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NASA THESAURUS SUPPLEMENT

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

January 2001
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NASA THESAURUS SUPPLEMENT

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

National Aeronautics and Space Administration

January 2001
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Introduction


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

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

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

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

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

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

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

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NASA THESAURUS SUPPLEMENT

PART 1
HIERARCHICAL LISTING

ACE satellite
USE Advanced Composition Explorer

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

AM-1 (EOS) spacecraft
USE Terra spacecraft

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.

anticoincidence shields
USE anticoincidence detectors

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

antiphase domains
USE antiphase boundaries

apoposis
(added October 2000)
DEF One of the two mechanisms by which cell death occurs (the other being the pathological process of NECROSIS). Apoposis 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.

archaeomagnetism
USE paleomagnetism

associative memory
(added December 1998)
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.

associative storage
USE associative memory

automatic indexing
USE Indexing (Information science)
bevel gears

(added May 1998)
GS bevel gears
RT gear teeth
cloud-to-ground discharges

cloud-to-ground discharges

Comet Nucleus Tour

CMBR (astronomy)

cochannel interference

cosmic microwave background radiation

critical current

cuprates

cy cloaddition

dendrimers

data mining

data retrieval
dielectric loss

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
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
dielectric loss

USE dendrimers
e-communication

USE electronic commerce
ekranoplanes

USE wing-in–ground effect vehicles
electroactive polymers

(added June 2000)

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

(added January 2000)

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

UF electrochemistry
GS synthesis (chemistry)
RT electrochemistry
  - electrolysis
  - polymerization
electronic commerce

(added April 2000)

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

UF e-commerce
GS commerce
  - electronic commerce
RT computer information security
  - electronic mail
  - Internet resources
  - World Wide Web
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

electrolysis

USE electrochemical synthesis
electrosynthesis

USE electrochemical synthesis

elves

(added January 2000)

DEF Transient air glow events observed near 90 km, nearly simultaneously with a strong cloud–to-ground lightning stroke. They often precede sprites, which may occur at lower altitudes a few milliseconds later. It is believed that elves are the result of wave heating by very low frequency (VLF) radio pulses emitted by the lightning discharge current.

GS atmospheric radiation
  - sky radiation
  - elves
  - electromagnetic radiation

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 from the periodic table.

UF EAM (physical chemistry)
GS MEAM (physical chemistry)
RT modified embedded atom method

enantiomeric compounds

USE enantiomers
enantiomers

(added August 1998)

DEF Isomeric pairs whose crystalline forms or molecular structures are not superimposable mirror images.

UF enantiomeric compounds
GS enantiomers
RT chirality
  - crystal structure
  - isomorphism
  - molecular structure
  - stereochemistry
  - symmetry

enantiomorphs

USE enantiomers
environmental cleanup

(added February 1999)

GS cleaning
RT environmental cleanup
  - decontamination
  - environment management
  - environment protection
  - hazardous wastes
  - oil pollution
  - oil slicks
  - pollution control
  - reclamation
  - soil pollution
  - waste disposal
  - water pollution
  - water treatment
Envisat-1 satellite
(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
(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 evanescent fiber optics internal waves plane waves propagation modes reflected waves wave propagation waves

exergy
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

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

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 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)
free-space optical interconnects

free-space optical interconnects
(added June 1998)
UF FSOI (integrated optics)
GS optical interconnects
GH free-space optical interconnects
RT integrated optics
interprocessor communication
optical computers
optical switching
optoelectronic devices
photronics

frequency domain analysis
(added April 1999)
GS analysis (mathematics)
GH 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
GH fullerides
RT alkali metal compounds
carbon 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
GH nuclear propulsion
GH fusion propulsion
RT inertial confinement fusion
nuclear electric propulsion
nuclear fusion
nuclear rocket engines
plasma propulsion
spacecraft propulsion

Gabor filters
(added February 1998)
GS image filters
GH Gabor filters
RT computer vision
identified filters
Gabor transformation
image analysis
image processing
low pass filters
neural nets
spatial filtering
textures

Gabor transformation
(added February 1998)
GS transformations (mathematics)
GH Gabor transformation
RT Fourier transformation
Gabor filters
holography
image processing
signal analysis
wavelet analysis

GPs games
(added October 1998)
GS games
GH differential games
GH pursuit–evasion games
GH war games
GH 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
GH 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
GH lipids
GH steroids
GH corticosteroids
gluocorticoids
secretions
endocrine secretions
hormones
corticosteroids
GH glucocorticoids
RT adrenal gland
atrophy
carbohydrate metabolism
hormone metabolism
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)
GH numerical analysis
GH finite volume method
GH Godunov method
RT procedures
GH finite volume method
GH 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
GH meteorological satellites
GH GOES satellites
GH GOES 10
GH synchronous satellites
GH GOES satellites
GH 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
GH algorithms
RT game theory
heuristic methods
minimax 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 group technology (manufacturing)
GH production engineering
GH 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
GH optimal control
GH H-2 control
GH optimization
GH optimal control
GH H-2 control
RT control systems design
control theory
controllers
feedback control
H-infinity control
linear quadratic Gaussian control

Hale–Bopp comet
(added July 1999)
GS celestial bodies
GH comets
GH Hale–Bopp comet
RT Comet 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
GS electrical impedance
GS Hall resistance
GS impedance
GS Hall resistance
RT electrical resistivity
GH Hall effect
GH magnetoresistivity
GH quantum Hall effect
∞ resistance
∞ transport properties

Hall thrusters
(added June 2000)
GS engines
GS rocket engines
GS electric rocket engines
GS electrostatic engines
GS Hall thrusters
RT electric propulsion
RT Hall accelerators
RT ion engines
RT plasma engines
RT 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
GS halocarbons
GS halogen compounds
GS bromine compounds
GS halon
GS halocarbons
GS halon
RT fire extinguishers
RT flame retardants
RT fluorocarbons

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

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

hassium
(added May 1998)
GS chemical elements
GS hassium
RT bohrium
RT 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
RT bed rest
RT bionautics
RT cardiovascular system
RT gravitational physiology
RT head down tilt
RT hemodynamic responses
RT lower body negative pressure
RT orthostatic tolerance
RT physiological responses
RT supine position
RT weightlessness simulation

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

heavy fermion systems
(added April 1999)
GS intermetallics
GS heavy fermion systems
GS heavy fermion superconductors
GS fermions
GS 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
GS heavy metals
RT cadmium
RT chromium
RT cobalt
RT copper
RT industrial wastes
RT lead (metal)
RT mercury (metal)
RT soil pollution
RT toxic hazards
RT 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
GS hindcasting
RT forecasting
RT meteorological parameters
RT nowcasting
RT oceanographic parameters
RT weather forecasting

HUT (physiology)
USE head up tilt

hybrid–Trefitz finite element method
USE finite element method
USE Trefftz method

hyperbranched polymers
USE dendrimers

hypothetical particles
(added November 1996)
GS particles
GS elementary particles
GS hypothetical particles
GS gluons
GS gravitinos
GS gravitons
GS partons
GS quarks
GS tachyons
GS weakly interacting massive particles

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

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
UF Imager for Magnetopause-to-Aurora Global Explorer
GS artificial satellites
GS scientific satellites
GS Explorer satellites

hydrophobicity
(added June 2000)
DEF The degree to which a substance is insoluble in water, or resists wetting or hydration.
GS hygral properties
GS hydrophobicity
RT adsorption
RT chemical properties
RT hydration
RT hygroscopicity
RT moisture resistance
∞ properties
∞ solubility
∞ sorption
∞ surface properties
∞ surfactants
∞ waterproofing
∞ wettability
∞ wetting
In vitro methods and tests

**IMAGE satellite**
- auroral zones
- Earth magnetosphere
- magnetic storms
- magnetopause
- plasmaphase
- 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 vitro methods and tests
- oo methodology
- oo tests
- tissue engineering

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

**RT bioassay**
- biotechnology
- conditions
- culture techniques
- cytology
- histology
- in vitro methods and tests
- intravenous procedures
- oo methodology
- oo tests

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

**UF automatic indexing**
- document indexing
- machine aided indexing

**GS information analysis**

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

**infight 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 infight simulation**
- simulation
- flight simulation

**Information analysis**
* (added April 2000)
GS information analysis
- data mining
- indexing (information science)
- scientific visualization
- numerical flow visualization
- trend analysis

**RT information resources management**

**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**

**RT Integrated Truss Structure Z1**
- 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
- comparison
- correction
- multisensor applications
- standardization

**Intracloud discharges**
* (added August 1999)
GS electron current
- electric discharges
- lightning
- . . . intracloud discharges

**intrasessional oscillations**
**USE intrasessional variations**

**Intrasessional variations**
* (added September 2000)
UF intrasessional oscillations
- variations
- periodic variations
- . . . intrasessional variations
- . . . Madden–Julian Oscillation

**RT annual variations**
- atmospheric circulation

**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 network**

**GS networks**
- communication networks
- . . . Iridium network
- satellite networks
- . . . 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**

**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
- Josephson junctions
- SIS (superconductors)
- superconducting devices
- superconductors (materials)
magnetorheological fluids

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

ferrofluids
ferromagnetic materials
fluids

MACHOs (astronomy)
USE massive compact halo objects

Madden–Julian Oscillation
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.

U F Madden–Julian Oscillation

DEF Magnetorheological fluids

RT electrohydrodynamic fluids

ferrofluids

ferromagnetic materials

fluids
magnetostratigraphy
- magnetic materials
- rheology
- smart materials
- vibration damping

magnetostratigraphy
(added April 1989)
GS stratigraphy
RT palaeomagnetism

markup languages
USE document markup languages

Mars Climate Orbiter
(added March 1999)
DEF One of two spacecraft comprising the Mars Surveyor 98 program; launched January 1999. After a soft landing near the Martian south pole, the Lander will search for near-surface ice and possibly 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 the Mars Polar Lander.

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

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.

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

Mars missions
- Mars missions
- Mars Global Surveyor
- Mars landing
- Mars Pathfinder
- Mars Polar Lander

Mars sample return missions
- Mars probes
- Mars surface samples
- Mars Surveyor 98 Program
- Mars 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 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 the Mars Polar Lander.

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

Mars Surveyor 98 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.

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 microprobes) are also piggybacking on the Lander.

Mars Surveyor 2001 Mission
(added July 1999)
DEF Mars exploration program consisting of a technology-validation mission related to multiple-lander spacecraft.

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.

Mars missions
- Mars missions
- Mars Global Surveyor
- Mars landing
- Mars Pathfinder
- Mars Polar Lander

Mars missions
- Mars missions
- Mars sample return missions
- Mars Surveyor 2001 Mission

Mars Surveyor 98 Lander
- Mars probes
- Mars surface samples
- Mars Surveyor 98 Program
- Mars missions
- return to Earth space flight

Mars Surveyor 98 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.

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 microprobes) are also piggybacking on the Lander.
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

nachmetal
(adDED June 1999)
DEF An alloy consisting of a natural mixture of rare-earth metals, used in electrode materials and hydrogen-storage alloys, as a general alloy addition, and in the production of some aluminum alloys and steels.
GS alloys
. rare earth alloys
. mischmetal
RT alloying aluminum alloys
cathodic coatings
cerium
desorption
electrode materials
intermetallics
steels

MJO (meteorology)
USE Madden–Julian Oscillation

modified embedded atom method
USE embedded atom method

mutagenesis
(adDED June 2000)
DEF Induction or development of a genetic mutation via a natural environmental mutagen or through the methods of genetic engineering.
RT deoxyribonucleic acid
gene expression
genome
mutagens
mutations
radiation effects

nacelle wing configurations
USE wing nacelle configurations

nanocomposites
(adDED December 2000)
GS composite materials
. nanocomposites
RT aluminum oxides
ceramic matrix composites
grain size
nanocrystals
nanocostructure (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.
GS artificial satellites
. nanosatellites
RT microelectromechanical systems
microminiaturization
microminiaturized electronic devices
microsatellites
satellite constellations
satellite design
small satellite technology
small scientific satellites

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
microlithography
nanostructures (characteristics)
nanostructures (devices)
nanotubes
quantum dots
quantum electronics
quantum wires
self assembly

nanotubes
(adDED June 2000)
DEF Nanostructures having a closed, tubular morphology that can be single-walled or multi-walled. The structures are believed to be defect free, leading to high strength despite their low density; and can be either electrically conductive or semiconductive, depending on their helicity.
GS microstructure
nanostructure (characteristics)
nanotubes
RT fullerenes
graphite
nanostructures (devices)
nanotechnology
∞ tubes

nanotubes
USE nanotubes

necrosis
(adDED October 2000)
DEF One of the two mechanisms by which cell death occurs (the other being the physiological process of apoptosis). A pathological process caused by the progressive 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.
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 (0.5-10+ microns) in order to enable the exploration of the most remote high redshift universe.
GS programs
projects
. . Next Generation Space Telescope project
RT astronomical observatories
infrared telescopes
NASA space programs
spaceborne telescopes

NGST project
USE Next Generation Space Telescope project

Nozomi Mars Orbiter
(adDED August 1998)
DEF A Japanese Mars mission spacecraft designed to study the Martian upper atmosphere and its interaction with the solar wind, and to develop technologies for use in future planetary missions. Specifically, instruments on the spacecraft enable the measurement of the structure, composition, and dynamics of the ionosphere, aeronomy effects of the solar wind, the escape of atmospheric constituents; the intrinsic magnetic field, and dust in the upper atmosphere and in-orbit around Mars.
GS interplanetary spacecraft
. Mars probes
. . Nozomi Mars Orbiter
Japanese spacecraft
. . Nozomi Mars Orbiter
unmanned spacecraft
. . . space 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
photonic
finite difference time-domain (FDTD) or finite for terminating infinite domain calculations in the pathological ceil death

interplanetary mission objectives included the study of the composition of the Martian satellite Phobos. Other plasma• extended magnetism, an absorbing boundary condition used perfectly matched layers

PDS (spectroscopy)
USE photothermal deflection spectroscopy

perfectly matched layers
(added July 1998)
DEF In the area of computational electromagnetism, an absorbing boundary condition used for terminating infinite domain calculations in the finite-difference time-domain (FDTD) or finite element methods. The approach has also been extended to the analysis of some problems in acoustics
UF PML (electromagnetism)
GS conditions
boundary conditions
RT computational electromagnetics
computational grids
emagnetic absorption
emagnetic 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

piezoelectric actuators
USE piezoelectric actuators

piezoelectric motors
(added January 2001)
DEF Any motor that uses the piezoelectric effect as a basis for its function.
UF piezomotors
gS actuators
piezoelectric actuators
electromechanical devices
piezoelectric actuators
RT active control
microelectromechanical systems
piezoelectric motors
piezoelectric transducers
smart materials
smart structures
ultrasonic wave transducers
vibration damping

piezoelectric motors
(added January 2001)
DEF Any motor that uses the piezoelectric effect to produce its mechanical output.
UF piezomotors
gS electromechanical devices
electric motors
piezoelectric motors
RT microelectromechanical systems
micromotors
piezoelectric actuators
piezoelectric transducers
ultrasonic wave transducers

piezomotors
USE piezoelectric motors

pilot ratings
(added August 1999)
DEF Subjective assessment of the handling and stability characteristics of an aircraft or other flight vehicle.
UF pilot opinion ratings
gS flight characteristics

Polar 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
gS scientific satellites
Polar/GGS spacecraft
RT auroras
Earth ionosphere
Earth magnetosphere
gemagnetism
plasma waves
solar 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

preventive maintenance
(added June 2000)
DEF maintenance prevention
preventive maintenance
RT aircraft maintenance
failure analysis
inspection
nondestructive tests
reliability analysis
quantum computers
(added March 2000)
DEF Devices capable of performing quantum computations. There are many proposals for the physical basis of quantum computers. The 0 and 1 of a quantum bit (i.e., qubit) could be the ground and excited states of an atom in a linear ion trap; the polarizations of photons interacting in an optical cavity, or the excess of one nuclear spin state over another in a liquid sample in an NMR machine.
GS data processing equipment
RT quantum computers
quantum cryptography
(added March 2000)
DEF Any form of cryptography that depends for its security on coherent quantum–mechanical effects (quantum interference or quantum entanglement) on coherent quantum–mechanical effects (quantum interference or quantum entanglement)
GS cryptography
RT quantum cryptography
quantum Hall effect
(added July 2000)
DEF Phenomenon where the Hall resistance of a two–dimensional electron system at low temperature and high magnetic fields, becomes quantized as h(e–squared), where h is Plank’s constant, e is the electronic charge, and j is either an integer or a rational fraction.
UF QHE (electronics)
GS galvansmagnetric effects
RT quantum Hall effect
electron gas
Hall resistance
magnetic effects
quantum electronics
semiconductor devices
superlattices

random positioning machines
USE clinostats
Rayleigh fading
(added June 2000)
DEF Rapid–fluctuation, small–scale fading resulting from multipath effects, and typically occurring in non–line–of–sight (NLOS) environments
GS fading
RT Rayleigh fading
channels (data transmission)
mobile communication systems
multipath transmission
phase shift keying
radio signals
reception diversity

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
RT rocket engines

rocket–based combined–cycle engines
USE Mindlin plates
renewable energy
(added December 1998)
GS renewable energy
RT biomass energy production
GS clean energy
RT energy policy
GS energy sources
RT energy technology
GS geothermal energy conversion
RT hydrogen–based energy
GS ocean thermal energy conversion
RT solar energy conversion
GS waste utilization
RT waterwave energy conversion
Ringleb flow
(added July 1998)
GS fluid flow
RT compressible flow
GS steady flow
RT two dimensional flow
GS transonic flow
RT transonic flow

red sprites
USE sprites (atmospheric physics)
Reissner–Mindlin plates
USE Mindlin plates
rocket–based combined–cycle engines
USE X Ray Timing Explorer
RXTE (satellite)
USE X Ray Timing Explorer
scarf joints

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

GS joints (juncions)

RT bolted joints
bonded joints
lap joints
metal joints
scarfing

scene generation

(added July 1998)

GS imaging techniques
- scene generation
  - simulation

RT computer graphics
flight simulation
image reconstruction
scientific visualization
target simulators

screech tones

(added March 1999)

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
- acoustic frequencies

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

SeaWiFS

USE Sea-viewing Wide Field-of-view Sensor

self assembly

(added January 2001)

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

GS assembling
- self assembly

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

Service Module (ISS)

(added March 1998)

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

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

electroreological fluids
electrostriction
ferroelastic materials
ferroelasticity
ferroelectric materials
ferromagnetic materials
ferromagnetic 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 three known examples—Shergotty, Nakhla, and Chassigny.

UF Martian meteorites

Shergotty Nakhla Chassigny meteorites

USE celestial bodies
- meteorites
  - stony meteorites
  - achondrites
  - SNC meteorites

RT chassignites
Mars (planet)
Mars surface
nakhlites
shergottites

tsoft gamma repeaters

(added January 2000)

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

UF SGR (astronomy)

GS celestial bodies
  - stars
  - neutron stars
  - soft gamma repeaters
  - x ray stars
  - soft gamma repeaters
  - gamma ray sources (astronomy)
  - soft gamma repeaters
  - x ray sources
  - x ray stars
  - soft gamma repeaters
  - gamma ray astronomy
  - gamma ray bursts
  - magnetars
  - supernova remnants

sonochemistry

USE ultrasonic processing

space station modules

(added November 1998)

GS modules

SeaWiFS

USE Sea-viewing Wide Field-of-view Sensor

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
satelliteborne instruments
water color
space station modules
- Kvant modules
- Proton 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

spectral mixture analysis
\( \text{USE spectral sensitivity} \)

spiral bevel gears
\( \text{added May 1999} \)
GS gears
- spiral bevel gears

SPRITE detectors
\( \text{USE infrared detectors} \)

sprites (atmospheric physics)
\( \text{added January 2000} \)
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
\( \text{added March 1999} \)
DEF First U.S. mission launched to robotically obtain samples in deep space and return them to Earth. The NASA Discovery-class mission will return dust samples collected from the debris cloud surrounding the nucleus of Comet Wild 2. Interstellar dust will also be collected. The mission spacecraft takes advantage of an Earth gravity-assist maneuver to reach the comet, and uses an aerogel-based dust collector.
GS space missions
- flyby missions
- Stardust Mission
RT comet nuclei
interstellar matter
Wild 2 comet

stepped leaders
\( \text{added August 1999} \)
GS electric current
- electric discharges
- lightning
- leaders (meteorology)
- stepped leaders

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

Sunyaev-Zeldovich effect
\( \text{added July 2000} \)
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 microwave background radiation
- \( \ldots \) galactic clusters
- intergalactic media
microwave scattering
radio astronomy
relic radiation

superhumps (astronomy)
\( \text{added October 1998} \)
RT accretion disks
- astronomical photometry
- binary stars
- cataclysmic variables
dwarf novae
- eclipsing binary stars
stellar spectrophotometry

SWAS (satellite)
\( \text{USE Submillimeter Wave Astronomy Satellite} \)

S-Z effect
\( \text{USE Sunyaev-Zeldovich effect} \)

Taguchi methods
\( \text{added September 2000} \)
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 tensegric structures
tensegric 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
RT isostic structures
prestressing
smart structures
structural design
oo structures
tensegric structures
USE tensegric structures
Terra spacecraft
(added June 1999)
DEF First in a series of EOS (Earth Observing System) spacecraft developed to advance the understanding of the ways that the Earth's lands, oceans, air, ice, and life function as a total environmental system. The spacecraft carries five high-resolution instruments: the Advanced Spaceborne Thermal Emission Radiometer (ASTER), the Clouds and the Earth Radiant Energy System (CERES), the Multi-Angle Imaging Spectroradiometer (ASTER), the Clouds and the Earth Radiant Energy System) spacecraft developed to advance the understanding of the ways that the Earth's lands, oceans, air, ice, and life function as a total environmental system. The spacecraft carries five high-resolution instruments: the Advanced Spaceborne Thermal Emission Radiometer (ASTER), the Clouds and the Earth Radiant Energy System (CERES), the Multi-Angle Imaging Spectroradiometer (ASTER), the Clouds and the Earth Radiant Energy System (CERES), 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
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
thermoacoustic refrigerators
USE thermoacoustic refrigerators
thalamocapillary 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
oo time response
time domain analysis
USE time domain analysis
time synchronization
(added December 1998)
GS synchronism
. time synchronization
RT clocks
frequency standards
frequency synchronization
Global Positioning System
time measurement
time signals
universal time
time synchronization
USE time synchronization
tissue engineering
(added October 2000)
DEF Discipline for the in vitro growth and maintenance of tissue, organ primordia, or the whole or part of an organ so as to preserve its architecture and/or function. In terms of application, the primary goal of this technology is the replacement of deficient organs.
GS bioengineering
tissue engineering
technologies
tissue engineering
USE tissue engineering
titan 4B launch vehicle
(added October 1999)
GS launch vehicles
. Titan launch vehicles
. Titan 4 launch vehicle
. Titan 4 launch vehicle
. Titan 4B 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
USE total impulse
tourism
(added April 1999)
GS tourism
. space tourism
RT industries
recreation
transportation
oo travel
tourism
USE tourism
TRACE satellite
USE Transition Region and Coronal Explorer
transition elements (chemistry)
USE transition metals
Transition Region and Coronal Explorer
(added May 1998)
DEF Small Explorer Mission satellite supporting the investigation of the relationships between fine-scale magnetic fields and their associated plasma structures in the transition region and lower corona of the Sun.
UF Explorer 73 satellite
TRACE satellite
GS artificial satellites
scientific satellites
. Explorer satellites
. Transition Region and Coronal Explorer
. small scientific satellites
. Transition Region and Coronal Explorer
RT chromosphere
Trojan asteroids

(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 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 co 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

Variable Specific Impulse Magnetoplasma Rocket

USE VASIMR (propulsion system)

V

VASIMR (propulsion system)

(added november 2000)

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

UF Variable Specific Impulse Magnetoplasma Rocket

GS engines

. rocket engines

. electric rocket engines

. electrothermal engines

. plasma engines

. VASIMR (propulsion system)

RT plasma power sources

. plasma engines

. VASIMR (propulsion system)

RT magnetic nozzles

. plasma propulsion

radio frequency heating

spacecraft propulsion

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

. reusable spacecraft

. aerospace planes

. VentureStar launch vehicle

soft landing spacecraft

. aerospace planes

. VentureStar launch vehicle

RT aerospace 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
volatile organic compounds

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
GS grid generation (mathematics)
GS image analysis
GS partitions (mathematics)
RT spatial distribution topology trajectory planning

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

GS sampling water sampling
RT environmental monitoring
GS ground water pollution monitoring
GS sea water
RT surface water
RT water water pollution
RT 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
RT wave rotors
RT compression waves
RT energy transfer
RT engine parts
RT gas dynamics
RT gas generators
RT gas turbine engines
RT topping cycle engines
RT turbomachinery
RT turboshfts
RT 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 cosmations
GS WIMPs (astronomy)
RT particles
RT elementary particles
RT hypothetical particles
RT weakly interacting massive particles
RT dark matter
RT missing mass (astrophysics)
RT solar neutrinos

WIG vehicles
USE wing-in-ground effect vehicles

Wild 2 comet
(added March 1998)
DEF Periodic comet, discovered January 1978, relatively new to the inner Solar System due to a shift in its orbit caused by the gravitational influence of Jupiter.

GS celestial bodies
RT comets
RT Wild 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 Physica (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
RT scientific satellites
RT Wind/GGS spacecraft
RT solar corpuscular radiation
RT solar terrestrial interactions
RT solar wind
RT space plasmas

wing-body and tail configurations
USE body–wing and tail 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
GS WIG vehicles
RT ground effect machines
RT wing-in-ground effect vehicles
RT ground effect (aerodynamics)
RT surface effect ships

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
RT X–32 aircraft
RT jet aircraft
RT X–32 aircraft
RT research vehicles
RT research aircraft
RT X–32 aircraft
RT SSTOL aircraft
RT 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 Boeing aircraft
RT X–35 aircraft
RT Lockheed aircraft
RT X–35 aircraft
RT research vehicles
RT research aircraft
RT X–35 aircraft
RT SSTOL aircraft
RT 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 unpowered 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
RT X–37 vehicle
RT hypersonic vehicles
RT 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
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

NUMERALS

AM- 1 (EOS) spacecraft
use Terra spacecraft
Deep Space 1 Mission
Envisat- 1 satellite
EOS AM- 1 spacecraft
use Terra spacecraft
Wild 2 comet
H- 2 control
Delta 3 launch vehicle
Delta 4 launch vehicle
Titan 4B launch vehicle
GOES 10
X- 32 aircraft
X- 35 aircraft
X- 37 vehicle
X- 43 vehicle
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
Mars Surveyor 98 Lander
use Mars Polar Lander
Mars Surveyor 98 Orbiter
use Mars Climate Orbiter
Mars Surveyor 98 Program
Boeing 717 aircraft
Mars Surveyor 2001 Mission

A

carrier sense multiple
access satellite
use Advanced Composition Explorer
piezoelectric
actuators
addressable memory
use associative memory
Advanced Composition Explorer
aerial vehicle
use pilotless aircraft
reconnaissance aircraft
aerohelis
aided indexing
use indexing (information science)
Boeing 717 aircraft
very large transport
VLTA
use very large transport aircraft
X-32 aircraft
X-35 aircraft
greedy algorithms

Alpha Magnetic Spectrometer
iron aluminides
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
use cost analysis

SMA (image)
use spectral mixture analysis

time domain
analysis

Laser Interferometer Space Antenna
use LISA (observatory)
an 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

field-programmable gate
self
arrays
assembly
associative memory
associative storage
use associative memory

Trojan asteroids

CMBR (astronomy)
use cosmic microwave background radiation

MACHOs (astronomy)
use massive compact halo objects
SGR (astronomy)
use soft gamma repeaters
superhumps
WIMPs (astronomy)
use weakly interacting massive particles

Astronomy Satellite
Astrophysics Facility
use X Ray Astrophysics Facility

sprites
atom method
imager for Magnetopause-to-

Aurora Global Explorer
automatic indexing
use indexing (information science)
facility

chandra x-ray astrophysics

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

finite element method

use finite element method

trefftz method

in-flight simulation

ringleb flow

flow noise

magnetorheological fluids

free-space optical communication

free-space optical interconnects

frequency domain analysis

fsoi (integrated optics)

use free-space optical interconnects

fullerides

membership functions

fuse (satellite)

use far lv spectroscopic explorer

fuselage–wing stores

use wing–fuselage stores

fusion propulsion

use vasimr (propulsion system)

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–to–aurora global explorer

use image satellite

total impulse

variable specific impulse

use vasimr (propulsion system)

automatic indexing

use indexing (information science)

document indexing

use indexing (information science)

machine aided indexing

use indexing (information science)

information analysis

indexing (information science)

(use free-space optical interconnects

integrated optics

use tensegrity structures

use tensegrity structures

use smart materials

weakly interacting massive particles

interactions

interannual variations

use annual variations

intercalibration

free-space optical interconnects
interconnects
interference
Interferometer
Gravitational-Wave
Observatory
use LIGO (observatory)
Laser
Interferometer
Space Antenna
use LISA (observatory)
intracloud
discharges
intrasessional
oscillations
use intraseasonal variations
intrasessional
variations
ion optics
Iridium network
Iridium satellites
use communication satellites
Iridium network
iron aluminides
Service Module
(ISS)
ISS (space station)
use International Space Station
Java (programming language)
scarf
Josephson
effect
Josephson
tunneling
use Josephson effect
Madden-Julian
Oscillation
kink
diabards
kinking
knowledge
discovery
use data mining
knowledge
extraction
use data mining
L
Polar Plasma
Laboratory
use Polar/GGS spacecraft
Mars Polar
Lander
use Mars Polar Lander
Java (programming language)
markup
languages
use document markup languages
very
large
transport
aircraft
Laser
Interferometer
Gravitational-Wave
Observatory
use LIGO (observatory)
Laser
Interferometer
Space Antenna
use LISA (observatory)
launch vehicle
launch vehicle
launch vehicle
launch vehicle
launch vehicles
launch vehicles
Law
parallel
(level)
layers
leaders
Laves
phases
Biot-Savart
perfectly
matched
stepped
leaders
leaders (meteorology)
thermal
lenses
use thermal lensing
thermal
lensing
LIGO (observatory)
LISA (observatory)
lithium
batteries
Long March launch vehicles
loop
simulation
loop
tests
loss
Lunar
Prospector
machine
aided
indexing
use indexing (information science)
random
positioning
machines
use clinostats
MACHOs (astronomy)
use massive compact halo objects
Madden-Julian
Oscillation
magnets
magnetic
nozzles
Alpha
Magnetic
Spectrometer
Imager
for
Magnetopause-to-Aurora
Global
Explorer
use IMAGE satellite
Variable
Specific
Impulse
use
VASIMR (propulsion system)
magnetorheological
fluids
magnetostratigraphy
e-mail
use electronic mail
preventive
maintenance
manufacturing
use group technology
(manufacturing)
group technology
use
clinostats
(martian)
missions
Mars
Orbiter
Mars
Polar Lander
Mars Surveyor 98
Lander
use Mars Surveyor 98 Lander
Java (programming language)
markup
languages
use document markup languages
March
launch vehicles
launch
vehicle
launch
vehicle
launch
vehicle
launch
vehicle
launch
vehicles
launch
vehicles
maintenance
manufacturing
use group technology
(maritime)
March
launch vehicles
launch
vehicle
launch
vehicle
launch
vehicle
launch
vehicle
launch
vehicles
launch
vehicles
weakly
interacting
massive
particles
matched
layers
APB
match
lenses
(materials)
use antiphase boundaries
ferroelastic
materials
intelligent
materials
smart
materials
finite
difference
time
domain
method
MEAM (physical chemistry) use embedded atom method
Tropical Rainfall Measuring Mission sat use TRMM satellite
meitnerium membership functions
associative 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 leaders (meteorology) use Madden-Julian Oscillation
embedded atom method (meteorology)
finite difference time domain method
Godunov method
hybrid-Trefftz finite element method
modified embedded atom method (method) use embedded atom method
Trefftz method
in vitro methods and tests
in vivo methods and tests
MGS (spacecraft) use Mars Global Surveyor
microelectromechanical systems microsats
microwave background radiation cosmic migration
Mindlin plate theory Mindlin plates
Mindlin plates Mindlin plates
Reissner-Mindlin data mining
X Ray Multi-Mirror Mission sat use XMM-Newton telescope
deformable mirrors mischmetal CONTOUR (mission)
use Comet Nucleus Tour
Deep Space 1 Mission (mission) use Deep Space 1 Mission
Genesis Mission
Mars Surveyor 2001 Mission
Stardust Mission
X Ray Multi-Mirror Mission (mission) use XMM-Newton telescope
Tropical Rainfall Measuring Mission sat use TRMM satellite
Mars missions mixture analysis
MJO (meteorology) use Madden-Julian Oscillation
modified embedded atom method use embedded atom method
Unity connecting module
Zarya control module
Zvezda Service Module use Service Module (ISS)
Service Module (ISS)
space station modules
transverse methods
piezoelectric motors
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 necrosis
network INdium
XMM-Newton telescope Next Generation Space Telescope project
NGST project use Next Generation Space Telescope project
flow noise Nozomi Mars Orbiter
magnetic nozzles (nuclear physics)
chain reactions Comet Nucleus Tour
Bond number

O
massive compact halo Laser Interferometer Gravitational-Wave Observatory use LIGO (observatory)
LIGO (observatory) pilot opinion ratings
free-space optical communication free-space optical interconnects
optical interconnects optical interconnects
optics ion optics orbit determination
Mars Climate Orbiter use Mars Climate Orbiter
Orbiter Nozomi Mars VOG (organic chemistry) use volatile organic compounds
volatile organic compounds
Oscillation
intraseasonal oscillations
use intraseasonal variations

P
hypothetical particles
particles
weakly interacting massive particles

Laves phases
Phobos spacecraft
photothermal deflection spectroscopy

EAM (physical chemistry)
use embedded atom method

MEAM (physical chemistry)
use embedded atom method

chain reactions (nuclear physics)
sprites (atmospheric physics)

HUT (physiology)
use head-up tilt

piezoelectric actuators
use piezoelectric actuators

piezoelectric motors

piezomotor
use piezoelectric motors

pilot opinion ratings
use pilot ratings

pilot ratings

Phaethon (hypothetical planet)
use hypothetical planets

Planet-B spacecraft
use Nozomi Mars Orbiter

hypothetical planets

Polar Plasma Laboratory
use Polar/GGS spacecraft

Mindlin plate theory
use Mindlin plates

Mindlin plates

Reissner-Mindlin plates
use Mindlin plates

PML (electromagnetism)
use perfectly matched layers

Polar/GGS spacecraft

Mars
Polar Lander
Polar Plasma Laboratory
use Polar/GGS spacecraft
dendritic polymers
use dendrimers

EAP (polymers)
use electroactive polymers

electroactive polymers
use dendrimers

Population III stars
random positioning machines
use clinostats
preventive maintenance
primordial stars
use Population III stars

ultrasonic processing
processing-in-the-element detectors

Mars Surveyor 98
Ukrainian space field

Java
Next Generation Space Telescope NGST

Java

SLWT (propellant tank)
use external tanks

fusion
VASIMR

Lunar
Prospector

proton–antiproton interactions
pursuit–evasion games

fiber pushout

Q
OHE (electronics)
use quantum Hall effect

quantum communication
quantum computation
quantum computers

quantum cryptography
quantum Hall effect

R
cosmic microwave background
Tropical Rainfall Measuring Mission sat
use TRMM satellite

random positioning machines
use clinostats

Cooper–Harper ratings
use pilot ratings

slenderness ratio
use aspect ratio

Chandra X Ray Astrophysics Facility
use X Ray Astrophysics Facility

X Ray Multi-Mirror Mission
use XMM-Newton telescope

Rossi X Ray Timing Explorer
use X Ray Timing Explorer

Rayleigh fading
RBCC engines
use rocket-based combined-cycle engines

chain reactions (chemistry)

chain reactions (nuclear physics)
red sprites
use sprites (atmospheric physics)
Trefftz finite element method
use finite element method
Trefftz method
TRMM satellite
Tropical Rainfall Measuring Mission
sat
use TRMM satellite
Z1 truss structure
use Integrated Truss Structure Z1
Integrated Josephson tunneling
use Josephson effect

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

V
Variable Specific Impulse
Magnetoplasma Rocket
use VASIMR (propulsion system)
interannual variations
use annual variations
intraseasonal variations
use VASIMR (propulsion system)
vehicle
use pilotless aircraft
reconnaissance aircraft
Delta 3 launch vehicle
Delta 4 launch vehicle
Titan 4B launch vehicle
VentureStar launch vehicle
X-37 vehicle
X-35 vehicle
X-43 vehicle
Long March launch vehicle
WIG vehicles
use wing-in-ground effect vehicles
Sea-viewing Wide Field-of-view Sensor
Sea-viewing Wide Field-of-view Sensor
view Sensor
very large transport aircraft
video conferencing
use video conferencing
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
Voronoi diagrams

W
water sampling
Wave Astronomy Satellite
Wave Observatory
use LIGO (observatory)
use LIGO (observatory)
use LIGO (observatory)
corrugated dielectric waveguides
dielectric waveguides
waves
weakly interacting massive particles
weather

Sea-viewing Wide Field-of-view Sensor
WIG vehicles
use wing-in-ground effect vehicles
Wild 2 comet
WIMP (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
nacelle wing configurations
use wing nacelle configurations
wing-in-ground effect vehicles
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- effect
use Sunyaev-Zeldovich effect
Integrated Truss Structure Z1
use Integrated Truss Structure Z1
Zarya control module
Zeldovich effect
Zenit launch vehicles
zero sum games
Zenit launch vehicles
use Service Module (ISS)
NASA THESAURUS SUPPLEMENT

PART 3

CHANGES

No term changes or deletions were made during this period.
**Abstract**

The *NASA Thesaurus Supplement* is a cumulative update to the 1998 edition of the *NASA Thesaurus* (NASA/SP--1998--7501). The Supplement, published every 6 months, includes all new terms and associated hierarchies added since the cutoff for the 1998 edition (December 1997). Parts 1 and 2 (*Hierarchical Listing and Rotated Term Display*) correspond to Volumes 1 and 2 of the 1998 printed edition of the *NASA Thesaurus*. Definitions are included in Part 1; uppercase/lowercase forms are provided in both Parts 1 and 2. Part 3 is a list of deletions or changes to valid terms.