial bodies
 - . stars
 - . . neutron stars
 - . . . **soft gamma repeaters**
 - . . . x ray stars

solar nebula

- ... **soft gamma repeaters**
- gamma ray sources (astronomy)
- ... **soft gamma repeaters**
- x ray sources
- ... x ray stars
- ... **soft gamma repeaters**
- RT gamma ray astronomy
- gamma ray bursts
- magnetars
- supernova remnants

solar nebula

(added June 2001)

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

- UF *protosolar nebula*
- GS celestial bodies
- ... nebulae
- ... **solar nebula**
- RT meteoritic composition
- planetary evolution
- protoplanets
- protostars
- solar system
- solar system evolution
- star formation
- stellar evolution
- sun

sonochemistry

USE **ultrasonic processing**

space station modules

(added November 1998)

- GS modules
- ... **space station modules**
- ... Destiny Laboratory Module
- ... Kvant modules
- ... Priroda module
- ... Service Module (ISS)
- ... Unity connecting module
- ... Zarya control module
- RT air locks
- compartments
- International Space Station
- Mir space station
- orbital assembly
- space erectable structures
- space station structures
- spacecraft modules

space tourism

(added April 1999)

- GS space industrialization
- ... **space tourism**
- tourism
- ... **space tourism**
- RT space commercialization
- space transportation

space weather

(added June 1999)

SN (FOR METEOROLOGICAL CONDITIONS RELATED TO THE MIDDLE AND LOWER ATMOSPHERES OF NON-EARTH PLANETS USE "PLANETARY METEOROLOGY")

DEF The dynamic, highly variable conditions of the geospace environment that encompasses the sun, the interplanetary medium, and the Earth magnetosphere-ionosphere-thermosphere system. Major contributing factors include variations in the solar wind, solar flares, and solar mass ejections. Effects of space weather phenomena include performance degradation of communication, navigation, and power systems on both spacecraft

and ground-based systems; and potential health hazards during extravehicular activity.

- RT Advanced Composition Explorer
- aerospace environments
- aerospace safety
- Earth ionosphere
- Earth magnetosphere
- Earth orbital environments
- geomagnetism
- ionospheric disturbances
- magnetic disturbances
- magnetic storms
- Polar/GGS spacecraft
- radiation hazards
- solar activity effects
- solar terrestrial interactions
- space plasmas
- weather

spacewalks

USE **extravehicular activity**

spectral mixture analysis

(added July 2000)

DEF Linear algebraic method for defining subpixel fractions for each of the spectral endmembers (e.g., ground cover categories) that constitute a mixed-pixel spectral signature.

- UF *SMA (image analysis)*
- GS discrimination
- ... **spectral mixture analysis**
- image analysis
- ... **spectral mixture analysis**
- spectrum analysis
- ... **spectral mixture analysis**
- RT image processing
- pixels
- principal components analysis
- remote sensing
- spectral reflectance

spectral response

USE **spectral sensitivity**

spiral bevel gears

(added May 1999)

- GS gears
- ... bevel gears
- ... **spiral bevel gears**

spreadsheets

(added March 2001)

DEF Software applications that present a display of multiple columns and rows, and allow a user to input and manipulate numerical data for planning, tracking, analysis, and financial calculations.

- GS computer programs
- ... applications programs (computers)
- ... **spreadsheets**
- RT computer techniques
- tables (data)

SPRITE detectors

USE **infrared detectors**

sprites (atmospheric physics)

(added January 2000)

DEF Short-lived luminosities observed at high altitudes above thunderstorms, apparently associated with upward discharges of thunderstorm electricity. They appear as columnar diffuse reddish glows between 30 km and 80 km above ground, lasting tens of milliseconds, following large positive cloud-to-ground lightning strokes.

- UF *red sprites*
- GS atmospheric radiation
- ... sky radiation
- ... **sprites (atmospheric physics)**
- electromagnetic radiation
- ... light (visible radiation)
- ... sky radiation
- ... **sprites (atmospheric physics)**
- RT atmospheric electricity
- atmospheric ionization
- cloud-to-ground discharges
- elves
- lightning
- thunderstorms

Stardust Mission

(added March 1999)

DEF First U.S. mission launched to robotically obtain samples in deep space and return them to Earth. The NASA Discovery-class mission will return dust samples collected from the debris cloud surrounding the nucleus of Comet Wild 2. Interstellar dust will also be collected. The mission spacecraft takes advantage of an Earth gravity-assist maneuver to reach the comet, and uses an aerogel-based dust collector.

- GS space missions
- ... flyby missions
- ... **Stardust Mission**
- ... sample return missions
- ... **Stardust Mission**
- RT comet nuclei
- interstellar matter
- Wild 2 comet

stellar seismology

USE **asteroseismology**

stepped leaders

(added August 1999)

- GS electric current
- ... electric discharges
- ... lightning
- ... leaders (meteorology)
- ... **stepped leaders**

Submillimeter Wave Astronomy Satellite

(added November 2000)

DEF A NASA Small Explorer Project (SMEX) satellite designed to study the chemical composition, energy balance, and structure of interstellar gas clouds and the processes that lead to the formation of stars and planets. Its primary objective is to survey water, molecular oxygen, carbon, and isotopic carbon monoxide emission in a variety of galactic star forming regions.

- UF *Explorer 74 satellite*
- SWAS (satellite)*
- GS artificial satellites
- ... scientific satellites
- ... astronomical satellites
- ... **Submillimeter Wave Astronomy Satellite**
- ... Explorer satellites
- ... **Submillimeter Wave Astronomy Satellite**
- ... small scientific satellites
- ... **Submillimeter Wave Astronomy 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 anisotropy

Compton effect
cosmic gases
cosmic microwave background radiation

∞ effects

galactic clusters
intergalactic media
microwave scattering
radio astronomy
relic radiation

superhumps (astronomy)

(added October 1998)

RT accretion disks

astronomical photometry
binary stars
cataclysmic variables
dwarf novae
eclipsing binary stars
stellar spectrophotometry

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 include 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
microelectronics
microminiaturized electronic devices
RISC processors
systems integration

S-Z effect

USE **Sunyaev-Zeldovich effect**

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

experiment design
multidisciplinary design optimization
optimization
parameter identification
reliability engineering
statistical analysis
total quality management

tensegric structures

USE **tensegrity structures**

tensegrity structures

(added January 2001)

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

UF *tensegric structures*

tensile-integrity structures

RT isotensoid structures

prestressing
smart structures
structural design
∞ structures

tensile-integrity structures

USE **tensegrity structures**

Terra spacecraft

(added June 1999)

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

UF *AM-1 (EOS) spacecraft*

EOS AM-1 spacecraft

GS artificial satellites

. **Terra spacecraft**

Earth Observing System (EOS)

. **Terra spacecraft**

RT Earth observations (from space)

remote sensing

thermal lenses

USE **thermal lensing**

thermal lensing

(added November 1998)

UF *thermal lenses*

GS **thermal lensing**

. thermal blooming

RT atmospheric optics

focusing
laser beams
photothermal deflection spectroscopy
wave front deformation

thermoacoustic effects

(added May 2000)

DEF Phenomena associated with the combination of temperature, pressure and displacement oscillations caused by acoustic

waves interacting with solid boundaries, such as the walls of a tube or a "stack".

RT acoustic excitation

acoustic instability

acoustics

acousto-optics

combustion stability

∞ effects

heat transfer

sound waves

thermoacoustic refrigerators

thermophysical properties

thermoacoustic refrigerators

(added May 2000)

DEF 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 refrigerating machinery

. refrigerators

. . **thermoacoustic refrigerators**

RT cooling systems

refrigerating

thermoacoustic effects

thermocapillary migration

(added September 1999)

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

RT bubbles

capillary flow

drops (liquids)

electromigration

interfacial tension

Marangoni convection

microgravity

space processing

temperature gradients

thermomigration

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
 - . **tissue engineering**
- RT bioreactors
 - cells (biology)
 - clonostats
 - 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 73 satellite*
 - TRACE satellite*
- GS artificial satellites
 - . scientific satellites
 - . Explorer satellites

. . . Transition Region and Coronal Explorer

. . . small scientific satellites
. . . **Transition Region and Coronal Explorer**

- RT chromosphere
 - 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
 - . **transverse momentum**
- RT angular momentum
 - elementary particle interactions
 - particle motion
 - transverse acceleration

Treftz method

(added July 1998)

DEF Boundary-type approximation scheme for the solution of boundary value problems for partial differential equations.

- UF *hybrid-Treftz finite element method*
- GS analysis (mathematics)
 - . numerical analysis
 - . approximation
 - . . . boundary element method
 - . . . **Treftz 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 sat*
- GS artificial satellites
 - . meteorological satellites
 - . **TRMM satellite**
 - . scientific satellites
 - . **TRMM satellite**
- RT atmospheric circulation
 - Earth radiation budget
 - equatorial atmosphere
 - rain
 - tropical meteorology

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**
- RT 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
 - . **Ukrainian space program**
- RT Ukraine
 - Zenit launch vehicles

ultrasonic processing

(added June 1998)

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

- UF *sonochemistry*
 - ultrasonic treatment*
- RT ∞ processing
 - ultrasonic cleaning
 - ultrasonics

ultrasonic treatment

USE **ultrasonic processing**

uncertain systems

(added June 2000)

- RT control systems design
 - control theory
 - fuzzy systems
 - linear systems
 - nonlinear systems
 - probability theory
- ∞ systems

undercooling

USE **supercooling**

Unity connecting module

(added November 1998)

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

- GS modules
 - . space station modules
 - . **Unity connecting module**
- RT Integrated Truss Structure Z1
 - International Space Station
 - spacecraft docking

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 1(sp) thrust

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

UF *Variable Specific Impulse Magnetoplasma Rocket*

GS engines
 . rocket engines
 . . electric rocket engines
 . . . plasma engines
 **VASIMR (propulsion system)**

RT magnetic nozzles
 plasma heating
 plasma propulsion
 radio frequency heating
 spacecraft propulsion

veins (petrology)

(added June 2001)

DEF A relatively thin mass of mineral that fills a crack or joint in a host rock.

RT inclusions
 meteoritic composition
 mineral deposits
 minerals
 rock intrusions
 rocks

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**
 reentry vehicles
 . recoverable spacecraft
 . . reusable spacecraft
 . . . aerospace planes
 **VentureStar launch vehicle**
 soft landing spacecraft
 . aerospace planes
 . . **VentureStar launch vehicle**

RT aerospike engines
 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 conferencing**

RT communication networks
 conferences
 television systems
 video compression
 video data

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.

UF *VOC (organic chemistry)*

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

W

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 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
 . . **wave rotors**

RT compression waves
 energy transfer
 engine parts
 gas dynamics
 gas generators
 gas turbine engines
 topping cycle engines
 turbomachinery
 turboshafts
 wave generation

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*
WIMPs (astronomy)

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
 internets
 on-line systems
 World Wide Web

WIG 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

to a shift in its orbit caused by the gravitational influence of Jupiter.

- GS celestial bodies
 - . comets
 - . . **Wind 2 comet**
- RT Stardust Mission

WIMPs (astronomy)

- USE **weakly interacting massive particles**

Wind/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. 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**
- RT Earth magnetosphere
 - gamma rays
 - interplanetary magnetic fields
 - Polar/GGS spacecraft
 - solar corpuscular radiation
 - solar terrestrial interactions
 - solar wind
 - space plasmas

wing-body and tail 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-32 aircraft

V/STOL aircraft

- . **X-32 aircraft**

X-35 aircraft

(added October 1998)

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**
 - V/STOL 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 unpiloted 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
 - . **X-37 vehicle**
 - soft landing spacecraft
 - . aerospace planes
 - . . **X-37 vehicle**
- RT reusable launch vehicles
 - ∞ spacecraft

X-43 vehicle

(added September 1999)

DEF The experimental research vehicle of the NASA Hyper-X program designed to flight validate key propulsion and related technologies for air-breathing hypersonic aircraft.

- GS aerospace vehicles
 - . **X-43 vehicle**
 - hypersonic vehicles
 - . **X-43 vehicle**
 - research vehicles
 - . **X-43 vehicle**
- RT hypersonic flight
 - Pegasus air-launched booster
 - supersonic combustion ramjet engines

XMM (telescope)

- USE **XMM-Newton telescope**

XMM-Newton telescope

(added August 2000)

DEF Spaceborne x-ray telescope, launched in December 1999, providing simultaneous, high-throughput non-dispersive spectroscopic imaging (EPIC instrument), medium-resolution dispersive spectroscopy (Reflection Grating

Spectrometer), and optical/UV imaging and timing from a co-aligned instrument (Optical Monitor).

- UF *X Ray Multi-Mirror Mission*
 - 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
 - . . **XMM-Newton telescope**
- RT x ray astronomy
 - X Ray Astrophysics Facility

Z

Z1 truss structure

- USE **Integrated Truss Structure Z1**

Zarya control module

(added November 1998)

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

- GS modules
 - . 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)**

NASA THESAURUS SUPPLEMENT

PART 2 ROTATED TERM DISPLAY

A

- systems-on-**a**-chip
Lorentz force **accelerator** thrusters
use magnetoplasmadynamic thrusters
- carrier sense multiple **access**
ACE satellite
use Advanced Composition Explorer
- piezoelectric **actuators**
content- **addressable** memory
use associative memory
Advanced Composition Explorer
- Darkstar unmanned **aerial** vehicle
use pilotless aircraft
reconnaissance aircraft
- aeroshells**
machine **aided** indexing
use indexing (information science)
- Boeing 717 **aircraft**
very large transport **aircraft**
VLTA **(aircraft)**
use very large transport aircraft
- X-32 **aircraft**
X-35 **aircraft**
greedy **algorithms**
Alpha Magnetic Spectrometer
- aluminides**
iron **AM-1** (EOS) spacecraft
use Terra spacecraft
- EOS **AM-1** spacecraft
use Terra spacecraft
AMS (spectrometer)
use Alpha Magnetic Spectrometer
- cost benefit **analysis**
use cost analysis
cost effectiveness
- frequency domain **analysis**
information **analysis**
sensitivity **analysis**
SMA (image **analysis**)
use spectral mixture analysis
- spectral mixture **analysis**
time domain **analysis**
anisoplanatism
- Laser Interferometer Space **Antenna**
use LISA (observatory)
antenna gain
anticoincidence detectors
anticoincidence shields
use anticoincidence detectors
antiphase boundaries
antiphase domains
use antiphase boundaries
- proton- **antiproton** interactions
APB (materials)
use antiphase boundaries
apoptosis
archaeomagnetism
use paleomagnetism
- pulsed **arcjet** engines
use pulsed jet engines
- field-programmable gate **arrays**
self **assembly**
associative memory
associative storage
use associative memory
- Trojan **asteroids**
asteroseismology
- CMBR **(astronomy)**
use cosmic microwave background radiation
- MACHOs **(astronomy)**
use massive compact halo objects
- SGR **(astronomy)**
use soft gamma repeaters
- superhumps **(astronomy)**
WIMPs **(astronomy)**
use weakly interacting massive particles
- Submillimeter Wave **Astronomy** Satellite
Chandra X Ray **Astrophysics** Facility
use X Ray Astrophysics Facility
- sprites **(atmospheric** physics)
embedded **atom** method
modified embedded **atom** method
use embedded atom method
- Imager for Magnetopause-to- **Aurora** Global Explorer
automatic indexing
use indexing (information science)

B

- Planet- **B** spacecraft
use Nozomi Mars Orbiter
- cosmic microwave **background** radiation
kink **bands**
baroreceptor reflexes
use baroreflexes
baroreflexes
- rocket- **based** combined-cycle engines
lithium **batteries**
- Euler-Bernoulli **beam** theory
use Euler-Bernoulli beams
- Euler-Bernoulli **beams**
cost **benefit** analysis
use cost analysis
cost effectiveness
- Euler- **Bernoulli** beam theory
use Euler-Bernoulli beams
- Euler- **Bernoulli** beams
bevel gears
spiral **bevel** gears
quasi- **biennial** oscillation
biomass burning
biomimetics
Biot-Savart law
blended-wing-body configurations

- blended**–wing–fuselage
 - use* blended–wing–body configurations
 - wing–**body** and tail configurations
 - use* body–wing and tail configurations
 - blended–wing–wing–**body** configurations
 - use* body–wing configurations
 - Boeing** 717 aircraft
 - bohrium**
 - Bond** number
 - Hale–**Bopp** comet
 - antiphase **boundaries**
 - laser–induced **breakdown** spectroscopy
 - biomass **burning**
 - BWB** configurations
 - use* blended–wing–body configurations
- C**
- digital **cameras**
 - carrier** sense multiple access
 - cascode** devices
 - pathological **cell** death
 - use* necrosis
 - programmed **cell** death
 - use* apoptosis
 - cellular** manufacturing
 - use* group technology (manufacturing)
 - chain** reactions (chemistry)
 - chain** reactions (nuclear physics)
 - Chandra** X Ray Astrophysics Facility
 - use* X Ray Astrophysics Facility
 - Shergotty Nakhla **Chassigny** meteorites
 - use* SNC meteorites
 - chain reactions **(chemistry)**
 - EAM (physical **chemistry**)
 - use* embedded atom method
 - MEAM (physical **chemistry**)
 - use* embedded atom method
 - MMH **(chemistry)**
 - use* monomethylhydrazines
 - transition elements **(chemistry)**
 - use* transition metals
 - VOC (organic **chemistry**)
 - use* volatile organic compounds
 - systems–on–a–**chip**
 - environmental **cleanup**
 - Mars **Climate** Orbiter
 - QBO **(climatology)**
 - use* quasi–biennial oscillation
 - clinorotation**
 - clinostat** rotation
 - use* clinorotation
 - clinostating**
 - use* clinorotation
 - clinostats**
 - cloud–to–**cloud** discharges
 - cloud**–to–ground discharges
 - CMBR** (astronomy)
 - use* cosmic microwave background radiation
 - cochannel** interference
- colloidal** suspensions
 - use* colloids
 - rocket–based **combined**–cycle engines
 - Hale–Bopp **comet**
 - Wild 2 **comet**
 - Comet** Nucleus Tour
 - e–**commerce**
 - use* electronic commerce
 - electronic **commerce**
 - commercial** off–the–shelf products
 - free–space optical **communication**
 - quantum **communication**
 - massive **compact** halo objects
 - Advanced **Composition** Explorer
 - enantiomeric **compounds**
 - use* enantiomers
 - volatile organic **compounds**
 - quantum **computation**
 - quantum **computers**
 - quantum **computing**
 - use* quantum computation
 - video **conferencing**
 - blended–wing–body **configurations**
 - BWB **configurations**
 - use* blended–wing–body configurations
 - flying wing **configurations**
 - use* blended–wing–body configurations
 - nacelle wing **configurations**
 - use* wing nacelle configurations
 - wing–body **configurations**
 - use* body–wing configurations
 - wing–body and tail **configurations**
 - use* body–wing and tail configurations
 - Unity **connecting** module
 - content**–addressable memory
 - use* associative memory
 - CONTOUR** (mission)
 - use* Comet Nucleus Tour
 - H–2 **control**
 - Zarya **control** module
 - Cooper**–Harper ratings
 - Transition Region and **Coronal** Explorer
 - corrugated** waveguides
 - cosmic** microwave background radiation
 - cosmions**
 - use* weakly interacting massive particles
 - cost** benefit analysis
 - use* cost analysis
 - cost effectiveness
 - COTS** products
 - use* commercial off–the–shelf products
 - inductively **coupled** plasma mass spectrometry
 - quantum **critical** current
 - quantum **cryptography**
 - cuprates**
 - critical **current**
 - rocket–based combined–**cycle** engines
 - cycloaddition**

D

Darkstar unmanned aerial vehicle
use pilotless aircraft
 reconnaissance aircraft

data mining

pathological cell **death**
use necrosis

programmed cell **death**
use apoptosis

Deep Space 1 Mission

photothermal **deflection** spectroscopy

deformable mirrors

Delta 3 launch vehicle

Delta 4 launch vehicle

dendrimers

dendritic polymers
use dendrimers

design optimization

Destiny Laboratory Module

anticoincidence **detectors**

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

SPRITE **detectors**
use infrared detectors

orbit **determination**

pulse **detonation** engines

pulse **detonation** wave engines
use pulse detonation engines

cascode **devices**

MEMS (electromechanical **devices**)
use microelectromechanical systems

Voronoi **diagrams**

dielectric loss

dielectric waveguides

finite **difference** time domain method

normalized **difference** vegetation index

differential games

digital cameras

cloud-to-cloud **discharges**

cloud-to-ground **discharges**

intracloud **discharges**

knowledge **discovery**
use data mining

protoplanetary **disks**

document indexing
use indexing (information science)

frequency **domain** analysis

time **domain** analysis

finite difference time **domain** method

antiphase **domains**
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**

Sunyaev-Zeldovich **effect**

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

wing-in-ground **effect** vehicles

thermoacoustic **effects**

ekranoplanes
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

electrosynthesis
use electrochemical synthesis

signal-processing-in-the-hybrid-Treffitz finite **element** detectors

element method
use finite element method
 Treffitz method

transition **elements** (chemistry)
use transition metals

elves

embedded atom method

modified **embedded** atom method
use embedded atom method

enantiomeric compounds
use enantiomers

enantiomers

enantiomorphs
use enantiomers

exergic **energy**
use exergy

renewable **energy**

tissue **engineering**

electromagnetic rocket **engines**
use plasma engines

PDE **(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
Euler–Bernoulli beams
evanescent waves

pursuit- **evasion** games
exergic energy
use exergy

exergy
exoplanets
use extrasolar planets
exosolar planets
use extrasolar planets

Advanced Composition **Explorer**
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

F

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

Ringleb **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
functions
FUSE (satellite)
use Far UV Spectroscopic Explorer
membership **fuselage**
blended-wing- **fuselage**–wing stores
use wing-fuselage stores
fusion propulsion

G

Gabor filters
Gabor transformation

antenna **gain**
games

differential **games**
pursuit-evasion **games**

zero sum **games**
soft **gamma** repeaters

field-programmable **gate** arrays
bevel **gears**

spiral bevel **gears**
scene **generation**

Next **Generation** Space Telescope project
Genesis mission

Polar/ **GGS** spacecraft
Wind/ **GGS** spacecraft

Imager for Magnetopause- **Global** Explorer
to-Aurora *use* IMAGE satellite

Mars **Global** Surveyor
glucocorticoids

Godunov method
GOES 10

Laser Interferometer **Gravitational**–Wave Observatory
use LIGO (observatory)

greedy algorithms
cloud-to- **ground** discharges

wing-in- **ground** effect vehicles
group technology (manufacturing)

H

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
Cooper- **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

Phaethon (**hypothetical** planet)

use hypothetical planets

hypothetical planets

I

ICP–MS (spectrometry)

use inductively coupled plasma

mass spectrometry

LA–**ICP**–MS (spectrometry)

Population **III** stars

SMA (**image** analysis)

use spectral mixture analysis

IMAGE satellite

Imager for Magnetopause-to-Aurora

Global Explorer

use IMAGE satellite

total **impulse**

Variable Specific **Impulse** Magnetoplasma Rocket

use VASIMR (propulsion system)

normalized difference vegetation **index**

automatic **indexing**

use indexing (information science)

document **indexing**

use indexing (information science)

machine aided **indexing**

use indexing (information science)

indexing (information science)

laser–**induced** breakdown spectroscopy

pulsed **inductive** thrusters

inductively coupled plasma mass

spectrometry

inflight simulation

use in-flight simulation

information analysis

indexing (**information** science)

FSOI (**integrated** optics)

use free-space optical interconnects

Integrated Truss Structure Z1

tensile–**integrity** structures

use tensegrity structures

intelligent materials

use smart materials

weakly **interacting** massive particles

proton–antiproton **interactions**

interannual variations

use annual variations

intercalibration

free-space optical

optical

cochannel

Laser

Interferometer Gravitational–Wave

Observatory

use LIGO (observatory)

Laser

Interferometer Space Antenna

use LISA (observatory)

intracloud discharges

intraseasonal oscillations

use intraseasonal variations

intraseasonal variations

ion optics

Iridium network

Iridium satellites

use communication satellites

Iridium network

iron aluminides

Service Module

(ISS)

US Laboratory Module

(ISS)

use Destiny Laboratory Module

ISS (space station)

use International Space Station

J

Java (programming language)

scarf **joints**

Josephson effect

Josephson tunneling

use Josephson effect

Madden–

Julian Oscillation

K

kink bands

kinking

knowledge discovery

use data mining

knowledge extraction

use data mining

L

LA–ICP–MS (spectrometry)

use inductively coupled plasma

mass spectrometry

Polar Plasma

Laboratory

use Polar/GGS spacecraft

Destiny

Laboratory Module

US

Laboratory Module (ISS)

use Destiny Laboratory Module

Mars Polar

Lander

Mars Surveyor 98

Lander

use Mars Polar Lander

Mars

landing sites

Langmuir monolayers

use monomolecular films

Java (programming

markup

language)

languages

use document markup languages

very

large transport aircraft

laser–induced breakdown

spectroscopy

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 **layers**
 stepped **leaders**
leaders (meteorology)
 thermal **lenses**
use thermal lensing
 thermal **lensing**
LFA thrusters
use magnetoplasmdynamic thrusters
LIBS (spectroscopy)
use laser-induced breakdown spectroscopy
LIGO (observatory)
LISA (observatory)
lithium batteries
Long March launch vehicles
 hardware-in-the-**loop** simulation
 hardware-in-the-**loop** tests
Lorentz force accelerator thrusters
use magnetoplasmdynamic thrusters
 dielectric **loss**
Lunar Prospector

M

machine aided indexing
use indexing (information science)
 random positioning **machines**
use clinostats
MACHOs (astronomy)
use massive compact halo objects
Madden-Julian Oscillation
magnetars
magnetic nozzles
 Alpha **Magnetic** Spectrometer
 Imager for **Magnetopause-to-Aurora** Global Explorer
use IMAGE satellite
 Variable Specific Impulse **Magnetoplasma** Rocket
use VASIMR (propulsion system)
magnetoplasmdynamic thrusters
magnetorheological fluids
magnetostratigraphy
 e-**mail**
use electronic mail
 preventive **maintenance**

cellular **manufacturing**
use group technology (manufacturing)
 group technology **(manufacturing)**
 Long **March** launch vehicles
markup languages
use document markup languages
Mars Climate Orbiter
Mars Global Surveyor
Mars landing sites
Mars missions
 2001 **Mars** Odyssey
 Nozomi **Mars** Orbiter
Mars Polar Lander
Mars Surveyor 98 Lander
use Mars Polar Lander
Mars Surveyor 98 Orbiter
use Mars Climate Orbiter
Mars Surveyor 98 Program
Mars Surveyor 2001 Mission
Martian meteorites
use SNC meteorites
 inductively coupled plasma **mass** spectrometry
massive compact halo objects
 weakly interacting **massive** particles
 perfectly **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
 Tropical Rainfall **Measuring** Mission sat
use TRMM satellite
meitnerium
membership functions
 associative **memory**
 content-addressable **memory**
use associative memory
MEMS (electromechanical devices)
use microelectromechanical systems
 heavy **metals**
 Martian **meteorites**
use SNC meteorites
 Shergotty Nakhla Chassigny **meteorites**
use SNC meteorites
 SNC **meteorites**
 leaders **(meteorology)**
 MJO **(meteorology)**
use Madden-Julian Oscillation
 embedded atom **method**
 finite difference time domain **method**
 Godunov **method**
 hybrid-Trefftz finite element **method**
use finite element method
 Trefftz method
 modified embedded atom **method**
use embedded atom method
 Trefftz **method**
 Taguchi **methods**
 in vitro **methods** and tests
 in vivo **methods** and tests

MGS (spacecraft)
use Mars Global Surveyor

micelles

microelectromechanical systems

microsatellites

microsats
use microsatellites

cosmic **microwave** background radiation

thermocapillary **migration**

Mindlin plate theory
use Mindlin plates

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**

DS1 (space **mission)**
use Deep Space 1 Mission

Genesis **mission**

Mars Surveyor 2001 **Mission**

Stardust **Mission**

X Ray Multi-Mirror **Mission**
use XMM-Newton telescope

Tropical Rainfall Measuring **Mission** sat
use TRMM satellite

Mars **missions**

sample return **missions**

spectral **mixture** analysis

MJO (meteorology)
use Madden-Julian Oscillation

MMH (chemistry)
use monomethylhydrazines

modified embedded atom method
use embedded atom method

Destiny Laboratory **Module**

Unity connecting **module**

Zarya control **module**

Zvezda Service **Module**
use Service Module (ISS)

Service **Module** (ISS)

US Laboratory **Module** (ISS)
use Destiny Laboratory Module

space station **modules**

transverse **momentum**

health and usage **monitoring** systems
use systems health monitoring

Langmuir **monolayers**
use monomolecular films

monomethylhydrazines

piezoelectric **motors**

MPD thrusters
use magnetoplasmadynamic thrusters

ICP- **MS** (spectrometry)
use inductively coupled plasma mass spectrometry

LA-ICP- **MS** (spectrometry)

X Ray **Multi-Mirror** Mission
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 **nebula**
use solar nebula

solar **nebula**

necrosis

Iridium **network**

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

magnetic **nozzles**

chain reactions **(nuclear** physics)

Comet **Nucleus** Tour

Bond **number**

O

massive compact halo **objects**

Laser Interferometer Gravitational-Wave **Observatory**
use LIGO (observatory)

LIGO **(observatory)**

LISA **(observatory)**

extraterrestrial **oceans**

planetary **oceans**
use extraterrestrial oceans

satellite **oceans**
use extraterrestrial oceans

2001 Mars **Odyssey**

commercial **off-the-shelf** products

systems- **on-a-chip**

pilot **opinion** ratings
use pilot ratings

free-space **optical** communication

optical interconnects

free-space **optical** interconnects

FSOI (integrated **optics)**
use free-space optical interconnects

ion **optics**

design **optimization**

shape **optimization**

orbit determination

Mars Climate **Orbiter**

Mars Surveyor 98 **Orbiter**
use Mars Climate Orbiter

Orbiter

Nozomi Mars	Orbiter	rogue planets
VOC	(organic chemistry) <i>use</i> volatile organic compounds	<i>use</i> hypothetical planets
volatile	organic compounds	transplutonic planets
Madden-Julian	Oscillation	<i>use</i> hypothetical planets
quasi-biennial	oscillation	Polar Plasma Laboratory
intraseasonal	oscillations <i>use</i> intraseasonal variations	<i>use</i> Polar/GGS spacecraft
	osteoblasts	inductively coupled plasma mass spectrometry
		pulsed plasma thrusters
		dusty plasmas
		Mindlin plate theory
		<i>use</i> Mindlin plates
		Mindlin plates
		Reissner-Mindlin plates
		<i>use</i> Mindlin plates
		Pleistocene epoch
		PML (electromagnetism)
		<i>use</i> perfectly matched layers
		Polar/GGS spacecraft
		Mars Polar Lander
		Polar Plasma Laboratory
		<i>use</i> Polar/GGS spacecraft
		dendritic polymers
		<i>use</i> dendrimers
		EAP (polymers)
		<i>use</i> electroactive polymers
		electroactive polymers
		hyperbranched polymers
		<i>use</i> dendrimers
		Population III stars
		random positioning machines
		<i>use</i> clinostats
		PPT (rocket engines)
		<i>use</i> pulsed plasma thrusters
		pressoreceptor reflexes
		<i>use</i> baroreflexes
		pressoreceptors
		<i>use</i> baroreceptors
		pressure sensitive paints
		preventive maintenance
		primordial stars
		<i>use</i> Population III stars
		ultrasonic processing
		signal- processing-in-the-element detectors
		commercial off-the-shelf products
		COTS products
		<i>use</i> commercial off-the-shelf products
		Mars Surveyor 98 Program
		Ukrainian space program
		field- programmable gate arrays
		programmed cell death
		<i>use</i> apoptosis
		Java (programming language)
		Next Generation Space Telescope project
		NGST project
		<i>use</i> Next Generation Space Telescope project
		SLWT (propellant tank)
		<i>use</i> external tanks
		propellant tanks
		proportional navigation
		fusion propulsion
		VASIMR (propulsion system)
		Lunar Prospector
		proton-antiproton interactions
		protoplanetary disks
		protosolar nebula
		<i>use</i> solar nebula

P

pressure sensitive	paints	
PSP	(paints) <i>use</i> pressure sensitive paints	
hypothetical	particles	
weakly interacting massive	particles	
	pathological cell death	
	<i>use</i> necrosis	
	PDE (engines)	
	<i>use</i> pulse detonation engines	
	PDRE (engines)	
	<i>use</i> pulse detonation engines	
	PDS (spectroscopy)	
	<i>use</i> photothermal deflection spectroscopy	
	PDWE (engines)	
	<i>use</i> pulse detonation engines	
	perfectly matched layers	
Quaternary	period	
veins	(petrology)	
	Phaethon (hypothetical planet)	
	<i>use</i> hypothetical planets	
Laves	phases	
	Phobos spacecraft	
	photoresists	
	photothermal deflection spectroscopy	
EAM	(physical chemistry)	
	<i>use</i> embedded atom method	
MEAM	(physical chemistry)	
	<i>use</i> embedded atom method	
chain reactions (nuclear	physics)	
sprites (atmospheric	physics)	
HUT	(physiology)	
	<i>use</i> head up tilt	
	piezoactuators	
	<i>use</i> piezoelectric actuators	
	piezoelectric actuators	
	piezoelectric motors	
	piezomotors	
	<i>use</i> piezoelectric motors	
	pilot opinion ratings	
	<i>use</i> pilot ratings	
	pilot ratings	
	PIT (rocket engines)	
	<i>use</i> pulsed inductive thrusters	
Phaethon (hypothetical	planet)	
	<i>use</i> hypothetical planets	
	Planet-B spacecraft	
	<i>use</i> Nozomi Mars Orbiter	
	planet X	
	<i>use</i> hypothetical planets	
	planetary oceans	
	<i>use</i> extraterrestrial oceans	
exosolar	planets	
	<i>use</i> extrasolar planets	
hypothetical	planets	

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
 fiber **pushout**

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 **radiation**
 Tropical **Rainfall** Measuring Mission sat
use TRMM satellite
random positioning machines
use clinostats
 Cooper–Harper **ratings**
 pilot **ratings**
 pilot opinion **ratings**
use pilot ratings
 slenderness **ratio**
use aspect ratio
 Chandra X **Ray** Astrophysics Facility
use X Ray Astrophysics Facility
 X **Ray** Multi–Mirror Mission
use XMM–Newton telescope
 Rossi X **Ray** Timing Explorer
use X Ray Timing Explorer
Rayleigh fading
RBCC engines
use rocket-based combined-cycle engines
 chain **reactions** (chemistry)
 chain **reactions** (nuclear physics)
red sprites
use sprites (atmospheric physics)
 baroreceptor **reflexes**
use baroreflexes
 pressoreceptor **reflexes**
use baroreflexes
 thermoacoustic **refrigerators**
 Transition **Region** and Coronal Explorer
Reissner–Mindlin plates
use Mindlin plates
 NDVI **(remote** sensing)
use normalized difference vegetation index

renewable energy
 soft gamma **repeaters**
 Hall **resistance**
 spectral **response**
use spectral sensitivity
 sample **return** missions
Ringieb flow
 Variable Specific Impulse
 Magnetoplasma **Rocket**
use VASIMR (propulsion system)
rocket–based combined-cycle engines
 electromagnetic **rocket** engines
use plasma engines
 PIT **(rocket** engines)
use pulsed inductive thrusters
 PPT **(rocket** engines)
use pulsed plasma thrusters
rogue planets
use hypothetical planets
Rossi X Ray Timing Explorer
use X Ray Timing Explorer
 clinostat **rotation**
use clinorotation
 wave **rotors**
RXTE (satellite)
use X Ray Timing Explorer

S

S–Z effect
use Sunyaev–Zeldovich effect
sample return missions
 water **sampling**
 Tropical Rainfall Measuring Mission **sat**
use TRMM satellite
 ACE **satellite**
use Advanced Composition Explorer
 Envisat-1 **satellite**
 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
 FUSE **(satellite)**
use Far UV Spectroscopic Explorer
 IMAGE **satellite**
 RXTE **(satellite)**
use X Ray Timing Explorer
 Submillimeter Wave Astronomy **Satellite**
 SWAS **(satellite)**
use Submillimeter Wave Astronomy Satellite
 TRACE **satellite**
use Transition Region and Coronal Explorer
 TRMM **satellite**
satellite oceans
use extraterrestrial oceans

satellites

Iridium	satellites <i>use</i> communication satellites Iridium network	DS1 (space mission) <i>use</i> Deep Space 1 Mission
Biot-	Savart law	free- space optical communication
	scarf joints	free- space optical interconnects
	scene generation	Ukrainian space program
indexing (information)	science	ISS (space station) <i>use</i> International Space Station
	screech tones	space station modules
	Sea -viewing Wide Field-of-view Sensor	Next Generation Space Telescope project
	seaborgium	space tourism
	SeaWiFS <i>use</i> Sea-viewing Wide Field-of-view Sensor	space weather
stellar	seismology <i>use</i> asteroseismology	AM-1 (EOS) spacecraft <i>use</i> Terra spacecraft
	self assembly	EOS AM-1 spacecraft <i>use</i> Terra spacecraft
carrier	sense multiple access	MGS (spacecraft) <i>use</i> Mars Global Surveyor
NDVI (remote)	sensing <i>use</i> normalized difference vegetation index	Phobos spacecraft
pressure	sensitive paints	Planet-B spacecraft <i>use</i> Nozomi Mars Orbiter
	sensitivity analysis	Polar/GGS spacecraft
Sea-viewing Wide Field-of-view	Sensor	Terra spacecraft
	Service Module (ISS)	Wind/GGS spacecraft
Zvezda	Service Module <i>use</i> Service Module (ISS)	spacewalks <i>use</i> extravehicular activity
	SGR (astronomy) <i>use</i> soft gamma repeaters	laser spark spectroscopy <i>use</i> laser-induced breakdown spectroscopy
	shape optimization	Variable Specific Impulse Magnetoplasma Rocket
commercial off-the-	shelf products	<i>use</i> VASIMR (propulsion system)
	Shergotty Nakhla Chassigny meteorites <i>use</i> SNC meteorites	spectral mixture analysis
anticoincidence	shields <i>use</i> anticoincidence detectors	spectral response <i>use</i> spectral sensitivity
	Shuttle Superlightweight Tank <i>use</i> external tanks propellant tanks	Alpha Magnetic Spectrometer (spectrometer) <i>use</i> Alpha Magnetic Spectrometer
	signal -processing-in-the-element detectors <i>use</i> infrared detectors	AMS (spectrometry) <i>use</i> inductively coupled plasma mass spectrometry
hardware-in-the-loop	simulation	inductively coupled plasma mass LA-ICP-MS (spectrometry) <i>use</i> inductively coupled plasma mass spectrometry
in-flight	simulation	laser spark spectroscopy <i>use</i> laser-induced breakdown spectroscopy
inflight	simulation <i>use</i> in-flight simulation	laser-induced breakdown spectroscopy (spectroscopy) <i>use</i> laser-induced breakdown spectroscopy
Mars landing	sites	LASS (spectroscopy) <i>use</i> laser-induced breakdown spectroscopy
web	sites <i>use</i> websites	LIBS (spectroscopy) <i>use</i> laser-induced breakdown spectroscopy
	slenderness ratio <i>use</i> aspect ratio	PDS (spectroscopy) <i>use</i> photothermal deflection spectroscopy
	SLWT (propellant tank) <i>use</i> external tanks propellant tanks	photothermal deflection spectroscopy
	SMA (image analysis) <i>use</i> spectral mixture analysis	spiral bevel gears
	smart materials	spreadsheets
	SNC meteorites	SPRITE detectors <i>use</i> infrared detectors
	SOAC (electronics) <i>use</i> systems-on-a-chip	red sprites <i>use</i> sprites (atmospheric physics)
	soft gamma repeaters	sprites (atmospheric physics)
	solar nebula	Stardust Mission
	sonochemistry <i>use</i> ultrasonic processing	Population III stars
Deep	Space 1 Mission	
Laser Interferometer	Space Antenna <i>use</i> LISA (observatory)	

- primordial **stars**
 use Population III stars
 ISS (space **station**)
 use International Space Station
 space **station** modules
 stellar seismology
 use asteroseismology
 stepped leaders
 associative **storage**
 use associative memory
 fuselage-wing **stores**
 use wing-fuselage stores
 electronic **structure**
 Z1 truss **structure**
 use Integrated Truss Structure Z1
 Integrated Truss **Structure** Z1
 clamped **structures**
 tensegric **structures**
 use tensegrity structures
 tensegrity **structures**
 tensile-integrity **structures**
 use tensegrity structures
 Submillimeter Wave Astronomy
 Satellite
 zero **sum** games
 Sunyaev–Zeldovich effect
 heavy fermion **superconductors**
 superhumps (astronomy)
 Shuttle **Superlightweight** Tank
 use external tanks
 propellant tanks
 Mars Global **Surveyor**
 Mars **Surveyor** 98 Lander
 use Mars Polar Lander
 Mars **Surveyor** 98 Orbiter
 use Mars Climate Orbiter
 Mars **Surveyor** 98 Program
 Mars **Surveyor** 2001 Mission
 hindlimb **suspension**
 colloidal **suspensions**
 use colloids
 SWAS (satellite)
 use Submillimeter Wave Astronomy
 Satellite
 time **synchronization**
 electrochemical **synthesis**
 VASIMR (propulsion **system**)
 health and usage monitoring **systems**
 use systems health monitoring
 heavy fermion **systems**
 microelectromechanical **systems**
 uncertain **systems**
 systems–on–a–chip
- T**
- wing-body and **Taguchi** methods
 tail configurations
 use body-wing and tail
 configurations
 Shuttle Superlightweight **Tank**
 use external tanks
 propellant tanks
 SLWT (propellant **tank**)
 use external tanks
 propellant tanks
 group **technology** (manufacturing)
- video **teleconferencing**
 use video conferencing
 XMM **(telescope)**
 use XMM–Newton telescope
 XMM–Newton **telescope**
 Next Generation Space **Telescope** project
 tensegric structures
 use tensegrity structures
 tensegrity structures
 tensile–integrity structures
 use tensegrity structures
 Terra spacecraft
 field **tests**
 hardware-in-the-loop **tests**
 use hardware-in-the-loop simulation
 in vitro methods and **tests**
 in vivo methods and **tests**
 Euler-Bernoulli beam **theory**
 use Euler-Bernoulli beams
 Mindlin plate **theory**
 use Mindlin plates
 thermal lenses
 use thermal lensing
 thermal lensing
 thermoacoustic effects
 thermoacoustic refrigerators
 thermocapillary migration
 Hall **thrusters**
 LFA **thrusters**
 use magnetoplasmadynamic
 thrusters
 Lorentz force accelerator **thrusters**
 use magnetoplasmadynamic
 thrusters
 magnetoplasmadynamic **thrusters**
 MPD **thrusters**
 use magnetoplasmadynamic
 thrusters
 pulsed inductive **thrusters**
 pulsed plasma **thrusters**
 head up **tilt**
 finite difference **time** domain analysis
 time domain method
 time synchronization
 Rossi X Ray **Timing** Explorer
 use X Ray Timing Explorer
 tissue engineering
 Titan 4B launch vehicle
 screech **tones**
 total impulse
 Comet Nucleus **Tour**
 tourism
 space **tourism**
 TRACE satellite
 use Transition Region and Coronal
 Explorer
 Gabor **transformation**
 transition elements (chemistry)
 use transition metals
 Transition Region and Coronal
 Explorer
 transplutonic planets
 use hypothetical planets
 very large **transport** aircraft
 transverse momentum
 ultrasonic **treatment**
 use ultrasonic processing

hybrid- **Treffitz** finite element method
use finite element method
 Treffitz method
Treffitz method
TRMM satellite
Trojan asteroids
Tropical Rainfall Measuring Mission
 sat
use TRMM satellite
 Z1 **truss** structure
use Integrated Truss Structure Z1
 Integrated **Truss** Structure Z1
 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 pilotless 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 **vegetation** index
 Darkstar unmanned aerial **vehicle**
use pilotless aircraft
 reconnaissance aircraft
 Delta 3 launch **vehicle**
 Delta 4 launch **vehicle**
 Titan 4B launch **vehicle**
 VentureStar launch **vehicle**
 X-37 **vehicle**
 X-43 **vehicle**
 Long March launch **vehicles**
 WIG **vehicles**
use wing-in-ground effect vehicles
 wing-in-ground effect **vehicles**
 Zenit launch **veins** (petrology)
VentureStar launch vehicle
very large transport aircraft
video conferencing
video teleconferencing
use video conferencing
 Sea-viewing Wide Field-of- **view** Sensor

Sea- **viewing** Wide Field-of-view Sensor
 in **vitro** methods and tests
 in **vivo** methods and tests
VLTA (aircraft)
use very large transport aircraft
VOC (organic chemistry)
use volatile organic compounds
volatile organic compounds
Voronoi diagrams

W

water sampling
 Submillimeter **Wave** Astronomy Satellite
 pulse detonation **wave** engines
use pulse detonation engines
 Laser Interferometer Gravitational- **Wave** Observatory
use LIGO (observatory)
wave rotors
 corrugated **waveguides**
 dielectric **waveguides**
 evanescent **waves**
weakly interacting massive particles
 space **weather**
web sites
use websites
websites
 Sea-viewing **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**-body configurations
 flying **wing** configurations
use blended-wing-body
 configurations
 nacelle **wing** configurations
use wing nacelle configurations
 blended- **wing**-fuselage
 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- **Z** effect
 - use* Sunyaev-Zeldovich effect
- Integrated Truss Structure **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)

NASA THESAURUS SUPPLEMENT

PART 3

CHANGES

No term changes or deletions were made during this period.

Report Documentation Page

1. Report No. NASA/SP—2000-7501/SUPPL7	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle NASA Thesaurus Supplement: A Three-Part Cumulative Update of the 1998 Edition of the NASA Thesaurus		5. Report Date July 2001	
		6. Performing Organization Code AO	
7. Author(s)		8. Performing Organization Report No.	
9. Performing Organization Name and Address NASA Scientific and Technical Information Program Office		10. Work Unit No.	
		11. Contract or Grant No.	
12. Sponsoring Agency Name and Address National Aeronautics and Space Administration Langley Research Center Hampton, VA 23681		13. Type of Report and Period Covered Special Publication	
		14. Sponsoring Agency Code	
15. Supplementary Notes			
16. Abstract The <i>NASA Thesaurus Supplement</i> is a cumulative update to the 1998 edition of the <i>NASA Thesaurus</i> (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 (<i>Hierarchical Listing</i> and <i>Rotated Term Display</i>) correspond to Volumes 1 and 2 of the 1998 printed edition of the <i>NASA Thesaurus</i> . 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.			
17. Key Words (Suggested by Author(s)) (Major) Thesauri Terminology Terms Aeronautics Aerospace Sciences Astronautics Astronomy Dictionaries (Minor) Indexes (Documentation) Information Retrieval Hierarchies Supplements		18. Distribution Statement Unclassified – Unlimited Subject Category – 82	
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages 48	22. Price A03

