

Glossary

ADU: Avtonomnaya Dvigatel'naya Ustanovka; Autonomous Engine Unit

Aerobraking: A maneuver where a spacecraft's orbit is changed by reducing its energy by repeated passages through a planet's upper atmosphere.

Aerocapture: A maneuver where a spacecraft enters into orbit around a planet by slowing it down by a passage through the upper levels of a planet's atmosphere.

Aerogel: A silicon-based foam in which the liquid component of a gel has been replaced with gas or, for use in space, effectively with vacuum, to produce a solid with a very low density.

AGORA: Asteroidal Gravity Optical and Radar Analysis

ALH: Allan Hills (meteorites)

AMPTE: Active Magnetospheric Particle Tracer Explorer

AMSAT: The Radio Amateur Satellite Corporation.

Aphelion: The point of maximum distance from the Sun of a heliocentric orbit. Its contrary is perihelion.

APL: The Applied Physics Laboratory of Johns Hopkins University.

Apoapsis: The point of maximum distance from the central body of any elliptical orbit. This word has been used to avoid complicating the nomenclature, but a term tailored to the central body is often used. The only exceptions used herein owing to their importance were for Earth (apogee) and the Sun (aphelion). The contrary of apoapsis is periapsis.

Apogee: The point of maximum distance from the Earth of a satellite orbit. Its contrary is perigee.

AS: Aerostatnaya Stantsiya; Aerostatic probe

ASI: Agenzia Spaziale Italiana; Italian Space Agency

ASLV: Advanced Satellite Launch Vehicle

ASPERA: Automatic Space Plasma Experiment with a Rotating Analyzer

Astronomical Unit: To a first approximation the average distance between the Earth and the Sun is 149,597,870,691 (\pm 30) meters.

AU: Astronomical Unit

BMDO: Ballistic Missile Defense Organization

Booster: Auxiliary rockets used to boost the lift-off thrust of a launch vehicle.

Bus: A structural part common to several spacecraft.

C4: Comet Coma Chemical Composition

CAESAR: Comet Atmosphere Encounter and Sample Return, or Comet Atmosphere and Earth Sample Return

CFD: Computational Fluid Dynamics

CHON: Carbon, Hydrogen, Oxygen and Nitrogen-rich molecules

CIA: Central Intelligence Agency

CISR: Comet Intercept and Sample Return

CNES: Centre National d'Etudes Spatiales; the French National Space Studies Center

CNRS: Centre National de la Recherche Scientifique; the French National Scientific Research Center

CNSR: Comet Nucleus Sample Return

CNUCE: Centro Nazionale Universitario di Calcolo Elettronico; the Italian National University Center for Electronic Computation

Conjunction: The time when a solar system object appears close to the Sun as seen by an observer. A conjunction where the Sun is between the observer and the object is called 'superior conjunction'. A conjunction where the object is between the observer and the Sun is called 'inferior conjunction'. See also opposition.

CONSCAN: Conical Scan

CONTOUR: Comet Nucleus Tour

Cosmic velocities: Three characteristic velocities of spaceflight:

First cosmic velocity: Minimum velocity to put a satellite in a low Earth orbit. This amounts to some 8 km/s.

Second cosmic velocity: The velocity required to exit the terrestrial sphere of

attraction for good. Starting from the ground, this amounts to some 11 km/s. It is also called 'escape' speed.

Third cosmic velocity: The velocity required to exit the solar system for good.

CRAF: Comet Rendezvous/Asteroid Flyby

Cryogenic propellants: These can be stored in their liquid state under atmospheric pressure at very low temperature; e.g. oxygen is a liquid below -183°C .

DAS: Dolgozhivushaya Avtonomnaya Stanziya; Long-Duration Autonomous Station

Deep Space Network: A global network built by NASA to provide round-the-clock communications with robotic missions in deep space.

Direct ascent: A trajectory on which a deep-space probe is launched directly from the Earth's surface to another celestial body without entering parking orbit.

DMSP: Defense Meteorological Satellite Program

DSN: Deep Space Network

DSPSE: Deep Space Program Science Experiment

DZhVS: Dolgozhivushaya Veneryanskaya Stanziya; long-duration Venusian probe

ECAM: Earth-Crossing Asteroid Mission

Ecliptic: The plane of the Earth's orbit around the Sun.

Ejecta: Material from a volcanic eruption or a cratering impact that is deposited all around the source.

EOS: Eole-Venus

EPONA: Energetic Particle Onset Admonitor

ESA: European Space Agency

Escape speed: See Cosmic velocities

ESO: European Southern Observatory

ESRO: European Space Research Organization (incorporated into ESA)

Flyby: A high relative speed and short-duration close encounter between a spacecraft and a celestial body.

GEM: Galileo Europa Mission

GEM: Giotto Extended Mission

GMM: Galileo Millennium Mission

GRB: Gamma-Ray Bursts

GSFC: Goddard Space Flight Center

GSLV: Geostationary Satellite Launch Vehicle

HAPPEN: Halley Post-Perihelion Encounter

HEOS: Highly Eccentric Orbit Satellite

HER: Halley Earth Return

HIM: Halley Intercept Mission

HMC: Halley Multicolor Camera

HST: Hubble Space Telescope

Hypergolic propellants: Two liquid propellants that ignite spontaneously on coming into contact, without requiring an ignition system. Typical hypergolics for a spacecraft are hydrazine and nitrogen tetroxide.

IACG: Inter-Agency Consultative Group

ICM: International Comet Mission

IHW: International Halley Watch

IKI: Institut Kosmicheskikh Isledovaniy; the Russian Institute for Cosmic Research

IMEWG: International Mars Exploration Working Group

IMP: Interplanetary Monitoring Platform

IRAS: InfraRed Astronomical Satellite

IRIS: Italian Research Interim Stage

ISAS: Institute of Space and Astronautical Sciences

ISEE: International Sun–Earth Explorer

ISO: Infrared Space Observatory

ISPM: International Solar Polar Mission

ISPP: In-Situ Propellant Production

ISRO: Indian Space Research Organization

IUE: International Ultraviolet Explorer

IUS: Inertial Upper Stage (previously: Interim Upper Stage)

JOP: Jupiter Orbiter with Probe

JPA: Johnstone Plasma Analyzer

JPL: Jet Propulsion Laboratory; a Caltech laboratory under contract to NASA

KGB: Komitet Gosudarstvennoy Bezopasnosti; Committee for the State Security

KTDU: Korrektiruyushaya Tormoznaya Dvigatel'naya Ustanovka; course correction and braking engine

Lander: A spacecraft designed to land on another celestial body.

LaRC: Langley Research Center

Launch window: A time interval during which it is possible to launch a spacecraft to ensure that it attains the desired trajectory.

LEAP: Light ExoAtmospheric Projectile

LESS: Low-cost Exploration of the Solar System

Lyman-alpha: The emission line corresponding to the first energy level transition of an electron in a hydrogen atom.

MAGE: Moteur d'Apogée Geostationnaire Européen; European Geostationary Apogee Motor

MAOSEP: Multiple Asteroid Orbiter with Solar Electric Propulsion

MAV: Mars Ascent Vehicle

MBB: Messerschmitt Bölkow Blohm

MEI: Moskovskiy Energeticheskiy Institut; Moscow's Power Institute

MER: Mars Exploration Rover

MESUR: Mars Environmental Survey

MGCO: Mars Geoscience/Climatology Orbiter

MGS: Mars Global Surveyor

MIT: Massachusetts Institute of Technology

MORO: Moon Orbiting Observatory

MPF: Mars Pathfinder, MESUR Pathfinder

MPO: Mercury Polar Orbiter

MRSR: Mars Rover and Sample Return

MSM: Mars Science Microrover

MSX: Midcourse Space Experiment

MS-T5: Mu Satellite-Test 5

MUADDEE: Mars Upper Atmosphere Dynamics, Energetics and Evolution Mission

MUSES: MU [rocket] Space Engineering Satellite

NAS: National Academy of Sciences

NASA: National Aeronautics and Space Administration

NASDA: National Space Development Agency

NEAR: Near Earth Asteroid Rendezvous

NEARS: Near Earth Asteroid Returned Sample

NEP: Nuclear Electric Propulsion

Occultation: When one object passes in front of and occults another, at least from the point of view of the observer.

OOE: Out-Of-Ecliptic mission

Orbit: The trajectory on which a celestial body or spacecraft is traveling with respect to its central body. There are three possible cases:

Elliptical orbit: A closed orbit where the body passes from minimum distance to maximum distance from its central body every semiperiod. This is the orbit of natural and artificial satellites around planets and of planets around the Sun.

Parabolic orbit: An open orbit where the body passes through minimum distance from its central body and reaches infinity at zero velocity in infinite time. This is a pure abstraction, but the orbits of many comets around the Sun can be described adequately this way.

Hyperbolic orbit: An open orbit where the body passes through minimum distance from its central body and reaches infinity at non-zero speed. This describes adequately the trajectory of spacecraft with respect to planets during flyby manoeuvres.

Opposition: The time when a solar system object appears opposite to the Sun as seen by an observer.

Orbiter: A spacecraft designed to orbit a celestial body.

PAH: Polycyclic Aromatic Hydrocarbons

PAM: Payload Assist Module

Parking orbit: A low Earth orbit used by deep-space probes before heading to their targets. This relaxes the constraints on launch windows and eliminates launch vehicle trajectory errors. Its contrary is direct ascent.

Periapsis: The minimum distance point from the central body of any orbit. See also apoapsis.

Perigee: The minimum distance point from the Earth of a satellite. Its contrary is apogee.

Perihelion: The minimum distance point from the Sun of a heliocentric orbit. Its contrary is aphelion.

PFF: Pluto Fast Flyby

PKE: Pluto Kuiper Express

POLO: Polar Orbiting Lunar Observatory

PrOP: Pribori Otchenki Prokhodimosti; instrument for cross-country characteristics evaluation

PSLV: Polar Satellite Launch Vehicle

PVM: Pioneer Venus Multiprobe

PVO: Pioneer Venus Orbiter

'Push-broom' camera: A digital camera consisting of a single row of pixels, with the second dimension created by the motion of the camera itself.

Re: Earth radii (6,371 km)

Rendezvous: A low relative speed encounter between two spacecraft or celestial bodies.

Retrorocket: A rocket whose thrust is directed opposite to the motion of a spacecraft in order to brake it.

Rj: Jupiter radii (approximately 71,200 km)

RKA: Rossiyskoye Kosmisheskoye Agenstvo; Russian Space Agency

Rover: A mobile spacecraft to explore the surface of another celestial body.

RPA: Rème Plasma Analyzer

RTG: Radioisotope Thermal Generator

RTH: Radioisotope Thermal Heater

SAR: Synthetic Aperture Radar

SEI: Space Exploration Initiative

SETI: Search for Extraterrestrial Intelligence

SLIM: Surface Lander Investigation of Mars

SLV: Satellite Launch Vehicle

SMACS: Small Missions to Asteroids/Comets

SNAP: System for Nuclear Auxiliary Power

SNC: Shergottites–Nakhlites–Chassignites meteorites

SOCCER: Sample of Comet Coma Earth Return

SOHO: Solar and Heliospheric Observatory

Solar flare: A solar chromospheric explosion creating a powerful source of high energy particles.

Space probe: A spacecraft designed to investigate other celestial bodies from a short range.

Spectrometer: An instrument to measure the energy of radiation as a function of wavelength in a portion of the electromagnetic spectrum. Depending on the wavelength the instrument is called, e.g. ultraviolet, infrared, gamma-ray spectrometer etc.

Spin stabilization: A spacecraft stabilization system where the attitude is maintained by spinning the spacecraft around one of its main inertia axes.

SSEC: Solar System Exploration Committee

SSED: Solar System Exploration Division

STS: Space Transportation System; the Space Shuttle

Synodic period: The period of time between two consecutive superior or inferior conjunctions or oppositions of a solar system body.

TAU: Thousand Astronomical Units mission

TDRS: Tracking and Data Relay Satellite

Telemetry: Transmission by a spacecraft via a radio system of engineering and scientific data.

3-axis stabilization: A spacecraft stabilization system where the axes of the spacecraft are kept in a fixed attitude with respect to the stars and other references (the Sun, the Earth, a target planet etc.)

TOPS: Thermoelectric Outer Planet Spacecraft

TOS: Transfer Orbit Stage

UDMH: Unsymmetrical DiMethyl Hydrazine

UMVL: Universalnyi Mars, Venera, Luna; Universal for Mars, Venus and the Moon

UTC: Universal Time Coordinated; essentially Greenwich Mean Time

V2: Vergeltungswaffe 2 (vengeance weapon 2)

Vidicon: A television system based on resistance changes of some substances when exposed to light. It has been replaced by the CCD.

VLA: Very Large Array

VLBI: Very Long Baseline Interferometry

VMPM: Venus Multiprobe Mission

VOIR: Venus Orbiting Imaging Radar

VRM: Venus Radar Mapper

Yarkovsky effect: A force acting on a rotating body in space caused by the emission of thermal photons, carrying momentum. Small asteroids and meteoroids are known to be perturbed by this effect.

Appendix 1

CHRONOLOGY OF SOLAR SYSTEM EXPLORATION 1983–1996

Date	Event
16 October 1983	The first orbital radar images of Venus are returned by Venera 15
7 January 1985	Sakigake, the first non-US, non-Soviet deep-space probe is launched
11 June 1985	The Vega 1 balloon is the first 'aircraft' to fly in the atmosphere of another planet (Venus)
11 September 1985	The International Comet Explorer flies by comet Giacobini–Zinner
28 January 1986	Space Shuttle Challenger explodes, derailing US planetary exploration initiatives
14 March 1986	The European Giotto flies by comet Halley
10 August 1990	Magellan enters orbit around Venus to deliver a complete radar map of the planet
29 October 1991	Galileo flies by asteroid Gaspra
13 September 1994	Ulysses makes the first pass over one of the poles of the Sun
7 December 1995	Galileo enters orbit around Jupiter as its atmospheric capsule plunges into the planet
17 February 1996	NEAR-Shoemaker, the first low-cost Discovery mission is launched
Related milestones	
4 July 1997	Mars Pathfinder lands on Mars carrying the first working planetary rover
14 February 2000	NEAR-Shoemaker enters orbit around asteroid Eros
12 February 2001	NEAR-Shoemaker lands on asteroid Eros

Appendix 2

PLANETARY LAUNCHES 1983–1996

Launch Date	Name	Main Target	Launcher	Nation
12 August 1978	International Cometary Explorer	P/Giacobini –Zinner	Delta 2914	USA
2 June 1983	Venera 15	Venus	8K82K Proton K/D-1	USSR
7 June 1983	Venera 16	Venus	8K82K Proton K/D-1	USSR
15 December 1984	Vega 1	Venus/Halley	8K82K Proton K/D-1	USSR
21 December 1984	Vega 2	Venus/Halley	8K82K Proton K/D-1	USSR
7 January 1985	Sakigake	P/Halley	Mu-3SII	Japan
2 July 1985	Giotto	P/Halley	Ariane 1	ESA
18 August 1985	Suisei	P/Halley	Mu-3SII	Japan
7 July 1988	(Fobos 1)	Mars/Phobos	8K82K Proton K/D-1	USSR
12 July 1988	(Fobos 2)	Mars/Phobos	8K82K Proton K/D-1	USSR
4 May 1989	Magellan	Venus	OV 104 + IUS	USA
18 October 1989	Galileo	Jupiter	OV 104 + IUS	USA
6 October 1990	Ulysses	Solar orbiter	OV 103 + IUS	ESA/USA
25 September 1992	(Mars Observer)	Mars	Commercial Titan III	USA
25 January 1994	(Clementine)	Moon/Asteroid	Titan IIG SLV	USA
17 February 1996	NEAR-Shoemaker	Asteroid	Delta 7925-8	USA
7 November 1996	Mars Global Surveyor	Mars	Delta 7925A	USA
16 November 1996	(Mars 8)	Mars	8K82K Proton K/D-1	Russia
4 December 1996	Mars Pathfinder	Mars	Delta 7925A	USA

Missions in parentheses are missions that failed, but the status of Fobos 2 and Clementine is disputed. Clementine successfully completed its lunar orbiter mission but not its asteroid flyby.

Appendix 3

GALILEO ORBITS AND ENCOUNTERS

Orbit	Satellite	Date	Minimum Distance (km)
J0	Europa	7 December 1995	32,958
J0	Io	7 December 1995	898
G1	Ganymede	27 June 1996	835
G2	Ganymede	6 September 1996	260
C3	Callisto	4 November 1996	1,136
E4	Europa	19 December 1996	692
J5	<i>No Encounters</i>	20 January 1997	–
E6	Europa	20 February 1997	586
G7	Ganymede	5 April 1997	3,102
G8	Ganymede	7 May 1997	1,603
C9	Callisto	25 June 1997	418
C10	Callisto	17 September 1997	539
E11	Europa	6 November 1997	2,042
E12	Europa	16 December 1997	205
E13	Europa	10 February 1998	3,562
E14	Europa	29 March 1998	1,645
E15	Europa	31 May 1998	2,515
E16	Europa	20 July 1998	1,837
E17	Europa	26 September 1998	3,582
E18	Europa	22 November 1998	2,273
E19	Europa	1 February 1999	1,439
C20	Callisto	5 May 1999	1,315
C21	Callisto	30 June 1999	1,047
C22	Callisto	14 August 1999	2,296
C23	Callisto	16 September 1999	1,057
I24	Io	11 October 1999	612

Orbit	Satellite	Date	Minimum Distance (km)
I25	Io	26 November 1999	300
E26	Europa	3 January 2000	351
I27	Io	22 February 2000	198
G28	Ganymede	20 May 2000	809
G29	Ganymede	28 December 2000	2,337
C30	Callisto	25 May 2001	138
I31	Io	6 August 2001	194
I32	Io	16 October 2001	184
I33	Io	17 January 2002	101.5
A34	Amalthea	5 November 2002	244
J35	<i>Jupiter Impact</i>	21 September 2003	–

Galileo orbits were named according to the satellite that was the main target of the periapsis pass: A = Amalthea, C = Callisto, E = Europa, G = Ganymede, I = Io, J = no encounter.

Chapter references

- [Acuña-1998] Acuña, M.H., et al., “Magnetic Field and Plasma Observations at Mars: Initial Results of the Mars Global Surveyor Mission”, *Science*, 279, 1998, 1676–1680
- [Acuña-1999] Acuña, M.H., et al., “Global Distribution of Crustal Magnetization Discovered by the Mars Global Surveyor MAG/ER Experiment”, *Science*, 284, 1999, 790–793
- [Adams-1981] Adams, R.E.W., Brown, W.E. Jr., Patrick Culbert, T., “Radar Mapping, Archeology, and Ancient Maya Land Use”, *Science*, 213, 1981, 1457–1463
- [Akiba-1980] Akiba, R., et al., “Orbital Design and Technological Feasibility of Halley Mission”, *Acta Astronautica*, 7, 1980, 797–805
- [Albee-1994] Albee, A.L., Uesugi, K.T., Tsou, P., “SOCCER: Comet Coma Sample Return Mission”. In: Lunar and Planetary Institute, Workshop on Particle Capture, Recovery and Velocity/Trajectory Measurement Technologies, 1994, 7–11
- [Albee-1998] Albee, A.L., Palluconi, F.D., Arvidson, R.E., “Mars Global Surveyor Mission: Overview and Status”, *Science*, 279, 1998, 1671–1672
- [Albee-2001] Albee, A.L., et al., “Overview of the Mars Global Surveyor Mission”, *Journal of Geophysical Research*, 106, 2001, 23,291–23,316
- [Alekseev-1986] Alekseev, V.A., et al., “The Plasma Near the Sun Sounded by Venera 15 Radio Signals: a VLBI Experiment”, *Soviet Astronomy Letters*, 12, 1986, 204–207
- [Alexandrov-1989] Alexandrov, Yu.N., Krivtsov, A.P., Rzhiga, O.N., “Venera 15 and 16 Spacecraft: Some Results on Venus Surface Reflectivity Measurements”, paper presented at the XXI Lunar and Planetary Science Conference, Houston, 1989
- [Alfvén-1970] Alfvén, H., “Exploring the Origin of the Solar System by Space Missions to the Asteroids”, paper presented at the Third Conference on Planetology and Space Mission Planning, New York, October 1970
- [Alvarez-1997] Alvarez, W., “T.Rex and the Crater of Doom”, Princeton University Press, 1997
- [Anderson-1977] Anderson, J.D., et al., “An Arrow to the Sun”. In: “Proceedings of the International Meeting on Experimental Gravitation, Pavia, September 17–20, 1976”, Rome, Accademia Nazionale dei Lincei, 1977, 393–422
- [Anderson-1994] Anderson, J.D., Vessot, R.F.C., Mattison, E.M. , “Gravitational Experiments for Solar Probe”, paper presented at the Memorial Conference “Ideas for Space Research after the Year 2000”, Padua, 18–19 February 1994
- [Anderson-1996a] Anderson, J.D., Sjogren, W.L., Schubert, G., “Galileo Gravity Results and the Internal Structure of Io”, *Science*, 272, 1996, 709–712
- [Anderson-1996b] Anderson, J.D., et al., “Gravitational Constrains on the Internal Structure of Ganymede”, *Nature*, 384, 1996, 541–543

- [Anderson-1997a] Anderson, J.D., et al., “Gravitational Evidence for an Undifferentiated Callisto”, *Nature*, 387, 1997, 264–266
- [Anderson-1997b] Anderson, J.D., et al., “Europa’s Differentiated Internal Structure: Inferences from Two Galileo Encounters”, *Science*, 276, 1997, 1236–1239
- [Anderson-1998] Anderson, J.D., et al., “Europa’s Differentiated Internal Structure: Inferences from Four Galileo Encounters”, *Science*, 281, 1998, 2019–2022
- [Anderson-2004] Anderson, J.D., et al., “Discovery of Mass Anomalies on Ganymede”, *Science*, 305, 2004, 989–991
- [Anderson-2005] Anderson, J.D., et al., “Amalthea’s Density is Less than that of Water”, *Science*, 308, 2005, 1291–1293
- [Andreichikov-1986] Andreichikov, B.M., et al., “Element Abundances in Venus Aerosols by X-Ray Radiometry: Preliminary Results” *Soviet Astronomy Letters*, 12, 1986, 48–49
- [Angold-1992] Angold, N., et al., “Ulysses Operations at Jupiter – Planning for the Unknown”, *ESA Bulletin*, 72, 1992, 44–51
- [Angold-2008] Angold, N., “Ulysses, the Over Achiever”, presentation at “The Ulysses Legacy” Press Conference, Paris, ESA Headquarters, 12 June 2008
- [Anselmo-1987a] Anselmo, L., Trumphy, S., “Low Cost Mission to Near-Earth Asteroids”, Paper AAS 87–405
- [Anselmo-1987b] Anselmo, L., “Proposta di Missione Spaziale agli Asteroidi Apollo-Amor-Aten” (A proposed space mission to Apollo-Amor-Aten asteroids), CNUCE Internal Report C87–11, 17 March 1987 (in Italian)
- [Anselmo-1990] Anselmo, L., Pardini, C., “Piazz: a Probe to the Apollo-Amor Asteroids”, in: “Proceedings of the 17th International Symposium on Space Technology and Science”, Tokyo, 1990, 1879–1884
- [Anselmo-1991] Anselmo, L., Milani, A., “Reconnaissance Mission to Near-Earth Asteroids”, *The Journal of the Astronautical Sciences*, 39, 1991, 469–485
- [Anselmo-1996a] Anselmo, J.C., “Mars Sample Return Still Years Away”, *Aviation Week & Space Technology*, 28 October 1996, 69
- [Anselmo-1996b] Anselmo, J.C., “Life on Mars? Evidence Emerges”, *Aviation Week & Space Technology*, 12 August 1996, 24–25
- [Anselmo-2007] Anselmo, L., Personal communication with the author, 8 September 2004
- [Antreasian-1998] Antreasian, P.G., Guinn, J.R., “Investigations into the unexpected Delta-V Increases during the Earth Gravity Assists of Galileo and NEAR”, Paper AIAA-98-4287
- [APL-1999] “The NEAR Rendezvous Burn Anomaly of December 1998: Final Report of the NEAR Anomaly Review Board”, Laurel, The Johns Hopkins University Applied Physics Laboratory, November 1999
- [Aran-2007] Aran, A., et al., “Modeling and Forecasting Solar Energetic Particle Events at Mars: the event on 6 March 1989”, *Astronomy & Astrophysics*, 469, 2007, 1123–1134
- [Armstrong-1997] Armstrong, J.W., et al., “The Galileo/Mars Observer/Ulysses Coincidence Experiment”. Paper presented at the 2nd Edoardo Amaldi Conference on Gravitational Waves, Geneva, 1997
- [Armstrong-2002] Armstrong, J.C., Wells, L.E., Gonzalez, G., “Rummaging through Earth’s Attic for Remains of Ancient Life”, Arxiv pre-print astro-ph/0207316
- [Asker-1996] Asker, J.R., “Next Missions to Mars May Prove Too Small”, *Aviation Week & Space Technology*, 19 August 1996, 26–27
- [Asker-2001a] Asker, J.A., “Attempt at Hard Landing Set For Asteroid Spacecraft” *Aviation Week & Space Technology*, 5 February 2001, 42–43
- [Asker-2001b] Asker, J.A., “Cheating Death, NEAR Lands, Operates on Eros”, *Aviation Week & Space Technology*, 19 February 2001, 24–25

- [Aston-1986] Aston, G., "Electric Propulsion: A Far Reaching Technology", *Journal of the British Interplanetary Society*, 39, 1986, 503–507
- [Atkinson-1996] Atkinson, D.H., Pollack, J.B., Seiff, A., "Galileo Doppler Measurements of the Deep Zonal Winds at Jupiter", *Science*, 272, 1996, 842–843
- [Atkinson-1997] Atkinson, D.H., Ingersoll, A.P., Seiff, A., "Deep Winds on Jupiter as Measured by the Galileo Probe", *Nature*, 388, 1997, 649–650
- [Atzei-1989] Atzei, A., et al., "Rosetta/CNSR – ESA's Planetary Cornerstone Mission", *ESA Bulletin*, 59, 1989, 18–29
- [Avanesov-1989a] Avanesov, G.A., et al., "Television Observations of Phobos", *Nature*, 341, 1989, 585–587
- [Avanesov-1989b] Avanesov, G., et al., "Regatta-Astro Project: Astrometric Studies from Small Space Laboratory". In: *Proceedings of the 141st IAU Symposium on the Inertial Coordinate System on the Sky*, Leningrad, 1989, 361–366
- [Avanesov-1991] Avanesov, G.A., Kostenko, V.I., "Regatta v Kosmicheskiy Polyet pod Solnetsnim Parusom" (Regatta for flight in space with a solar sail), *Zemlya I Vselennaya*, January 1991, 3 (in Russian)
- [AWST-1979] "OMB Kills Halley/Tempel 2 Mission", *Aviation Week & Space Technology*, 26 November 1979, 20
- [AWST-1980] "Venus Orbiting Imaging Radar Design Proposals Due This Year", *Aviation Week & Space Technology*, 24 March 1980
- [AWST-1983] "Hardware From Past Programs Will Cut Venus Mapper Costs", *Aviation Week & Space Technology*, 14 February 1983, 20
- [AWST-1985a] "Industry Observer", *Aviation Week & Space Technology*, 29 July 1985, 11
- [AWST-1985b] "NASA Chief Favors ISTP, Ocean Mapping Over Comet Mission", *Aviation Week & Space Technology*, 16 September 1985, 18
- [AWST-1986a] "New Vega Flyby", *Aviation Week & Space Technology*, 24 March 1986, 22
- [AWST-1986b] "Glavcosmos Formed by Soviets to Help Run Space Program", *Aviation Week & Space Technology*, 24 March 1986, 77
- [AWST-1987a] "Soviet Mars Mission Will Use Modular Propulsion System", *Aviation Week & Space Technology*, 2 November 1987, 81
- [AWST-1987b] "JPL Studying Aeroshell Structure for Mars Rover, Spacecraft", *Aviation Week & Space Technology*, 3 August 1987, 61
- [AWST-1988a] "NASA Board Nears End of Fire Review", *Aviation Week & Space Technology*, 24 October 1988, 24
- [AWST-1988b] "Magellan Fire Inquiry Board Urges New Test Procedures", *Aviation Week & Space Technology*, 14 November 1988, 35
- [AWST-1988c] "U.S./Soviet Balloon Flights May Aid Future Mars Missions", *Aviation Week & Space Technology*, 29 August 1988, 49
- [AWST-1988d] "Soviets Consider Varied Concepts for 1994 Mars Exploration Flight", *Aviation Week & Space Technology*, 18 July 1988, 19
- [AWST-1989a] "CRAF Will Be First in Series of Missions Using Mariner Mk.2", *Aviation Week and Space Technology*, 9 October 1989, 99–109
- [AWST-1989b] "Magellan's Radar Images of Venus to Unmask Cloud-Shrouded Planet", *Aviation Week & Space Technology*, 9 October 1989, 113–115
- [AWST-1989c] "Galileo Represents Peak in Design Complexity", *Aviation Week & Space Technology*, 9 October 1989, 77–78
- [AWST-1990a] "Magellan Switched to Safer Mode; Computer Faults Still Puzzle Controllers", *Aviation Week & Space Technology*, 10 September 1990, 30

- [AWST-1990b] “Magellan Spacecraft Regains High-Data Rate Communications”, *Aviation Week & Space Technology*, 17 September 1990, 41
- [AWST-1996] “Crunch Time for Mars 96”, *Aviation Week & Space Technology*, 7 October 1996, 70
- [AWST-2002] “Quit Fiddling and Image Jupiter Moon”, *Aviation Week & Space Technology*, 8 July 2002, 70
- [Baird-2007] Baird, D.T., et al., “Zonal Wind Calculations from Mars Global Surveyor Accelerometer and Rate Data”, *Journal of Spacecraft and Rockets*, 44, 2007, 1180–1187
- [Balogh-1984] Balogh, A., “AGORA: Asteroid Rendezvous”, *Spaceflight*, June 1984, 242–245
- [Balsiger-1986] Balsiger, H., et al., “Ion Composition and Dynamics at Comet Halley”, *Nature*, 321, 1986, 330–334
- [Balsiger-1988] Balsiger, H., Fechtig, H., Geiss, J., “A Close Look at Halley’s Comet”, *Scientific American*, September 1988, 62–69
- [Bandfield-2000] Bandfield, J.L., Hamilton, V.E., Christensen, P.R., “A Global View of Martian Surface Composition from MGS-TES”. *Science*, 287, 2000, 1626–1630
- [Bandfield-2003] Bandfield, Glotch, T.D., V.E., Christensen, P.R., “Spectroscopic Identification of Carbonate Minerals in the Martian Dust”, *Science*, 301, 2003, 1084–1087
- [Banerdt-1994] Banerdt, W.B., et al., “Gravity Studies of Mead Crater, Venus”, paper presented at the Lunar and Planetary Science Conference XXV, Houston, 1994
- [Barbieri-1985] Barbieri, C., et al., “La Halley Multicolour Camera: Contributo Italiano alla sua Realizzazione” (The Italian Contribute to the Halley Multicolour Camera). In: “Le Comete nell’Astronomia Moderna: Il Prossimo Incontro con la Cometa di Halley” (Comets in Modern Astronomy: The Forthcoming Encounter with Halley’s Comet), Naples, Guida, 1985, 229–250 (in Italian)
- [Barbosa-1992] Barbosa, D.D., Kivelson, M.G., “Ulysses Spacecraft Rendezvous with Jupiter”, *Science*, 257, 1992, 1487–1489
- [Basilevsky-1988] Basilevsky, A.T., “Northern Beta: Photogeologic Analysis of Venera 15/16 Images and Maps”, paper presented at the XIX Lunar and Planetary Science Conference, Houston, 1988
- [Basilevsky-1992] Basilevsky, A.T., Weitz, C.M., “The Geology of the Venera/Vega Landing Sites”, paper presented to the International Colloquium on Venus, Pasadena, 10–12 August 1992
- [Baumgärtel-1998] Baumgärtel, K., et al., “‘Phobos Events’ – Signature of Solar Wind Interaction with a Gas Torus?”, *Earth Planets Space*, 50, 1998, 453–462
- [Becker-2005] Becker, S.C., “Astro Projection: Virtual Reality, Telepresence, and the Evolving Human Space Experience”, *Quest*, 12 No.3, 2005, 34–55
- [Beech-1990] Beech, P., Meyer, D., “Post-Launch Operations and Data Production”, *ESA Bulletin*, 63, 1990, 60–63
- [Bell-1998] Bell, J., “Mars Pathfinder: Better Science?”, *Sky & Telescope*, July 1998, 36–43
- [Belton-1991] Belton, M.J.S., et al., “Images from Galileo of the Venus Cloud Deck” *Science*, 253, 1991, 1531–1536
- [Belton-1992] Belton, M.J.S., et al., “Galileo Encounter with 951 Gaspra: First Pictures of an Asteroid”, *Science*, 257, 1992, 1647–1652
- [Belton-1994] Belton, M.J.S., et al., “First Images of Asteroid 243 Ida”, *Science*, 265, 1994, 1543–1547
- [Belton-1996] Belton, M.J.S., et al., “Galileo’s First Images of Jupiter and the Galilean Satellites”, *Science*, 274, 1996, 377–385
- [Bender-1978] Bender, D.F., “Ballistic Trajectories”. In: Neugebauer, M., Davies, R.W., “A Close-Up of the Sun”, Pasadena, JPL, 1978, 535–543

- [Bertaux-1986] Bertaux, J.L., et al., “Active Spectrometry of the Ultraviolet Absorption within the Venus Atmosphere”, *Soviet Astronomy Letters*, 12, 1986, 33–36
- [Bertotti-1992] Bertotti, B., et al., “The Gravitational Wave Experiment”, *Astronomy & Astrophysics Supplement Series*, 92, 1992, 431–440
- [Bertotti-1995] Bertotti, B., et al., “Search for Gravitational Wave Trains with the Spacecraft Ulysses”, *Astronomy & Astrophysics*, 296, 1995, 13–25
- [Bertotti-2007] Bertotti, B., interview with the author, Pavia, 27 April 2007
- [Bevilacqua-1994] Bevilacqua, F., Cesare, S., “A Project for a Solar Sail Propelled Spaceship”, *Journal of the British Interplanetary Society*, 47, 1994, 57–66
- [Bibing-1989] Bibing, J.-P., et al., “Results from the ISM Experiment”, *Nature*, 341, 1989, 591–593
- [Bickler-1989] Bickler, D.B., “Articulated Suspension System”, United States Patent No. 4,840,394, 20 June 1989
- [Bickler-1993] Bickler, D.B., “The New Family of JPL Planetary Surface Vehicles”. In: “Missions, Technologies et Conception des Vehicules Mobiles Planetaires”, Toulouse, Cépaduès, 1993
- [Bindschadler-2003] Bindschadler, D.L., et al., “Project Galileo: Final Mission Status”, paper presented at the LIV Congress of the International Astronautical Federation, Bremen, 2003
- [Binzel-1990] Binzel, R.P., “Pluto”, *Scientific American*, June 1990, 50–58
- [Bird-1992a] Bird, M.K., et al., “The Coronal-Sounding Experiment”, *Astronomy & Astrophysics Supplement Series*, 92, 1992, 425–430
- [Bird-1992b] Bird, M.K., et al., “Ulysses Radio Occultation Observations of the Io Plasma Torus During the Jupiter Encounter”, *Science*, 257, 1992, 1531–1535
- [Blamont-1987a] Blamont, J., “Venus Devoilée” (Venus Unveiled), Paris, Editions Odile Jacob, 1987, 251 (in French)
- [Blamont-1987b] *ibid.* 285
- [Blamont-1987c] *ibid.*, 173–215
- [Blamont-1987d] *ibid.* 248
- [Blamont-1987e] *ibid.*, 247
- [Blamont-1987f] *ibid.*, 250
- [Blamont-1987g] *ibid.*, 232–238
- [Blamont-1987h] *ibid.*, 302–304
- [Blamont-1987i] *ibid.*, 249–250
- [Blamont-1987j] *ibid.*, 312
- [Blamont-1987k] *ibid.*, 317
- [Blamont-1987l] *ibid.*, 320
- [Blamont-1987m] *ibid.*, 335
- [Blamont-1989] Blamont, J.E., et al., “Vertical Profiles of Dust and Ozone in the Martian Atmosphere Deduced from Solar Occultation Measurements”, *Nature*, 341, 1989, 600–603
- [Blume-1984] Blume, W.H., et al., “Overview of the Planetary Observer Program”, Paper AIAA-84-0454
- [Boain-1993] Boain, R.J., “Clementine II: a Double Impact Asteroid Flyby and Impact Mission”, paper presented at the Workshop on Advanced Technology for Planetary Instruments, 28–30 April 1993
- [Bockstein-1988] Bockstein, I., Chochia, P., Kronrod, M., “Methods of Venus Radiolocation Map Sythesis using Strip Images of Venera-15 and Venera-16 Space Station”, *Earth, Moon and Planets*, 43, 1988, 233–259
- [Bogatchev-2000] Bogatchev, A., et al., “Walking and wheel-walking robots”, paper presented at the 3rd International Conference on Climbing and Walking Robots, Madrid, 2000

- [Bojor-1996] Bojor, Yu., et al., “Analysis of the Mission Profiles and Means for the US-Russian Project of the Mission to Pluto”, paper presented at the First IAA Symposium on Realistic Near-Term Advanced Scientific Space Missions, Aosta, 25–27 June 1996
- [Bokulic-1997] Bokulic, R.S., Moore, W.V., “The NEAR Solar Conjunction Experiment”, paper dated 1997
- [Bond-1993] Bond, P., “Close Encounter with a Comet”, *Astronomy*, November 1993, 42–47
- [Bonnet-1994] Bonnet, R.M., “The Influence of Giuseppe Colombo on the ESA Science Programme”, paper presented at the Memorial Conference “Ideas for Space Research after the Year 2000”, Padua, 18–19 February 1994
- [Bonnet-2002] Bonnet, R.M., “History of the Giotto Mission”, *Space Chronicle*, 55, 2002, 5–11
- [Borg-1994] Borg, J., Bribing, J.-P., Maag, C., “Main Characteristics of the COMET/COMRADE Experiments”, Paper presented at the Workshop on Particle Capture, Recovery and Velocity/Trajectory Measurement Technologies, 1994
- [Bortle-1996] Bortle, J.E., “Winter’s Express Comet”, *Sky & Telescope*, February 1996, 94–95
- [Brain-2006] Brain, D.A., “Mars Global Surveyor Measurements of the Martian Solar Wind Interaction”, *Space Science Reviews*, 126, 2006, 77–112
- [Bromberg-1966] Bromberg, J.L., Gordon, T.J.: “Extensions of Saturn”, paper presented at the XVII International Astronautical Congress, Madrid, 1966
- [Brownlee-2003] Brownlee, D.E., et al., “Stardust: Comet and Interstellar Dust Sample Return Mission”, *Journal of Geophysical Research*, 108, 2003, 1–1 to 1–15
- [Bruns-1990] Bruns, A.V., et al., “Solar Brightness Oscillations: Phobos 2 Observations”, *Soviet Astronomy Letters*, 16, 1990, 140–145
- [Burke-1984] Burke, J.D., “The Missing Link Revealed”, *Studies in Intelligence*, Spring 1984, 27–34
- [Burke-1990] Burke, J.D., Mostert, R.N., “A Network of Small Landers on Mars”, Paper AIAA-90-3577-CP
- [Burnham-1996] Burnham, D., Salmon, A., “Mars ‘96: Russia’s Return to the Forbidden Planet”, *Spaceflight*, August 1996, 272–274
- [Burns-1999] Burns, J.A., et al., “The Formation of Jupiter’s Faint Rings”, *Science*, 284, 1999, 1146–1150
- [Butrica-1996a] Butrica, A.J., “To See the Unseen – A History of Planetary Radar Astronomy”, Washington, NASA, 1996, 177–187
- [Butrica-1996b] *ibid.*, 194
- [Butrica-1996c] *ibid.*, 187–188
- [Butrica-1996d] *ibid.*, 193
- [Butrica-1996e] *ibid.*, 204
- [Butrica-1996f] *ibid.*, 252–254
- [Cadogan-1998] Cadogan, D., Sandy, C., Grahne, M., “Development and Evaluation of the Mars Pathfinder Inflatable Airbag Landing System”, paper IAF-98-I.6.02
- [Calder-1992a] Calder, N., “Giotto to the Comets”, London, Presswork, 1992, 20–28
- [Calder-1992b] *ibid.*, 29–38
- [Calder-1992c] *ibid.*, 65
- [Calder-1992d] *ibid.*, 69–70
- [Calder-1992e] *ibid.*, 64
- [Calder-1992f] *ibid.*, 37 and 45
- [Calder-1992g] *ibid.*, 114–115
- [Calder-1992h] *ibid.*, 82
- [Calder-1992i] *ibid.*, 64
- [Calder-1992j] *ibid.*, 96–97

- [Calder-1992k] *ibid.*, 98–99
- [Calder-1992l] *ibid.*, 100–101
- [Calder-1992m] *ibid.*, 105–106
- [Calder-1992n] *ibid.*, 109–110
- [Calder-1992o] *ibid.*, 118–119
- [Calder-1992p] *ibid.*, 135–136
- [Calder-1992q] *ibid.*, 128
- [Calder-1992r] *ibid.*, 123
- [Calder-1992s] *ibid.*, 148
- [Calder-1992t] *ibid.*, 147–163
- [Calder-1992u] *ibid.*, 164–197
- [Caldwell-1992] Caldwell, J., Turgeon, B., Hua, X.-M., “Hubble Space Telescope Imaging of the North Polar Aurora on Jupiter”, *Science*, 257, 1992, 1512–1515
- [Canby-1986] Canby, T.Y., “Are The Soviets Ahead in Space?”, *National Geographic*, October 1986, 420–459
- [Cantor-2007] Cantor, B.A., “MOC Observations of the 2001 Mars Planet-Encircling Dust Storm”, *Icarus*, 186, 2007, 60–96
- [Caplinger-2001] Caplinger, M.A., Malin, M.C., “Mars Orbiter Camera Geodesy Campaign”, *Journal of Geophysical Research*, 168, 2001, 23,595–23,606
- [Caprara-1992] Caprara, G., “L’Italia nello Spazio” (Italy in Space), Rome, Valerio Levi, 1992, 202 (in Italian)
- [Carlier-1993] Carlier, C., Gilli, M., Laidet, L., “CNES: The French Space Agency 1962–1992”, Paper IAA-2-1-93-669, presented at the XLIV Congress of the International Astronautical Federation, Graz, 1993
- [Carlier-1995] Carlier, C., Gilli, M., “The First Thirty Years at CNES: the French Space Agency 1962–1992”, Paris, CNES/La Documentation Française, 1995, 141 and 210
- [Carlson-1991] Carlson, R.W., et al., “Galileo Infrared Imaging Spectroscopy Measurements at Venus”, *Science*, 253, 1991, 1541–1548
- [Carlson-1992] Carlson, R.W., et al., “Near-Infrared Mapping Spectrometer Experiment on Galileo”, *Space Science Reviews*, 60, 1992, 457–502
- [Carlson-1996] Carlson, R., et al., “Near-Infrared Spectroscopy and Spectral Mapping of Jupiter and the Galilean Satellites: Results from Galileo’s Initial Orbit”, *Science*, 274, 1996, 385–388
- [Carlson-1999a] Carlson, R.W., “A Tenuous Carbon Dioxide Atmosphere on Jupiter’s Moon Callisto”, *Science*, 283, 1999, 820–821
- [Carlson-1999b] Carlson, R.W., et al., “Sulfuric Acid on Europa and the Radiolytic Sulfur Cycle”, *Science*, 286, 1999, 97–99
- [Carlson-1999c] Carlson, R.W., et al., “Hydrogen Peroxide on the Surface of Europa”, *Science*, 283, 1999, 2062–2064
- [Carlson-2007] Carlson, R.W., Personal communication with the author, 3 December 2007
- [Carr-1998] Carr, M.H., et al., “Evidence for a Subsurface Ocean on Europa”, *Nature*, 391, 1998, 363–365
- [Carroll-1993a] Carroll, M.W., “Cheap Shots”, *Astronomy*, 21, August 1993, 38–47
- [Carroll-1993b] Carroll, M., “Mars: The Russians are Going! The Russians are Going!”, *Astronomy*, October 1993, 26–33
- [Carroll-1995] Carroll, M., “New Discoveries on the Horizon: NASA’s Next Missions”, *Astronomy*, 23, November 1995, 36–43
- [Carroll-1997] Carroll, M., “Europa: Distant Ocean, Hidden Life?”, *Sky & Telescope*, December 1997, 50–55

- [Caseley-1990] Caseley, P.J., Marsden, R.G., “The Ulysses Scientific Payload”, *ESA Bulletin*, 63, 1990, 29–38
- [Cattermole-1997] Cattermole, P, Moore, P., “Atlas of Venus”, Cambridge University Press, 1997, 50–103
- [Chaikin-2007] Chaikin, A., “Global Surveyor’s Last Hurrah”, *Sky & Telescope*, April 2007, 38–41
- [Chapman-1995] Chapman, R.J., Regeon, P.A., “The Clementine Lunar Orbiter Project”, paper presented at the Austrian Space Agency Summer School 1995, Alpbach, Germany, 26 July–3 August 1995
- [Cheng-2001] Cheng, A.J., et al., “Laser Altimetry of Small Scale Features on 433 Eros from NEAR–Shoemaker”, *Science*, 2001, 292, 488–491
- [Cheng-2002] Cheng, A.F., et al., “Small Scale Topography from Laser Altimetry and Imaging”, *Icarus*, 155, 2002, 51–74
- [Chicarro-1993] Chicarro, A., Scoon, G., Coradini, M., “MARSNET – A Network of Stations on the Surface of Mars”, *ESA Journal*, 17, 1993, 225–237
- [Chicarro-1994] Chicarro, A., Scoon, G., Coradini, M., “INTERMARSNET – An International Network of Stations on Mars for Global Martian Characterization”, *ESA Journal*, 18, 1994, 207–218
- [Christensen-1998] Christensen, P.R., et al., “Results from the Mars Global Surveyor Thermal Emission Spectrometer”, *Science*, 279, 1998, 1692–1698
- [Christensen-2001] Christensen, P.R., et al., “Mars Global Surveyor Thermal Emission Spectrometer Experiment: Investigation Description and Surface Science Results”, *Journal of Geophysical Research*, 106, 2001, 23,823–23,871
- [Christou-2007] Christou, A.A., Vaubaillon, J., Withers, P., “The Dust Trail Complex of Comet 79P/du Toit–Hartley and Meteor Outbursts on Mars”, *Astronomy & Astrophysics*, 471, 2007, 321–329
- [CIA-1988] “Soviet Scientific Space Program: Gaining Prestige”, Langley, CIA, January 1988, 10
- [Clark-2000] Clark, P.S., “Launch Profiles Used by the Four-Stage Proton-K”, *Journal of the British Interplanetary Society*, 53, 2000, 197–214
- [Collins-1986] Collins, D.H., Miller, S.L., “Comet Rendezvous: The Next Stage in Cometary Exploration”, *Journal of the British Interplanetary Society*, 39, 1986, 263–272
- [Collins Petersen-1997] Collins Petersen, C., “Welcome to Mars”, *Sky & Telescope*, October 1997, 34–37
- [Combes-1986] Combes, M., et al., “Infrared Sounding of Comet Halley from Vega 1”, *Nature*, 321, 1986, 266–268
- [Connerney-1999] Connerney, J.E.P., et al., “Magnetic Lineations in the Ancient Crust of Mars”, *Science*, 284, 1999, 794–798
- [Cosmovici-1983] Cosmovici, C.B., Schmidt, E., Stanggassinger, U., “ASTIS: Infrared Spectrometer for the German Asteroids Mission”. In: “Asteroids, comets, meteors; Proceedings of the Meeting”, Uppsala University, 1983, p. 187–191
- [Covault-1979] Covault, C., “Funds Cut Forces Comet Strategy Shift”, *Aviation Week & Space Technology*, 3 December 1979, 61–65
- [Covault-1985a] Covault, C., “U.S. Plans Soviet Talks on Joint Manned Mission”, *Aviation Week & Space Technology*, 7 January 1985, 16–18
- [Covault-1985b] Covault, C., “First Comet Probe Reveals Structure of Great Complexity”, *Aviation Week & Space Technology*, 16 September 1985, 16–19
- [Covault-1985c] Covault, C., “NASA Defining Mission to Return Cometary Matter to Earth in 1990s”, *Aviation Week & Space Technology*, 9 December 1985, 115–117

- [Covault-1985d] Covault, C., “Soviets in Houston Reveal New Lunar, Mars, Asteroid Flights”, *Aviation Week & Space Technology*, 1 April 1985, 18–20
- [Covault-1989a] Covault, C., “Magellan Prepared for Course Correction as Astronauts Land Atlantis in Crosswind”, *Aviation Week & Space Technology*, 15 May 1989, 25
- [Covault-1989b] Covault, C., “Galileo Launch to Jupiter by Atlantis Culminates Difficult Effort with Shuttle”, *Aviation Week & Space Technology*, 9 October 1989, 58–67
- [Covault-1996a] Covault, C., “Mars Surveyor Leads New Era of Exploration”, *Aviation Week & Space Technology*, 11 November 1996, 22–24
- [Covault-1996b] Covault, C., “Confusion Marks Mars 96 Failure”, *Aviation Week & Space Technology*, 25 November 1996, 71–72
- [Covault-2006] Covault, C., “Rescue Ops Over Mars”, *Aviation Week & Space Technology*, 27 November 2006, 53–55
- [Cowley-1985] Cowley, S.W., “ICE Encounters Giacobini–Zinner”, *Nature*, 317, 1985, 381
- [Crowley-2007] Crowley, G., Tolson, R.H., “Mars Thermospheric Winds from Mars Global Surveyor and Mars Odyssey Accelerometers”, *Journal of Spacecraft and Rockets*, 44, 2007, 1188–1194
- [Cunningham-1983] Cunningham, C., “European Satellite Studies of Minor Planets”, *Minor Planets Bulletin*, 10, 1983, 26–27
- [Cunningham-1985] Cunningham, C., “European Satellite Studies of Minor Planets II”, *Minor Planets Bulletin*, 12, 1985, 29–30
- [Cunningham-1988a] Asteroid diameters are from IRAS data published in: Cunningham, C.J., “Introduction to Asteroids”, Richmond, Willmann-Bell, 1988, 148–164
- [Cunningham-1988b] *ibid.*, 135
- [Cunningham-1988c] *ibid.*, 132
- [Cunningham-1988d] *ibid.*, 93–123
- [Cunningham-1988e] *ibid.*, 132–133
- [Cunningham-1988f] *ibid.*, 135
- [Cunningham-1988g] *ibid.*, 134
- [Cunningham-1988h] *ibid.*, 136–138
- [Cunningham-1988i] *ibid.*, 136
- [Cunningham-1988j] *ibid.*, 133–134
- [Cunningham-1988k] *ibid.*, 89–92
- [Cunningham-1989] Cunningham, C., “European Satellite Studies of Minor Planets III”, *Minor Planets Bulletin*, 16, 1989, 20–21
- [Cunningham-1996] Cunningham, G.E., “Mars Global Surveyor Mission”, *Acta Astronautica*, 38, 1996, 367–375
- [Dale-1986] Dale, D., Felici, F., Lo Galbo, P., “The Giotto Project: From Early Concepts to Flight Model”, *ESA Bulletin*, 46, 1986, 22–33
- [Davies-1988a] Davies, J.K., “Satellite Astronomy: The Principles and Practice of Astronomy from Space”, Chichester, Ellis Horwood, 1988, 119–120
- [Davies-1988b] *ibid.*, 115–116
- [Davies-2003] Davies, A.G., “Temperature, Age and Crust Thickness Distribution of Loki Patera on Io from Galileo NIMS Data: Implications for Resurfacing Mechanism”, *Geophysical Research Letters*, 30, 2003, 2133–2136
- [Dawson-2004] Dawson, V.P., Bowles, M.D., “Taming Liquid Hydrogen: The Centaur Upper Stage Rocket 1958–2002”, Washington, NASA, 2004, 202–207
- [Day-2006] Day, D.A., “The Heat of a Burning Atom”, *Spaceflight*, April 2006, 145–150
- [Debus-2002] Debus, A., et al., “Landers Sterile Integration Implementations: Example of Mars 96 Mission”, *Acta Astronautica*, 50, 2002, 385–392

- [Dehant-2003] Dehant, V., “A Liquid Core for Mars?”, *Science*, 300, 2003, 260–261
- [Divsalar-1995] Divsalar, D., Simon, M.K., “CDMA With Interference Cancellation for Multiprobe Missions”, *JPL TDA Progress Report 42-120*, 1995, 40–53
- [Doengi-1998] Doengi, F., et al., “Lander Shock-Alleviation Techniques”, *ESA Bulletin*, 93, 1998, 51–60
- [Doody-1993] Doody, D.F., “Grappling for Gravity”, *Sky & Telescope*, August 1993, 20
- [Doody-1995] Doody, D.F., “Aerobraking the Magellan Spacecraft in Venus Orbit”, *Acta Astronautica*, 35, 1995, 475–480
- [Dornheim-1985] Dornheim, M.A., “Soviets’ Vega 2 Balloon, Lander Transmit Data from Venus”, *Aviation Week & Space Technology*, 24 June 1985, 22–24
- [Dornheim-1988] Dornheim, M.A., “Magellan Probe Signifies Renewed Interest in Planetary Programs”, *Aviation Week & Space Technology*, 6 June 1988, 38–41
- [Dornheim-1989] Dornheim, M.A., “Galileo Thrusters Approved for Flight, But Mission Plan May be Abbreviated”, *Aviation Week & Space Technology*, 10 April 1989, 23
- [Dornheim-1990a] Dornheim, M.A., “Magellan Begins Systems Checkouts After Entering Orbit Around Venus”, *Aviation Week & Space Technology*, 20 August 1990, 30–31
- [Dornheim-1990b] Dornheim, M.A., “Magellan Radar Produces Sharp Images, But Computer Problems Vex Controllers”, *Aviation Week & Space Technology*, 27 August 1990, 29
- [Dornheim-1991] Dornheim, M.A., “Improper Antenna Deployment Threatens Galileo Jupiter Mission”, *Aviation Week & Space Technology*, 22 April 1991, 25
- [Dornheim-2005] Dornheim, M.A., “Sat-to-Sat Photos May Help Diagnose Ills of Other Spacecraft”, *Aviation Week & Space Technology*, 30 May 2005, 47
- [Dubinin-1998] Dubinin, E., et al., “Multiple Shocks near Mars”, *Earth Planets Space*, 50, 1988, 279–287
- [Dunham-1990] Dunham, D.W., Jen, S.-C., Farquhar, R.W., “Trajectories for Spacecraft Encounters with Comet Honda–Mrkos–Pajdušáková in 1996”, *Acta Astronautica*, 22, 1990, 161–171
- [Dunham-2000] Dunham, D.W., et al., “Recovery of NEAR’s mission to Eros”, *Acta Astronautica*, 47, 2000, 503–512
- [D’Uston-1989] D’Uston, C., et al., “Observation of the Gamma-Ray Emission from the Martian Surface by the APEX Experiment”, *Nature*, 341 1989, 598–600
- [Duxbury-1997] Duxbury, T.C., “Proposed Clementine II Mission”, paper dated October 1997
- [Eaton-1990] Eaton, D., “The Ulysses Storage and Recertification Activities: The Managerial Problems”, *ESA Bulletin*, 63, 1990, 73–77
- [Eberhart-1985] Eberhart, J., “The ICE Plan Cometh”, *Science News*, 31 August 1985, 138–139
- [Eberhardt-1986] Eberhardt, P. et al., “The CAESAR Project – A Comet Atmosphere Encounter and Sample Return”, In: *ESA Proceedings of the 20th ESLAB Symposium on the Exploration of Halley’s Comet. Volume 2: Dust and Nucleus*, 1986, 243–248
- [Edwards-2004] Edwards, C.D. Jr., et al., “A Martian Telecommunications Network: UHF Relay Support of the Mars Exploration Rovers by the Mars Global Surveyor, Mars Odyssey, and Mars Express Orbiters”, paper presented at the LV Congress of the International Astronautical Federation, Vancouver, 2004
- [Efimov-2008a] Efimov, A.I., et al., “Coronal Radio-Sounding Detection of a CME During the 1997 Galileo Solar Conjunction”, *Advances in Space Research*, 42, 2008, 110–116
- [Efimov-2008b] Efimov, A.I., et al., “Solar Wind Turbulence During the Solar Cycle Deduced from Galileo Coronal Radio-Sounding Experiments”, *Advances in Space Research*, 42, 2008, 117–123

- [Elachi-1980] Elachi, C., "Spaceborne Imaging Radar: Geologic and Oceanographic Applications", *Science*, 209, 1980, 1073–1082
- [Elfving-1993] Elfving, A., "Automation Technology for Remote Sample Acquisition". In: "Missions, Technologies et Conception des Vehicules Mobiles Planetaires", Toulouse, Cépaduès, 1993
- [Eremenko-1993] Eremenko, A, Martinov, B., Pitchkhadze, K., "Rover in 'the Mars 96' Mission". In: "Missions, Technologies et Conception des Vehicules Mobiles Planetaires", Toulouse, Cépaduès, 1993
- [Erickson-1999] Erickson, J.K., et al., "Project Galileo: Completing Europa, Preparing for Io", paper presented at the L Congress of the International Astronautical Federation, Amsterdam, 1999
- [Erickson-2000] Erickson, J.K., et al., "Project Galileo: Surviving Io, Meeting Cassini", paper presented at the LI Congress of the International Astronautical Federation, Rio de Janeiro, 2000
- [ESA-1975] "14th SOL Meeting", ESA document 4164, 1 September 1975
- [ESA-1976] "Out-of-Ecliptic Mission – Progress Report", ESA document 4327, 3 December 1976
- [ESA-1979a] "Report on Studies for a Comet Mission to Halley and Tempel-2", document ESA 4214, 12 January 1979
- [ESA-1979b] "International Comet Mission", document ESA 8047, containing correspondence, reports etc. dated between 22 March 1979 and 19 April 1980
- [ESA-1979c] "31st SOL Meeting: Paris from 3 May to 4 May 1979", document ESA 4218, 25 June 1979
- [ESA-1979d] "Ad-hoc Panel on polar orbiters of the Moon and Mars", document ESA 4743, July 1979
- [ESA-1979e] "Exploration of Mars", document ESA 4712, 22 November 1979
- [ESA-1980] "32nd SOL meeting : Noordwijk on 22/11/1979", document ESA 4221, 31 January 1980
- [Esposito-1994] Esposito, P.B., et al., "Navigating Mars Observer: Launch Through Encounter and Response to the Spacecraft's Pre-Encounter Anomaly", Paper AAS 94-119
- [Esposito-1999] Esposito, P. et al., "Navigating Mars Global Surveyor Through the Martian Atmosphere: Aerobraking 2", paper AAS 99-443
- [Etchegaray-1987] Etchegaray, M.I. (ed.), "Preliminary Scientific Rationale for a Voyage to a Thousand Astronomical Units", Pasadena, JPL, 1987
- [Evans-2001] Evans, L.G., et al., "Elemental Composition from Gamma-Ray Spectroscopy of the NEAR–Shoemaker Landing Site on 433 Eros", *Meteoritics & Planetary Science*, 36, 2001, 1639–1660
- [Farquhar-1976] Farquhar, R.W., Muhoen, D.P., Richardson, D.L., "Mission Design for a Halo Orbiter of the Earth", Paper AIAA 76-810
- [Farquhar-1983] Farquhar, R., "ISEE-3 A Late Entry in the Great Comet Chase", *Astronautics & Aeronautics*, September 1983, 50–55
- [Farquhar-1995] Farquahr, R.W, Dunham, D.W., McAdams, J.V., "NEAR Mission Overview and Trajectory Design", Paper AAS 95-378
- [Farquhar-1999] Farquhar, R.W., "The use of Earth-return trajectories for missions to comets", *Acta Astronautica*, 44, 1999, 607–623
- [Farquhar-2001] Farquhar, R.W., "The Flight of ISEE-3/ICE: Origins, Mission History, and a Legacy", *The Journal of the Astronautical Sciences*, 49, 2001, 23–73
- [Ferrin-1988] Ferrin, I., Gil, C., "The Aging of Comets Halley and Encke", *Astronomy and Astrophysics*, 194, 1988, 288–296

- [Festou-1986] Festou, M.C., et al., "IUE Observations of Comet Halley During the Vega and Giotto Encounters", *Nature*, 321, 1986, 361–363
- [Fischer-1996] Fischer, H.M., et al., "High-Energy Charged Particles in the Innermost Jovian Magnetosphere", *Science*, 272, 1996, 856–858
- [Flight-1987] "Mars Observer Delayed", *Flight International*, 28 March 1987, 135
- [Flight-1988] "ESA Nears Science Mission Decision", *Flight International*, 19 November 1988, 21
- [Flight-1989a] "Phobos 2 in Trouble", *Flight International*, 14 January 1989, 13
- [Flight-1989b] "Dress Rehearsal Proves Magellan", *Flight International*, 20 June 1990, 21
- [Flight-1989c] "Soviets Turn from Mars to Moon", *Flight International*, 7 January 1989, 7
- [Flight-1989d] "Greece in Space", *Flight International*, 14 October 1989, 32
- [Flight-1990] "Mars-Race Spacecraft Needs \$10 Million Funding", *Flight International*, 4 April 1990, 28
- [Flight-1991a] "Galileo High-Gain Antenna Failure Blurs Jupiter", *Flight International*, 8 May 1991, 10
- [Flight-1991] "Dornier Wins Mars Camera Contract", *Flight International*, 4 December 1991, 16
- [Flight-1992a] "Successful Giotto Set for Third Comet", *Flight International*, 22 July 1992, 17
- [Flight-1992b] "NASA/Russian Mars Agreement", *Flight International*, 21 October 1992, 23
- [Flight-1993] "India Aims at Mercury", *Flight International*, 31 March 1993, 19
- [Flight-1994] "Martin Marietta Drops Observer Claim", *Flight International*, 19 January 1994, 23
- [Flight-1997] "Mars Find", *Flight International*, 22 January 1997, 22
- [Folkner-1997a] Folkner, W.M., et al., "Earth-Based Radio Tracking of the Galileo Probe for Jupiter Wind Estimation", *Science*, 275, 1997, 644–646
- [Folkner-1997b] Folkner, W.M., et al., "Interior Structure and Seasonal Mass Redistribution of Mars from Radio Tracking of Mars Pathfinder", *Science*, 278, 1997, 1749–1751
- [Forward-1986] Forward, R.L., "Feasibility of Interstellar Travel: A Review", *Journal of the British Interplanetary Society*, 39, 1986, 379–384
- [Frank-1996] Frank, L.A., et al., "Plasma Observations at Io with the Galileo Spacecraft", *Science*, 274, 1996, 394–395
- [Freese-2000] Freese, J.J., "The Viability of U.S. Anti-Satellite (ASAT) Policy: Moving Toward Space Control", USAF Institute of National Security Studies, INSS Occasional Paper 30, January 2000, 21–22
- [Friedlander-1971] Friedlander, A.L., Niehoff, J.C., Waters, J.I., "Trajectory Requirements for Comet Rendezvous", *Journal of Spacecraft*, 8, 1971, 858–866
- [Friedman-1980] Friedman, L.D., "A Proposal for a U.S. Initiative: The International Halley Watch", Paper AIAA-80-0113
- [Friedman-1988] Friedman, L., "Starsailing: Solar Sails and Interstellar Travel", New York, Wiley Science, 1988
- [Friedman-1993a] Friedman, L.D., "What Happened to Mars Observer?", *The Planetary Report*, November/December 1993, 4
- [Friedman-1993b] Friedman, L.D., "Loss of Mars Balloon Relay Will Affect Mars '94 and '96 Missions", *The Planetary Report*, November/December 1993, 5
- [Friedman-1994] Friedman, L.D., "Cleverness: Colombo's Legacy to Mission Design", paper presented at the Memorial Conference "Ideas for Space Research after the Year 2000", Padua, 18–19 February 1994
- [Furniss-1987a] Furniss, T., "Countdown to Co-operation", *Flight International*, 5 December 1987, 30–33

- [Furniss-1987b] Furniss, T., “Soviets Plan 1992 Mars Rover” *Flight International*, 24 October 1987, 35
- [Furniss-1987c] Furniss, T., “Phobos – The Most Ambitious Mission”, *Flight International*, 27 June 1987, 43–45
- [Furniss-1990a] Furniss, T., “Infernal Device”, *Flight International*, 26 September 1990, 40–42
- [Furniss-1990b] Furniss, T., “Shuttle Clear to Launch Ulysses”, *Flight International*, 19 September 1990, 17
- [Furniss-1990c] Furniss, T., “Discovery Gives a Boost to Ulysses”, *Flight International*, 17 October 1990, 10
- [Furniss-1990d] Furniss, T., “Aerobraking Development Begins”, *Flight International*, 31 January 1990, 17
- [Furniss-1992a] Furniss, T., “Return to the Red Planet”, *Flight International*, 2 September 1992, 149–150
- [Furniss-1992b] Furniss, T., “Mars Observer en Route after Scars”, *Flight International*, 7 October 1992, 21
- [Furniss-1993] Furniss, T., “Low Cost Discoveries”, *Flight International*, 17 March 1993, 27
- [Furniss-1996] Furniss, T., “Mars Probe May Be to Blame for Failure”, *Flight International*, 27 November 1996, 26
- [Furniss-1997] Furniss, T., “The Mars Burn”, *Flight International*, 26 November 1997, 49
- [Galeev-1990] Galeev, A.A., et al., “K Solntsu!” (To the Sun!), *Nauka v SSSR*, No.1, 1990, page unknown. (in Russian)
- [Galeev-1995] Galeev, A.A., et al., “Russian Programs of Planetary Exploration: Mars-94/98 Missions”, *Acta Astronautica*, 35, 1995, 9–33
- [Garcia-1991] Garcia, H.A., Fárník, F., “Stereoscopic Measurements of Flares from Phobos and GOES”, *Solar Physics*, 131, 1991, 137–148
- [Garvin-1988] Garvin, J.B., Ulaby, F.T., “Dielectric Properties of Meteorites: Implications for Radar Observations of Phobos”, paper presented at the Lunar and Planetary Science Conference XIX, Houston, 1988
- [Geenty-2005] Geenty, J., “Flights of Fancy. The Lost Space Shuttle Missions of 1986”, *Spaceflight*, 47, January 2005, 26–32
- [Geissler-1998] Geissler, P.E., et al., “Evidence for Non-Synchronous Rotation of Europa”, *Nature*, 391, 1998, 368–370
- [Geissler-1999] Geissler, P.E., et al., “Galileo Imaging of Atmospheric Emissions from Io”, *Science*, 285, 1999, 870–874
- [Gel'man-1986] Gel'man, B.G., et al., “Reaction Gas Chromatography of Venus Cloud Aerosols” *Soviet Astronomy Letters*, 12, 1986, 42–43
- [Gianvanni-1990] Gianvanni, P., “Capitana Italica verso Marte?” (Italian Flagship to Mars?), *JP4*, January 1990, 10 (in Italian)
- [Gierasch-2000] Gierasch, P.J., et al., “Observation of Moist Convection in Jupiter’s Atmosphere”, *Nature*, 403, 2000, 628–630
- [Giorgini-1995] Giorgini, J., et al., “Magellan Aerobrake Navigation”, *Journal of the British Interplanetary Society*, 48, 1995, 111–122
- [Goldman-1994] Goldman, S. J.: “Clementine Maps the Moon”, *Sky & Telescope*, August 1994, 20–24
- [Goldman-1997] Goldman, S.J., “A Sol in the Life of Pathfinder”, *Sky & Telescope*, November 1997, 32–34
- [Golombek-1997] Golombek, M.P., et al., “Overview of the Mars Pathfinder Mission and Assessment of Landing Site Predictions”, *Science*, 278, 1997, 1743–1748

- [Golombek-1998] Golombek, M.P., “The Mars Pathfinder Mission”, *Scientific American*, July 1998, 40–49
- [Gore-1986] Gore, R., “Halley’s Comet 1986 – More than Met the Eye”, *National Geographics*, December 1986, 758–785
- [Goy-1990] Goy, F., “Regata per Marte” (Mars Regatta), *Volare*, June 1990, 42–45 (in Italian)
- [Graps-2000] Graps, A.L., et al., “Io as a Source of the Jovian Dust Streams”, *Nature*, 405, 2000, 48–49
- [Grard-1982] Grard, R., “Kepler – A Mission to the Planet Mars”, *ESA Bulletin*, 32, 1982, 22–24
- [Grard-1986] Grard, R., et al. “Observations of Waves and Plasma in the Environment of Comet Halley”, *Nature*, 321, 1986, 290–291
- [Grard-1988] Grard, R., “The Vesta Mission – A Visit to the Small Bodies of the Solar System”, *ESA Bulletin*, No. 55, 1988, 36–40
- [Grard-1989a] Grard, R., et al., “First Measurements of Plasma Waves near Mars”, *Nature*, 341, 1989, 607–609
- [Grard-1989b] Grard, R.J.L., Marsden, R.G., “The Phobos Mission: First Results from the Plasma Wave System and Low-Energy Telescope”, *ESA Bulletin*, 56, 1989, 81–82
- [Grard-1994] Grard, R., Scoon, G., Coradini, M., “Mercury Orbiter – An Interdisciplinary Mission”, *ESA Journal*, 18, 1994, 197–205
- [Gringauz-1986] Gringauz, K.I., et al. “First In Situ Plasma and Neutral Gas Measurements at Comet Halley”, *Nature*, 321, 1986, 282–285
- [Grün-1993] Grün, E., et al., “Discovery of Jovian Dust Streams and Interstellar Grains by the Ulysses Spacecraft”, *Nature*, 362, 1993, 428–430
- [Grün-1994] Grün, E., et al., “Interstellar Dust in the Heliosphere”, *Astronomy and Astrophysics*, 286, 1994, 915–924
- [Grün-1996] Grün, E., et al., “Dust Measurements During Galileo’s Approach to Jupiter and Io Encounter”, *Science*, 274, 1996, 399–401
- [Guernsey-2001] Guernsey, C.S., “Propulsion Lessons Learned from the Loss of Mars Observer”, Paper AIAA-2001-3630
- [Gurnett-1991] Gurnett, D.A., et al., “Lightning and Plasma Wave Observations from the Galileo Flyby of Venus”, *Science*, 253, 1991, 1522–1525
- [Gurnett-1996a] Gurnett, D.A., et al., “Galileo Plasma Wave Observations in the Io Plasma Torus and Near Io”, *Science*, 274, 1996, 391–392
- [Gurnett-1996b] Gurnett, D.A., et al., “Evidence for a Magnetosphere at Ganymede from Plasma-Wave Observations by the Galileo Spacecraft”, *Nature*, 384, 1996, 535–537
- [Gurnett-1997] Gurnett, D.A., et al., “Absence of a Magnetic-Field Signature in Plasma-Wave Observations at Callisto”, *Nature*, 387, 1997, 261–262
- [Gurnett-2002] Gurnett, D.A., et al., “Control of Jupiter’s Radio Emission and Aurorae by the Solar Wind”, *Nature*, 415, 2002, 985–987
- [Hainaut-2004] Hainaut, O.R., et al., “Post-Perihelion Observations of Comet 1P/Halley. V: $r_h = 28.1$ AU”, *Astronomy and Astrophysics*, 417, 2004, 1159–1164
- [Hainaut-2007] Hainaut, O.R., Personal communication with the author, 9 June 2007
- [Harland-2000a] Harland, D.M., “Jupiter Odyssey: The Story of NASA’s Galileo Mission”, Chichester, Springer-Praxis, 2000, 45–49
- [Harland-2000b] *ibid.*, 57–62
- [Harland-2000c] *ibid.*, 72–78
- [Harland-2000d] *ibid.*, 111–125
- [Harland-2000e] *ibid.*, 138–143, 186–189, 250–255 and 301–306

- [Harland-2000f] *ibid.*, 190–196
- [Harland-2000g] *ibid.*, 265
- [Harland-2000h] *ibid.*, 204–207
- [Harland-2000i] *ibid.*, 265–268
- [Harland-2000j] *ibid.*, 155–160
- [Harland-2000k] *ibid.*, 268
- [Harland-2000l] *ibid.*, 313
- [Harland-2000m] *ibid.*, 173–174
- [Harland-2000n] *ibid.*, 313–315
- [Harland-2000o] *ibid.*, 285–288
- [Harland-2000p] *ibid.*, 208–211
- [Harland-2000q] *ibid.*, 219–222
- [Harland-2000r] *ibid.*, 223–226
- [Harland-2000s] *ibid.*, 226–227
- [Harland-2000t] *ibid.*, 330–348
- [Harvey-2000a] Harvey, B., “The Japanese and Indian Space programs”, Chichester, Springer–Praxis, 2000, 3–37
- [Harvey-2000b] *ibid.*, 127–189
- [Harvey-2007a] Harvey, B., personal communication with the author, 15 November 2007
- [Harvey-2007b] Harvey, B., “Russian Planetary Exploration: History, Development, Legacy and Prospects”, Chichester, Springer–Praxis, 2007, 251–252
- [Harvey-2007b] *ibid.*, 266–275
- [Harvey-2007c] *ibid.*, 281–284
- [Hawkyard-1990] Hawkyard, A., Buia, P., “The Ulysses Spacecraft”, *ESA Bulletin*, 63, 1990, 40–49
- [Head-1991] Head, J.W., et al., “Venus Volcanism: Initial Analysis from Magellan Data”, *Science*, 252, 1991, 276–288
- [Head-1999] Head, J.W. III, et al., “Possible Ancient Oceans on Mars: Evidence from Mars Orbiter Laser Altimeter Data”, *Science*, 286, 1999, 2134–2137
- [Head-2001] Head, J., et al., “Ganymede: Very High Resolution Data from G28 Reveal New Perspectives on Processes and History”, paper presented at the XXXII Lunar and Planetary Science Conference, Houston, 2001
- [Henderson-1989] Henderson, B.W., “NASA Scientists Hope Mars Rover Will be Precursor to Manned Flight”, *Aviation Week & Space Technology*, 9 October 1989, 85–94
- [Hengeveld-2005] Hengeveld, E., “The Reluctant Space Shuttle”, *Spaceflight*, December 2005, 460–464
- [Hill-2002] Hill, T.W., “Magnetic Moments at Jupiter”, *Nature*, 415, 2002, 965–966
- [Hirao-1984] Hirao, K., “The Suisei/Sakigake (Planet-A/MS-T5) Missions”. In: “Space Missions to Halley’s Comet”, Noordwijk, ESA SP-1066, 1984
- [Hirao-1986] Hirao, K., Itoh, T. “The Planet-A Halley Encounters”, *Nature*, 321, 1986, 294–297
- [Hirao-1987] Hirao, K., Itoh, T., “The Sakigake/Suisei Encounter with Comet P/Halley”, *Astronomy & Astrophysics*, 187, 1987, 39–46
- [Hoppa-1999] Hoppa, G.V., et al., “Formation of Cycloidal Features on Europa”, *Science*, 285, 1999, 1899–1902
- [Hoppa-2000] Hoppa, G.V., et al., “Europa’s Sub-Jovian Hemisphere from Galileo I25: Tectonic and Chaotic Surface Features”, paper presented at the Lunar and Planetary Science Conference XXXI, Houston, 2000
- [Hoppa-2001] Hoppa, G.V., et al., “Europa’s Rate of Rotation Derived from the Tectonic Sequence in the Astypalaea Region”, *Icarus*, 153, 2001, 208–213

- [Houppis-1986] Houppis, H.L.F., Gombosi, T.I., “An Icy-Glue Nucleus Model of Comet Halley”, In: ESA Proceedings of the 20th ESLAB Symposium on the Exploration of Halley’s Comet. Volume 2: Dust and Nucleus, 1986, 397–401
- [Hubbard-1992] Hubbard, G.S., et al., “Mars Environmental Survey (MESUR): Science objectives and mission description”, paper presented at the Lunar and Planetary Institute Workshop on the Martian Surface and Atmosphere Through Time, 1992
- [Hudson-2000] Hudson, R.S., et al., “Radar Observations and Physical Model of Asteroid 6489 Golevka”, *Icarus*, 148, 2000, 37–51
- [Hufbauer-1992] Hufbauer, K., “European Space Scientists and the Genesis of the Ulysses Mission, 1965–1979”. In: Russo, A. (ed.), “Science Beyond the Atmosphere: the History of Space Research in Europe”, ESA, Proceedings of a Symposium held in Palermo, 5–7 November 1992
- [Hughes-1980] Hughes, D., “Mission to the Comets”, *New Scientist*, 10 January 1980, 66–69
- [Hviid-1997] Hviid, S.F., et al., “Magnetic Properties Experiments on the Mars Pathfinder Lander: Preliminary Results”, *Science*, 278, 1997, 1768–1770
- [IAUC-3737] “International Astronomical Unit Circular No. 3737”, 21 October 1982
- [IAUC-3937] “International Astronomical Unit Circular No. 3937”, 12 April 1984
- [IAUC-7243] “International Astronomical Unit Circular No. 7243”, 23 August 1999
- [IAUC-8107] “International Astronomical Unit Circular No. 8107”, 4 April 2003
- [Iorio-2007] Iorio, L., “High-Precision Measurement of Frame-Dragging with the Mars Global Surveyor Spacecraft in the Gravitational Field of Mars”, Arxiv pre-print gr-qc/0701042
- [Ivanov-1988] Ivanov, M.A., “The Results of Morphometric Study of the Tessera Terrain of Venus from Venera 15/16 Data”, paper presented at the XIX Lunar and Planetary Science Conference, Houston, 1988
- [Ivanov-1990] Ivanov, B.A., “Venusian Impact Craters on Magellan Images: View from Venera 15/16”, *Earth Moon and Planets*, 50/51, 1990, 159–173
- [Izenberg-1998] Izenberg, N.R., Anderson, B.J., “NEAR Swings by Earth en Route to Eros”, *Eos Transaction American Geophysical Union*, 79, 1998, 289–295
- [Jaffe-1980] Jaffe, L.D., et al., “An Interstellar Precursor Mission”, *Journal of the British Interplanetary Society*, 33, 1980, 3–26
- [James-1982] James, W., “Unveiling Venus with VOIR”, *Sky & Telescope*, February 1982, 141–144
- [Janin-1984] Janin, G., “Towards the Halley Comet”. In: “Mathématiques spatiales pour la préparation et la réalisation de l’exploitation des satellites/Space mathematics for the preparation and the development of satellites exploration”, Toulouse, Cépaduès, 1984, 1051–1071
- [Jaroff-1997] Jaroff, L., “Dreadful Sorry, Clementine”, *Time Magazine*, 27 October 1997, page unknown
- [Jenkins-2002] Jenkins, R.M., “The Giotto Spacecraft plus ‘Why was Giotto Special?’”, *Space Chronicle*, 55, 2002, 12–30
- [Johnson-1991] Johnson, T.V., et al., “The Galileo Venus Encounter”, *Science*, 253, 1991, 1516–1518
- [Johnston-1998] Johnston, M.D., et al., “Mars Global Surveyor Aerobraking at Mars”, Paper AAS 98-112
- [Johnstone-1986] Johnstone, A., et al., “Ion Flow at Comet Halley”, *Nature*, 321, 1986, 344–347
- [Jones-2002] Jones, G.H., “Ulysses’s Encounter with Comet Hyakutake”, paper presented at the Asteroids, Comets, Meteors – ACM 2002 International Conference, 29 July–2 August 2002

- [Jones-2003] Jones, G.H., et al., “Possible Distortion of the Interplanetary Magnetic Field by the Dust Trail of Comet 122P/De Vico”, *The Astrophysical Journal*, 597, 2003, L61–L64
- [JP4-1992] “Tecnospazio e le Comete” (Tecnospazio and Comets), JP4, April 1992, 11 (in Italian)
- [JPL-1978] “Solar Polar Fact Sheet”, Pasadena, JPL, 26 July 1978
- [JPL-1991] “Outward to the Beginning: The CRAF and Cassini Missions”, JPL Brochure 400-341, June 1991
- [JPL-1993] “Mars Observer Loss of Signal: Special Review Board Final Report”, JPL Publication 93–28, November 1993
- [JWG-1986a] Joint Working Group on Cooperation in Planetary Exploration, “United States and Western Europe Cooperation in Planetary Exploration”, Washington, National Academic Press, 1986
- [JWG-1986b] *ibid.*, 146–147
- [JWG-1986c] *ibid.*, 149–157
- [JWG-1986d] *ibid.*, 59–64
- [Kahn-1997] Kahn, R., “A Martian Mystery”, *Sky & Telescope*, October 1997, 38–39
- [Kamoun-1982] Kamoun, P., et al., “Comet Grigg–Skjellerup: Radar Detection of the Nucleus”, *Bulletin of the American Astronomical Society*, 14, 1982, 753
- [Kaneda-1986] Kaneda, E., et al., “Strong Breathing of the Hydrogen Coma of Comet Halley”, *Nature*, 320, 1986, 140–141
- [Kargel-1997] Kargel, J.S., “The Rivers of Venus”, *Sky & Telescope*, August 1997, 32–37
- [Kawashima-1993] Kawashima, N., et al., “Development/Drilling Test of Auger Boring Machine on Board Mars Rover for Mars Exploration”. In: “Missions, Technologies et Conception des Vehicules Mobiles Planetaires”, Toulouse, Cépaduès, 1993
- [Keating-1998] Keating, G.M., et al., “The Structure of the Upper Atmosphere of Mars: In Situ Accelerometer Measurements from Mars Global Surveyor”, *Science*, 279, 1998, 1672–1676
- [Keller-1986] Keller, H.U., et al., “First Halley Multicolour Camera Imaging Results from Giotto”, *Nature*, 321, 1986, 320–326
- [Keller-1988] Keller, H.U., Kramm, R., Thomas, N., “Surface Features on the Nucleus of Comet Halley”, *Nature*, 331, 1988, 227–231
- [Kelly Beatty-1984] Kelly Beatty, J., “Radar Views of Venus”, *Sky & Telescope*, February 1984, 110–112
- [Kelly Beatty-1985a] Kelly Beatty, J., “A Radar Tour of Venus”, *Sky & Telescope*, June 1985, 507–510
- [Kelly Beatty-1985b] Kelly Beatty, J., “Comet G–Z: The Inside Story”, *Sky & Telescope*, November 1985, 426–427
- [Kelly Beatty-1993] Kelly Beatty, J., “Working Magellan’s Magic”, *Sky & Telescope*, August 1993, 16–20
- [Kelly Beatty-1993b] Kelly Beatty, J., “The Long Road to Jupiter”, *Sky & Telescope*, April 1993, 18–21
- [Kelly Beatty-1995] Kelly Beatty, J., “Ida & Company”, *Sky & Telescope*, January 1995, 20–23
- [Kelly Beatty-1996a] Kelly Beatty, J., “Into the Giant”, *Sky & Telescope*, April 1996, 20–22
- [Kelly Beatty-1996b] Kelly Beatty, J., “Life from Ancient Mars?”, *Sky & Telescope*, October 1996, 18–19
- [Kelly Beatty-1999] Kelly Beatty, J., “In Search of Martian Seas”, *Sky & Telescope*, November 1999, 38–41
- [Kelly Beatty-2001] Kelly Beatty, J., “NEAR Falls for Eros”, *Sky & Telescope*, May 2001, 34–37

- [Kemurdjian-1992] Kemurdjian, A.L., et al., “Soviet Developments of Planet Rovers in Period of 1964–1990”. In: “Missions, Technologies et Conception des Vehicules Mobiles Planetaires”, Toulouse, Cépaduès, 1993
- [Keppler-1986] Keppler, E., et al., “Neutral Gas Measurements of Comet Halley from Vega 1”, *Nature*, 321, 1986, 273–274
- [Kerr-1979] Kerr, R.A., “Planetary Science on the Brink Again”, *Science*, 206, 1979, 1288–1289
- [Kerr-1984] Kerr, R.A., “Probing the Long Tail of the Magnetosphere”, *Science*, 226, 1984, 1298–1299
- [Kerr-1985] Kerr, R.A., “New Plasma Physics Lab at Giacobini–Zinner”, *Science*, 230, 1985, 51–52
- [Kerr-1986] Kerr, R.A., “VEGA’s 1 and 2 Visit Halley”, *Science*, 231, 1986, 1366
- [Kerr-1990] Kerr, R.A., “Will Magellan Find a Half-Sister of Earth’s?”, *Science*, 249, 1990, 742–744
- [Kerr-1991] Kerr, R.A., “Magellan: No Venusian Plate Tectonics Seen”, *Science*, 252, 1991, 213
- [Kerr-1993] Kerr, R.A., “More Venus Science, or the Off Switch for Magellan?”, *Science*, 259, 1993, 1696–1697
- [Keszthelyi-1999] Keszthelyi, L., et al., “Revisiting the Hypothesis of a Mushy Global Magma Ocean on Io”, *Icarus*, 141, 1999, 415
- [Khurana-1997] Khurana, K.K., et al., “Absence of an Internal Magnetic Field at Callisto”, *Nature*, 387, 1997, 262–264
- [Khurana-1998] Khurana, K.K., et al., “Induced Magnetic Fields as Evidence for Subsurface Oceans in Europa and Callisto”, *Nature*, 395, 1998, 777–780
- [Kieffer-2000] Kieffer, S.W., et al. “Prometheus: Io’s Wandering Plume”, *Science*, 288, 2000, 1204–1208
- [Killeen-1995] Killeen, T., Brace, L., “MUADEE: A Discovery-Class Mission for Exploration of the Upper Atmosphere of Mars”, *Acta Astronautica*, 35, 1995, 377–386
- [Kiseleva-2007] Kiseleva, T.P., Khrutskaya, E.V., “Pulkovo Astrometric Observations of Bodies in the Solar System from 1898 to 2005: Observational Database”, *Solar System Research*, 41, 2007, 72–80
- [Kissel-1986a] Kissel, J., et al., “Composition of Comet Halley Dust Particles from Giotto Observations”, *Nature*, 321, 1986, 336–337
- [Kissel-1986b] Kissel, J., et al., “Composition of Comet Halley Dust Particles from Vega Observations”, *Nature*, 321, 1986, 280–282
- [Kivelson-1993] Kivelson, M.G., et al., “Magnetic Field Signatures Near Galileo’s Closest Approach to Gaspra”, *Science*, 261, 1993, 331–334
- [Kivelson-1996a] Kivelson, M.G., et al., “A Magnetic Signature at Io: Initial Report from the Galileo Magnetometer”, *Science*, 273, 1996, 337–340
- [Kivelson-1996b] Kivelson, M.G., et al., “Discovery of Ganymede’s Magnetic Field by the Galileo Spacecraft”, *Nature*, 384, 1996, 537–541
- [Kivelson-1997] Kivelson, M.G., et al., “Europa’s Magnetic Signature: Report from Galileo’s Pass on 19 December 1996”, *Science*, 276, 1997, 1239–1241
- [Kivelson-2000] Kivelson, M.G., et al., “Galileo Magnetometer Measurements: A Stronger Case for a Subsurface Ocean at Europa”, *Science*, 289, 2000, 1340–1343
- [Klaes-1993] Klaes, L., “The Soviets and Venus – Part 3”, *Electronic Journal of the Astronomical Society of the Atlantic*, April 1993
- [Klimov-1986] Klimov, S., et al. “Extremely-Low-Frequency Plasma Waves in the Environment of Comet Halley”, *Nature*, 321, 1986, 292–293
- [Kolyuka-1991] Kolyuka, Yu, et al., “Phobos and Deimos Astrometric Observations from the Phobos Mission”, *Astronomy & Astrophysics*, 244, 1991, 236–241

- [Konopliv-1996] Konopliv, A.S., Sjogren, W.L., “Venus Gravity Handbook”, Pasadena, JPL, 1996
- [Korablev-2002] Korablev, O.I., “Solar Occultation Measurements of the Martian Atmosphere on the Phobos Spacecraft: Water Vapor Profile, Aerosol Parameters, and Other Results”, *Solar System Research*, 36, 2002, 12–34
- [Kotelnikov-1984] Kotelnikov, V.A., et al., “The Maxwell Montes Region, Surveyed by the Venera 15, Venera 16 Orbiters”, *Soviet Astronomy Letters*, 10, 1984, 369–373
- [Kovtunenکو-1990] Kovtunenکو, V.M., et al., “Unifitsirovanniy Avtomaticheskii Kosmicheskii Apparat Dlya Provedeniya Issledovaniy Dalniy Planet Solnechnoy Sistemy Meshplanetnogo Prostranstva i Solntsa (Proyekt ‘Tsiolkovskii’)”, (Unified Space Probes to Observe the Distant Planets of the Solar System, the Interplanetary Space, and the Sun (Project ‘Tsiolkovskii’)), 1990 (?). (in Russian)
- [Kovtunenکو-1995] Kovtunenکو, V.M., et al., “Opportunity to Create the System for Space Protection of the Earth Against Asteroids and Comets on the Base of Modern Technology”, paper presented at the Planetary Defense Workshop, Lawrence Livermore National Laboratory, May 1995
- [Kozicharow-1979] Kozicharow, E., “Timing, Budget Spur Solar Polar Mission”, *Aviation Week & Space Technology*, 29 October 1979, 46–47
- [Kraemer-2000a] Kraemer, R. S., “Beyond the Moon: A Golden Age of Planetary Exploration 1971–1978”, Washington, Smithsonian Institution Press, 2000, 225
- [Krasnopolsky-1986] Krasnopolsky, V.A., et al., “Spectroscopic Study of Comet Halley by the Vega 2 Three-Channel Spectrometer”, *Nature*, 321, 1986, 269–271
- [Krasnopolsky-1989] Krasnopolsky, V.A., et al., “Solar Occultation Spectroscopic Measurements of the Martian Atmosphere at 1.9 and 3.7 μm ”, *Nature*, 341, 1989, 603–604
- [Kremnev-1986a] Kremnev, R.S., et al., “The Vega Balloons: A Tool for Studying Atmosphere Dynamics on Venus”, *Soviet Astronomy Letters*, 12, 1986, 7–9
- [Kremnev-1986b] Kremnev, R.S., et al., “VEGA Balloon System and Instrumentation”, *Science*, 231, 1986, 1408–1411
- [Kresak-1987] Kresak, L., “The 1808 Apparition and the Long-Term Physical Evolution of Periodic Comet Grigg–Skjellerup”, *Bulletin of the Astronomical Institute of Czechoslovakia*, 38, 1987, 65–75
- [Krimigis-1995] Krimigis, S.M., Veverka, J., “Foreword: Genesis of Discovery”, *Journal of Astronautical Sciences*, 43, 1995, 345–347
- [Krogh-2007] Krogh, K., “Iorio’s ‘High-Precision Measurement’ of Frame-Dragging with the Mars Global Surveyor”, Arxiv pre-print astro-ph/0701653
- [Kronk-1984a] Kronk, G.W., “Comets: A Descriptive Catalog”, Hillside, Henslow, 1984, 308–309
- [Kronk-1984b] *ibid.*, 254–255
- [Kronk-1984c] *ibid.*, 255–256
- [Kronk-1984d] *ibid.*, 248–249
- [Kronk-1988a] Kronk, G.W., “Meteor Showers: A Descriptive Catalog”, Hillside, Enslow, 1988, 189–194
- [Kronk-1988b] *ibid.*, 57–59
- [Kronk-1999] Kronk, G.W., “Cometography: A Catalog of Comets” Volume 1: Ancient-1799, Cambridge University Press, 1999, 375
- [Krüger-2005] Krüger, H., et al., “Dust Stream Measurements from Ulysses’ Distant Jupiter Encounter”, paper presented at the Dust in Planetary Systems conference, 26–28 September 2005, Kaua’i

- [Krüger-2007] Krüger, H., et al., “Interstellar Dust in the Solar System”, Arxiv astro-ph/0706.3310 preprint
- [Krupp-2006] Krupp, E.C., “Lost in Space”, *Sky & Telescope*, September 2006, 40–41
- [Ksanfomality-1989] Ksanfomality, L.V., et al., “Spatial Variations in Thermal and Albedo Properties of the Surface of Phobos”, *Nature*, 341, 1989, 588–591
- [Kumar-1978] Kumar, S., “Science Strategy for Halley Flyby/Tempel-2 Rendezvous Mission”, paper presented at the Workshop on Experimental Approaches to Comets, Houston, 11–13 September 1978
- [Kurth-2002] Kurth, W.S., et al., “The Dusk Flank of Jupiter’s Magnetosphere”, *Nature*, 415, 2002, 991–994
- [Kuznik-1985] Kuznik, F., “Visit to a Small Comet”, *Space World*, July 1985, 23–26
- [Lande-1995] Lande, A.L., “The Mars ‘94 Oxidant Experiment (MOx): Creation of Something from Nothing om 1 Year”, *Acta Astronautica*, 35, 1995, 69–78
- [Langevin-1983] Langevin, Y., “The New European Project for the Exploration of Asteroids: AGORA”, paper presented at the XIV Lunar and Planetary Science Conference, Houston, 1983
- [Lanzerotti-1996] Lanzerotti, L.J., et al., “Radio Frequency Signals in Jupiter’s Atmosphere”, *Science*, 272, 1996, 858–860
- [Lanzerotti-1998] Lanzerotti, L.J., et al., “Spin Rate of Galileo Probe During Descent into the Atmosphere of Jupiter”, *Journal of Spacecraft and Rockets*, 35, 1998, 100–102
- [Laplace-1993] Laplace, H., Morelière, M., Gorse, C., “The Mars 96 Balloon Guiderope: an Autonomous System in Extreme Environment Conditions”. In: “Missions, Technologies et Conception des Vehicules Mobiles Planetaires”, Toulouse, Cépaduès, 1993
- [Lardier-1992a] Lardier, C., “L’Astronautique Soviétique” (Soviet Astronautics), Paris, Armand Colin, 1992, 275 (in French)
- [Lardier-1992b] *ibid.*, 279–280
- [Laros-1997] Laros, J.G., et al., “Gamma-Ray Burst Arrival Time Localizations: Simultaneous Observations by Mars Observer, Compton Gamma Ray Observatory, and Ulysses”, *The Astrophysical Journal Supplement Series*, Vol. 110, May 1997, 157–161
- [Lawler-2005] Lawler, A., “NASA Plans to Turn Off Several Satellites”, *Science*, 307, 2005, 1541
- [Lee-1996] Lee, W., “Mars Global Surveyor Project Mission Plan”, JPL Document D-12088, November 1996
- [Leertouwer-1990] Leertouwer, J.P., Eaton, D., “The Ulysses Launch Campaign”, *ESA Bulletin*, 63, 1990, 56–59
- [Lenorovitz-1985] Lenorovitz, J.M., “France Designing Spacecraft for Soviet Interplanetary Mission”, *Aviation Week & Space Technology*, 7 October 1985, 50–51
- [Lenorovitz-1986a] Lenorovitz, J.M., “Both Soviet Vega Spacecraft Relay New Data From Halley”, *Aviation Week & Space Technology*, 17 March 1986, 18–20
- [Lenorovitz-1986b] Lenorovitz, J.M., “Soviets Urge International Effort Leading to Manned Mars Mission”, *Aviation Week & Space Technology*, 24 March 1986, 76–77
- [Lenorovitz-1987a] Lenorovitz, J.M., “French Offer Balloon Platform for Use on Soviet Mars Mission”, *Aviation Week & Space Technology*, 3 August 1987, 63–65
- [Lenorovitz-1987b] Lenorovitz, J.M., “Soviets Advance Definition Work on 1990s Unmanned Mars Mission”, *Aviation Week & Space Technology*, 26 October 1987, 72–73
- [Lenorovitz-1988] Lenorovitz, J.M., “Launch of Two Phobos Spacecraft Begins Ambitious Mission to Mars”, *Aviation Week & Space Technology*, 18 July 1988, 16
- [Lenorovitz-1989] Lenorovitz, J.M., “Soviets to Study Phobos Surface from Fixed-Site, Mobile Landers”, *Aviation Week & Space Technology*, 29 August 1989, 48–49

- [Lenorovitz-1993] Lenorovitz, J.M., “Asteroid Flyby Proposed Using LEAP Penetrators”, *Aviation Week & Space Technology*, 28 June 1993, 27–28
- [Lenorovitz-1994] Lenorovitz, J.M., “LEAP Lander Proposed”, *Aviation Week & Space Technology*, 6 June 1994, 25–26
- [Li-2002] Li, H., Robinson, M.S., Murchie, M., “Preliminary Remediation of Scattered Light in NEAR MSI Images”, *Icarus*, 155, 2002, 244–252
- [Linkin-1986] Linkin, V.M., et al., “Vertical Thermal Structure in the Venus Atmosphere from Provisional Vega 2 Temperature and Pressure Data” *Soviet Astronomy Letters*, 12, 1986, 40–42
- [Logsdon-1989] Logsdon, J.M., “Missing Halley’s Comet: The Politics of Big Science”, *Isis*, 80, 1989, 254–280
- [Lomberg-1996] Lomberg, J., “Visions of Mars”, *Sky & Telescope*, December 1996, 30–34
- [Lopes-Gaultier-2000] Lopes-Gaultier, R., et al., “A Close-Up Look at Io from Galileo’s Near-Infrared Mapping Spectrometer”, *Science*, 288, 2000, 1201–1204
- [Lorenz-2006] Lorenz, R.D., “Spin of Planetary Probes in Atmospheric Flight”, *Journal of the British Interplanetary Society*, 59, 2006, 273–282
- [Lundin-1989] Lundin, R., et al., “First Measurements of the Ionospheric Plasma Escape from Mars”, *Nature*, 341, 1989, 609–612
- [Lundquist-2008] Lundquist, C.A., “Fred L. Whipple, Pioneer in the Space Program”, *Acta Astronautica*, 62, 2008, 91–96
- [Lusignan-1991] Lusignan, B., et al., (ed.), “The Stanford US-USSR Mars Exploration Initiative”, Stanford University, 1991, Vol. 1, 721–725 and 734–743
- [Luttmann-1992] Luttmann, H.W., “Russen Testen Sonnensegel” (The Russians to test solar sails), *Flug Revue*, October 1992, 86–87 (in German)
- [Lyons-1999] Lyons, D.T., et al., “Mars Global Surveyor: Aerobraking Mission Overview”, *Journal of Spacecraft and Rockets*, 36, 1999, 307–313
- [Maeda-1993] Maeda, T., et al., “The Robotic Mars Rover”. In: “Missions, Technologies et Conception des Vehicules Mobiles Planetaires”, Toulouse, Cépaduès, 1993
- [Maehl-1983] Maehl, R., “The TIROS-based Asteroid Mission”, *Spaceflight*, December 1983, 430–435
- [Maffei-1987a] For one of the best popular accounts of the history of Halley’s comet see: Maffei, P., “La Cometa di Halley” (Halley’s Comet), Milan, Mondadori, 1987, 149–315 (in Italian)
- [Maffei-1987b] *ibid.*, 362–363
- [Malin-1991] Malin, M.C., et al., “Design and Development of the Mars Observer Camera”, *International Journal of Imaging Systems and Technology*, 3, 1991, 76–91
- [Malin-1998] Malin, M.C., et al., “Early Views of the Martian Surface from the Mars Orbiter Camera of Mars Global Surveyor”, *Science*, 279, 1998, 1681–1685
- [Malin-1999] Malin, M.C., “Visions of Mars”, *Sky & Telescope*, April 1999, 42–49
- [Malin-2000a] Malin, M.C., Edgett, K.S., “Sedimentary Rocks of Early Mars”, *Science*, 290, 2000, 1927–1937
- [Malin-2000b] Malin, M.C., Edgett, K.S., “Evidence for Recent Groundwater Seepage and Surface Runoff on Mars”, *Science*, 288, 2000, 2330–2335
- [Malin-2001a] Malin, M.C., Edgett, K.S., “Mars Global Surveyor Mars Orbiter Camera: Interplanetary Cruise through Primary Mission”, *Journal of Geophysical Research*, 106, 2001, 23429–23570
- [Malin-2001b] Malin, M.C., Caplinger, M.A., Davis, S.D., “Observational Evidence for an Active Surface Reservoir of Solid Carbon Dioxide on Mars”, *Science*, 294, 2001, 2146–2148
- [Malin-2003] Malin, M.C., Edgett, K.S., “Evidence for Persistent Flow and Aqueous Sedimentation on Early Mars”, *Science*, 302, 2003, 1931–1934

- [Malin-2006] Malin, M.C., et al., “Present-Day Impact Cratering Rate and Contemporary Gully Activity on Mars”, *Science*, 314, 2006, 1573–1577
- [Mama-1993] Mama, H.P., “An Indian Spacecraft to Mercury?”, *Spaceflight*, June 1993, 211
- [Maran-1985] Maran, S.P., “On the Trail of Comet G–Z”, *Sky & Telescope*, September 1985, 198–203
- [Marsden-1991] Marsden, R.G., Wenzel, K.-P., “First Scientific Results from the Ulysses Mission”, *ESA Bulletin*, 67, 1991, 78–83
- [Marsden-1992] Marsden, R.G., Wenzel, K.-P., “The Ulysses Jupiter Flyby – The Scientific Results”, *ESA Bulletin*, 72, 1992, 52–59
- [Marsden-1995] Marsden, R.G., “Ulysses Explores the South Pole of the Sun”, *ESA Bulletin*, 82, 1995, 48–55
- [Marsden-1996] Marsden, R.G., Smith, E.J., “Ulysses: Solar Sojourner”, *Sky & Telescope*, March 1996, 24–30
- [Marsden-1997] Marsden, R.G., Wenzel, K.-P., Smith, E.J., “The Heliosphere in Perspective – Key Results from the Ulysses Mission at Solar Minimum”, *ESA Bulletin*, 92, 1997, 75–81
- [Marsden-2000] Marsden, R.G., “Ulysses at Solar Maximum and Beyond”, *ESA Bulletin*, 103, 2000, 41–47
- [Marsden-2003] Marsden, R.G., Smith, E.J., “News from the Sun’s Poles Courtesy of Ulysses”, *ESA Bulletin*, 114, 2003, 61–67
- [Martin-1995] Martin, T.Z., et al., “Observations of Shoemaker–Levy Impacts by the Galileo Photopolarimeter Radiometer”, *Science*, 268, 1995, 1875–1879
- [Mastal-1990] Mastal, E.F., Campbell, R.W., “RTGs – The Powering of Ulysses”, *ESA Bulletin*, 63, 1990, 50–55
- [Mazets-1986] Mazets, E.P., “Comet Halley Dust Environment from SP-2 Detector Measurements”, *Nature*, 321, 1986, 276–278
- [McBride-1997] McBride, N., et al., “The Inner Dust Coma of Comet 26P/Grigg–Skjellerup: Multiple Jets and Nucleus Fragments?”, *Monthly Notices of the Royal Astronomical Society*, 289, 1997, 535–553
- [McComas-2006] McComas, D.J., “Solar Probe: A Long Time Coming”, *Astronomy*, December 2006, 47
- [McCord-1998] McCord, T.B., et al., “Salts on Europa’s Surface Detected by Galileo’s Near Infrared Mapping Spectrometer”, *Science*, 280, 1998, 1242–1245
- [McCord-2001] McCord, T.B., Hansen, G.B., Hibbitts, C.A., “Hydrated Salt Minerals on Ganymede’s Surface: Evidence of an Ocean Below”, *Science*, 292, 2001, 1523–1525
- [McCullogh-2007] McCullogh, M.E., “Can the Flyby Anomalies be Explained by a Modification of Inertia?” *Arxiv pre-print astro-ph/0712.3022*
- [McCurdy-2005a] McCurdy, H.E., “Low-Cost Innovation in Spaceflight: the Near Earth Asteroid Rendezvous (NEAR) Shoemaker Mission”, *Washington, NASA*, 2005, 6
- [McCurdy-2005b] *ibid.*, 18–19
- [McCurdy-2005c] *ibid.*, 14–15
- [McCurdy-2005d] *ibid.*, 35–37
- [McCurdy-2005e] *ibid.*, 47–49
- [McDonnell-1986] McDonnell, J.A.M., et al., “Dust Density and Mass Distribution near Comet Halley from Giotto Observations”, *Nature*, 321, 1986, 338–341
- [McDonnell-1987] McDonnell, J.A.M., et al., “The Dust Distribution within the Inner Coma of Comet P/Halley 1982: Encounter by Giotto’s Impact Detectors”, *Astronomy and Astrophysics*, 187, 1987, 719–741
- [McDonnell-1993] McDonnell, J.A.M., “Dust Particle Impacts During the Giotto Encounter with Comet Grigg–Skjellerup”, *Nature*, 362, 1993, 732–734

- [McDonnell Douglas-1995] “Kilauea: A Terrestrial Analogue for Planetary Exploration”, McDonnell Douglas brochure, Undated but probably 1995
- [McEwen-1998] McEwen, A.S., et al., “High-Temperature Silicate Volcanism on Jupiter’s Moon Io”, *Science*, 281, 1998, 87–90
- [McEwen-2000] McEwen, A.S., et al., “Galileo at Io: Results from High-Resolution Imaging”, *Science*, 288, 2000, 1193–1198
- [McEwen-2002] McEwen, A.S., “Active Volcanism on Io”, *Science*, 297, 2002, 2220–2221
- [McFadden-1993] McFadden, L.A., et al. “The enigmatic object 2201 Oljato: Is it an asteroid or an evolved comet?” *Journal of Geophysical Research*, 98, 1993, E2, p. 3031–3041
- [McGarry-1997] McGarry, A., Angold, N., “Ulysses 7 Years On – Operational Challenges and Lessons Learned”, *ESA Bulletin*, 92, 1997, 69–74
- [McGarry-2004a] McGarry, A., Castro, F., Hodges, M., “Hydrazine Operations at Near-Freezing Temperatures During the Ulysses Extended Mission”, paper presented at the 4th International Spacecraft Propulsion Conference, 2–9 June 2004 Chia Laguna
- [McGarry-2004b] McGarry, A., Castro, F., Hodges, M.L., “Increasing Science with Diminishing Resources – Extending the Ulysses Mission to 2008”, paper presented at the SpaceOps 2004 Conference, 17–21 May 2004, Montreal
- [McInnes-2003] McInnes, C.R., “Solar Sailing: Mission Applications and Engineering Challenges”, *Philosophical Transactions of the Royal Society of London*, 361, 2003, 2989–3008
- [McKay-1996] McKay, D.S., et al., “Search for Past Life on Mars: Possible Relic Biogenic Activity in Martian Meteorite ALH84001”, *Science*, 273, 1996, 924–930
- [McKenna-Lawlor-2002] McKenna-Lawlor, S.M.P., “Overview of the Observations Made by the EPONA Instrument During the Giotto/GEM Mission”, *Space Chronicle*, 55, 2002, 51–69
- [McLaughlin-1984] McLaughlin, W.I., Randolph, J.E., “Starprobe: to Confront the Sun”, *Journal of the British Interplanetary Society*, 37, 1984, 375–380
- [McLaughlin-1985] McLaughlin, W., “Near Earth Asteroid Rendezvous”, *Spaceflight*, December 1985, 440–441
- [McLaughlin-1992] McLaughlin, W.I., “Ulysses Swings by Jupiter”, *Spaceflight*, May 1992, 166–167
- [Mecham-1989] Mecham, M., “Mars Observer Begins New Era Using Proven Spacecraft Design”, *Aviation Week & Space Technology*, 9 October 1989, 79–82
- [Meltzer-2007a] Meltzer, M., “Mission to Jupiter: A History of the Galileo Project”, Washington, NASA, 2007, 9–36
- [Meltzer-2007b] *ibid.*, 37–59 and 65–66
- [Meltzer-2007c] *ibid.*, 61–62
- [Meltzer-2007d] *ibid.*, 118–148
- [Meltzer-2007e] *ibid.*, 66–68
- [Meltzer-2007f] *ibid.*, 71–84
- [Meltzer-2007g] *ibid.*, 94
- [Meltzer-2007h] *ibid.*, 96–103
- [Meltzer-2007i] *ibid.*, 151–152
- [Meltzer-2007j] *ibid.*, 171–179
- [Meltzer-2007k] *ibid.*, 180–181
- [Meltzer-2007l] *ibid.*, 195–197
- [Meltzer-2007m] *ibid.*, 202–209
- [Meltzer-2007n] *ibid.*, 209–221
- [Mendillo-2006] Mendillo, M., et al., “Effects of Solar Flares on the Ionosphere of Mars”, *Science*, 311, 2006, 1135–1138

- [Michielsen-1968] Michielsen, H.F., “A Rendezvous with Halley’s Comet in 1985–1986”, *Journal of Spacecraft*, 5, 1968, 328–334
- [Milazzo-2002] Milazzo, M.P., et al., “Eruption Temperatures at Tvashtar Catena, Io From Galileo I25 and I27”, paper presented at the Lunar and Planetary Science Conference XXXIII, Houston, 2002
- [Mishkin-2003a] Mishkin, A., “Sojourner: An Insider’s View of the Mars Pathfinder Mission”, New York, Berkeley Book, 2003, 13–37
- [Mishkin-2003b] *ibid.*, 38–51
- [Mishkin-2003c] *ibid.*, 65
- [Mishkin-2003d] *ibid.*, 57–58
- [Mishkin-2003e] *ibid.*, 66–81
- [Mishkin-2003f] *ibid.*, 95
- [Mishkin-2003g] *ibid.*, 134–144
- [Mishkin-2003h] *ibid.*, 97–123
- [Mishkin-2003i] *ibid.*, 248–249
- [Mishkin-2003j] *ibid.*, 282–301
- [Mishkin-2003k] *ibid.*, 301–303
- [Mitchell-1998] Mitchell, R.T., et al., “Project Galileo The Europa Mission”, paper presented at the XLIX Congress of the International Astronautical Federation, Melbourne, 1998
- [Morabito-2000] Morabito, D., et al., “The 1998 Mars Global Surveyor Solar Corona Experiment”, JPL TDA Progress Report 42-142, 2000, 1–18
- [Mordovskaya-2002a] Mordovskaya, V.G., Oraevsky, V.N., Styashkin, V.A., “The Peculiarities of the Interaction of Phobos with the Solar Wind are Evidence of the Phobos Magnetic Obstacle (from Phobos-2 Data)”, Arxiv pre-print astro-ph/0212072
- [Mordovskaya-2002b] Mordovskaya, V.G., Oraevsky, “In Situ Measurements of the Phobos Magnetic Field During the Phobos-2 Mission”, Arxiv pre-print astro-ph/0212073
- [Moreels-1986] Moreels, G., et al., “Near-Ultraviolet and Visible Spectrophotometry of Comet Halley from Vega 2”, *Nature*, 321, 1986, 271–272
- [Moshkin-1986] Moshkin, B.E., et al., “Vega 1, 2 Optical Spectrometry of Venus Atmospheric Aerosols at the 60–30 km Levels: Preliminary Results” *Soviet Astronomy Letters*, 12, 1986, 36–39
- [MSSS-1996] “Mars 96”, Malin Space Science Systems Internet site
- [Mudgway-2001a] Mudgway, D.J., “Uplink-Downlink A History of the Deep Space Network 1957–1997”, Washington, NASA, 2001, 216–219
- [Mudgway-2001b] *ibid.*, 280–281
- [Mudgway-2001c] *ibid.*, 324–326
- [Mudgway-2001d] *ibid.*, 329
- [Muenger-1985] Muenger, E.A., “Searching the Horizon: A History of Ames Research Center 1940–1976”, Washington, NASA, 1985, 250
- [Münch-1986] Münch, R.E., Sagdeev, R.Z., Jordan, J.F., “Pathfinder: Accuracy Improvement of Comet Halley Trajectory for Giotto Navigation”, *Nature*, 321, 1986, 318–320
- [Murray-1989a] Murray, B., “Journey into Space”, New York, W.W. Norton & C., 1989, 125–129
- [Murray-1989b] *ibid.*, 243–251
- [Murray-1989c] *ibid.*, 257–263
- [Murray-1989d] *ibid.*, 271–273
- [Murray-1989e] *ibid.*, 185–219
- [Murray-1989f] *ibid.*, 221–237
- [Naeye-2007] Naeye, R., “Flowing Water on Today’s Mars?”, *Sky & Telescope*, March 2007, 17

- [NASA-1966] “Space Flight Handbooks Vol. III Part 5: Trajectories to Jupiter, Ceres and Vesta”, NASA, 1966
- [NASA-1980] “To Explore Venus – Venus Orbiting Imaging Radar Mission”, NASA Brochure 1060-145, July 1980
- [NASA-1986] “Space Shuttle Mission STS-51L Press Kit”, Washington, NASA, 1986
- [NASA-1987] “A Preliminary Study of Mars Rover/Sample Return Missions”, Washington, NASA, January 1987
- [NASA-1993a] “Mars Observer Mars Orbit Insertion Press Kit”, Washington, NASA, August 1993
- [NASA-1993b] “Mars Observer Mission Failure Investigation Board Report”, Washington, NASA, 31 December 1993
- [NASA-1993c] “Discovery Program Workshop Summary Report”, NASA TM-108233, 1993
- [NASA-1994] Joint U.S./Russian Technical Working Groups, “Mars Together and Fire & Ice”, NASA CR-19884, October 1994, 65–90
- [NASA-1995] “Near-Earth Asteroid Returned Sample (NEARS) Final Technical Report”, NASA CR-197297, 1995
- [NASA-1997] “Mars Pathfinder Landing Press Kit”, Washington, NASA, July 1997
- [NASA-2003] “Galileo End of Mission Press Kit”, Washington, NASA, September 2003
- [NASA-2007] “Mars Global Surveyor (MGS) Spacecraft Loss of Contact”, NASA Release, 13 April 2007
- [Nasirov-1989] Nasirov, P.P., et al., “Unikal’nyi Eksperiment Pa Nevestoy Mekhanike” (A unique experiment in celestial mechanics), *Zemliya i Vselennaya*, 1989, 6, page unknown (in Russian)
- [Naudet-1996] Naudet, C.J., Border, J.S., Woo, R., “Magellan Radio Scattering Measurements in the Solar Wind”, paper presented at the Spring 1996 Meeting of the American Geophysical Union
- [Nelson-1995] Nelson, R.M., et al., “Hermes Global Orbiter: A Discovery Mission in Gestation”, *Acta Astronautica*, 35, 1995, 387–395
- [Nelson-1997] Nelson, R.M., “Mercury: The Forgotten Planet”, *Scientific American*, November 1997, 56–67
- [Nelson-2001] Nelson, R.L., Whittenburg, K.E., Holdridge, M.E., “433 Eros Landing: Development of NEAR–Shoemaker’s Controlled Descent Sequence”, paper presented at the XV Annual AIAA/USU Conference on Small Satellites, Logan, 2001
- [Neubauer-1986] Neubauer, F.M., et al., “First Results from the Giotto Magnetometer Experiment at Comet Halley”, *Nature*, 321, 1986, 352–355
- [Neugebauer-1983] Neugebauer, M., “Mariner Mark II and the Exploration of the Solar System”, *Science*, 219, 1983, 443–449
- [Neugebauer-2007] Neugebauer, M., et al., “Encounter of the Ulysses Spacecraft with the Ion Tail of Comet McNaught”, Center for Solar-Terrestrial Research preprint, 2007
- [Neukum-1996] Neukum, G., et al., “The Experiments HRSC and WAOSS on the Russian Mars 94/96 Missions”, *Acta Astronautica*, 38, 1996, 713–720
- [Niemann-1996] Niemann, H.B., et al., “The Galileo Probe Mass Spectrometer: Composition of Jupiter’s Atmosphere”, *Science*, 272, 1996, 846–849
- [Nock-1987] Nock, K.T., “TAU – A Mission to a Thousand Astronomical Units”, Paper AIAA-87-1049
- [NRC-1998a] National Research Council, European Space Foundation, “U.S.-European Collaboration in Space Science”, Washington, National Academy Press, 1998, 61–62
- [NSSDC-2004] NASA NSSDC Internet site, Venera 16 proton flux data
- [Oberg-1999] Oberg, J., “The Probe that Fell to Earth”, *New Scientist*, 6 March 1999, 38

- [Oberg-2000] Oberg, J., "The Strange Case of Fobos-2", Space.com website, 30 June 2000
- [Oertel-1984] Oertel, D., et al., "Venera 15 and Venera 16 Infrared Spectrometry: First Results", *Soviet Astronomy Letters*, 10, 1984, 101–105
- [Oglivie-1986] Oglivie, K.W., et al., "Ion Composition Results During the International Cometary Explorer Encounter with Giacobini-Zinner", *Science*, 232, 1986, 374–377
- [Olson-1979] Olson, R.J.M., "Giotto's Portrait of Halley's Comet", *Scientific American*, 240, 1979, No. 5, 160–170
- [O'Neil-1990] O'Neil, W.J., "Project Galileo", paper presented at the AIAA Space Programs and Technologies Conference, Huntsville, 25–28 September 1990
- [O'Neil-1991] O'Neil, W.J., "Project Galileo Mission Status", paper presented at the XLII Congress of the International Astronautical Federation, Montreal, 1991
- [O'Neil-1992] O'Neil, W.J., et al., "Galileo Completing VEEGA – A Mid-Term Report", paper presented at the XLIII Congress of the International Astronautical Federation, Washington, 1992
- [O'Neil-1993] O'Neil, W.J., et al., "Performing the Galileo Jupiter Mission with the Low-Gain Antenna (LGA) and an Enroute Report", paper presented at the XLIV Congress of the International Astronautical Federation, Graz, 1993
- [O'Neil-1994] O'Neil, W.J., et al., "Galileo Preparing for Jupiter Arrival", paper presented at the XLV Congress of the International Astronautical Federation, Jerusalem, 1994
- [O'Neil-1995] O'Neil, W.J., et al., "Galileo on Jupiter Approach", paper presented at the XLVI Congress of the International Astronautical Federation, Oslo, 1995
- [O'Neil-1996] O'Neil, W.J., et al., "Project Galileo at Jupiter", paper presented at the XLVII Congress of the International Astronautical Federation, Beijing, 1996
- [O'Neil-1997] O'Neil, W.J., et al., "Project Galileo Completing its Primary Mission", paper presented at the XLVIII Congress of the International Astronautical Federation, Turin, 1997
- [Orton-1996] Orton, et al., "Earth-Based Observations of the Galileo Probe Entry Site", *Science*, 272, 1996, 839–840
- [Ostro-1985] Ostro, S.J., "Radar Observations of Asteroids and Comets", *Publications of the Astronomical Society of the Pacific*, 97, 1985, 877–884
- [Ostro-1996] Ostro, S.J., et al., "Radar Observations of Asteroid 1620 Geographos", *Icarus*, 121, 1996, 46–66
- [Otero-2000] Otero, S.A., Fieseler, P.D., Lloyd, C., "Delta Velorum is an Eclipsing Binary", *Information Bulletin On Variable Stars* No. 4999, 7 December 2000
- [Page-1975] Page, D.E., "Exploratory Journey out of the Ecliptic Plane", *Science*, 190, 1975, 845–850
- [Paige-2001] Paige, D.A., "Global Change on Mars?", *Science*, 294, 2001, 2107–2108
- [Palluconi-1997] Palluconi, F.D., Albee, A.L., "Mars Global Surveyor: Ready for Launch in November 1996", *Acta Astronautica*, 40, 1997, 511–516
- [Pappalardo-1998] Pappalardo, R.T., et al., "Geological Evidence for Solid-State Convection in Europa's Ice Shell", *Nature*, 391, 1998, 365–368
- [Pardini-1990] Pardini, C., Anselmo, L., "Missione Piazzi: Importanza Scientifica e Fattibilità Tecnica" (The Piazzi mission: scientific importance and technical feasibility), CNUCE Internal report C90-36, 10 December 1990 (in Italian)
- [Parker-1998] Parker, S., "Mars Global Surveyor: You Ain't Seen Nothin' Yet", *Sky & Telescope*, January 1998, 32–34
- [Parker-1989] Parker, T.J. et al., "Transitional morphology in west Deuteronilus mensae, Mars: Implications for modification of the lowland/upland boundary", *Icarus*, 82, 1989, 111–145
- [Parker-1993] Parker, T.J. et al., "Coastal geomorphology of the Martian northern plains", *J. Geophys. Res.*, 98, 1993, 11061–11078

- [Parker-2007a] Parker, T.J., et al., “HiRISE Captures the Viking and Mars Pathfinder Landing Sites”, paper presented at the Lunar and Planetary Science Conference XXXVIII, Houston, 2007
- [Parker-2007b] Parker, T., Manning, R., “Mars Litter Inventory: Using HiRISE to Find out Stuff”, presentation dated 28 February 2007
- [Perminov-1999] Perminov, V.G., “The Difficult Road to Mars: A Brief History of Mars Exploration in the Soviet Union”, Washington, NASA, 1999, 76
- [Perminov-2004] Perminov, V., “Perviy Otechestvennyy Radiolokatsionnyy Karti Veneri” (The first national radar maps of Venus), *Novosti Kosmonavтики*, No. 9, 2004, page unknown (in Russian)
- [Perminov-2005] Perminov, V., “Aerostaty v Nyeve Veneri: K 20-Letnyu Poleta AMS Vega” (Aerostats in the atmosphere of Venus: on the 20th Anniversary of the Flight of the Vega Probe), *Novosti Kosmonavтики*, August 2005, 60–63 (in Russian)
- [Perminov-2006] Perminov, V., “Vstrecha S Kometoy Galleya – K 20-Letnyu Poleta AMS Vega” (Encounter with Comet Halley: on the 20th Anniversary of the Flight of the Vega Probe), *Novosti Kosmonavтики*, May 2006, 68–72 (in Russian)
- [Petropoulos-1993] Petropoulos, B., Telonis, P., “Physical Parameters of the Atmosphere of Venus from Venera 15 and 16 Missions”, *Earth Moon and Planets*, 63, 1993, 1–7
- [Phillips-1991] Phillips, R.J., et al., “Impact Craters on Venus: Initial Analysis from Magellan”, *Science*, 252, 1991, 288–297
- [Powell-1959] Powell, B.W., “Solar Sail: Key to Interplanetary Voyaging?”, *Spaceflight*, October 1959, 116–118
- [Preston-1986] Preston, R.A., et al., “Determination of Venus Winds by Ground-Based Radio Tracking of the VEGA Balloons”, *Science*, 231, 1986, 1414–1416
- [Prialnik-1992] Prialnik, D., Bar-Nun, A., “Crystallization of Amorphous Ice as the Cause of Comet P/Halley’s Outburst at 14 AU”, *Astronomy and Astrophysics*, 258, 1992, L9–L12
- [Ragent-1996] Ragent, B. et al., “Results of the Galileo Probe Nephelometer Experiment”, *Science*, 272, 1996, 854–856
- [Randolph-1978] Randolph, J.E., “Solar Probe Study”. In: Neugebauer, M., Davies, R.W., “A Close-Up of the Sun”, Pasadena, JPL, 1978, 521–534
- [Rawal-1986] Rawal, J.J., “Possible Satellites of Mercury and Venus”, *Earth, Moon, and Planets*, 36, 1986, 135–138
- [Reinhard-1986a] Reinhard, R., “A Brief History of the Giotto Mission”, *ESA Bulletin*, 46, 1986, 19–21
- [Reinhard-1986b] Reinhard, R., “The Giotto Experiments”, *ESA Bulletin*, 46, 1986, 41–51
- [Rème-1986] Rème, H., et al., “Comet Halley-Solar Wind Interaction from Electron Measurements Aboard Giotto”, *Nature*, 321, 1986, 349–352
- [Rieder-1997] Rieder, R., et al., “The Chemical Composition of Martian Soil and Rocks Returned by the Mobile Alpha Proton X-Ray Spectrometer: Preliminary Results from the X-Ray Mode”, *Science*, 278, 1997, 1771–1774
- [Riedler-1986] Riedler, W., et al. “Magnetic Field Observations in Comet Halley’s Coma”, *Nature*, 321, 1986, 288–289
- [Riedler-1989] Riedler, W., et al., “Magnetic Fields near Mars: First Results”, *Nature*, 341, 1989, 604–607
- [Robertson-1994] Robertson, D.F., “To Boldly Go...”, *Astronomy*, December 1994, 34–41
- [Robinson-2001] Robinson, M.S., et al., “The Nature of Ponded Deposits on Eros”, *Nature*, 413, 2001, 396–400
- [Rocard-1989] Rocard, F., et al., “French Participation in the Soviet Phobos Mission”, *Acta Astronautica*, 22, 1990, 261–267

- [Rogers-1996] Rogers, A., “Come in, Mars”, *Newsweek*, 19 August 1996, 41–45
- [Rokey-1993] Rokey, M.J., “Magellan Radar Special Flight Experiments”, *Journal of Spacecraft and Rockets*, 30, 1993, 715–723
- [Rosenbauer-1989] Rosenbauer, H., et al., “Ions of Martian Origin and Plasma Sheet in the Martian Magnetosphere: Initial Results of the TAUS Experiment”, *Nature*, 341, 1989, 612–614
- [Rosengren-1990] Rosengren, M., “Orbit Design and Control for Ulysses”, *ESA Bulletin*, 63, 1990, 66–69
- [Rossman-2002] Rossman, I.P. III, et al., “A Large Paleolake Basin at the Head of Ma’adim Vallis, Mars”, *Science*, 296, 2002, 2209–2212
- [Rover Team-1997] Rover Team, “Characterization of the Martian Surface Deposits by the Mars Pathfinder Rover, Sojourner”, *Science*, 278, 1997, 1765–1767
- [Russell-2000] Russell, C.T., Kivelson, M.G., “Detection of SO in Io’s Exosphere”, *Science*, 287, 2000, 1998–1999
- [Russo-2000a] Russo, A., “The Definition of ESA’s Scientific Programme for the 1980s”. In: Krige, J., Russo, A., Sebesta, L. (eds.), “A History of the European Space Agency 1958–1987”, Vol. 2, Noordwijk, ESA, 2000, 138–179
- [Russo-2000b] Russo, A., “Towards the Turn of the Century”. *Ibid.*, 189–195 and 210–217
- [Russo-2000c] Russo, A., “The Scientific Programme between ESRO and ESA (1973–1977)”. *Ibid.*, 109
- [Russo-2000d] Russo, A., “Towards the Turn of the Century”. *Ibid.*, 189
- [Rust-2005] Rust, D.M., et al., “Comparison of Interplanetary Disturbances at the NEAR Spacecraft with Coronal Mass Ejections at the Sun”, *The Astrophysical Journal*, 621, 2005, 524–536
- [Rust-2006] Rust, T. III, “Galileo Probe Thermal Control”, paper presented at the 4th International Planetary Probe Workshop, Pasadena, 2006
- [Sagan-1993a] Sagan, C., et al., “A Search for Life on Earth from the Galileo Spacecraft”, *Nature*, 365, 1993, 715–721
- [Sagan-1993b] Sagan, C., “Return to the Wonder World: Mars Observer in Perspective”, *The Planetary Report*, November/December 1993, 6–7
- [Sagdeev-1986a] Sagdeev, R.Z., et al., “Television Observations of Comet Halley from Vega Spacecraft”, *Nature*, 321, 1986, 262–266
- [Sagdeev-1986b] Sagdeev, R.Z., et al., “Vega Spacecraft Encounters with Comet Halley”, *Nature*, 321, 1986, 259–262
- [Sagdeev-1986c] Sagdeev, R.Z., et al., “Overview of VEGA Venus Balloon In Situ Meteorological Measurements”, *Science*, 231, 1986, 1411–1414
- [Sagdeev-1986d] Sagdeev, R.Z., et al., “The VEGA Balloon Experiment”, *Science*, 231, 1986, 1407–1408
- [Sagdeev-1989] Sagdeev, R.Z., Zakharov, A.V., “Brief History of the Phobos Mission”, *Nature*, 341, 1989, 581–585
- [Sagdeev-1994a] Sagdeev, R.Z., “The Making of a Soviet Scientist”, New York, John Wiley & Sons, 1994, 275–276
- [Sagdeev-1994b] *ibid.*, 280
- [Sagdeev-1994c] *ibid.*, 282–283
- [Sagdeev-1994d] *ibid.*, 283–284
- [Sagdeev-1994e] *ibid.*, 313–314
- [Sagdeev-1994f] *ibid.*, 315–316
- [Saito-1986] Saito, T., et al., “Interaction Between Comet Halley and the Interplanetary Magnetic Field observed by Sakigake”, *Nature*, 321, 1986, 303–307

- [Santo-1995] Santo, A.G., Lee, S.C., Gold, R.E., “NEAR Spacecraft and Instrumentation”, *Journal of Astronautical Sciences*, 43, 1995, 373–397
- [Saunders-1951] Saunders, R. (i.e. Wiley, C.), “Clipper Ships of Space”, *Astrounding Science Fiction*, May 1951, 136–143
- [Saunders-1991] Saunders, R.S., Pettengill, G.H., “Magellan: Mission Summary”, *Science*, 252, 1991, 247–249
- [Saunders-1999] Saunders, R.S., “Venus”. In: Kelly Beatty, J., Petersen, C.C., Chaikin, A. (eds.), “The New Solar System”, Cambridge University Press, 4th edition, 1999, 97–110
- [Savich-1986] Savich, N.A., et al., “Dual-Frequency Vega Radio Sounding of Comet Halley”, *Soviet Astronomy Letters*, 12, 1986, 283–286
- [Sawyer-2006a] Sawyer, K., “The Rock from Mars: a Detective Story on Two Planets”, New York, Random House, 3–21
- [Sawyer-2006b] *ibid.*, 161
- [Sawyer-2006c] *ibid.*, 132–133
- [Scarf-1986] Scarf, F.L., et al., “Plasma Wave Observations at Comet Giacobini–Zinner”, *Science*, 232, 1986, 377–381
- [Schaber-1986] Schaber, G.G., Kozak, R.C., “Venera 15/16 and Arecibo Radar Images of Venus: Complementary Data Sets”, paper presented at the XVII Lunar and Planetary Science Conference, Houston, 1986
- [Schaefer-2007] Schaefer, D.H., Paddack, S.J. Rubincam, D.P., “Explorer XII: Spinning Faster than Expected”, *Science*, 317, 2007, 898–899
- [Schenk-2001] Schenk, P.M., et al., “Flooding of Ganymede’s Bright Terrains by Low-Viscosity Water-Ice Lavas”, *Nature*, 410, 2001, 57–60
- [Schofield-1997] Schofield, J.T., et al., “The Mars Pathfinder Atmospheric Structure Investigation/Meteorology (ASI/MET) Experiment”, *Science*, 278, 1997, 1752–1757
- [Schubert-1996] Schubert, G., et al., “The Magnetic Field and Internal Structure of Ganymede”, *Nature*, 384, 1996, 544–545
- [Schulze-Makuch-2002] Schulze-Makuch, D., Irwin, L.N., Irwin, T., “Astrobiological relevance and feasibility of a sample collection mission to the atmosphere of Venus”, In: “Proceedings of the First European Workshop on Exo-Astrobiology, 16–19 September 2002, Graz”, 247–250
- [Schwaiger-1971] Schwaiger, L.-E., et al., “Solar Electric Propulsion Asteroid Belt Mission”, *Journal of Spacecraft and Rockets*, 8, 1971, 612–617
- [Schwehm-1992] Schwehm, G.H., “The Giotto Extended Mission to Comet Grigg–Skjellerup: Summary of Preliminary Results”, *ESA Bulletin*, 72, 1992, 61–65
- [Scoon-1993] Scoon, G.E.N., “Mission and System Concepts from Mars Robotic Precursor Missions”. In: “Missions, Technologies et Conception des Vehicules Mobiles Planetaires”, Toulouse, Cépaduès, 1993
- [Scott-1996a] Scott, W.B., “Clementine 2 to Fire Probes at Asteroids”, *Aviation Week & Space Technology*, 27 May 1996, 46–47
- [Scott-1996b] Scott, W.B., “MGS Completing Prelaunch Checks”, *Aviation Week & Space Technology*, 16 September 1996, 49
- [Sedbon-1989] Sedbon, G., “Rosetta – Key to the Solar System”, *Flight International*, 2 September 1989, 28–29
- [Seiff-1996] Seiff, A., et al., “Structure of the Atmosphere of Jupiter: Galileo Probe Measurements”, *Science*, 272, 1996, 844–845
- [Seiff-1997] Seiff, A., et al., “Thermal Structure of Jupiter’s Upper Atmosphere Derived from the Galileo Probe”, *Science*, 276, 1997, 102–104

- [Sekanina-1985] Sekanina, Z., "Precession Model for the Nucleus of Periodic Comet Giacobini-Zinner", *The Astronomical Journal*, 90, 1985, 827–845
- [Sekanina-1986] Sekanina, Z., Larson, S.M., "Dust Jets in Comet Halley Observed by Giotto and from the Ground", *Nature*, 321, 1986, 357–361
- [Sekanina-1987] Sekanina, Z., "Nucleus of Comet Halley as a Torque-Free Rigid Rotator", *Nature*, 325, 1987, 326–328
- [Selivanov-1989] Selivanov, A.S., et al., "Thermal Imaging of the Surface of Mars", *Nature*, 341 1989, 593–595
- [Selivanov-1990] Selivanov, A.S., et al., "The TERMOSKAN Experiment: A Thermal Survey of the Surface of Mars from Phobos 2", *Soviet Astronomy Letters*, 16, 1990, 147–150
- [Shutte-1989] Shutte, N.M., et al., "Observations of Electron and Ion Fluxes in the Vicinity of Mars with the HARP Spectrometer", *Nature*, 341, 1989, 614–616
- [Siddiqi-2002a] Siddiqi, A.A., "Deep Space Chronicle: A Chronology of Deep Space and Planetary Probes 1958–2000", Washington, NASA, 2002, 131–132
- [Siddiqi-2002b] *ibid.*, 137–139
- [Simpson-1986] Simpson, J.A., et al., "Dust Counter and Mass Analyser (DUCMA) Measurements of Comet Halley's Coma from Vega Spacecraft", *Nature*, 321, 1986, 278–280
- [Simpson-1994] Simpson, R.A., Pettengill, G.H., Ford, P.G., "The Magellan Quasi-Specular Bistatic Radar Experiment", paper presented at the Lunar and Planetary Science Conference XXV, Houston, 1994
- [Simpson-2000] Simpson, R.A., Tyler, G.L., "MGS Bistatic Radar Probing of the MPL/DS2 Target Area", paper presented at the 2000 Division for Planetary Science Meeting, Pasadena, 23–27 October 2000
- [Simpson-2002] Simpson, R.A., "Highly Oblique Bistatic Radar Observations Using Mars Global Surveyor", paper presented at the 2002 General Assembly of the Union Radio-Scientifique Internationale
- [Sjogren-1992a] Sjogren, W.L., "Venus Gravity: Status and New Data Acquisition", paper presented at the Lunar and Planetary Science Conference XXIII, Houston, 1992
- [Sjogren-1992b] Sjogren, W.L., "Venus Gravity: Summary and Coming Events", paper presented at the International Colloquium on Venus, 1992
- [Sjogren-1993] Sjogren, W.L., Konopliv, A.S., Borderies, N., "Venus Gravity: New Magellan Low Altitude Data", paper presented at the Lunar and Planetary Science Conference XXIV, Houston, 1993
- [Sjogren-1994] Sjogren, W.L., Konopliv, A.S., "Venus Gravity Field Determination: Progress and Concern", paper presented at the Lunar and Planetary Science Conference XXV, Houston, 1994
- [Sjogren-1997] Sjogren, W.L., "Venus: Gravity". In: Shirley, J.H., Fairbridge, R.W., "Encyclopedia of Planetary Sciences", Dordrecht, Kluwer, 1997, 904–905
- [Slyuta-1988] Slyuta, E.N., Nikolaeva, O.V., "Distribution of Small Domes on Venus: Venera 15/16 Data", paper presented at the XIX Lunar and Planetary Science Conference, Houston, 1988
- [Smith-1982] Smith, B.A., "JPL Attempting to Revive Venus Radar Imaging Plan", *Aviation Week & Space Technology*, 15 March 1982, 18–19
- [Smith-1984] Smith, B.A., "New Radar Unit Cuts Venus Mapper Costs", *Aviation Week & Space Technology*, 16 April 1984, 141–145
- [Smith-1986] Smith, E.J., et al., "International Cometary Explorer Encounter with Giacobini-Zinner: Magnetic Field Observations", *Science*, 232, 1986, 382–385
- [Smith-1987a] Smith, B.A., et al., "Rejection of a Proposed 7.4-day Rotation Period of the Comet Halley Nucleus", *Nature*, 326, 1987, 573–574

- [Smith-1987b] Smith, B.A., “Future Soviet Space Exploration to Focus on Mars, Asteroids”, *Aviation Week & Space Technology*, 22 June 1987, 81–85
- [Smith-1989] Smith, B.A., “Missions Mark Resurgence of U.S. Planetary Exploration”, *Aviation Week & Space Technology*, 9 October 1989, 44–54
- [Smith-1992] Smith, E.J., Wenzel, K.-P., Page, D.E., “Ulysses at Jupiter: An Overview of the Encounter”, *Science*, 257, 1992, 1503–1507
- [Smith-1994] Smith, B.A., “Mars Global Surveyor Faces Tight Timetable”, *Aviation Week & Space Technology*, 8 August 1994, 63–64
- [Smith-1997a] Smith, B.A., “MGS Settling into Mars Orbit”, *Aviation Week & Space Technology*, 6 October 1997, 33
- [Smith-1997b] Smith, P.H., et al., “Results from the Mars Pathfinder Camera”, *Science*, 278, 1997, 1758–1764
- [Smith-1998] Smith, D.E., et al., “Topography of the Northern Hemisphere of Mars from the Mars Orbiter Laser Altimeter”, *Science*, 279, 1998, 1686–1692
- [Smith-1999a] Smith, B.A., “Antenna Problem Stalls Mars Mapping Mission”, *Aviation Week & Space Technology*, 26 April 1999, 85
- [Smith-1999b] Smith, D.E., et al., “The Global Topography of Mars and Implications for Surface Evolution”, *Science*, 284, 1999, 1495–1503
- [Smith-1999c] Smith, D.E., et al., “The Gravity Field of Mars: Results from Mars Global Surveyor”, *Science*, 286, 1999, 94–97
- [Smith-2001] Smith, D.E., et al., “Seasonal Variations of Snow Depth on Mars”, *Science*, 294, 2001, 2141–2144
- [Snyder-1997] Snyder, C.W., “Phobos Mission”. In: Shirley, J.H., Fairbridge, R.W., “*Encyclopedia of Planetary Sciences*”, Dordrecht, Kluwer, 1997, 574–576
- [Sobel-1993] Sobel, D., “The Last World”, *Discover*, May 1993, 68–76
- [Sobel’man-1990] Sobel’man, I.I., et al., “Images of the Sun Obtained with the TEREK X-Ray Telescope on the Spacecraft Phobos 1”, *Soviet Astronomy Letters*, 16, 1990, 137–140
- [Somogyi-1986] Somogyi, A.J., et al. “First Observations of Energetic Particles near Comet Halley”, *Nature*, 321, 1986, 285–288
- [Spaceflight-1977] “Solar Sailing”, *Spaceflight*, April 1977, 124–125
- [Spaceflight-1992a] “What Became of the Other Halley Explorers?” *Spaceflight*, June 1992, 212
- [Spaceflight-1992b] “NASA Unveils Lean Budget for 1993”, *Spaceflight*, March 1992, 93–95
- [Spaceflight-1992c] “Indian Space Probe”, *Spaceflight*, November 1992, 345
- [Spaceflight-1992d] “Magellan Probe Suffers Major Failure”, *Spaceflight*, February 1992, 38
- [Spaceflight-1992e] “Magellan Resumes Venus Mapping Following Transmitter Failure”, *Spaceflight*, March 1992, 78
- [Spaceflight-1992f] “Crucial Mars Launch Delayed”, *Spaceflight*, October 1992, 336
- [Spaceflight-1992g] “Mars Observer Launched”, *Spaceflight*, November 1992, 342
- [Spaceflight-1992h] “Space Probe Diary”, *Spaceflight*, December 1992, 393
- [Spaun-2001] Spaun, N.A., et al., “Scalloped Depressions on Ganymede from Galileo (G28) Very High Resolution Imaging”, paper presented at the XXXII Lunar and Planetary Science Conference, Houston, 2001
- [Spencer-1992] Spencer, J.R., et al., “Volcanic Activity on Io at the Time of the Ulysses Encounter”, *Science*, 257, 1992, 1507–1510
- [Spencer-1995] Spencer, J.R., Mitton, J. (eds.), “The Great Comet Crash: The Impact of Comet Shoemaker–Levy 9 on Jupiter”, Cambridge University Press, 1995, 75–76
- [Spencer-1998] Spencer, D.A., et al., “Mars Pathfinder Atmospheric Entry Reconstruction”, paper AAS 98-146

- [Spencer-1999a] Spencer, J.R., et al., “Temperatures on Europa from Galileo Photopolarimeter-Radiometer: Nighttime Thermal Anomalies”, *Science*, 284, 1999, 1514–1516
- [Spencer-1999b] Spencer, D.A., et al., “Mars Pathfinder Entry, Descent, and Landing Reconstruction”, *Journal of Spacecraft and Rockets*, 36, 1999, 357–366
- [Spencer-2000a] Spencer, J.R., et al., “Discovery of Gaseous S₂ in Io’s Pele Plume”, *Science*, 288, 2000, 1208–1210
- [Spencer-2000b] Spencer, J.R., et al., “Io’s Thermal Emission from the Galileo Photopolarimeter-Radiometer”, *Science*, 288, 2000, 1198–1201
- [Spencer-2001] Spencer, J., “Galileo’s Closest Look at Io”, *Sky & Telescope*, May 2001, 40–46
- [Spudis-1994] Spudis, P. D., Plescia, J.B., Stewart, A.D., “Return to Mercury: The Discovery-Mercury Polar Flyby Mission”, paper presented at the Lunar and Planetary Science Conference XXV, Houston, March 1994
- [Sromovsky-1996] Sromovsky, L.A., et al., “Solar and Thermal Radiation in Jupiter’s Atmosphere: Initial Results of the Galileo Probe Net Flux Radiometer”, *Science*, 272, 1996, 851–854
- [ST-1946] “Meteorites and Space Travel”, *Sky & Telescope*, November 1946, 7. (Reprinted in: Page, T, Page, L.W., “Wanderers in the Sky”, New York, Macmillan, 1965, 206–207, replacing “space vessel” with “space probe”)
- [ST-1995] “Metal ‘Frost’ on Venus?” *Sky & Telescope*, August 1995, 13
- [ST-1998] “Cydonia Defaced”, *Sky & Telescope*, July 1998, 20
- [ST-1999] “A Shot in the Dark”, *Sky & Telescope*, November 1999, 17
- [ST-2000a] “Ganymede’s Snows”, *Sky & Telescope*, March 2000, 24
- [ST-2000b] “Recent Volcanism on Mars”, *Sky & Telescope*, October 2000, 34
- [Stahle-1994] Stahle, R.L., et al., “Last but not Least – Trip to Pluto”, *Spaceflight*, March 1994, 101–104, April 1994, 140–143
- [Stahle-1999] Stahle, R.L., et al., “Ice & Fire: Missions to the Most Difficult Solar System Destinations... on a Budget”, *Acta Astronautica*, 45, 1999, 423–439
- [Steffes-1992] Steffes, P.G., et al., “Preliminary Results from the October 1991 Magellan Radio Occultation Experiment”, paper presented at the 1992 24th Annual DPS Meeting
- [Steffy-1983] Steffy, D.A., “The Mars Geoscience Climatology Orbiter”, paper presented at the Lunar and Planetary Science Conference XIV, Houston, March 1983
- [Stephenson-1994] Stephenson, R.R., Bernard, D.E., “JPL Mars Observer In-Flight Anomaly Investigation (With Emphasis on Attitude Control Aspects)”, Draft dated 25 January 1994
- [Stern-1993] Stern, S.A., et al., “A Low-Cost Mission to 2060 Chiron Based on the Pluto Fast Flyby”, 1993
- [Stern-1998] Stern, A., Mitton, J., “Pluto and Charon”, New York, John Wiley & Sons, 1998, 171–202
- [Stern-2007] Stern, S.A., “The New Horizons Pluto Kuiper Belt Mission: An Overview with Historical Context”, Arxiv pre-print astro-ph/0709.4417
- [Stofan-1993] Stofan, E.R., “The New Face of Venus”, *Sky & Telescope*, August 1993, 22–31
- [Stooke-2000] Stooke, P.J., “The Pathfinder Landing Area in MGS/MOC Images”, paper presented at the Lunar and Planetary Science Conference XXXI, Houston, 2000
- [Stuhlinger-1970] Stuhlinger, E., “Planetary Exploration with Electrically Propelled Vehicles”, paper presented at the Third Conference on Planetology and Space Mission Planning, New York, October 1970
- [Stuhlinger-1986] Stuhlinger, E., et al., “Comet Nucleus Sample Return Missions with Electrically Propelled Spacecraft”, *Journal of the British Interplanetary Society*, 39, 1986, 273–281

- [Sukhanov-1985] Sukhanov, A.A., “Otchet o Nauchno-Issledovatel'skoy Rabote ‘Issledovaniye Vozmoshnostey Osutshchestvleniya Nekatorikh Perspektivnykh Kosmicheskikh Proektov’” (Relation on the Scientific Research Work ‘Feasibility Study of Some Long Term Space Projects’), Moscow, IKI, 1985 (in Russian)
- [Surkov-1986a] Surkov, Yu.A., et al., “Vega 1 Mass Spectrometry of Venus Cloud Aerosols: Preliminary Results” *Soviet Astronomy Letters*, 12, 1986, 44–45
- [Surkov-1986b] Surkov, Yu.A., et al., “Vega 1, 2 Humidity Profiles for the Venus Atmosphere”, *Soviet Astronomy Letters*, 12, 1986, 31–33
- [Surkov-1986c] Surkov, Yu.A., et al., “Vega 2 Lander Analysis of Rock Composition in Northern Aphrodite Terra”, *Soviet Astronomy Letters*, 12, 1986, 28–31
- [Surkov-1986d] Surkov, Yu.A., et al., “Uranium, Thorium, Potassium Abundances in Venus Rocks”, *Soviet Astronomy Letters*, 12, 1986, 46–48
- [Surkov-1989] Surkov, Yu.A., et al., “Determination of the Elemental Composition of Martian Rocks from Phobos 2”, *Nature*, 341 1989, 595–598
- [Surkov-1993] Surkov, Yu.A., “Discovery Venera Surface – Atmosphere Geochemistry Experiments Mission Concept”, paper presented at the Lunar and Planetary Science Conference XXIV, Houston, 1993
- [Surkov-1997a] Surkov, Yu. A., “Exploration of Terrestrial Planets from Spacecraft”, Chichester, Wiley–Praxis, 1997, 406–408 and 371–373
- [Surkov-1997b] *ibid.*, 387–392
- [Surkov-1997c] *ibid.*, 212–220 and 378–381
- [Surkov-1997d] *ibid.*, 381–382
- [Surkov-1997e] *ibid.*, 383–386
- [Surkov-1997f] *ibid.*, 396–400 and 419–427
- [Surkov-1997g] *ibid.* 433–436
- [Theilig-2001] Theilig, E.E., Bindschadler, D.L., Vandermey, N., “Project Galileo: From Ganymede Back to Io”, paper presented at the LII Congress of the International Astronautical Federation, Toulouse, 2001
- [Theilig-2002] Theilig, E.E., et al., “Project Galileo: Farewell to the Major Moons of Jupiter”, paper presented at the LIII Congress of the International Astronautical Federation, Houston, 2002
- [Thomas-Keprta-2002] Thomas-Keprta, K.L., “Magnetofossils from Ancient Mars: A Robust Biosignature in the Martian Meteorite ALH84001”, *Applied and Environmental Microbiology*, 68, 2002, 3663–3672
- [Thomson-1982a] Thomson, A.A., “Off to the Asteroids”, *Spaceflight*, January 1982, 7–9
- [Thomson-1982b] Thomson, A.A., “Exploring Mars with Kepler”, *Spaceflight*, 24, April 1982, 151–153
- [Time-1977] “Sailing to Halley’s Comet”, *Time*, 14 March 1977, 22
- [Tolson-1995] Tolson, R.H., Patterson, M.T., Lyons, D.T., “Magellan Windmill and Termination Experiments”. In: “Mécanique Spatiale/Spaceflight Mechanics”, Toulouse, Cépaduès, 1995
- [Tolson-1999] Tolson, R.H., et al., “Utilization of Mars Global Surveyor Accelerometer Data for Atmospheric Modeling”, *AAS* 99-386
- [Treiman-1999] Treiman, A., “Microbes in a Martian Meteorite?”, *Sky & Telescope*, April 1999, 52–58
- [Trombka-2000] Trombka, J.I., et al., “The Elemental Composition of Asteroid 433 Eros: Results of the NEAR–Shoemaker X-ray Spectrometer”, *Science*, 289, 2000, 2101–2105
- [Tsander-1924] Tsander, F.A., “Report of the Engineer F.A. Tsander Concerning Interplanetary Voyages”, 1924?. In: Tsander, F.A., “From a Scientific Heritage”, Washington, NASA, 1969

- [Tsou-1985] Tsou, P., Brownlee, D.E., Albee, A.L., “Comet Coma Sample Return Via Giotto II”, *Journal of the British Interplanetary Society*, 38, 1985, 232–239
- [Tsou-1985b] Tsou, P., Albee, A., “Comet Flyby Sample Return”, Paper AIAA-85-0465
- [Turtle-2001] Turtle, E.P., Pierazzo, E., “Thickness of a European Ice Shell from Impact Crater Simulations”, *Science*, 294, 2001, 1326–1328
- [Turtle-2004] Turtle, E.P., et al., “The Final Galileo SSI Observations of Io: Orbits G28-I33”, *Icarus*, 169, 2004, 3–28
- [Tyler-1991] Tyler, G.L., et al., “Magellan: Electrical and Physical Properties of Venus’ Surface”, *Science*, 252, 1991, 265–270
- [Tytell-2000] Tytell, D., “Martian Mudflows”, *Sky & Telescope*, September 2000, 56–57
- [Tytell-2001a] Tytell, D., “Ancient Martian Lakes? Perhaps.”, *Sky & Telescope*, March 2001, 20–21
- [Tytell-2001b] Tytell, D., Kelly Beatty, J., “Other Ways to Make Martian Gullies”, *Sky & Telescope*, July 2001, 26
- [Tytell-2001c] Tytell, D., “A Greener, Drier Mars”, *Sky & Telescope*, February 2001, 20–21
- [Tytell-2001d] Tytell, D., “Dust Storm Clouds Out Mars”, *Sky & Telescope*, November 2001, 22
- [Tytell-2004] Tytell, D., “When Mars Had an Icy Equator”, *Sky & Telescope*, July 2004, 26
- [Uesugi-1986] Uesugi, K., “Collision of Large Dust Particles with Suissei Spacecraft”, In: *ESA Proceedings of the 20th ESLAB Symposium on the Exploration of Halley’s Comet. Volume 2: Dust and Nucleus*, 1986, 219–222
- [Uesugi-1988] Uesugi, K., et al., “Follow-On Missions of Sakigake and Suissei”, *Acta Astronautica*, 18, 1988, 241–246
- [Uesugi-1995] Uesugi, K., Kawaguchi, J., Tsou, P., “SOCCER (Sample of Comet Coma Earth Return) Mission”, *Acta Astronautica*, 35, 1995, 171–179
- [Ulivi-2004] Ulivi, P., with Harland, D.M., “Lunar Exploration: Human Pioneers and Robotic Surveyors”, Chichester, Springer–Praxis, 2004, 257–264
- [Ulivi-2006] Ulivi, P., “ESRO and the deep space: European Planetary Exploration Planning before ESA”, *Journal of the British Interplanetary Society*, 59, 2006, 204–223
- [Ulivi-2008] Ulivi, P., “Europe’s ‘Arrows to the Sun’: Two Gravity and Solar Probe proposals from ESRO and ESA”, *Journal of the British Interplanetary Society*, 61, 2008, 98–112
- [Vaisberg-1986] Vaisberg, O.L., “Dust Coma Structure of Comet Halley from SP-1 Detector Measurements”, *Nature*, 321, 1986, 274–276
- [Vekshin-1999] Vekshin, B., “Pisma Zhitateley” (reader’s letters), *Novosti Kosmonavtiki*, No. 5, 1999, 53 (in Russian)
- [Verigin-1999] Verigin, V., “9 Let Granata” (9 years of Granat), *Novosti Kosmonavtiki*, No.2 1999, 38–40 (in Russian)
- [Veverka-1997a] Veverka, J.F., Farquhar, R.W., “NEAR Views of Mathilde”, *Sky & Telescope*, October 1997, 30–32
- [Veverka-1997b] Veverka, J., et al., “NEAR’s Flyby of 253 Mathilde: Images of a C Asteroid”, *Science*, 278, 1997, 2109–2114
- [Veverka-1999] Veverka, J., et al., “Imaging of Asteroid 433 Eros During NEAR’s Flyby Reconnaissance”, *Science*, 285, 1999, 562–564
- [Veverka-2000] Veverka, J., et al., “NEAR at Eros: Imaging and Spectral Results”, *Science*, 289, 2000, 2088–2097
- [Veverka-2001a] Veverka, J., et al., “Imaging of Small-Scale Features on 433 Eros from NEAR: Evidence for a Complex Regolith”, *Science*, 2001, 292, 484–488
- [Veverka-2001b] Veverka, J., et al., “The Landing of NEAR–Shoemaker on Asteroid 433 Eros”, *Nature*, 413, 2001, 390–393

- [VnIITransmash-1999] VnIITransmash, “Specimens of Space Technology, Earth Based Demonstrators of Planetary Rovers, Running Mock-ups”, Saint Petersburg, 1999
- [VnIITransmash-2000] “Pages of history of VnIITransmash”, Saint Petersburg, VnIITransmash, pages unknown (in Russian)
- [Volare-1989] “Primi Accordi Italiani con la NASA dell’Est” (First Italian agreements with the Eastern NASA), *Volare*, June 1989, 14 (in Italian)
- [von Roseninge-1986] von Roseninge, T.T., Brandt, J.C., Farquhar, R.W., “The International Cometary Explorer Mission to Comet Giacobini–Zinner”, *Science*, 232, 1986, 353–356
- [von Zahn-1996] von Zahn, U., Hunten, D.M., “The Helium Mass Fraction in Jupiter’s Atmosphere”, *Science*, 272, 1996, 849–851
- [Vorontsov-1989] Vorontsov, V.A., et al., “Mars Exploration: Balloons and Penetrators”, *Acta Astronautica*, 19, 1989, 843–845
- [Waldrop-1981a] Waldrop, M.M., “Down the Wire with Halley”, *Science*, 214, 1981, 35
- [Waldrop-1981b] Waldrop, M.M., “Planetary Science *in Extremis*”, *Science*, 214, 1981, 1322–1324
- [Waldrop-1982] Waldrop, M.M., “Planetary Science: Up from the Ashes?”, *Science*, 218, 1982, 665–666
- [Waldrop-1989] Waldrop, M.M., “Phobos at Mars: A Dramatic View – And Then Failure”, *Science*, 245, 1989, 1044–1045
- [Weinberger—1984] “Defense Space Launch Strategy”, Memorandum from Secretary of Defense to Secretaries of the Military Departments, *et al.*, 7 February 1984
- [Weinstein-1993] Weinstein, S., et al., “Follow on Missions for the Pluto Spacecraft”, paper presented at the IAA International Conference on on Low Cost Missions, 1993
- [Weisbin-1993] Weisbin, C.R., Montemerlo, M., Whittaker, W., “Evolving Directions in NASA’s Planetary Rover Requirements and Technology”. In: “Missions, Technologies et Conception des Vehicules Mobiles Planetaires”, Toulouse, Cépaduès, 1993
- [Weissman-1995] Weissman, P.R., et al., “Galileo NIMS Direct Observations of the Shoemaker–Levy 9 Fireballs and Fall Back”, paper presented at the Lunar and Planetary Science Conference XXVI, Houston, March 1995
- [Weissman-1999] Weissman, P.R., “Cometary Reservoirs”. In: Kelly Beatty, J., Petersen, C.C., Chaikin, A. (eds.), “The New Solar System”, Cambridge University Press, 4th edition, 1999, 59–68
- [Wenzel-1990a] Wenzel, K.-P., Eaton, D., “Ulysses – A Brief History”, *ESA Bulletin*, 63, 1990, 10–12
- [Wenzel-1990b] Wenzel, K.-P., et al., “The Scientific Mission of Ulysses”, *ESA Bulletin*, 63, 1990, 21–27
- [West-1986] West, R.M., et al., “Post Perihelion Imaging of Comet Halley at ESO”, *Nature*, 321, 1986, 363–365
- [Westwick-2007a] Westwick, P.J., “Into the Black: JPL and the American Space Program 1976–2004”, New Haven, Yale University Press, 2007, 42–58
- [Westwick-2007b] *ibid.*, 108–110
- [Westwick-2007c] *ibid.*, 96–97
- [Westwick-2007d] *ibid.*, 70
- [Westwick-2007e] *ibid.*, 175–177
- [Westwick-2007f] *ibid.*, 175–185
- [Westwick-2007g] *ibid.*, 268
- [Westwick-2007h] *ibid.*, 160
- [Westwick-2007i] *ibid.*, 198–201

- [Westwick-2007j] *ibid.*, 195
- [Westwick-2007k] *ibid.*, 183–185
- [Westwick-2007l] *ibid.*, 258–260
- [Westwick-2007m] *ibid.*, 227
- [Westwick-2007n] *ibid.*, 48
- [Westwick-2007o] *ibid.*, 142–154 and 207–227
- [Westwick-2007p] *ibid.*, 218–219
- [Westwick-2007q] *ibid.*, 149
- [Westwick-2007r] *ibid.*, 142–154 and 263
- [Whipple-1966] Whipple, F.L., interviewed by Caras, R.A. on 6 May 1966 in: Frewin, A., “Are We Alone? The Stanley Kubrick Extraterrestrial-Intelligence Interviews”, Elliot & Thompson, 2005
- [Whipple-1987] Whipple, F.L., “The Cometary Nucleus: Current Concepts”, *Astronomy & Astrophysics*, 187, 1987, 852–858
- [Wilkins-1986] Wilkins, D.E.B., Parkes, A., Nye, H., “The Giotto Encounter and Post-Encounter Operations”, *ESA Bulletin*, 46, 1986, 66–70
- [Willcockson-1999] Willcockson, W.H., “Mars Pathfinder Heathshield Design and Flight Experience”, *Journal of Spacecraft and Rockets*, 36, 1999, 374–379
- [Williams-2005] Williams, D., personal communication with the author, 27 September 2005
- [Wilmoth-1999] Wilmoth, R.G., et al., “Rarefied Aerothermodynamic Predictions for Mars Global Surveyor”, *Journal of Spacecraft and Rockets*, 36, 1999, 314–322
- [Wilson-1985] Wilson, K.T., “The CRAF Mission”, *Spaceflight*, December 1985, 452–453
- [Wilson-1986a] Wilson, A., “Sampling the Snowballs”, *Flight International*, 7 June 1986, 45–46
- [Wilson-1986b] Wilson, A., “Comet Workshop”, *Flight International*, 6 September 1986, 44–45
- [Wilson-1986c] Wilson, A., “Missions to Mars”, *Flight International*, 12 July 1986, 35–37
- [Wilson-1987a] Wilson, A., “Solar System Log”, London, Jane’s Publishing, 1987, 112–113
- [Wilson-1987b] *ibid.*, 117–118 and 122–124
- [Wilson-1987c] *ibid.*, 118–122
- [Wilson-1987d] *ibid.*, 114–117
- [Wilson-1987e] *ibid.*, 106–107
- [Wilson-1987f] Wilson, A., “Comets Loom Closer”, *Flight International*, 8 August 1987, 33–35
- [Wilson-1987g] Wilson, A., “Return to Mercury”, *Flight International*, 19 September 1987, 46–49
- [Woerner-1998] Woerner, D.F., “Revolutionary Systems and Technologies for Missions to the Outer Planets”, paper presented at the Second IAA Symposium on Realistic Near-Term Advanced Scientific Space Missions, Aosta, 29 June–1 July 1998
- [Wood-1981] Wood, L.J., “Navigation Accuracy Analysis for a Halley Intercept Mission”, *Journal of Guidance*, 5, 1981, 300–306
- [Yeomans-1997] Yeomans, D.K., et al., “Estimating the Mass of Asteroid 253 Mathilde from Tracking Data During the NEAR Flyby”, *Science*, 278, 1997, 2106–2109
- [Yeomans-1999] Yeomans, D.K., et al., “Estimating the Mass of Asteroid 433 Eros During the NEAR Spacecraft Flyby”, *Science*, 285, 1999, 560–561
- [Yeomans-2000] Yeomans, D.K., et al., “Radio Science Results During the NEAR–Shoemaker Spacecraft Rendezvous with Eros”, *Science*, 289, 2000, 2085–2088
- [Yoder-2003] Yoder, C.F., et al., “Fluid Core Size of Mars from Detection of the Solar Tide”, *Science*, 300, 2003, 299–303

- [Young-1990] Young, C. (ed.), “The Magellan Venus Explorer’s Guide”, Pasadena, JPL, 1990, 51–68
- [Young-1996] Young, R.E., Smith, M.A., Sobeck, C.K., “Galileo Probe: In Situ Observations of Jupiter’s Atmosphere”, *Science*, 272, 1996, 837–838
- [Zaitsev-1989] Zaitsev, Yu., “The Successes of Phobos-2”, *Spaceflight*, November 1989, 374–377
- [Zak-2004] “Planetary: Projects and Concepts”, Anatoly Zak website
- [Zhulanov-1986] Zhulanov, Yu.V., Mutkin, L.M., Nenarokov, D.F., “Aerosol Counts in the Venus Clouds: Preliminary Vega 1, 2 Density Profiles, H = 63–47 km”, *Soviet Astronomy Letters*, 12, 1986, 49–52
- [Zuber-1998] Zuber, M.T., “Observations of the North Polar Region of Mars from the Mars Orbiter Laser Altimeter”, *Science*, 282, 1998, 2053–2060
- [Zuber-2000a] Zuber, M., et al., “The Shape of 433 Eros from NEAR–Shoemaker Laser Rangefinder”, *Science*, 289, 2000, 2097–2101
- [Zuber-2000b] Zuber, M.T., et al., “Internal Structure and Early Thermal Evolution of Mars from Mars Global Surveyor Topography and Gravity”, *Science*, 287, 2000, 1788–1793

Further reading

BOOKS

- Godwin, R., (editor), “Deep Space: The NASA Mission Reports”, Burlington, Apogee, 2005
- Godwin, R., (editor), “Mars: The NASA Mission Reports”, Burlington, Apogee, 2000
- Godwin, R., (editor), “Mars: The NASA Mission Reports Volume 2”, Burlington, Apogee, 2004
- Kelly Beatty, J., Collins Petersen, C., Chaikin, A. (editors), “The New Solar System”, 4th edition, Cambridge University Press, 1999
- Shirley, J.H., Fairbridge, R.W., “Encyclopedia of Planetary Sciences”, Dordrecht, Kluwer Academic Publishers, 1997
- Surkov, Yu.A., “Exploration of Terrestrial Planets from Spacecraft”, Chichester, Wiley–Praxis, 1994

MAGAZINES

- Aerospace America
- l’Astronomia (in Italian)
- Aviation Week & Space Technology
- ESA Bulletin
- Espace Magazine (in French)
- Flight International
- Novosti Kosmonavtiki (in Russian)
- Science
- Scientific American
- Sky & Telescope
- Spaceflight

INTERNET SITES

- Don P. Mitchell’s “The Soviet Exploration of Venus” (www.mentallandscape.com/V_Venus.htm)

522 Further reading

Encyclopedia Astronautica (www.astronautix.com)
Jonathan's Space Home Page (planet4589.org/space/space.html)
JPL (www.jpl.nasa.gov)
Malin Space Science Systems (www.msss.com)
NASA NSSDC (nssdc.gsfc.nasa.gov)
Novosti Kosmonavtiki (www.novosti-kosmonavtiki.ru)
NPO Imeni S.A. Lavochkina (www.laspace.ru)
Space Daily (www.spacedaily.com)
Spaceflight Now (www.spaceflightnow.com)
The Planetary Society (planetary.org)

Previous volumes in this series:

Part 1: The golden age 1957–1982

List of illustrations	ix
List of tables	xvii
Foreword	xix
Author's preface	xxi
Acknowledgments	xxiii
Introduction	xxv
Mercury: extremes of heat and cold	xxv
Venus: a swamp or a greenhouse?	xxvii
Mars, life and the 'canali'	xxxii
Jupiter: a ball of hydrogen	xxxix
Saturn, its rings and moons	xliii
Uranus and Neptune: outer giants	xlv
Pluto: the incredible shrinking planet	1
Asteroids: those fantastic points of light	lii
Comets: flying sandbanks or dirty snowballs?	liii
Phantoms: Vulcan, trans-Plutonian planets and the like	lv
1. The beginning	1
Space race	1
Humans or robots?	2
The first 'artificial planets'	5
The first interplanetary probe	5
The first JPL projects	9
The first Soviet probes	12
The first success	18
Product 2MV	26
The 'Zond' probes	31
Farewell to the 'little green men'	33

Korolyov's last probes	45
Solar probes	48
Together to Venus	52
A Voyager without sails	65
A repeat mission.	70
Mars again	73
Other players	88
2. Of landers and orbiters	97
A new decade	97
To the surface!	97
Into the storm	99
A first look beyond the asteroids	125
The taste of Venus	156
The curse of the transistor	160
Soviet soil from the Red Planet	167
The planet of contradictions.	171
Hot and hotter	196
Snowballs will wait.	206
Postcards from Hell	209
Landing in Utopia	216
Pigeons, rovers, sniffers	256
The Venusian fleet	262
The color of Venus.	284
'Purple Pigeons' from the cold	289
3. The grandest tour	301
The journey of three lifetimes.	301
Grand Tour reborn	309
The spacecraft that could	311
Launch and teething troubles	318
Jupiter: ring, new moons and volcanoes!	323
The return to Jupiter: life, perhaps?	346
Saturn and mysterious Titan.	363
The final one-two punch	382
Dull planet, incredible moon	398
To a blue planet	422
The larger perspective.	441
Glossary	457
Appendices.	465
Chapter references	477
Further reading	523
Index.	525

Index

- 1F Mars and Phobos probe (see also Fobos 1, 2), 146–147
- 4M Mars lander and rover, 423
- 4V-1 Venus probe (see also Venera 9, 10, 11, 12), 42
- 4V-2 Venus radar orbiter (see also Venera 15, 16), 6–10
- 5M Mars sample return, 39
- 5VK Venus–Halley probe (see also Vega, Vega 1, 2), 42
- 5VP Venus probe, 39
- 5VS Venus probe, 39
- 8K78M Molniya launcher, 376, 437
- 8K82K Proton launcher, 10, 52, 120, 121, 147, 156, 376, 437, 439, 442

- Adrastea (Jupiter satellite), 239, 274, 277, 297
- Aeroassist Flight Experiment, 336
- Aerobraking, 6, 65, 105, 191–192, 193, 195, 380–381, 390–393, 396, 398–401, 439
- Aerocapture, 336, 424
- AGORA (Asteroidal Gravity Optical and Radar Analysis), 118–119, 138
- ALH84001 meteorite, 384–388, 401, 414
- Allen, L., 133
- Alvarez, L.W., 118
- Amalthea (Jupiter satellite), 239, 254, 274, 277, 289, 294–296, 297, 303, 304, 306, 309, 310, 311
- Ambler rover, 340
- Ames Research Center, 39, 196, 202, 349, 424, 442, 443
- AMPTE (Active Magnetospheric Particle Tracer Explorer), 83

- AMSAT (Radio Amateur Satellite Corporation), 119
- Andropov, Yu.V., 12
- Antiballistic Missile Treaty, 357
- APL: see Applied Physics Laboratory
- Apollo lunar manned program, 104, 188, 328, 379
- Apollo 11, 156, 340
- Apollo 13, 217
- Apollo 15, 184
- Applied Physics Laboratory (APL), 349, 350, 359, 360, 361
- Arecibo radio-telescope, 3, 14, 46, 61, 64, 92
- Argus platform, 429, 431
- Ariane launcher (see also Ariane 1–5), 68, 119, 135, 139, 198
- Ariane 1, 31, 312
- Ariane 2, 136
- Ariane 3, 31, 104, 136
- Ariane 4, 118, 119, 120, 138, 348
- Ariane 5, 68, 138, 462
- ASI (Agenzia Spaziale Italiana), 120
- ASLV (Advanced Satellite Launch Vehicle), 139
- Asterex 118, 119, 136
- Asteroid (1) Ceres, 117, 118
- Asteroid (4) Vesta, 117, 118, 119, 120–123
- Asteroid (8) Flora, 225
- Asteroid (17) Thetis, 119
- Asteroid (29) Amphitrite, 212
- Asteroid (45) Hestia, 106
- Asteroid (63) Ausonia, 215
- Asteroid (158) Koronis, 231, 232
- Asteroid (243) Ida, 215, 229, 231–234, 237, 282

- Asteroid (243) Dactyl, 232–234
 Asteroid (253) Mathilde, 359–360, 362–363, 367
 Asteroid (433) Eros, 117, 125, 357, 359–360, 363–372
 Asteroid (449) Hamburga, 114
 Asteroid (476) Hedwig, 106
 Asteroid (739) Mandeville, 114
 Asteroid (772) Tanete, 106
 Asteroid (951) Gaspra, 215, 221, 222, 225–226, 229, 231, 232
 Asteroid (1219) Britta, 212
 Asteroid (1415) Malautra, 106
 Asteroid (1566) Icarus, 138
 Asteroid (1620) Geographos, 353, 356
 Asteroid (1943) Anteros, 359, 360
 Asteroid (1972) Yi Xing, 212
 Asteroid (2019) Van Albada, 359
 Asteroid (2060) Chiron, 350, 376
 Asteroid (2062) Aten, 118
 Asteroid (2100) Ra-Shalom, 352
 Asteroid (2101) Adonis, 90
 Asteroid (2201) Oljato, 89
 Asteroid (3200) Phaeton, 138
 Asteroid (3361) Orpheus, 125
 Asteroid (3551) Verenia, 358
 Asteroid (4179) Toutatis, 229, 357
 Asteroid (4660) Nereus, 125, 352, 359, 360
 Asteroid (6178) 1986 DA, 352
 Asteroid (6489) Golevka, 357
 Asteroid (10302) 1989 ML, 352
 Asteroid (14827) Hypnos, 357
 Asteroid (15760) 1992 QB1, 370
 Asteroid (136199) Eris, 377
 Asteroids, knowledge of, 117–118, 226, 229, 232–234, 362–363, 365, 367–372
 Asteroids, missions to, 89–90, 99, 106, 117–125, 146, 212, 215, 225–226, 231–234, 348, 350, 352, 353, 356–357, 359–372, 376
 Astron satellite, 90
 Atlas II launcher, 120
 Atlas-Centaur launcher (see also Centaur stage), 200, 312
 Atmospheric Explorer C satellite, 6, 193
 Atomized Sample Return, 103–104
 Australia Telescope Compact Array, 242
 Axford, W.I., 313
 Baklanov, O.D., 428
 Battelle Memorial Institute, 10
 Beggs, J.M., 2
 Bendoya, P., 234
 Bickler, D.B., 443
 Blamont, J., 37, 424
 Blue Rover, 337, 340
 BMDO (Ballistic Missile Defense Organization), 135, 352, 353
 Bogomolov, A.N., 90
 British National Committee on Space Research, 312
 Brown, M.E., 377
 Bush, G.H., 340–341, 428
 CAESAR (Comet Atmosphere Encounter and Sample Return), 104
 Caesar, C.J., 104
 Calar Alto Observatory, 94
 Callisto (Jupiter satellite), 228, 249, 255–256, 258, 260, 266, 271–274, 277, 278, 280, 288, 289, 298, 303
 Callisto, Valhalla basin, 255, 256, 288, 303
 Capitana Italica solar sail, 347–348
 Cassini, G.D., 102
 Cassini Saturn orbiter, 102, 114, 120, 123, 125, 130, 296, 298, 301, 303, 375
 Centaur stage (see also Centaur G, Centaur G-prime), 5, 18, 100, 102, 106, 113, 119, 120, 128, 168, 197, 198, 212, 213, 229, 312, 314, 317, 319
 Centaur G stage, 168, 170, 200, 212
 Centaur G-prime stage, 200, 212, 314, 335
 Challenger Space Shuttle accident, 50, 80, 102, 113, 114, 128, 153, 170, 172, 209, 210, 213, 217, 317, 328, 346
 Chandra X-ray Observatory, 326
 Charon (Pluto satellite), 373–374, 375, 377
 Chernobyl nuclear accident, 80, 217
 CHON molecules, 88
 Christy, J.W., 373
 CIA (Central Intelligence Agency), 9, 12
 Clarke, A.C., 312
 Clementine (DSPSE) spacecraft, 236, 335, 352–356, 379
 Clementine 2, 356–357
 Clinton, W.J., 357, 388
 Cluster satellites, 136, 138, 442
 CNES (Centre National d'Etudes Spatiales), 39, 46, 120, 434

- CNSR (Comet Nucleus Sample Return): see Rosetta
- CNUCE (Centro Nazionale Universitario di Calcolo Elettronico), 119
- Collins, M., 156
- Colombo, G., 29, 125, 126, 128, 212
- Columbus, C., 347, 348, 427
- Columbus Mars mission: see Mars 92
- Comet 1P/Halley, 16–51, 58, 60, 64, 71–89, 90, 92, 103, 105, 106, 112, 113, 130, 198, 213, 320
- Comet 1P/Halley, missions to, 16–51, 52, 53, 60–61, 62, 63, 66–89, 102, 347
- Comet 2P/Encke, 352, 359
- Comet 3D/Biela, 90
- Comet 4P/Faye, 47
- Comet 6P/d'Arrest, 104, 106, 352
- Comet 9P/Tempel 1, 352
- Comet 10P/Tempel 2, 24–25, 26, 47, 104, 106–111, 113, 114
- Comet 12P/Pons–Brooks, 325
- Comet 15P/Finlay, 105, 352
- Comet 19P/Borrelly, 47
- Comet 21P/Giacobini–Zinner, 60–64, 65, 68, 73, 82, 91, 92, 93, 104, 105
- Comet 22P/Kopff, 47, 105, 106, 114, 120
- Comet 26P/Grigg–Skjellerup, 92–96
- Comet 41P/Tuttle–Giacobini–Kresak, 47
- Comet 45P/Honda–Mrkos–Pajdušáková, 91, 93, 104, 105
- Comet 46P/Wirtanen, 105
- Comet 55P/Tempel–Tuttle, 92–96
- Comet 67P/Churyumov–Gerasimenko, 105, 115
- Comet 72P/Denning–Fujikawa, 90
- Comet 73P/Schwassmann–Wachmann 3, 104, 115
- Comet 78P/Gehrels, 120
- Comet 79P/du Toit–Hartley, 93, 105, 419
- Comet 81P/Wild 2, 105, 106
- Comet 103P/Hartley 2, 93
- Comet 122P/De Vico, 325
- Comet C/1974 C1 Bradfield, 37
- Comet C/1983 H1 IRAS–Araki–Alcock, 79
- Comet C/1989 X1 Austin, 220
- Comet C/1990 K1 Levy, 220
- Comet C/1996 B2 Hyakutake, 325, 361
- Comet C/1999 T1 McNaught–Hartley, 325
- Comet C/2000 S5 SOHO, 325
- Comet C/2006 P1 McNaught, 325
- Comet D/1819 W1 Blanpain, 90
- Comet D/1993 F2 Shoemaker–Levy 9, 234–237, 239, 246, 256, 285, 322
- Comets, knowledge of, 63–64, 71–88, 94–96, 236–237, 325
- Comets, missions to, 16–51, 52, 53, 58–89, 91–96, 98, 99, 102, 103–117, 120, 146, 348, 350, 352
- Comet Coma Chemical Composition (C4), 352
- Comet Intercept and Sample Return, 98, 105
- Comet Sample Return missions (see also Rosetta), 22, 99, 103–104, 114–115
- Compton Gamma Ray Observatory (CGRO), 333
- CONSCAN (Conical Scan), 85, 317, 322
- CONTOUR (Comet Nucleus Tour), 65, 352
- Corona solar probe: see YuS
- CORONA US spy satellite, 104, 105
- CRAF (Comet Rendezvous/Asteroid Flyby), 102, 105, 106–114, 117, 125, 191, 213, 443
- Cretaceous–Tertiary extinction, 118
- DAS (Dolgozhivushaya Avtonomnaya Stanziya) Phobos lander, 150–151
- Deep Space 2 microprobes, 384, 403
- Deimos (Mars satellite), 149, 158, 160, 421, 430, 456
- Delta launcher (see also Delta II), 51, 60, 106
- Delta II launcher, 139, 349, 361, 375, 378, 380, 388, 442, 452, 462
- Delta Velorum (star), 301
- DISCO satellite, 136
- Discovery program, 349–352, 357, 359, 376, 443, 452, 461, 462, 464
- DMSP (Defense Meteorological Satellite Program), 238
- Dolgoprudenskii design bureau, 44
- Drop Zond, 376, 379
- DSN (Deep Space Network) and the Canberra, Goldstone, Madrid antennae, 2, 31, 37, 46, 47, 50, 53, 54, 61, 63, 64, 68, 71, 92, 93, 115, 146, 160, 164, 171, 176, 177, 218, 228, 231, 262, 278, 304, 314, 326, 333, 353, 361, 453
- DSPSE (Deep Space Program Science Experiment): see Clementine

- Dual Orbiter: see Mars Observer, Kepler
DzhVS Venus lander, 188
- E-8 lunar probes, 147
- Earth-Orbiting Ultraviolet Jovian Observer, 352
- East German Academy of Sciences, 10, 430
- ECAM (Earth-Crossing Asteroid Mission), 120
- Edgeworth, K.F., 377
- Effelsberg radio-telescope, 46
- Einstein, A., 138
- Elara (Jupiter satellite), 271
- Energiya launcher, 424, 427
- EORSAT: see US-P
- Eos (Eole-Venus) probe, 37, 44
- ESA (European Space Agency), 25, 29–31, 37, 41, 50, 70, 71, 92, 94, 104, 114, 115, 116, 117, 118, 119, 120, 125, 126, 135–139, 145, 146, 151, 153, 156, 158, 196, 313, 314, 317, 320, 324, 325, 326, 429, 442, 461, 462
- ESO (European Southern Observatory), 71, 89, 94, 157
- ESRO (European Space Research Organization), 20, 58, 60, 117, 125, 136, 312–313
- Europa (Jupiter satellite), 228, 239, 240, 247, 248, 252, 254, 256–258, 260–261, 262, 263, 265, 266, 271, 272, 274, 275–277, 278, 279, 280, 282–285, 287–288, 289, 293–294, 296–297, 298, 303, 304, 309, 377, 378
- Callanish crater, 260, 263, 296
- Conamara Chaos, 263, 275, 279
- Pwyll crater, 260, 263, 279, 296
- Tyre Macula, 266, 280, 282
- Orbiter, 377, 378, 379
- Europa III launcher, 312
- European Space Foundation, 102
- Explorer 12, 22
- Farquhar, R.W., 61, 92
- ‘Fire and Ice’: see Outer Planet/Solar Probe program
- Fobos project, 145–167, 423, 248, 429, 431, 437
- Fobos 1, 156–157, 158
- Fobos 2, 146–167, 328, 396, 401, 414
- Fobos 3, 167
- Fregat ADU stage, 147, 156, 160, 428, 437, 439, 442
- Frosch, R.A., 313
- Gaia satellite, 135
- Galilean satellites: see Io, Europa, Ganymede, Callisto
- Galilei, G., 187
- Galileo Jupiter orbiter and probe, 2, 25, 47, 49, 96, 100, 102, 111, 113, 125, 130, 133, 168, 170, 171, 172, 196–311, 317, 319, 322, 332, 334, 335, 349, 363, 388
- Program history, 196–200, 212–217
- Orbiter description, 200–202
- Atmospheric probe, 202–208, 237–238, 241–242, 243–247, 252, 310, 311
- Instrumentation, 205–212
- Launch, 217–218
- Cruise, 218–239
- Antenna accident, 222–225, 226–228, 230–231, 247–248
- Arrival at Jupiter, 239–243
- Primary mission, 247–278
- Galileo Europa Mission (GEM), 278–296
- Galileo Millennium Mission (GMM), 296–303
- End of Mission, 303–311
- Galileo II NASA airplane, 3–4
- Gamma-Ray Bursts, 58, 60, 153, 157–158, 317, 333, 431
- Ganymede (Jupiter satellite), 228, 239, 242, 249–251, 254–255, 260, 265–266, 268–271, 272, 275, 279, 280, 285, 298, 301
- Galileo Regio, 249–250, 254
- Marius Regio, 249–250, 254, 268
- Uruk Sulcus, 249–250, 254
- General Relativity, 126, 128, 138, 419
- GEOS satellite, 32
- Geotail satellite, 91
- Giacobini, M., 61
- Giotto di Bondone, 29
- Giotto probe, 29–37, 41, 47, 50, 52, 64, 68, 70–71, 80–89, 92–96, 104, 111, 113, 115, 119, 125, 135, 209, 210, 320
- Giotto 2 probe, 104
- Glavcosmos Soviet space agency, 145–146
- Goddard Space Flight Center, 60, 104
- GOES satellites, 153

- Gold, T., 388
 Goldin, D.S., 334, 350, 376, 379, 388
 Goldstone radio-telescope: see Deep Space Network
 Gorbachev, M.S., 56–57
 Gore, A.A. Jr., 388
 Granat satellite, 90
 Grand Tour, 197, 200, 312, 374
 Grigg, J., 92–96
 GSLV (Geostationary Satellite Launch Vehicle), 139
- H-II launcher, 462
 Halley Flyby/Tempel 2 Rendezvous: see International Comet Mission
 Halley, E., 16
 HAPPEN (Halley Post Perihelion Encounter), 29
 Harch, A., 232–234
 Hechler, M., 92–96
 Heliogyro, 23
 Heliopause, 132–135, 312
 Helios solar probes, 49, 311
 HEOS 2 (Highly Eccentric Orbit Satellite), 209
 HER (Halley Earth Return), 47, 99, 103, 105
 Hermes Mercury Orbiter (JPL), 351
 Hermes Mercury Polar Orbiter (ESA): see MPO
 Hermes spaceplane, 117
 HIM (Halley Intercept Mission), 47
 Himalia (Jupiter satellite), 274
 HIPPARCOS satellite, 135
 Hiten (MUSES-A), 105, 193
 Horizon 2000 program, 114–115
 Horizon 2000 plus program, 139
 HS 376 satellite bus, 327
 Hubble Space Telescope, 1, 49–50, 197, 232–234, 236, 246, 251, 252, 274, 291, 296, 303, 320, 326, 334, 390, 396, 452, 458
 Huygens Titan probe, 114, 123
- Iapetus (Saturn satellite), 78
 ICE (International Cometary Explorer) (see also ISEE 3), 58–65, 68, 73, 89, 104, 174
 IKI (Institut Kosmicheskikh Isledovaniy), 39, 41, 42, 57, 145, 146, 151, 153, 166, 424, 428
 IMEWG (International Mars Exploration Working Group), 462
 Infrared Telescope Facility, 294
 Inter-Agency Consultative Group (IACG), 50
 Interkosmos program, 10, 42, 120
 INTERMARSNET project, 138, 462
 International Comet Mission, 24–26, 29, 106
 International Halley Watch, 26, 38, 49, 50
 International Solar-Terrestrial Physics program, 91
 International Sun–Earth Explorer program, 58–60
 Interplanetary Monitoring Platform, 58
 Interstellar Precursor Mission, 132–133
 Io (Jupiter satellite), 208, 228, 239, 240, 241, 248, 249, 250, 252–254, 255, 256, 258, 260, 262, 265, 266, 268, 271, 272, 274, 277, 278, 279, 280, 282, 285, 288, 289–293, 294, 296, 297, 298, 299, 301, 303, 304, 305–309, 310, 311, 320, 321–322, 376
 Loki Patera, 252, 266, 282, 290, 291, 293, 297, 305, 309, 321
 Pele Patera, 252, 291, 293, 297, 301, 305, 309
 Pillan Patera, 272, 274, 291, 309
 Prometheus Patera, 255, 260, 272, 291–292, 297, 301, 309
 Tvashtar Catena, 294, 296, 297, 301, 303, 304, 306
 Ion Propulsion, 20, 23–24, 25, 117, 118, 119, 133, 138
 IRAS (InfraRed Astronomy Satellite), 138
 IRIS (Italian Research Interim Stage), 120
 ISAS (Institute of Space and Astronautical Sciences), 27–29, 50, 91, 105, 106, 462
 ISEE 1 satellite, 60
 ISEE 2 satellite, 26, 60
 ISEE 3 satellite (see also ICE), 58–62
 ISO (Infrared Space Observatory), 136
 ISPM (International Solar Polar Mission), 2, 313–314
 ISRO (Indian Space Research Organization), 139–140
 IUE (International Ultraviolet Explorer), 80, 87
 IUS (Inertial Upper Stage), 26, 47, 100, 125, 170, 172, 174, 197, 198, 213, 217–218, 313, 314, 317, 319, 320, 329, 379

- Jet Propulsion Laboratory (JPL), 1–2, 3–4, 20–26, 36, 37, 47, 50, 60, 71, 96, 102, 103, 105, 115, 126, 128, 132, 133, 156, 166, 167, 170, 172, 177, 191–192, 193, 196, 197, 198, 210, 212, 213, 224, 241, 282, 294, 313, 314, 327, 328, 329, 334, 335, 337, 340, 349, 351, 352, 361, 375, 379, 380, 381, 388, 392, 432, 433, 443, 444, 445, 448, 450
- Jewitt, D.C., 377
- Jodrell Bank radio-telescope, 46, 333
- Johnson Space Center, 385
- Joint Working Group for US-European cooperation in planetary exploration, 102, 119
- JPL see Jet Propulsion Laboratory
- Jupiter,
- Great Red Spot, 249, 251, 262, 266, 272, 288, 298
 - knowledge of, 245–247, 251–252, 285, 288, 301–303, 320–322, 326
 - missions to, 18, 117, 125–132, 135, 196–311, 312, 313, 314, 319–322, 326, 376
 - ring, 243, 260, 274, 285, 298, 306, 310
- Jupiter Orbiter with Probe (see also Galileo Jupiter orbiter), 196–197
- Kagoshima launch range, 65
- Keck Observatory, 294
- Kepler, J., 136
- Kepler Mars orbiter, 136, 145, 156, 461
- Keyworth, G.A., 2
- Kitt Peak Observatory, 67
- Kometa design bureau, 6
- Kovtunenکو, V.M., 428
- Kowal, C.T. 376
- Kremnev, R.S., 157
- Krimigis, S.M., 349–352
- Kuiper, G.P., 377
- Kuiper belt, 377
- Kulikov, S.D., 428
- Kyokko satellite, 29
- Lagrange, J.-L. de, 58
- Lagrangian points, 58–61, 65, 278
- Langley Research Center, 443
- Large Space Telescope: See Hubble Space Telescope
- La Silla observatory: see ESO
- Lawrence Livermore National Laboratory, 352
- Lavochkin design bureau and association, 6, 44, 132, 145, 146, 150, 157, 166, 424, 428, 429, 437
- LEAP (Light ExoAtmospheric Projectile), 357
- LESS (Low-cost Exploration of the Solar System), 96
- Levy, D.H., 234
- Lewis Research Center, 197, 445
- Lunar and Planetary Laboratory, 113
- Lunar Geoscience Orbiter, 98
- Luu, J.X., 377
- M1 Mars probe (see also Mars 94, Mars 96, Mars 8), 428–429
- M-71 Soviet Mars missions, 90, 431
- M-73 Soviet Mars missions, 42
- M-V launcher, 106
- Magalhães, F., 168
- Magellan European astronomy satellite, 136
- Magellan Venus orbiter, 9, 100, 102, 146, 167–195, 215, 219, 380
- Malin, M.C., 404
- MAOSEP (Multiple Asteroid Orbiter with Solar Electric Propulsion), 119
- Marie Curie rover, 445
- Mariner 2, 22
- Mariner 4, 22, 126, 153, 228, 384
- Mariner 5, 96
- Mariner 6, 416
- Mariner 7, 416
- Mariner 9, 5, 146, 161, 171, 384, 404, 416
- Mariner 10, 6, 22, 47, 96, 126, 137, 138, 350
- Mariner Jupiter Orbiter (see also Galileo Jupiter orbiter), 196–197
- Mariner Mark II program, 96, 98–100, 102, 106, 111, 114, 115, 168, 327, 349, 350, 375, 462
- Mars 3, 314
- Mars 5, 156, 328
- Mars 8, 439–442
- Mars 92 mission, 427
- Mars 94 mission: see also Mars 96 mission, 329, 427, 428–434, 461, 462
- Mars 96 mission: see also Mars 98 mission, 384, 427, 428, 434–439, 444, 461
- Mars 98 mission, 437

- Mars,
 knowledge of, 158, 162–164, 394–401, 424–418, 419–421, 456, 458–460
 missions to, 90, 96, 97, 98–99, 100–102, 121–124, 135–136, 138, 139, 145–167, 193, 327–342, 347–348, 352, 379–384, 388–462
 Olympus Mons, 415
 search for life, 164, 384–388
 Valles Marineris, 162, 396, 398, 404, 414, 415, 418, 452, 462
 MARSNET project, 461–462
 Marsokhod (see also Mars 96, Mars 98), 423–424, 434–436
 Marsokhodik, 456, 462
 Mars–Aster, 123–124
 Mars balloons, 329, 424, 428, 434, 436, 437
 Mars Climate Orbiter, 382, 464
 Mars Exploration Rovers (MER), 414, 416, 418, 422
 Mars Express, 418, 419, 422, 442
 Mars Geoscience/Climatology Orbiter (see also Mars Observer), 98–99, 100–102, 327–328
 Mars Global Network, 341
 Mars Global Surveyor, 380–384, 388–423, 437, 452
 Mars mobile laboratory, 96
 Mars Observer, 102, 123, 136, 156, 193, 231, 322, 327–335, 350, 376, 379, 380, 381, 382, 383, 384, 403, 407, 428
 Mars Observer 2, 335, 341, 379
 Mars Odyssey, 382, 418–419, 422
 Mars Pathfinder, 350, 378, 390, 396, 403, 407, 414, 432, 437, 443–461
 Mars penetrators, 98, 424, 428–434, 443
 Mars Polar Lander, 384, 403, 416, 424
 Mars Polar Penetrator, 443
 Mars Reconnaissance Orbiter, 422, 423, 460
 Mars rovers (see also Mars Pathfinder, Marsokhod, Sojourner, Robby, Rocky, Rocky 3), 102, 136, 335, 337–340, 341, 388, 423–424, 426, 427, 428, 443
 Mars Rover and Sample Return mission (MRSR), 335–342, 424, 443
 Mars Sample Return mission, 96, 115, 146, 335–342, 379, 380, 424–427
 Mars Science Micro rover (MSM): see Sojourner, Marie Curie
 Mars Science Working Group, 443
 Mars Surface Probe, 98
 Mars Surveyor Program, 335, 379, 381, 384, 388, 462, 464
 Mars Surveyor 1998 lander: see Mars Polar Lander
 Mars Surveyor 1998 orbiter: see Mars Climate Orbiter
 Mars Surveyor 2001 lander, 403
 Mars Surveyor 2001 orbiter: see Mars Odyssey
 Mars Together, 376
 Mars Upper Atmosphere Dynamics, Energetics and Evolution Mission (MUADEE), 352
 Mars upper atmosphere mission, 98
 Max Planck Institute, 41, 119, 153, 376
 Maxwell, J.C., 12, 22
 Maxwell Montes: see Venus, Maxwell Montes
 McDonnell, J.A.M., 94
 McKay, D.S., 387
 Medvezkye Ozyora deep space communication center, 46–47, 53
 MEI (Moskovskiy Energeticheskiy Institut), 9, 12
 Mercury, missions to, 22–23, 136–140, 350–351
 Mercury Orbiter, 138
 Mercury Polar Flyby, 350
 MESUR (Mars Environmental Survey), 350, 442–443, 461, 462
 MESUR Pathfinder: see Mars Pathfinder
 Meteor, satellite series, 10
 Metis (Jupiter satellite), 274, 277, 297
 MGS: see Mars Global Surveyor
 Ministry of General Machine Building, 6, 39, 428
 Mir Mars rover prototype, 423–424
 Mir space station, 103, 398, 428
 Molniya communication satellites 47
 Molniya launcher: see 8K78M
 Moon missions, 98, 135, 138, 146, 323, 357
 MORO (Moon Orbiting Observatory), 138
 Morris, D.
 Mount Palomar observatory, 50–51, 234
 MPF: see Mars Pathfinder
 MPO (Mercury Polar Orbiter), 137–138
 MSX (Midcourse Space Experiment), 360

- MS-T5: see Sakigake
 Multicomet Sample Return, 104–105
 Multiple Asteroid Orbiter, 102
 MUSES-A: see Hiten
 MUSES-C Hayabusa, 106
 Mu-3S launcher, 27
 Mu-3SII launcher, 27, 106
 Mu-5 launcher: see M-V
- NASDA (National Space Development Agency), 27, 462
 National Academy of Sciences, 61, 102, 117, 125
 National Research Council, 47, 452
 Naval Research Laboratory, 352, 356
 NEAR (Near Earth Asteroid Rendezvous), 98, 125, 350, 357, 359–372
 Near Earth Asteroids, 89–90, 106, 118, 120, 125, 195, 234, 352, 353, 356–357, 359–360, 382
 Near-Earth Asteroid Returned Sample (NEARS), 352
 NEAR–Shoemaker: see NEAR (Near Earth Asteroid Rendezvous)
 Neptune, missions to, 98, 100, 376
 New Horizons, 379
 Newton mission: see CRAF
 Nina Solar Sail, 347
 NOAA 1, 334
 Nozette, S., 353
 Nuclear-Electric Propulsion (NEP), 133, 135
- Opportunity rover: see Mars Exploration Rovers
 Out-of-Ecliptic missions (see also ISPM, Ulysses), 102, 125, 130, 135, 311–327
 Outer Planet/Solar Probe program, 377–379
- Paine, T.O., 329
 Parker, T.J., 411
 Parkes radio-telescope, 37, 71
 Pathfinder project, 50, 68, 71, 80
 Pegasus XL, 352
 Penetrators (see also Venus, Mars penetrators), 113, 120, 121, 123
 Phobos (Mars satellite), 145–167, 335, 338, 430
 Piazzi mission, 120
 Piazzi, G., 120
- Pioneer 5, 22
 Pioneer 7, 49, 61, 87
 Pioneer 8, 61
 Pioneer 10, 85, 117, 200, 209, 248, 265, 272
 Pioneer 11, 85, 117, 310, 312
 ‘Pioneer Anomaly’, 222
 Pioneer Jupiter probes, 117, 125, 130, 196, 312, 317, 349
 Pioneer solar probes: see also Pioneer 7, 8, 192, 311, 349
 Pioneer Venus mission, 1, 352
 Pioneer Venus Multiprobe, 53, 98, 174, 196, 202, 204, 351
 Pioneer Venus Orbiter, 3, 4, 5, 6, 10, 38, 47, 63, 89, 98, 168, 174, 176, 182, 193
 Planet-A: see Suisei
 Planetary Observer program, 96, 97–98, 99, 102, 104, 105, 125, 168, 327–328, 349, 350
 Planetary Society, 424, 434
 Pluto
 knowledge of, 373–374
 missions to, 98–99, 132, 133, 350, 374–379
 Pluto-350, 374, 375
 Pluto Express, 376–377
 Pluto Fast Flyby (PFF), 375–376
 Pluto Kuiper Express (PKE), 377–379
 POLO (Polar Orbiting Lunar Observatory), 135
 Polyus-V radar, 9–10
 PrOP-F Phobos ‘hopper’, 149, 157
 Proton launcher: see 8K82K
 PSLV (Polar Satellite Launch Vehicle), 139
 Puck (Uranus satellite)
 ‘Purple Pigeons’, 22, 327
- Radio-occultation technique, 57, 136, 179, 243, 248, 258, 260, 261, 263, 265, 272, 278, 289, 297, 301, 303, 306, 375, 379, 403, 414
 Reagan, R.W., 2, 6, 197, 313
 Regatta spacecraft, 348
 RKA (Rossiyskoye Kosmisheskoye Agenstvo), 58, 428, 437
 Robby rover, 337–340, 443
 Rocky rover, 443
 Rocky 3 rover, 443
 Rocky 4 rover (see also Sojourner, Marie Curie), 436, 443

- RORSAT: see US-A
- Rosetta comet nucleus sample return, 115–117, 135
- Rosetta comet orbiter, 117, 462
- RTG (Radioisotope Thermal Generator), 99, 111, 114, 115, 116, 125, 128, 130, 200, 213, 215, 217, 296, 313, 314, 319, 326, 337, 374, 377, 378, 424, 432, 434, 442
- Sagan, C., 230, 335
- Sagan Memorial Station: see Mars
Pathfinder
- Sagdeev, R.Z., 39, 57
- Sakigake, 27–29, 60, 65–68, 80, 90–91, 93
- Satcom K satellite, 327
- Saturn V launcher and derivatives, 18, 312
- Saturn, missions to, 18, 98, 99–100, 102, 130, 132, 135, 296
- Saturn Orbiter (see also Cassini), 99–100, 102
- Savin. A.I., 9
- Scout launcher, 27, 138
- SDI (Strategic Defense Initiative), 133, 349, 359, 360
- Seasat satellite, 3, 4, 6, 96
- SETI (Search for Extraterrestrial Intelligence), 9
- Shoemaker, C.S., 234
- Shoemaker, E.M., 234, 367, 368
- Simeis Astronomical Observatory, 215
- Simpson, J.A., 41
- SIRIO satellite, 120
- Skjellerup, J.F., 92–96
- Skylab space station, 31, 168
- SLIM (Surface Lander Investigation of Mars), 443
- SLV (Satellite Launch Vehicle), 139
- Small Explorer program, 349
- Small Missions to Asteroids/Comets (SMACS), 352
- Smithsonian National Air and Space Museum, 65
- SOCER (Sample of Comet Coma Earth Return), 105–106
- SOHO (Solar and Heliospheric Observatory), 136, 325, 363
- Sojourner rover, 444–445, 452, 453, 456–461
- Solar Probe (ESA project), 125–126, 128
- Solar probes, 125–132, 311–327, 352, 376, 377
- Solar Sail Cup, 347–348
- Solar sails, 20–23, 132, 347–348
- Solar System Exploration Committee (SSEC), 61, 96–97, 100, 102, 115, 125, 168, 341, 375
- Solar System Exploration Division (SSED), 349
- Solar Wind Sample Return, 352
- Solnechnii Zond: see YuS
- Soviet Academy of Sciences, 6, 39, 130, 146
- Soyuz–Fregat launcher, 442
- SP-100 nuclear reactor, 133, 135
- Space Flyer Unit satellite, 105
- Space Exploration Initiative (SEI), 341
- Space Shuttle, 1, 2, 5, 22, 23–24, 26, 31, 47, 49, 98, 100, 102, 103, 104, 105, 106, 113, 117, 119, 120, 125, 128, 133, 168, 170, 174, 196, 197, 200, 212, 213, 217, 218, 229, 313, 314, 317, 319–320, 327, 328, 335, 350, 379, 428
- Atlantis, 174, 212, 217–218, 320
- Challenger, 212
- Columbia, 319
- Discovery, 319–320
- STS-30 flight, 174
- STS-34 flight, 217–218
- STS-41 flight, 320
- STS-51L flight (see also Challenger accident), 50
- STS-61E flight, 50
- STS-61F flight, 212
- STS-61G flight, 212
- STS-82 flight, 336
- Space Station Freedom, 103, 104, 328, 337–340, 350
- Space Telescope: see Hubble Space Telescope
- Space Tug, 26
- Staehle, R., 375–376
- Starprobe, 126–130, 132, 361
- Star Trek*, 196
- ‘Star Wars’ project (see also SDI), 46, 349
- Suisei (Planet-A), 27–29, 52, 60, 63, 68, 74–75, 80, 87, 90–92
- Sunblazer, 27, 375
- Surveyor Moon landers, 379
- Surveyor Block II Moon landers, 337–340
- TAU (Thousand Astronomical Units) mission, 133–135

- Taurus launcher, 356
 TDRS (Tracking and Data Relay Satellite), 200, 213, 224
 Thebe (Jupiter satellite), 274, 277, 297, 309
 Tiros satellite, 328
 Titan (Saturn satellite), 99–100, 102, 123, 130, 287, 289, 374
 Titan atmospheric probe (see also Huygens), 99–100, 102, 130, 132
 Titan II ballistic missile, 353
 Titan IIG, 353, 356
 Titan III launcher (see also Titan IIIE–Centaur), 47, 113, 312, 317, 328, 329, 380
 Titan IIIE–Centaur, 197, 213
 Titan IV–Centaur, 113, 115, 128, 213, 224, 336, 375, 376
 TOS (Transfer Orbit Stage), 125, 329
 TOPS ‘Grand Tour’ spacecraft, 312
 Topaz-2 nuclear reactor, 135
 Triton (Neptune satellite), 374
 Trojan asteroids, 234, 278
 Truth, S., 445
 Tsander, F.A., 22
 Tsiolkovskii mission: see YuS
 Tsiolkovskii, K.E., 22, 130
 Tsou, P., 103
- Ulysses out-of-ecliptic mission, 102, 153, 168, 209, 212, 213, 231, 313–327, 332, 333, 431
 UMVL (see also Vesta, 1F, Fobos 1, 2, M1, Mars 94, 96, 98), 37, 57, 121, 123, 130, 146, 427, 428, 434
 United Nations, 434
 Uranus,
 missions to, 98, 100, 376
 rings, 2
 US-A radar satellite, 9
 US-P radar satellite, 9
 Ussurisk deep space communication center, 47
 Usuda deep space tracking center, 29, 64, 75
- V2 missile, 31
 Valles Marineris: see Mars, Valles Marineris
 Vega 1, 46, 52–57, 71–74, 75, 76, 77–80, 90
 Vega 2, 46, 52–53, 55–57, 71, 75–80, 90
 Vega balloons, 39, 42, 44–47, 53–55, 56–57, 151
- Vega, Soviet Venus-Halley probe, 37–47, 50, 52–57, 64, 65, 68, 71–80, 83, 85, 87, 88, 89–90, 102, 111, 113, 130, 145, 146, 153, 156, 209, 210, 424
 Venera 8, 56, 182
 Venera 9, 3, 14, 42, 56
 Venera 10, 3, 42, 56
 Venera 11, 44
 Venera 12
 Venera 13, 3, 9, 10, 41, 44, 56
 Venera 14, 3, 9, 10, 41, 44, 56
 Venera 15, 6–16, 146, 167, 169, 182, 186, 187, 189
 Venera 16, 6–16, 53, 146, 167, 169, 182, 186, 187, 189
 Venera 84 mission, 37, 39
 Venture Venus probe, 136
 Venus,
 Aphrodite Terra continent, 54, 55, 56, 174, 181, 187, 188, 189, 194
 Cleopatra crater, 13, 186
 knowledge of, 12–15, 182–191, 218–220
 Maxwell Montes, 13, 179–180, 186–187, 191–192
 missions to, 3–16, 27, 37–47, 52–58, 90, 97, 98, 120–121, 136, 139, 146, 167–195, 213, 215, 218–220, 350, 351–352
 Venus Atmospheric Probe, 98
 Venus Composition Probe, 352
 Venus Express, 442
 Venus Multiprobe Mission (VMPM), 351–352
 Venus penetrators, 58
 Venus Radar Mapper: see Magellan
 Vernadsky Institute of Geochemistry and Applied Chemistry, 146, 182
 Very Large Telescope (VLT): see ESO
 Vesta mission, 103, 120–123, 146
 Viking 1, 332, 384, 403, 423, 450, 453
 Viking 2, 416, 421
 Viking Mars missions, 1, 49, 96, 111, 117, 145, 146, 153, 160, 161, 168, 196, 197, 204, 327, 335, 384, 390, 396, 404, 407, 411, 414, 415, 433, 443, 448, 450, 453, 456, 458, 460
 VLA (Very Large Array), 244
 VNII Transmash, 149, 423, 424, 429, 434
 VOIR (Venus Orbiting Imaging Radar), 2, 3, 5–6, 9, 26, 100, 167, 168, 191, 195

- Voyager 1, 200, 248, 260, 293, 374
Voyager 2, 2, 71, 78, 92, 102, 236, 258, 272, 283, 374
Voyager, Mars and Venus probes, 204
Voyager, outer solar system mission, 1, 3, 6, 100, 111, 113, 130, 135, 168, 172, 196, 197, 204, 208, 210, 212, 213, 239, 243, 247, 249, 251, 252, 254, 255, 266, 271, 274, 282, 291, 292, 310, 374
VRM (Venus Radar Mapper): see Magellan
Weinstein, S., 375–376
Wells, H.G., 340
Whipple. F.L., 31, 78
Whipple shield, 31, 41, 42, 47, 82, 93
Wright, J.L., 20–22
X-80 astronomy satellite, 136
Yarkovsky effect, 368
Yeltsin, B.N., 428
Yevpatoria deep space communication center, 12, 14, 46, 47, 53, 157, 442
YuS (Yupiter-Solntsy), 130–132
Zinner, E., 61