Archive-name: space/references

Last-modified: $Date: 93/04/01 14:39:21 $

Astronomical Society of the Pacific

1290 24th Avenue

San Francisco, CA 94122

More expensive but better organized slide sets.

Cambridge University Press

32 East 57th Street

New York, NY 10022

Crawford-Peters Aeronautica

P.O. Box 152528

San Diego, CA 92115

An excellent source of all kinds of space publications. They publish

a number of catalogs, including:

Aviation and Space, 1945-1962

Aviation and Space, 1962-1990

Space and Related Titles

European Southern Observatory

Information and Photographic Service

Dr R.M. West

Karl Scharzschild Strasse 2

D-8046 Garching bei Munchen

Slide sets, posters, photographs, conference proceedings.

Finley Holiday Film Corporation

12607 East Philadelphia Street

Whittier, California 90601

Wide selection of Apollo, Shuttle, Viking, and Voyager slides at ~50 cents/slide. Call for a catalog.

Hansen Planetarium (Utah)

Said to hold sales on old slide sets. Look in Sky & Telescope for contact info.

Lunar and Planetary Institute

3303 NASA Road One

Houston, TX 77058-4399

Technical, geology-oriented slide sets, with supporting booklets.

John Wiley & Sons

605 Third Avenue

New York, NY 10158-0012

Sky Publishing Corporation

PO Box 9111

Belmont, MA 02178-9111

Offers "Sky Catalogue 2000.0" on PC floppy with information (including parallax) for 45000 stars.

Roger Wheate

Geography Dept.

University of Calgary, Alberta

Canada T2N 1N4

wheate@uncamult.bitnet

Offers a 40-slide set called "Mapping the Planets" illustrating recent work in planetary cartography, comes with a booklet and information on getting your own copies of the maps. $50 Canadian,

shipping included.

Superintendent of Documents

US Government Printing Office

Washington, DC 20402

Univelt, Inc.

P. O. Box 28130

San Diego, Ca. 92128

Publishers for the American Astronomical Society.

US Naval Observatory

202-653-1079 (USNO Bulletin Board via modem)

202-653-1507 General

Willmann-Bell

P.O. Box 35025

Richmond, Virginia 23235 USA

In 1990 the Princeton Planetary Society published the first edition of "Space Jobs: The Guide to Careers in Space-Related Fields." The publication was enormously successful: we distributed 2000 copies to space enthusiasts across the country and even sent a few to people in Great Britain, Australia, and Ecuador. Due to the tremendous response to the first edition, PPS has published an expanded, up-to-date second edition of the guide.

The 40-page publication boasts 69 listings for summer and full-time job opportunities as well as graduate school programs. The second edition of "Space Jobs" features strategies for entering the space field and describes positions at consulting and engineering firms, NASA, and non-profit organizations. The expanded special section on graduate

schools highlights a myriad of programs ranging from space manufacturing to space policy. Additional sections include tips on becoming an astronaut and listings of NASA Space Grant Fellowships and Consortia, as well as NASA Centers for the Commercial Development of Space.

To order send check or money order made payable to Princeton Planetary Society for $4 per copy, plus $1 per copy for shipping and handling (non-US customers send an International Money Order payable in US dollars) to:

Princeton Planetary Society
315 West College
Princeton University
Princeton, NJ 08544

SDI's SSRT (Single Stage Rocket Technology) project has funded a suborbital technology demonstrator called DC-X that should fly in mid-1993. Further development towards an operational single-stage to orbit vehicle (called Delta Clipper) is uncertain at present.

An collection of pictures and files relating to DC-X is available by anonymous FTP or email server in the directory

bongo.cc.utexas.edu:pub/delta-clipper

Chris W. Johnson (chrisj@emx.cc.utexas.edu) maintains the archive.

Official names are decided by committees of the International Astronomical Union, and are not for sale. There are purely commercial organizations which will, for a fee, send you pretty certificates and star maps describing where to find "your" star. These organizations have absolutely no standing in the astronomical community and the names they assign are not used by anyone else. It's also likely that you won't be

able to see "your" star without binoculars or a telescope. See the back pages of Astronomy or other amateur astronomy publications for contact info; one such organization may be found at:

International Star Registry

34523 Wilson Road

Ingleside, IL 60041

This is not an endorsement of ISR.

The LLNL "Great Exploration", a plan for an on-the-cheap space station, Lunar base, and Mars mission using inflatable space structures, excited a lot of interest on the net and still comes up from time to time. Some references cited during net discussion were:

Avation Week Jan 22, 1990 for an article on the overall Great Exploration

NASA Assessment of the LLNL Space Exploration Proposal and LLNL Responses by Dr. Lowell Wood LLNL Doc. No. SS 90-9. Their address is: PO Box 808 Livermore, CA 94550 (the NASA authors are unknown).

Briefing slides of a presentation to the NRC last December may be available. Write LLNL and ask.

Conceptual Design Study for Modular Inflatable Space Structures, a final report for purchase order B098747 by ILC Dover INC. I don't know how to get this except from LLNL or ILC Dover. I don't have an address for ILC.

Lunar Exploration Inc. (LEI) is a non-profit corporation working on a privately funded lunar polar orbiter. Lunar Prospector is designed to perform a geochemical survey and search for frozen volatiles at the poles. A set of reference files describing the project is available in

ames.arc.nasa.gov:pub/SPACE/LEI/*

Grant H Heiken, David T Vaniman, and Bevan M French (editors), "Lunar Sourcebook, A User's Guide to the Moon", Cambridge University Press 1991, ISBN 0-521-33444-6; hardcover; expensive. A one-volume encyclopedia of essentially everything known about the Moon, reviewing current knowledge in considerable depth, with copious references. Heavy emphasis on geology, but a lot more besides, including considerable discussion of past lunar missions and practical issues relevant to future mission design. *The* reference book for the Moon; all others are obsolete.

Wendell Mendell (ed), "Lunar Bases and Space Activities of the 21st Century", $15. "Every serious student of lunar bases *must* have this book" - Bill Higgins. Available from:

Lunar and Planetary Institute

3303 NASA Road One

Houston, TX 77058-4399

If you want to order books, call (713)486-2172.

Thomas A. Mutch, "Geology of the Moon: A Stratigraphic View", Princeton University Press, 1970. Information about the Lunar Orbiter missions, including maps of the coverage of the lunar nearside and farside by various Orbiters.

A list of Earth orbiting satellites (that are still in orbit) is available by anonymous FTP in:

ames.arc.nasa.gov:pub/SPACE/FAQ/Satellites

"Space in Miniature #2: Gemini" by

Michael J. Mackowski

1621 Waterwood Lane, St. Louis, MO 63146

Only 34pp but enough pictures & diagrams to interest more than just the modelling community, I feel.

Marco's Miniatures of Dracut, Mass. have produced a 1/144 Skylab in an edition of 500 & a 1/48 Lunar Rover (same scale as Monogram and Revell Lunar Modules) in a similar edition. Prices are $45 for Skylab, $24 for LRV. Check with them for postage etc. I have no connection with them, but have found their service to be good and their stock of rare/old kits *is* impressive. Prices range from reasonable ($35 for Monogram 1/32 scale Apollo CSM with cutaway details) to spectacular ($145 for Airfix Vostok).

Four Star Collectibles

P.O. Box 658

Dracut Mass 01826, USA.

Voyager, HST, Viking, Lunar Rover etc. kits from:

Lunar Models

5120 Grisham

Rowlett, Texas 75088

As reviewed by Bob Kaplow:

Peter Alway's book "Scale Model Rocketry" is now available. Mine arrived in the mail earlier this week. To get your own copy, send $19.95 + $2.50 s/h ($22.45 total) to:

Peter Alway

2830 Pittsfield

Ann Arbor, MI 48104

The book includes information on collecting scale data, construction

of scale models, and several handy tables. Appendicies include plans for 3 sport scale models, a 1:9.22 D Region Tomahawk (BT50), a 1/40 V-2 (BT60), and a 1/9.16 Aerobee 150A (BT55/60).

I've only begun to study the book, but it certainly will be a valuable data source for many modellers. Most vehicles include several paragraphs of text describing the missions flown by the rocket, various specs including "NAR" engine classification, along with a dimensioned drawing, color layouts & paint pattern, and a black & white photograph.

The vehicles included are the Aerobee 150A, Aerobee 300, Aerobee Hi, Arcas, Asp, Astrobee 1500, Astrobee D, Atlas Centaur, Atlas-Agena, Atlas-Score, Baby WAC, D-Region Tomahawk, Deacon Rockoon, Delta B, Delta E, Gemini-Titan II, Iris, Javelin, Juno 1, Juno 2, Little Joe 1, Little Joe 2, Mercury-Atlas, Mercury-Redstone, Nike-Apache, Nike-Asp, Nike-Cajun, Nike-Deacon, Nike-Tomahawk, RAM B, Saturn 1 Block 1, Saturn 1 Block 2, Saturn 1B, Saturn 5, Scout, Standard Aerobee, Terrapin, Thor-Able, Titan III C, Titan III E, Trailblazer 1, V-2, Vanguard, Viking Model 1, Viking Model 2, and Wac Corporal.

George P. Sutton, "Rocket Propulsion Elements", 5th edn, Wiley-Interscience 1986, ISBN 0-471-80027-9. Pricey textbook. The best (nearly the only) modern introduction to the technical side of rocketry. A good place to start if you want to know the details. Not for the math-shy. Straight chemical rockets, essentially nothing on more advanced propulsion (although earlier editions reportedly had some coverage).

Dieter K. Huzel and David H. Huang, "Design of Liquid Propellant

Rocket Engines", NASA SP-125.

Out of print; reproductions may be obtained through the NTIS (expensive). The complete and authoritative guide to designing liquid-fuel engines. Reference #1 in most chapters of Sutton. Heavy emphasis on practical issues, what works and what doesn't, what the typical values of the fudge factors are. Stiff reading, massive detail; written for rocket engineers by rocket engineers.

Brij N. Agrawal, "Design of Geosynchronous Spacecraft", Prentice-Hall, ISBN 0-13-200114-4.

James R. Wertz ed, "Spacecraft Attitude Determination and Control", Kluwer, ISBN 90-277-1204-2.

P.R.K. Chetty, "Satellite Technology and its Applications", McGraw-Hill, ISBN 0-8306-9688-1.

James R. Wertz and Wiley J. Larson (editors), "Space Mission Analysis and Design", Kluwer Academic Publishers (Dordrecht/Boston/London) 1991, ISBN 0-7923-0971-5 (paperback), or 0-7923-0970-7 (hardback).

This looks at system-level design of a spacecraft, rather than detailed design. 23 chapters, 4 appendices, about 430 pages. It leads the reader through the mission design and system-level design of a fictitious earth-observation satellite, to illustrate the principles that it tries to convey. Warning: although the book is chock-full of many useful reference tables, some of the numbers in at least one of those tables (launch costs for various launchers) appear to be quite wrong. Can be ordered by telephone, using a credit card; Kluwer's phone number

is (617)-871-6600. Cost $34.50.

This needs more and more up-to-date references, but it's a start.

"Antiproton Annihilation Propulsion", Robert Forward

AFRPL TR-85-034 from the Air Force Rocket Propulsion Laboratory

(AFRPL/XRX, Stop 24, Edwards Air Force Base, CA 93523-5000).

PC => Paper copy, A10 => $US57.90 -- or maybe Price Code?

MF => MicroFiche, A01 => $US13.90

Technical study on making, holding, and using antimatter for

near-term (30-50 years) propulsion systems. Excellent

bibliography. Forward is the best-known proponent

of antimatter.

This also may be available as UDR-TR-85-55 from the contractor,

the University of Dayton Research Institute, and DTIC AD-A160

from the Defense Technical Information Center, Defense Logistics

Agency, Cameron Station, Alexandria, VA 22304-6145. And it's

also available from the NTIS, with yet another number.

"Advanced Space Propulsion Study, Antiproton and Beamed Power

Propulsion", Robert Forward

AFAL TR-87-070 from the Air Force Astronautics Laboratory, DTIC

Summarizes the previous paper, goes into detail on beamed power

systems including " 1) pellet, microwave, and laser beamed power

systems for intersteller transport; 2) a design for a

near-relativistic laser-pushed lightsail using near-term laser

technology; 3) a survey of laser thermal propulsion, tether

transportation systems, antiproton annihilation propulsion,

exotic applications of solar sails, and laser-pushed

interstellar lightsails; 4) the status of antiproton annihilation propulsion as of 1986; and 5) the prospects for obtaining antimatter ions heavier than antiprotons." Again, there is an extensive bibliography.

"Application of Antimatter - Electric Power to Interstellar Propulsion", G. D. Nordley, JBIS Interstellar Studies issue of

G. L. Matloff and A. J. Fennelly, "Interstellar Applications and Limitations of Several Electrostatic/Electromagnetic Ion Collection Techniques", JBIS 30 (1977):213-222

N. H. Langston, "The Erosion of Interstellar Drag Screens", JBIS 26

C. Powell, "Flight Dynamics of the Ram-Augmented Interstellar Rocket", JBIS 28 (1975):553-562

A. R. Martin, "The Effects of Drag on Relativistic Spacefight", JBIS

"A Laser Fusion Rocket for Interplanetary Propulsion", Roderick Hyde, LLNL report UCRL-88857. (Contact the Technical Information Dept. at Livermore)

Fusion Pellet design: Fuel selection. Energy loss mechanisms. Pellet compression metrics. Thrust Chamber: Magnetic nozzle. Shielding. Tritium breeding. Thermal modeling. Fusion Driver (lasers, particle beams, etc): Heat rejection. Vehicle Summary: Mass estimates. Vehicle Performance: Interstellar travel required exhaust velocities at the limit of fusion's capability. Interplanetary missions are limited by power/weight ratio. Trajectory modeling. Typical mission profiles. References, including the 1978 report in JBIS, "Project Daedalus", and several on ICF and driver technology.

"Fusion as Electric Propulsion", Robert W. Bussard, Journal of Propulsion and Power, Vol. 6, No. 5, Sept.-Oct. 1990

Fusion rocket engines are analyzed as electric propulsion systems, with propulsion thrust-power-input-power ratio (the thrust-power "gain" G(t)) much greater than unity. Gain values of conventional (solar, fission) electric propulsion systems are always quite small (e.g., G(t)<0.8). With these, "high-thrust" interplanetary flight is not possible, because system acceleration (a(t)) capabilities are always less than the local gravitational acceleration. In contrast, gain values 50-100 times higher are found for some fusion concepts, which offer "high-thrust" flight capability. One performance example shows a 53.3 day (34.4 powered; 18.9 coast), one-way transit time with 19% payload for a single-stage Earth/Mars vehicle. Another shows the potential for high acceleration (a(t)=0.55g(o)) flight in Earth/moon space.

"The QED Engine System: Direct Electric Fusion-Powered Systems for Aerospace Flight Propulsion" by Robert W. Bussard, EMC2-1190-03, available from Energy/Matter Conversion Corp., 9100 A. Center Street, Manassas, VA 22110.

[This is an introduction to the application of Bussard's version of the Farnsworth/Hirsch electrostatic confinement fusion technology to propulsion. 1500<Isp<5000 sec. Farnsworth/Hirsch demonstrated a 10**10 neutron flux with their device back in 1969 but it was dropped when panic ensued over the surprising stability of the Soviet Tokamak. Hirsch, responsible for the

panic, has recently recanted and is back working on QED. -- Jim Bowery]

"PLASMAKtm Star Power for Energy Intensive Space Applications", by Paul M. Koloc, Eight ANS Topical Meeting on Technology of Fusion Energy, special issue FUSION TECHNOLOGY, March 1989.

Aneutronic energy (fusion with little or negligible neutron flux) requires plasma pressures and stable confinement times larger than can be delivered by current approaches. If plasma pressures appropriate to burn times on the order of milliseconds could be achieved in aneutronic fuels, then high power densities and very compact, realtively clean burning engines for space and other special applications would be at hand. The PLASMAKtm innovation will make this possible; its unique pressure efficient structure, exceptional stability, fluid-mechanically compressible Mantle and direct inductive MHD electric power conversion advantages are described. Peak burn densities of tens of megawats per cc give it compactness even in the multi-gigawatt electric output size. Engineering advantages indicate a rapid development schedule at very modest cost. [I strongly recommend that people take this guy seriously. Bob Hirsch, the primary proponent of the Tokamak, has recently declared Koloc's PLASMAKtm precursor, the spheromak, to be one of 3 promising fusion technologies that should be pursued rather than Tokamak. Aside from the preceeding appeal to authority, the PLASMAKtm looks like it finally models ball-lightning with solid MHD physics. -- Jim Bowery]

Retrieve files pub/SPACE/SPACELINK/6.5.2.* from the Ames SPACE archive; these deal with many aspects of ion drives and describe the SERT I and II missions, which flight-tested cesium ion thrusters in the 1960s and 70s. There are numerous references.

IEEE Transactions on Magnetics (for example, v. 27 no. 1, January 1991 issue). Every so often they publish the proceedings of the Symposium on Electromagnetic Launcher Technology, including hundreds of papers on the subject. It's a good look at the state of the art, though perhaps not a good tutorial for beginners. Anybody know some good review papers?

"Technical Notes on Nuclear Rockets", by Bruce W. Knight and Donald Kingsbury, unpublished. May be available from: Donald Kingsbury, Math Dept., McGill University, PO Box 6070, Station A, Montreal, Quebec M3C 3G1 Canada.

Starsailing. Solar Sails and Interstellar Travel. Louis Friedman, Wiley, New York, 1988, 146 pp., paper $9.95. (Not very technical, but an adequate overview.)

"Roundtrip Interstellar Travel Using Laser-Pushed Lightsails (Journal of Spacecraft and Rockets, vol. 21, pp. 187-95, Jan.-Feb.

Tethers and Asteroids for Artificial Gravity Assist in the Solar System, by P.A. Penzo and H.L. Mayer., _Journal of Spacecraft and Rockets_ for Jan-Feb 1986.

Details how a spacecraft with a kevlar tether of the same mass can change its velocity by up to slightly less than 1 km/sec. if it is travelling under that velocity wrt a suitable asteroid.

"Alternate Propulsion Energy Sources", Robert Forward

NTIS AD-B088 771/1 PC A07/MF A01 Dec 83 138p

Keywords: Propulsion energy, metastable helium, free-radical hydrogen, solar pumped (sic) plasmas, antiproton annihiliation, ionospheric lasers, solar sails, perforated sails, microwave sails, quantum fluctuations, antimatter rockets... It's a wide, if not deep, look at exotic energy sources which might be useful for space propulsion. It also considers various kinds of laser propulsion, metallic hydrogen, tethers, and unconventional nuclear propulsion. The bibliographic information, pointing to the research on all this stuff, belongs on every daydreamer's shelf.

Future Magic. Dr. Robert L. Forward, Avon, 1988. ISBN 0-380-89814-4.

Nontechnical discussion of tethers, antimatter, gravity control, and even futher-out topics.

Deep Black, by William Burrows;

"best modern general book for spysats."

1) A Base For Debate: The US Satellite Station at Nurrungar, Des Ball, Allen and Unwin Australia, 1987 ISBN 0 04 355027 4 [covers DSP early warning satellites]

2) Pine Gap: Australia and the US Geostationary Signals intelligence satellite program, Des Ball, Allen and Unwin Australia, 1988 ISBN 0 04 363002 5. [covers RHYOLITE/AQUACADE, CHALET/VORTEX, and MAGNUM signals intelligence satellites]

3) Guardians: Strategic Reconnaissance Satellites, Curtis Peebles, 1987, Ian Allan, ISBN 0 7110 17654 [good on MOL, military Salyut and Soviet satellites, less so on others. Tends to believe what he's told so flaws

in discussion of DSP, RHYOLITE et al..]

4) America's Secret Eyes In Space: The Keyhole Spy Satellite Program,

Jeffrey Richelson, 1990, Harper and Row, ISBN 0 88730 285 8 [in a class

of its own, *the* historical reference on the KEYHOLE satellites]

5) Secret Sentries in Space, Philip J Klass, 1971.

"long out of print but well worth a look"

%J Communications of the ACM

%D September 1984

%K Special issue on space [shuttle] computers

%A Myron Kayton

%T Avionics for Manned Spacecraft

%J IEEE Transactions on Aerospace and Electronic Systems

%D November 1989

Other various AIAA and IEEE publications.

Computers in Spaceflight: The NASA Experience

James E. Tomayko

%A D. K. Cullers

%A Ivan R. Linscott

%A Bernard M. Oliver

%T Signal Processing in SETI

%J Communications of the ACM

%D November 1984

%K CR Categories and Subject Descriptors: D.4.1 [Operating Systems]:

Process Management - concurrency; I.5.4 [Pattern Recognition]:

Applications - signal processing; J.2 [Phsyical Sciences and Engineering]:

astronomy

General Terms: Design

Additional Key Words and Phrases: digital Fourier transforms,
finite impulse-response filters, interstellar communications,
Search for Extra-terrestrial Intelligence, signal detection,
spectrum analysis

A fairly long writeup on receiving and interpreting weather satellite photos is available from the Ames SPACE archive in pub/SPACE/FAQ/WeatherPhotos.

The American Radio Relay League publication service offers the following references (also see the section on AMSAT in the space groups segment of the FAQ):

ARRL Satellite Experimenters Handbook,#3185, $20

ARRL Weather Satellite Handbook,#3193, $20

IBM-PC software for Weather Satellite Handbook, #3290, $10

AMSAT NA 5th Space Symposium,#0739, $12

AMSAT NA 6th Space Symposium,#2219, $12

Shipping is extra.

The American Radio Relay League
Publications Department
225 Main Street
Newington, CT 06111

Srinivas Bettadpur contributed a writeup on tides, available from the Ames SPACE archive in pub/SPACE/FAQ/Tides. It covers the following areas:

- 2-D Example of Tidal Deformation
- Treatment of Tidal Fields in Practice

- Long term evolution of the Earth-Moon system under tides

The writeup refers to the following texts:

"Geophysical Geodesy" by K. Lambeck

"Tides of the planet Earth" by P. Melchior

NEXT: FAQ #6/15 - Constants and equations for calculations