PUBLICATIONS

APL staff members were authors or co-authors of the following unclassified books and technical articles that were recently published:

Achilles D, Silberhorn C, Sliwa C, Banaszek K, Walmsley IA, Fitch MJ, Jacobs BC, Pittman TB, and Franson JD
Photon-number-resolving detection using time-multiplexing, *J. Modern Optics* **51**(9-10), 1499–1515 (2004).

Anderson BJ, and Acuña MH
Search for solar wind-asteroid interactions at Eros, *Adv. Space Res.* **33**(11), 1989–1995 (2004).

Elfouhaily T, Guignard S, and Thompson DR
Formal tilt invariance of the local curvature approximation and its connection to the integral equation method, *IEEE Geosci. Remote Sens. Lett.* **102**, 51–56 (2004).

Firebaugh SL, Charles HK Jr, Edwards RL, Keeney AC, and Wilderson SF
Fabrication and characterization of a capacitive micromachined shunt switch, *J. Vacuum Sci. Tech. A* **22**(4), 1383–1387 (2004).

Frey HU, Ostgaard N, Immel TJ, Korth H, and Mende SB
Seasonal dependence of localized, high-latitude dayside aurora (HiLDA), *J. Geophys. Res.* **109**, A04303 (2004).

Korth H, Anderson BJ, Acuña MH, Slavin JA, Tsyganenko NA, Solomon SC, and McNutt RL Jr
Determination of the properties of Mercury's magnetic field by the MESSENGER mission, *Planet. Space Sci.* **52**(8), 733–746 (2004).

Lario D, Livi S, Roelof EC, Decker RB, Krimigis SM, and Dougherty MK
Heliospheric energetic particle observations by the Cassini spacecraft: Correlation with 1 AU observations, *J. Geophys. Res.* **109**, A09S0 (2004).

Mack SA, and Schoeberlein HC
Richardson number and ocean mixing: Towed chain observations, *J. Phys. Oceanog.* **34**(4), 736–754 (2004).

Moen J, Okasavik K, and Carlson HC
On the relationship between ion upflow events and cusp auroral transients, *Geophys. Res. Lett.* **31**(11), L11808 (2004).

Perez JD, Zhang X-X, Brandt PC, Mitchell DG, Jahn J-M, and Pollock CJ
Dynamics of ring current ions as obtained from IMAGE HENA and MENA ENA images, *J. Geophys. Res.* **109**(A5), A05208 (2004).

Rust D, and Roundhill D
System and method of dynamic automatic sensing of available dynamic range, *J. Acoust. Soc.* **115**(5), 1882 (2004).

Saur J, Mauk BH, Kaßner A, and Neubauer FM
A model for the azimuthal plasma velocity in Saturn's magnetosphere, *J. Geophys. Res.* **109**(A5), A05217 (2004).

Spall JC
Stochastic optimization, in *Handbook of Computational Statistics*, J Gentle, Y Mori, and Y Mori (eds.), Springer-Verlag (2004).

Spudis PD
How Earth got its Moon, *J. Astron.* **32**(7), 42–47 (2004).

Ukhorskiy AY, Sitnov MI, Sharma AS, and Papadopoulos K
Global and multi-scale features of solar wind-magnetosphere coupling: From modeling to forecasting, *Geophys. Res. Lett.* **31**(8), L08802 (2004).

Yamaguchi R, Kawano H, Ohtani S-I, Yumoto K, Kokubun S, and the Circum-pan Pacific Magnetometer Network Group
Energy storage and release in the magnetotail as a function of the position and the substorm magnitude, *J. Geophys. Res.* **109**(A3), A03206 (2004).

Zhang Y, Paxton LJ, Meng C-I, Morrison D, Wolven B, Kil H, and Christensen AB
Double dayside detached auroras: TIMED/GUVI observations, *Geophys. Res. Lett.* **31**(10), L10801 (2004).

CONFERENCES WITH PROCEEDINGS

APL staff members were among those who gave the following presentations that appeared in conference proceedings:

Avila RD
A primitive model for an intelligence system, *72nd Military Operations Res. Soc. Symp.*, Monterrey, CA (Jun 2004).

Beasley MA, Firebaugh SL, Edwards RL, Keeney AC, and Osiander R
MEMS thermal switch for spacecraft thermal control, *MEMS/MOEMS Components and Their Applications,* Vol. 5344, San Jose, CA, pp. 98–105 (Jan 2004).

Beasley MA, Firebaugh SL, Edwards RL, Keeney AC, and Osiander R
Microfabricated thermal switch for emittance control, *Space Technol. and Applications Int. Forum 2004*, Albuquerque, NM, pp. 119–125 (Jan 2004).

Cybyk BZ, Wilkerson JT, and Grossman KR
Performance characteristics of the sparkJet flow control actuator, *2nd AIAA Flow Control Conf.*, Portland, OR (Jun 2004).

Dobey VT, and Eirich PL
Environmental data models: Necessary but not sufficient for interoperability, *Proc. 2004 Spring Simulation Interoperability Workshop*, 04S-SIW-114, Arlington, VA, http://www.sisostds.org/ (Apr 2004).

Fitch MJ, Schauki D, Kelly CA, and Osiander R
THz imaging and spectroscopy for landmine detection, *Terahertz and Gigahertz Electronics and Photonics III. Proc. SPIE,* Vol. 5354, Bellingham, WA, pp. 45–54 (Jan 2004).

Florio EN, Magruder SF, Happel-Lewis SL, and Wojcik RA
Improving over-the-counter medication sales monitoring by modeling related factors, *Proc. APHA 2003 Ann. Mtg.*, San Francisco, CA, http://www.apha.org/meetings/future_past.htm (Nov 2003).

Hildebrandt WA, Katz B, and Lin JJ
Answering definition questions using multiple knowledge sources, *2004 Human Language Technol. Conf. and the North Am. Chapter of the Assoc. for Computational Linquistics Ann. Mtg.*, Boston, MA (May 2004).

Jablon AR, and Agrawal AK
Optimal number of array faces for active phased array radars, *Proc. 2004 IEEE Int. Antennas and Propagation Symp. and USNC/URSI Nat. Radio Sci. Mtg.*, Monterey, CA, pp. 4096–4099 (Jun 2004).

Marshall RE, Burgess EH III, and Rottier JR
The relationship between modified radio refractivity and the structure of the atmospheric boundary layer: A mathematical bridge between radio and atmospheric scientists, *Proc. 2004 IEEE Int. Antennas and Propagation Symp. and USNC/URSI Nat. Radio Sci. Mtg.*, Monterey, CA (Jun 2004).

Mayfield JC, and McNamee JP
Combining methods for the TREC 2003 robust task, *Revised Papers of the Twelfth Text REtrieval Conf. (TREC 2003)*, Gaithersburg, MD, pp. 356–363, http://trec.nist.gov/pubs/trec12/t12_proceedings.html (May 2004).

McGrath BE, Frostbutter DA, Parthasarathy KN, Heyler GA, and Chang Y
Mars exploration rovers launch contingency efforts, *Space Technol. and Applications Int. Forum: STAIF 2004: Conf. on Thermophys.*

in *Microgravity; Commercial/Civil Next Gen. Space Transp.; 21st Symp. Space Nuclear Power & Propulsion; Human Space Explor.; Space Colonization; New Frontiers & Future Conf.*, Albuquerque, NM, p. 8, http://proceedings.aip.org/proceedings/confproceed/699.jsp (Feb 2004).

Mount DM, Netanyahu NS, Piatko C, Silverman R, and Wu AY
A computational framework for incremental motion, *20th Ann. ACM Symp. on Computational Geometry*, Brooklyn, NY (Jun 2004).

Newhall BK, Jenkins JW, and Dietz JE
Improved estimation of the shape of towed sonar arrays, *Proc. IMTC/04 Conf.*, 4528, Lake Como, Italy, http://www.ewh.ieee.org/soc/im/imtc/ (May 2004).

Rottier JR, Marshall RE, and Burgess EH III
Rules of thumb for formation of radar surface ducts, *Proc. 2004 IEEE Int. Antennas and Propagation Symp. and USNC/URSI National Radio Sci. Mtg.*, Monterey, CA (Jun 2004).

Sample JL, Rebello KJ, Saffarian H, and Osiander R
Carbon nanotube coatings for thermal control, *ITHERM 2004: Ninth InterSoc. Conf. on Thermal and Thermomechanical Phenomena in Electronic Systems*, Las Vegas, NV, pp. 297–301 (Jun 2004).

Upshur JI, White C, Bayne ME, Davis B, Walker L, Reece MA, Thompson WL, Cheng S, and Wallis RE
Advanced non-linear model for accurate prediction of harmonically terminated power amplifier performance, *Proc. IEEE Microwave Theory and Techniques Soc. (MTT-S), Int. Microwave Symp.*, Fort Worth, TX, pp. 1077–1080 (Jun 2004).

The following papers appeared in conference proceedings available on CD-ROM:

Boone BG, Bruzzi JR, Kluga BE, Rogala EW, Chen PC, and Hale RD
Development and testing of an actively controlled large aperture Cassegrain telescope for spacecraft deployment, *Proc. The Int. Soc. for Optical Engineering, Soc. of Photo-Optical Instrumentation Engineers Conf.*, Glasgow, Scotland (Jun 2004).

Burbank JL, Conklin RE Jr, Kasch WT, and Nichols RA
Cross-layer interactions: A framework for adaptive communications, *14th Virginia Tech/MPRG Symp. on Wireless Personal Communications*, Blacksburg, VA, http://www.mprg.org/2004symposium/2004symposium.shtml (Jun 2004).

Fowler KR
Transient response for automatic gain control with multiple intensity thresholds for image-intensified camera, *Proc. IMTC/04 Conf.*, 4354, Lake Como, Italy (May 2004).

Fowler KR, and Land HB
System design that minimizes both missed detections and false alarms: A case study in arc fault detection, *Proc. IMTC/04 Conf.*, 4009, Lake Como, Italy (May 2004).

Kasch WT, and Burbank JL
The application of commercial WLAN technologies for military operations, *14th Virginia Tech/MPRG Symp. on Wireless Personal Communications*, Blacksburg, VA, http://www.mprg.org/2004symposium/2004symposium.shtml (Jun 2004).

Newhall BK, Jenkins JW, and Dietz JEG
Improved estimation of the shape of towed sonar arrays, *Proc. IMTC/04 Conf.*, 4528, Lake Como, Italy, pp. 873–877 (May 2004).

Robinette EJ, Palmese GR, and Wienhold PD
Toughening of epoxy-amine resin systems for VARTM and filament winding applications, *SAMPE 2004 ISSE*, Long Beach, CA (May 2004).

Silberberg D, Frank P, Immer E, Hider R, and Bethea W
Automated query formulation and data source integration for simplifying data fusion, *Proc. 2004 Military Sensing Symp. (MSS) Nat. Symp. on Sensor and Data Fusion*, Ann Arbor, MI (Jun 2004).

Wienhold PD, Fasold MJ, and Schaefer ED
The development of a light baffle assembly for the CRISM instrument, *SAMPE 2004 ISSE*, Long Beach, CA (May 2004).

PRESENTATIONS

APL staff members were among those who gave the following presentations:

Agrawal A, Frank J, White J, and Richards J
Impact of T/R moule power on the attributes of active phased array radars, *Tri-Service Radar Symp.*, Albuquerque, NM (Jun 2004).

Anderson BJ, Korth H, Waters CL, Green DL, Frey H, Lyon JG, and Wiltberger MJ
Recent science results from the Iridium constellation magnetometers, *Dartmouth Space Sci. Seminar*, Dartmouth College, Hanover, NH (Jun 2004).

Biermann PJ, Ward EE, Cain RP, Carkhuff BG, Merkle AC, and Roberts JC
Development of a human surrogate torso model for ballistic impact and blast, *49th Ann. Int. SAMPE Symp. and Exhibition*, Long Beach, CA (May 2004).

Beasley MA, Firebaugh SL, Edwards RL, Keeney AC, and Osiander R
Design and packaging for a microelectromechanical thermal switch radiator, *ITHERM 2004*, Las Vegas, NV (Jun 2004).

Dunham D
Exploring the cosmos by doing something different, *Am. Astronaut. Soc. (AAS) Brouwer Award Lecture*, Laurel, MD (May 2004).

Dunham D
Asteroidal occultation results, *Sci. Telescope Symp.*, Big Bear, CA (May 2004).

Dunham D
Occultation workshop, *Riverside Telescope Makers Conf.*, Camp Oakes, CA (May 2004).

Firebaugh SL, Charles HK Jr, Edwards RL, Keeney AC, and Wilderson SF
Packaging considerations for microelectromechanical switches, *54th Electronic Components and Technol. Conf.*, Las Vegas, NV (Jun 2004).

Foreman TL, Strock MA, Boyer D, LeFurjah G, Newkirk MH, Gehman JZ, Rottier JR, Rzemien R, Lin CC, Weaver A, and DePasquale P
Littoral S-band clutter measurements on USS *Lake Champlain* CG 57, *Tri-Service Radar Symp.*, Albuquerque, NM (Jun 2004).

Franson JD
Quantum information processing using photons, *35th Mtg. of the Div. of Atomic, Molecular and Optical Phys.*, Tucson, AZ (May 2004).

Haggerty DK
The high radiation anisotropy composition and electron spectrometer, *GEANT4 Space Users Workshop*, Nashville, TN (May 2004).

Haggerty DK, Ho GC, Roelof EC, and Gold RE
Inter-calibration of ACE/EPAM from different detector heads: Implications for NOAA RTSW users, *NOAA, Space Weather Week*, Boulder, CO (Apr 2004).

Ho GC, Donegan MM, and Vandegriff J
Real-time upstream monitoring system: Predicting interplanetary shock arrivals using energetic particle data from ACE, *NOAA, Space Weather Week*, Boulder, CO (Apr 2004).

Hori T, Lui ATY, Ohtani S, Brandt PC, McEntire RW, Maezawa K, Mukai T, Kasaba Y, and Hayakawa H
Storm-time convection in the plasma sheet: Particle transport during substorm and non-substorm intervals, *Earth and Planet. Joint Mtg.*, Chiba, Japan (May 2004).

Jablonski DG, Long MA, and Baker R
Demonstration of pattern steering techniques for mitigating antenna-to-antenna interference in two-antenna telemetry installations on military aircraft, *ITEA 2004 Technol. Rev.*, Monterey, CA (Jun 2004).

Kelly M, and McEvaddy PJ
A model-data fusion technique to retrieve the three-dimensional cloud distribution, *72nd Military Operations Res. Soc. Symp.*, Monterey, CA (Jun 2004).

Kil H, Paxton LJ, Su SY, Zhang Y, and Yeh CH
Origin of the large equatorial plasma density depletions during storm time, *Cedar Workshop*, Santa Fe, NM (Jun 2004).

Kil H, Paxton LJ, Su SY, Zhang Y, and Pi X
Onset condition of the negative storm, *Cedar Workshop*, Santa Fe, NM (Jun 2004).

Korth H
Signals from the termination shock: Recent Voyager observations, *First General Assembly of the European GeoScis. Union*, Nice, France (Apr 2004).

Lario D, Livi S, Krimigis SM, McKibben RB, Maclennan CG, Reisenfeld DB, de Koning C, Russell CT, and Dougherty MK
Heliospheric energetic particle observations during the October–November 2003 superstorm event, *First General Assembly of the European GeoScis. Union*, Nice, France (Apr 2004).

Lea DJ, HaineTW, and Gasparovic RF
Controllability and observability of the meridional overturning circulation in the Irminger Sea, *Colloquium on Marine Environmental Monitoring and Prediction*, Liege, Belgium (May 2004).

Lea DJ, HaineTW, and Gasparovic RF
Testing a data assimilation system to monitor the meridional overturning circulation in the Irminger Sea, *First Int. Climate Variability Predictability (CLIVAR) Sci. Conf.*, Baltimore, MD (Jun 2004).

Liang J
Linking substorm current system to a thin current sheet in the Earth's magnetotail, *Thin Current Sheet Workshop*, College Park, MD (Apr 2004).

Ohtani S-I
Storm-substorm relationship, *Earth and Atmospheric Space Sci. Seminar at UCLA, Inst. GeoPhys. and Planet. Phys. (IGPP)*, Los Angeles, CA (Apr 2004).

Rebello KJ, and Darrin A
Microsystems and micropower, *Interagency Adv. Power Group: The 2004 Mechanical Working Group Mtg.*, JHU/APL, Laurel, MD (May 2004).

Rebello KJ, Sample JL, Saffarian H, and Osiander R
Carbon nanotube coatings for thermal control, *ITHERM 2004: 9th InterSoc. Conf. on Thermal and Thermomechanical Phenomena in Electrical Systems*, Las Vegas, NV (Jun 2004).

Swartz WH, Kelly MA, and Lloyd SA
The detectability of polar stratospheric clouds and potential impact on target acquisition, *Commander's Quarterly Tech. Seminar*, HQ Air Force Weather Agency, Offutt AFB, Bellvue, NE (Feb 2004).

Vervack RJ Jr, Yee J-H, DeMajistre R, and Swartz WH
Intercomparison of MSX/UVISI-derived ozone and temperature profiles with ground-based, SAGE II, HALOE, and POAM III Data, *Quadrennial Ozone Symp.*, Kos, Greece (Jun 2004).

Weiss MB, Morrison DD, Hashemian MR, and Paxton LJ
Space physics metadata searching using space physics data markup language (SPDML), *Coupling Energetics and Dynamics of Atmospheric Regions (CEDAR) Conf.*, Santa Fe, NM (Jun 2004).

Wesolek DM, Moran M, Rebello KJ, Berhane B, Osiander R, and Darrin AM
Development of a novel MEMS Stirling cooler, *Interagency Adv. Power Group (IAPG) Mechanical Working Group*, Laurel, MD (May 2004).

White DM
Chemical-biological defense and emergency response, *Assoc. for the Advancement of Medical Instrumentation*, Boston, MA (Jun 2004).

Wickenden DK
CMOS-MEMS for military applications: Critical research issues, *ARO/MEMS Workshop*, Arlington, VA (Jun 2004).

Yee J-H, Swartz WH, Shetter RE, Hall SR, Lefer BL, Browell EV, and Avery MA
Column composition retrieved from direct solar irradiance measurements during SOLVE II, *Solar Occultation Satellite Sci. Team Mtg.*, Boulder, CO (Jun 2004).

Yee J-H, Swartz WH, Shetter RE, Hall SR, Lefer BL, Rall CE, Bevilacqua RM, Lumpe J, Pitts MC, Zawodny JM, Thomason LW, Russel PB, Livingston JM, and Schmid B
Column composition retrieved from direct solar irradiance measurements during SOLVE II, *Quadrennial Ozone Symp.*, Kos, Greece (Jun 2004).

The following papers were presented at the *National Sci. Foundation Geospace Environment Modeling (GEM) Workshop*, Snowmass, CO (Jun 2004):

Korth H
High latitude pointing flux observations by the Iridium constellation during northward IMF conditions.

Ohtani S-I, Brandt PC, and Mitchell DG
ENA flux variations during storm-time substorms: A superpose epoch analysis of IMAGE/HENA data.

Ohtani S-I, Ueno G, Higuchi T, and Kawano H
Annual and semiannual variations of the location and intensity of large-scale field-aligned currents.

Ukhorskiy AY
The impact of ULF waves on the outer radiation belt electrons.

Ukhorskiy AY, Sitnov MI, Sharma AS, Anderson BJ, Ohtani S, and Lui ATY
Data-derived forecasting model for relativistic electron intensity at geosynchronous orbit.

Wing S, Fujimoto M, Newell PT, and Meng C-I
Plasma sheet for northward IMF.

Wing S, Newell PT, and Meng C-I
Double cusp.

COLLOQUIA

The following topics were presented at the weekly APL Colloquium in 2004:

15 July
X-43A—The First Flight of a Scramjet Powered Airplane, G Corpening, NASA Dryden Flight Research Center

17 Sept
Science and the Vision for Space Exploration, O Figueroa, NASA Headquarters Science Mission Directorate