

Laboratory for Atmospheric and Space Physics



Activity Report
2006
University of Colorado at Boulder

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A Message from the Director

One of our goals at the Laboratory for Atmospheric and Space Physics is to try to communicate clearly to our community, our state, and the broader national and international stakeholders what we do and why we do it. This communication takes many forms. We host many tours and public lectures. LASP is very active in providing information to the press and hardly a week goes by that there is not an article in local papers about some new space or Earth science result coming from LASP. The Lab staff publishes numerous scientific and technical papers each year, talks are given at myriad conferences and symposia, and LASP faculty, staff, and students go all over the world to exchange ideas and collaborate. In many instances, LASP members get the chance to serve on high-level advisory committees for the National Academies or for U.S. government agencies or to present the Lab's point of view to Congressional committees. An annual report such as this one can never fully convey all of the LASP activities and achievements, nor can it capture all of the forms of communication that we build into our institutional approaches. We hope each year – however imperfectly – that this annual report can capture a small flavor of all that LASP does for the University of Colorado, for the state and region, and for the world of space science and technology.

As Director of LASP, I have the privilege of seeing and hearing each day about the remarkable achievements of the staff and students here in the Lab. It is staggering to see the challenges that our people have to confront in

science, engineering, data systems, and mission operations. I am immensely proud of the team of people that has been assembled within LASP and I am astonished at the range of problems our people have taken on (and solved). We believe (and, I think, rightly so) that we have one of the premier university research organizations in the world.

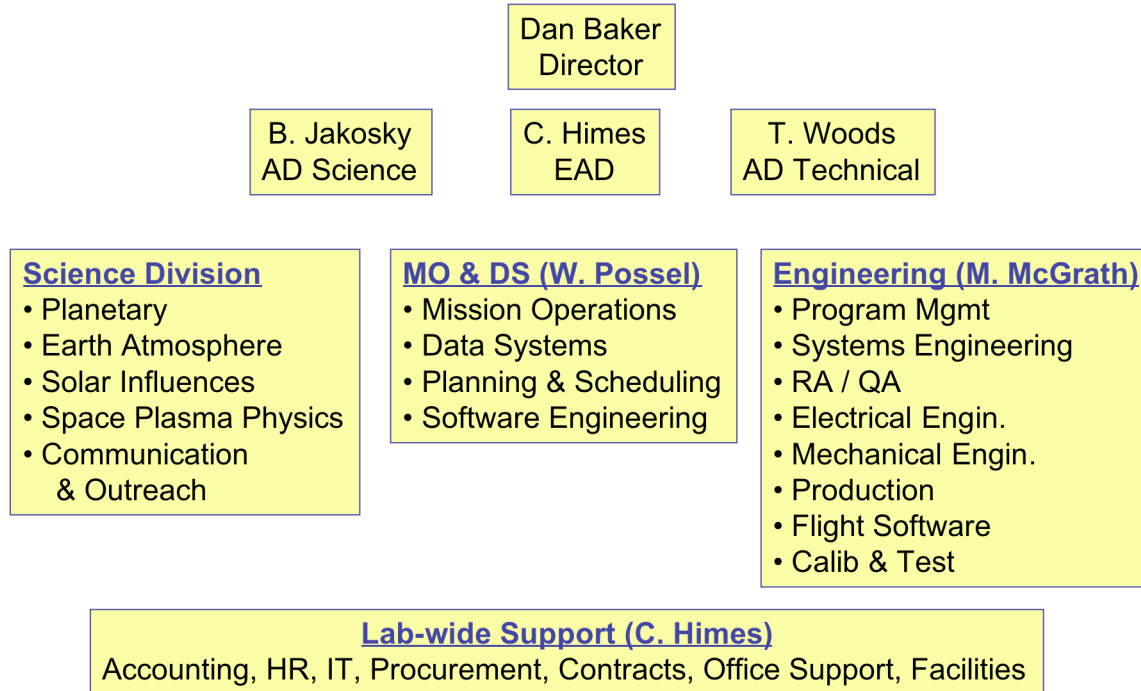
In order to be successful now and into the future, LASP needs the trust, encouragement, and support of the University and its local sister institutions. I am very pleased with the outstanding relationships that LASP has with other departments and institutes at CU and with the unflagging support that we get from the University administration. We also rely extensively on support from federal agencies such as NASA, NSF, and NOAA and we deeply appreciate the resources they provide, and the confidence they have in LASP's abilities.

There are many challenges that are confronted as our organization grows. Adding new people and facilities while maintaining our traditional LASP culture is a top concern. We look forward to working actively with the broad space research community in many new endeavors during the coming year. Thank you to the students, staff, and faculty of LASP for all their hard work. Special thanks go to Ann Alfaro for her thorough and careful efforts in preparing this report.

Daniel N. Baker

Please visit LASP's Website for the latest developments: <http://lasp.colorado.edu>

LASP Organization Chart



LASP: A Brief History

In 1946-47, a handful of American universities joined with the military and with industry to initiate the era of space exploration. The University of Colorado was one of those pioneering universities. The first experiments to be performed in space were lofted by sub-orbital rockets. A key obstacle to these first rocket flights was providing a stabilized platform for cameras and other experiments. With support from the Naval Research Center and the Air Force Cambridge Research Laboratory (now the Phillips Laboratory), the University of Colorado formed a research group called the Upper Air Laboratory (UAL) to solve this problem. Their solution — called the biaxial pointing platform — cleared the way for some

of the first major scientific discoveries made in space. Researchers and engineers from the UAL flew experiments into space on over 50 rocket flights before Sputnik. By 1965, the UAL had grown substantially. Along with this growth came a new building on campus and a new name: the Laboratory for Atmospheric and Space Physics. The public is invited to tour our facility and to observe the work that LASP does today.

LASP Appropriated Funding

During the period 1/1/2006 to 12/31/2006 LASP appropriated funding totaled over \$38M for support of 170 grants and contracts.

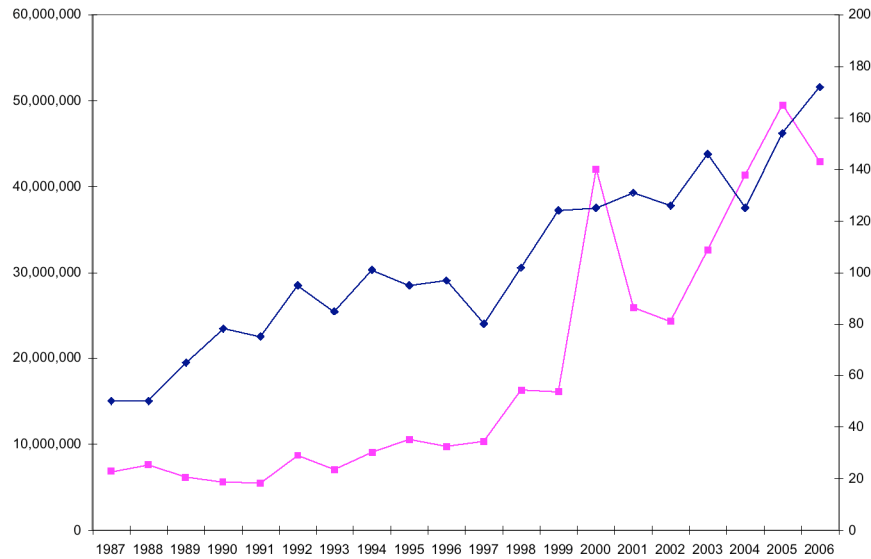
Research Support for 2006

Source of Funding	Total Grant Dollars
<i>Federal Agencies:</i>	
Department of Energy	149,239
Department of Commerce	79,734
National Aeronautics and Space Administration	21,810,921
National Science Foundation	603,095
<i>Non-Federal Agencies:</i>	
Arizona State University	82,750
Ball Aerospace Systems Division	1,260,342
Boston University	415,400
Carnegie Institution of Washington	122,769
Computational Physics, Inc.	5,525
Hampton University	9,400,983
Jet Propulsion Laboratory	1,507,134
Johns Hopkins University	44,170
Lockheed Martin Corporation	666,932
Northrop Grumman	580,000
Science Systems and Applications, Inc.	14,650
Southwest Research Institute	573,404
Starsys Research Corporation	219,000
University Corporation for Atmospheric Research	62,814
University of Arizona	257,238
University of California at Los Angeles	10,000
University of California at Berkeley	195,342
Totals:	<u>\$38,961,442</u>

Top 5 CU Research Funding Groups

"Top 5" FY2006 Rank	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	%Increase FY1997 to FY2006
1. LASP	10,298,858	16,244,208	16,089,026	41,986,298	25,987,525	24,371,139	32,607,103	41,372,440	49,453,649	42,851,606	316%
2. CIRES	28,455,839	25,473,164	29,356,782	30,661,734	27,882,972	35,918,716	39,276,732	40,274,272	41,040,700	40,399,893	42%
3. JILA	13,026,696	8,053,910	14,497,088	16,033,159	18,168,442	16,049,326	18,987,532	13,765,277	17,507,277	22,908,958	76%
4. MCDB	9,711,951	10,190,381	11,662,716	9,576,371	13,423,372	9,949,656	15,240,130	16,170,965	11,091,640	13,518,798	39%
5. IBG	6,725,710	6,577,450	6,355,575	7,557,783	10,083,876	9,963,505	10,590,359	11,738,638	10,925,336	12,457,152	85%

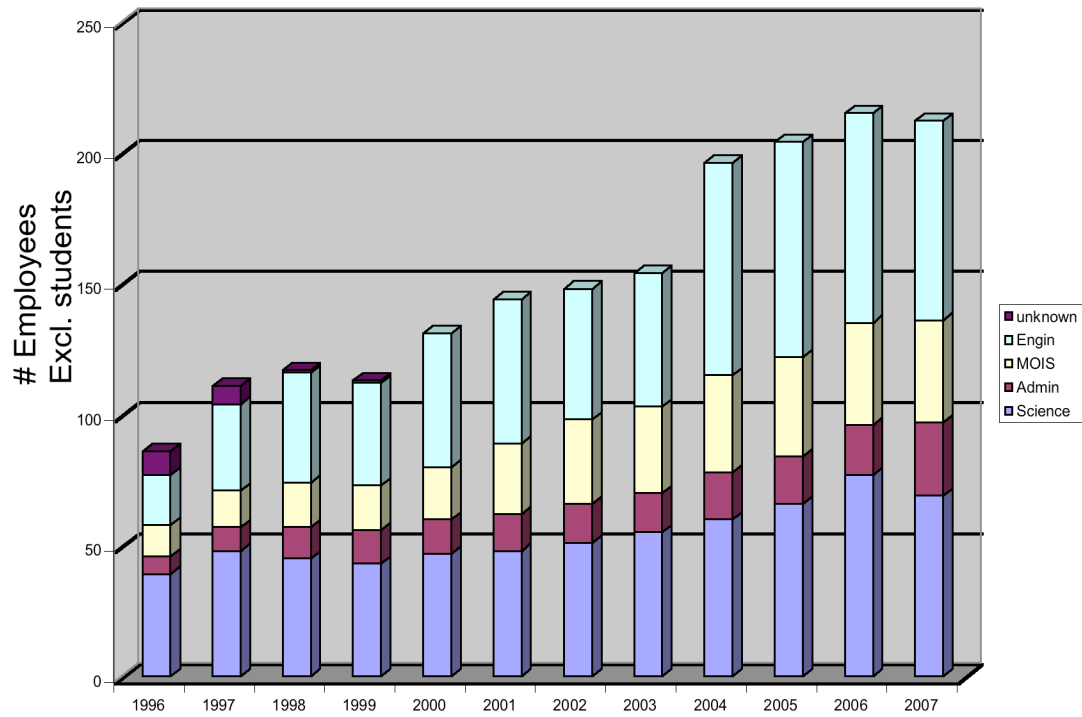
LASP Awards



In FY 2006, LASP contributed 16% of all CU Boulder research awards

Pink – Award Dollars
Blue – Number of Awards

Success Has Led to Growth



Earth Atmospheric Group

Lower atmosphere

- Linnea Avallone
- Sebastian Schmidt
- Jamie Smith
- Brian Toon

Upper atmosphere

- Aimee Merkel
- Dave Rusch

Middle atmosphere

- Lynn Harvey
- Mike Mills
- Cora Randall
- Cynthia Singleton

Planetary Sciences Group

Mars/astrobiology

- Annamaria Cereti
- Brian Hynek
- Bruce Jakosky
- Sara Martinez-Alonso
- Tom McCollom
- Mike Mellon
- Mindi Searls

Solar system plasmas

- Fran Bagenal
- Peter Delamere
- Mihaly Horanyi
- Nick Schneider
- Zoltan Sternovsky

Cassini/dynamics/planet formation

- Nicole Albers
- Josh Colwell
- Larry Esposito
- Jacques Gustin
- Kazunori Iwasaki
- Kris Larsen
- Keiji Otsuki
- Miodrag Sremcevic
- Glen Stewart
- Ian Stewart

Messenger/Mercury

- Bill McClintock
- Greg Holsclaw

Solar Influences Group

Solar EUV and space weather applications

- Phil Chamberlin
- Frank Eparvier
- Andrew Jones
- Tom Woods

Atmospheric and climate applications

- Jerry Harder
- Greg Kopp
- Peter Pilewskie
- Erik Richard
- Marty Snow

Solar physics

- Juan Fontenla
- Mark Rast

Space Physics Group

Space plasmas

- Laila Andersson
- Bob Ergun
- Stefan Eriksson
- Jack Gosling
- Kyoung Joo Hwang
- Bill Peterson

Earth's magnetosphere

- Dan Baker
- Scot Elkington
- Shri Kanekal
- Wenlong Liu
- Xinlin Li
- Ted Sarris

Missions/instruments in development

(LASP hardware in italics)

Planetary

- Mars Phoenix
- Mars Science Laboratory
- JUNO
- MAVEN (*EUVM, IUVS, LPW, STATIC*)

Solar Influences

- *GLORY TIM*
- *GOES EXIS*
- *NPOESS TSIS*
- *SDO EVE*

Space Physics

- Canadian ePOP
- *MMS*
- *RBSP-ECT*
- *RBSP-EFI*
- *MORE*

Atmosphere

- *AIM*
- *GOLD*
- *SECEP*
- *TC4*

Active flight projects that we're involved in

(*LASP hardware in italics*)

Planetary

- Mars Odyssey
- Mars Reconnaissance Orbiter
- *Cassini UVIS*
- Cassini dust
- *MESSENGER MASCS*
- *New Horizons*
- ESA Venus Express VMC
- Rosetta

Solar influences

- *TIMED SEE*
- *SORCE*
- SOHO

Space

- Ulysses
- SAMPEX
- IMEX
- POLAR TIMAS
- FAST IMS
- STEREO
- WIND
- *THEMIS*

Atmospheric

- ACE
- HIRDLS
- Microwave Limb Sounder
- PACDEX
- MILAGRO
- GoMACCS

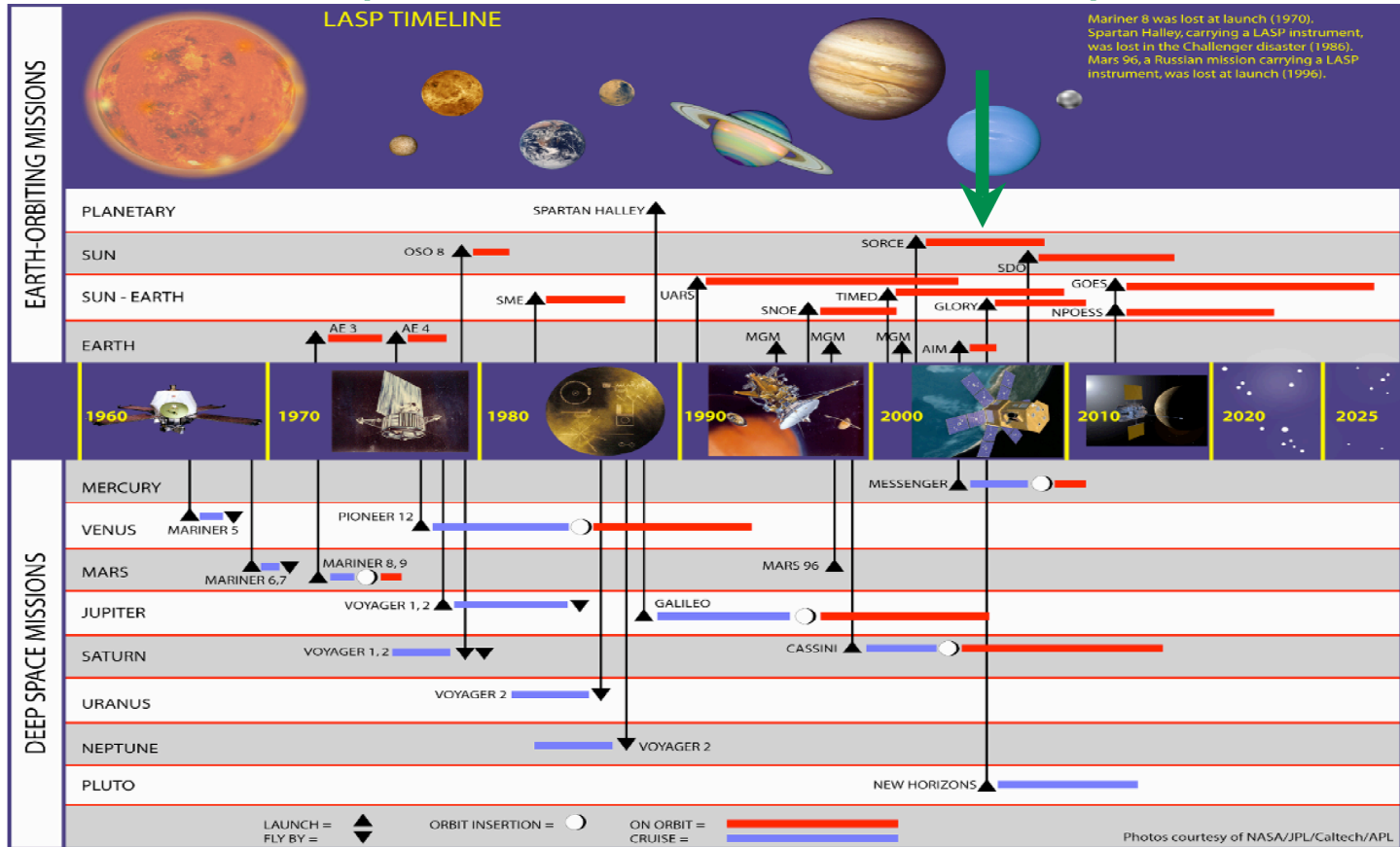
A few of the non-flight science projects

- eGY
- WACCM
- Tropospheric measurements and monitoring
- Solar radiation physical model/flare irradiance spectral model
- Precision Solar Photometric Telescope
- Theoretical modeling of planet formation
- Laboratory analysis of Mars ground/ice interactions
- Laboratory analysis of planetary biogeochemistry
- CU Center for Astrobiology in the NASA Astrobiology Institute

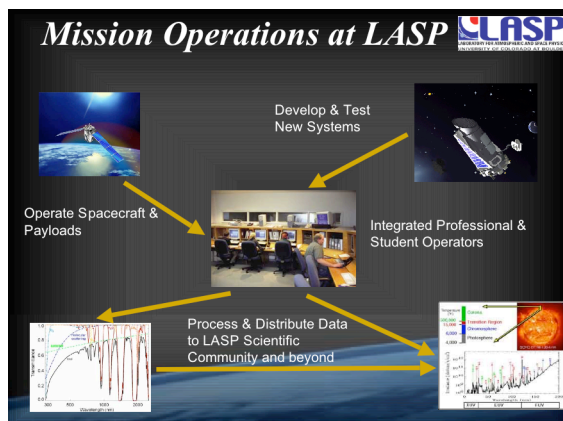
137 non-flight science projects during FY 07

Summary of LASP Projects

- 4 Implementation, 2 Formulation, 5 New Phase A
- 3 mission operations, 11 instrument operations



Mission Operations and Data Systems



LASP's Mission Operations and Data Systems (MO&DS) Division continued to be at the forefront of university-based institutions in the world for developing and running all aspects of spacecraft operations and producing world class science data products. Over the years, we have built a solid foundation based on successfully operating seven spacecraft (as many as four simultaneously) and numerous scientific instruments on earth orbiting and interplanetary spacecraft. The division's key attributes are: low cost space system operations, strong student involvement, superb in-house software tools, and close ties to the scientific community to produce world-class science products.

MO&DS continued to conduct operations on three NASA spacecraft during 2006 - Quick Scatterometer (QuikSCAT) satellite, the Ice, Cloud and Land Elevation Satellite (ICESat) and the Solar Radiation and Climate Experiment (SORCE) satellite. All the spacecraft at LASP are operated by highly trained and certified professionals and students. In 2006, our spacecraft continued to perform smoothly and generated a tremendous amount of science data.

We also prepared for several future missions, NASA's Aeronomy of Ice in the Mesosphere (AIM) and Kepler. AIM's mission is to investigate Polar Mesospheric Clouds that form over Earth's polar regions. The AIM spacecraft will be launched from Vandenberg Air Force and checked out and operated by LASP in 2007. Kepler will search for Earth-size planets orbiting stars and is currently scheduled for launch in late 2008.

Our science data systems provide a variety of services, including instrument planning and sequencing, instrument performance monitoring, engineering and science data processing, long-term data management and data archiving. Our Science Operations Center (SOC) performs the full spectrum of science instrument operations. This includes scheduling instrument operations and generating commands, monitoring instrument health, acquiring and processing raw instrument telemetry, and generating science data products for the science community. Figure 1 shows the spacecraft we have operated or are operating today at LASP. It also illustrates science data systems for major instruments, for example the UARS SOLSTICE and Cassini UVIS experiments, that LASP has operated. Currently LASP is operating 11 scientific instruments.

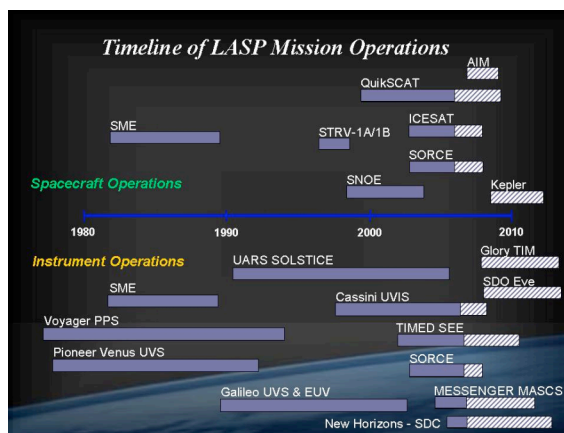


Figure 1

Data Systems Software

The Data Systems group provides LASP and NASA with algorithm development, numerical analysis, programming, data management, data analysis, and data system design expertise, with an emphasis on developing and maintaining large-scale, robust data systems. We maintain expertise in all facets of data systems development, including numerical analysis, algorithms, programming techniques and methodologies, software project management. Members of this group work closely with scientists and engineers throughout the space mission lifecycle in order to develop the most appropriate systems to serve LASP's scientific mission, and to provide the community with high-quality scientific data products and results.

We developed, operated, and maintained scientific data systems for many NASA projects spanning many decades. Most recently, we managed the ground data systems and generated routine scientific data products for UARS SOLSTICE, Cassini

UVIS, TIMED SEE, SORCE, and Messenger MASCS. Preparations are underway to support the ground data systems for the AIM, Glory TIM, and SDO EVE projects.

Daniel N. Baker, Director
LASP Scientists

Tenure Track:

Linnea M. Avallone
Frances Bagenal
Charles A. Barth (Ret.)
Robert Ergun
Larry W. Esposito
Mihály Horányi
Bruce M. Jakosky
Xinlin Li
Robert T. Pappalardo
Peter Pilewskie
Cora E. Randall
Mark P. Rast
Nicholas M. Schneider
Owen B. Toon

Peter Delamere
Scot Elkington
Francis G. Eparvier
Stefan Eriksson
Juan Fontenla
Jack Gosling
Jacques Gustin
Jerald W. Harder
Lynn Harvey
Noel Hinners
Greg Holsclaw
James E. Howard
Kyoung Joo Hwang
Brian Hynek
Kazunori Iwasaki
Shri Kanekal
Greg Kopp
Kristopher Larsen
George M. Lawrence (Ret.)
William E. McClintock
Tom McCollom
Daniel Main

Sara Martinez-Alonzo
Michael Mellon
Aimee Merkel
Michael Mills
Keiji Ohtsuki
William Peterson
Sean Raymond
Erik C. Richard
E. Joshua Rigler
Gary J. Rottman (Ret.)
David W. Rusch
Theodore Sarris
Sebastian Schmidt
Mindy Searls
Jamison Smith
Martin Snow
Miodrag Sremcevic
Zoltan Sternovsky
A. Ian F. Stewart
Glen R. Stewart
Gary E. Thomas (Ret.)
Thomas N. Woods

Research Associates:

Nicole Albers
Laila Anderssen
Phil Chamberlin
Emily CoBabe-Ammann
Joshua E. Colwell

Visiting Scholars

Joseph Ajello, Jet Propulsion Laboratory, Pasadena, CA
Charles Barton, The Australian National University
Gerd Baumgarten, University of Rostock, Germany
Anthony Chan, Rice Univ., Houston, Texas
Richard Eastes, Univ. of Central Florida
Claus Froehlich, Physikalisch-Meteorologisches Observatorium, Davos, Switzerland
Mary Hudson, Dartmouth College, New Hampshire
Antal Juhasz, KFKI Research Institute for Particle and Nuclear Physics, Budapest, Hungary
Hiroshi Kobayashi, Nagoya University, Japan
Judith Lean, Naval Research Laboratory, Washington, DC
Mark Lewis, Trinity University, San Antonio, TX
William Lotko, Dartmouth College, New Hampshire
Robert McPherron, Univ. of California, Los Angeles
Ian Mann, Univ. of Alberta, Canada
Robert Meier, Naval Research Laboratory, Washington, DC
Wayne Pryor, Central Arizona Coolidge, Coolidge, AZ
Eric Quemarais, CNRS, Verrieres le Buisson, France
Petri Toivanen, Helsinki University of Technology, Finland
Robert Weigel, George Mason University, Fairfax, VA

Engineering/Missions Ops/Program Support/Science

Engineering:

Gregg Allison
Michael D. Anfinson
Richard Arnold
Dennis L. Baker
Susan Batiste
Douglas Bausch
Helmut P. Bay
Christopher Belting
Bryce Bolton
Mary Bolton
James S. Bowers
Brian D. Boyle
Shelley Bramer
Catherine Brant
Vanessa Briggs
Jeff Brown
Patrick Brown
Chelsey Bryant
Valerie Bullock
Zachary G. Castleman
Steve Chappell
Wesley Cole
Christopher Converse
David Crotser
Kip W. Denhalter
Sharon Dooley
Virginia Drake
Tim Flaherty
David Gathright
Jeff Graw
Elizabeth Grogan
Roger Gunderson
Scott Gurst
David Harber
Karl Heuerman
Timothy Holden
Vaughn Hoxie
Edgar Johansson
James Johnson
Richard Kohnert
Bret Lamprecht
Mark R. Lankton
Ryan Lewis
Michael McGrath
James Mack
Jack Marshall
Nathaniel Miller
Aref Nammari
Brian Nuel
Sara Ohrtman

Heather Passe
Norman C. Perish
Thomas Reese
Dwight Reinhardt
Hans Rohner
Timothy Ruske
Judith A. Salazar
Patti Sicken
Thomas Sparn
Stephen Steg
David Street
Trenton Taylor
Wayne Tighe
Matt Triplett
Scott A. Tucker
Gregory Ucker
Douglas Vincent
Tracy Vincent
Pamela J. Wagner
James Westfall
Neil White
Ann Williams
Heather Reed Withnell
Peter Withnell
Ray Wrigley
Ed Wullschleger
Alan Yehle
Jason Young
Jennifer Young

Mission Ops:

Robert P. Biro
Karen Beth Bryant
Lillian Connelly
Pamela Crandall
Randal L. Davis
Michael Dorey
Jack Faber
Ken Greist
Jessica Harano
Christian Jeppeson
Alain J. Jouchoux
David E. Judd
Michelle Kelley
Barry Knapp
Jay Kominek
Sally Lasater
Douglas M. Lindholm
Debra McCabe
Willie Mein

Jerel Moffatt
Steve P. Monk
Chris Pankratz
Nicole Ramos
Randy Reukauf
Pat Ringrose
Stephen Roughton
Cynthia Russell
Sean Ryan
Patrick Smith
Gail Tate
Brian Templeman
Ann Windnagel
Donald Woodraska

Program Support:

Ann Alfaro
Judy Antman
Nancy Brooks
Anita Davis
Steve Ericksen
Brian Evans
Phillip L. Evans
Karla Lefevre Frank
Rodney Freeman
Judith (Dede) Gleason
Bonnie Kae Grover
Sarah Haworth
Caroline Himes
Rose A. Hoag
Bonnie W. Hotard
Erick Jasiak
Lindsay McCandliss
Beth McGilvray
Melanie McKinney
Deborah Marohnich
Hannah Meyer
Marissa Meyer
John M. Padgett
Ann Perez de Tejada
Marissa Rusinek
Gary Schut
John D. Smith
Paul Weidmann

Science:

Kathryn Becker
Laura Bloom
Michael T. Callan

Zhangzhao Chen
Matthew Chojnacki
Alexandra DeWolfe
Vincent Dols

Michael Gehmeyr
Vanessa George
James Howard
Wenlong Liu

George Millward
Doan Nguyen
Feng Tien
Heather Weisacosky

2006 Ph.D. Graduates

Chappell, Steven Patrick, Aerospace Engineering Sciences
August 12, 2006

Analysis of Planetary Exploration Spacesuit Systems and Evaluation of a Modified partial-Gravity Simulation Technique"

Thesis Advisor: David M. Klaus, Aerospace Engineering Sciences

Gannon, Jennifer Lea, Physics

August 12, 2006

"Magnetospheric Electron Dynamics"

Thesis Advisor: Xinlin Li, LASP

Holsclaw, Gregory Michael, Electrical Engineering

May 12, 2006

"The MESSENGER Visible and Infrared Spectrograph: Design, Calibration, and Analysis of Lunar Observations"

Thesis Advisor: William McClintock, LASP

Madry, William Lansing, Astrophysical, Planetary, and Atmospheric Sciences

May 12, 2006

"Modeling the Generation, Transport, and radiative Effects of Sea Salt Aerosol"

Thesis Advisor: Owen B. Toon

Main, Daniel Scott, Physics

May 12, 2006

"Multi-Ion Plasma Processes in the Low Altitude Auroral Upward Current Region"

Thesis Advisor: Robert Ergun, LASP

Mitchell, Colin, Physics

May 12, 2006

"Charged Dust Dynamics in Saturn's Magnetosphere"

Thesis Advisor: Mihaly Horanyi, Physics

Graduate Students

Anderson, Dewey
Haydar Arslan
Austin Barker
Charles Bardeen
Suzanne Benze
Todd Bradley
Nicole Cates
Steve Chappell

Li Chen
Seth Claudepierre
Zane Crawford
Christopher Cully
Samik Dasgupta
Bruce Davis
Sean Davis
Jason English

Tina (Tianyi) Fan
Nathan Farr
Bruce Ferguson
Joe Flasher
Damhnait Gleeson
Alexa Halford
Anna Haugsjaa
Brian Hinde

Rachel Hock
Odelle Hoffman
Monica Hoke
Courtney Hoskins
David James
Lars Kalnajs
Bruce Kindel
Ervin Krauss
Dongwon Lee
Patrick McBride
Kevin McGouldrick
Kevin McWilliams
Lansing Madry
Daniel Main
David Malaspina
Danielle Massey
Rebecca Matichuk
Patrick Meagher

Colin Mitchell
Nate Murphy
Katherine Nauert
Trang Nguyen
Heather Passe
Radu Popescu
Andrew Poppe
Manny Presicci
Than Putzig
Licia Ray
Jason Reimuller
Lonnie Riesberg
Stuart Robbins
Chester Rubbo
Eric Schleicher
Karen Schmidt
Supreet Kaur Sidhu
Cynthia Shaw Singleton

Karie Michelle Shipley
Hanna Sizemore
David Steussy
Lin Su
Lindsey Link Tierney
Sarah Thomas
Heather Tollerud
Dustin Trail
Weichao Tu
Drew Lawson Turner
Jennifer Uchida
Richard Urata
Vernon Volpe
Kaj Williams
Torsten Zorn

Undergraduate Students

John Adam
Keegan Amyx
Marcus Arnold
Jeffrey Baxter
Brandon Bobian
Aaron Bornstein
Michelle Bourgeois
Christopher Brosz
Benjamin Brown
Lottie Brown
Karen Beth Bryant
Roane Buja
Christopher Bunch
Burhan Muzaffar
Laura Bush
Samuel Califf
Bryan Callahan
Ross Callison
Christopher Carnahan
Rhain Carpenter
Michael Chaffin
Scott L. Chamberlin
Matthew Chojnack
Ransom Christofferson
Chris Cloutier
Zane Crawford
Stephen Crooks
Sarah Cox
Adam Davidson
Alan Davies
Tera Dunn
Claire Duquenois

Negar Ehsan
Attila Elteto
Neal Evans
James Everton
Nathan Farber
David Goluskin
Brandon Gonzales
Michael Habinsky
George Hanlon
Jessica Harano
Tyler Harrison
Aaron Hayden
Ryan Hickman
Rachel Hoover
Andrew Jenkins
Matthew Kelly
Lang Kenney
Kimberly Kroh
Davis Lawry
Dustin Leverman
Adam Lightman
Jacob Lilevjen
Anthony Lindell
Kurt Lorhammer
Jennifer Lowell
Brooks Lustig
Brian McArdle
Grant McGilvray
Justin McHenry
Danielle Massey
Kaleena Menke
Fabio Mezzalira

Taylor Mills
David Motta
McCall Mullen
Vlad Munteanu
Larissa Myers
Katherine Nauert
John Neice
Jacob Niece
Jonathan Nikkel
Kostas Pagratis
Jason Patterson
Brian Payne
Michael Phan
Ryan Phillips
Therese Possel
Scott Potter
Kathryn Rash
Tyler Redick
Ryan Rhodes
Lauren Roemer
Alex Rofsmeier
Alex Romanov
Teresa L. Ross
Patricia Rubi
Joshua Rubin
Crystal Salcido
Charles Sanders
Peter Schwinn
Molly Selting
John Shelton
Abigale Shepard
Kelsi Singer

Patrick Smith
Jordan Spatz
Jastsch Sud
Timothy Sullivan
Jacob Taylor
Timothy Taylor
Linda Te

Edward Thiemann
Allison Toltz
Dustin Trail
Diem Tran
Thu Yen Tran
Melina Tremblay
Veronica Vertucci

Christopher White
Geneva Wilkesanders
Jennifer Wilson
Erin Wood
Ian Woodford
Courtney Wright

Scientific Research Interests

Laila Andersson

Kinetic processes in space plasmas such as double layers, electron phase space holes and Alfvén waves (anywhere where measurement has or will be made). Atmospheric loss through ion outflow for objects such as Earth and Mars. Instrumentation for space plasma missions, for the moment to develop new techniques for future missions.

laila.andersson@lasp.colorado.edu (303) 492-1689

Linnea Avallone

Experimental and theoretical studies of tropospheric and stratospheric chemistry, particularly of halogens and related species. Analyzing measurements of chemical species to understand dynamical processes in the stratosphere and troposphere. Development of instrumentation for autonomous in situ measurements of trace species related to understanding the lifetimes of anthropogenic pollutants.

avallone@miranda.colorado.edu (303) 492-5913

Frances Bagenal

Magnetic fields and plasma environments of solar system objects—mainly Jupiter and the Sun, but more recently, other planets, comets and asteroids.

bagenal@colorado.edu (303) 492-2598

Daniel N. Baker

Research in space instrument design and calibration, space physics data analysis, and magnetospheric modeling. Study of plasma physical and energetic particle phenomena in the magnetospheres of Jupiter and Mercury, along with the plasma sheet and magnetopause boundary regions of the Earth's magnetosphere. Analysis of large data sets from spacecraft; involvement in missions to Earth's deep magnetotail and comets; the study of solar wind-magnetospheric energy coupling; theoretical mod-

eling of magnetotail instabilities. Study of magnetosphere-atmosphere coupling; applying space plasma physics to study of astrophysical systems. Research to understand space weather and effects on human technology. Teaching of space physics and public policy, as well as public outreach to space technology community and general public.

daniel.baker@lasp.colorado.edu (303) 492-4509

Charles A. Barth

Planetary ultraviolet spectroscopy; observation and theory of nitric oxide in the Earth's upper atmosphere; research on planetary atmospheres.

charles.barth@lasp.colorado.edu (303) 492-7502

Joshua E. Colwell

Origin and evolution of planetary rings, observational and theoretical studies of planetary rings, comets, and satellites including Earth's moon. Impact processes on asteroids, satellites, and ring particles. Dynamics of dust in ring-satellite systems. Dusty plasma dynamics. Thermal models of airless bodies.

josh.colwell@lasp.colorado.edu (303) 492-6805

Scot Elkington

Space physics theory and modeling, primarily understanding energetic particle dynamics in the inner magnetosphere in the context of radial diffusion and adiabatic transport processes within the radiation belts. Also working on models of plasma sheet access of energetic particles to the inner magnetosphere through convection/substorm injection, development of physical space weather radiation belt models, and magnetohydrodynamic/particle simulations.

elkingto@lasp.colorado.edu (303) 735-0810

Francis G. Eparvier

Research interests include the aeronomy of the upper atmosphere, the effects of solar irradiance and particle flux variability on the upper atmosphere, and the sources of that solar variability. Approaches include rocket and satellite measurements of the solar outputs and of the atmosphere, and data analysis and theoretical modeling. Currently Co-Investigator on the Thermosphere- Ionosphere-Mesosphere Energetics and Dynamics (TIMED) satellite Solar EUV Experiment (SEE).
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<http://stripe.colorado.edu/~eparvier>

Larry W. Esposito

Observational and theoretical studies of planetary atmospheres and rings; chemistry and dynamics of the Venus clouds; waves in Saturn's rings; numerical methods for radiation transfer.
espo@lasp.colorado.edu (303) 492-7325

John T. Gosling

Space plasma physics; observational studies of the Sun, the solar wind and Earth's magnetosphere using satellite and space probe data; solar-terrestrial physics; magnetic reconnection; collisionless shocks; coronal mass ejections; corotating interaction regions.
jack.gosling@lasp.colorado.edu (303) 735-5536

Jerald Harder

Measurement and interpretation of solar spectral irradiance; Development of space-borne prism spectrometers.
jerry.harder@lasp.colorado.edu (303) 492-1891

Mihaly Horanyi

Dusty space and laboratory plasmas. Electrodynamic processes and their role in the origin and evolution of the solar system. Comets, planetary rings, plasma surface interactions at moons and asteroids. Aerosol charging, in situ and remote observations of dust.
mihaly.horanyi@lasp.colorado.edu (303) 492-6903

Bruce M. Jakosky

Teaching and research activities focus on understanding the nature of planetary surfaces and atmospheres and the possibility for the existence of life in the universe. Specific activities include teaching undergraduate and graduate courses, training graduate students, research and grant activity

pertaining to planetary science and exobiology, leading the campus effort in astrobiology, exploring the nature of the interactions between science and society, and outreach to the public.
bruce.jakosky@argyre.colorado.edu (303) 492-8004

Greg Kopp

Development and characterization of the SORCE, Glory, and NPOESS Total Irradiance Monitors for solar irradiance measurements. Solar physics. Electro-optical instrumentation and electrical substitution radiometry.
Greg.Kopp@lasp.colorado.edu, 303-735-0934

George M. Lawrence

Physical chemistry, laboratory spectroscopy, experiment design and analysis, signal conditioning, vacuum technology, IR detectors, UV detectors, imaging detectors, microchannel plates.
george.lawrence@lasp.colorado.edu (303) 492-5389

Xinlin Li

Space physics, data analysis and modeling. Especially interested in understanding the dynamics of relativistic electrons in the magnetosphere: the source, loss, and transportation of these MeV electrons; also interested in charged particle injections into inner magnetosphere during magnetic storms and substorms, and magnetosphere-atmosphere coupling due to energetic particle precipitations.
lix@kotron.colorado.edu (303) 492-3514

William E. McClintock

Observational Astrophysics - Ultraviolet observations of the outer atmospheres of cool stars and the very local ($d < 20$ pc) interstellar medium. Ultraviolet Observations of Planetary Atmospheres. Development of state-of-the-art instrumentation for high resolution spectroscopy for the 900-2500/ wavelength range.
bill.mcclintock@lasp.colorado.edu (303) 492-8407

Michael Mellon

The history of water on Mars, the martian permafrost, surface-atmosphere interactions and the martian climate. Periglacial geology and geophysics on Earth and Mars. Use of ice-related geomorphic features as an indicating of the distribution of subsurface ice. Antarctic analogs to martian geomorphology. Laboratory research in transport processes in frozen soils, including gas diffusion and solute migration and the effects of water vapor, ice,

and adsorbate on transport physics. Remote sensing and thermophysical properties of planetary regoliths, with specific emphasis on martian surface material. Planetary surface temperature behavior and geothermal heat flow.
mellon@argyre.colorado.edu (303) 492-1711

Keiji Ohtsuki

Theoretical studies of planet formation; origin and dynamical evolution of ring-satellite systems.
ohtsuki@lasp.colorado.edu (303) 492-0260

Peter Pilewski

Solar spectral variability and its effects on terrestrial climate. Airborne radiometry to study the radiative effects on climate due to clouds and aerosols. Surface, airborne and satellite remote sensing of clouds and aerosols. Theoretical atmospheric radiative transfer. Quantifying the radiative energy budget. Teaching radiative transfer, remote sensing, and instrumentation laboratory. Principal Investigator for the Total Solar Irradiance Sensor (TSIS).
peter.pilewski@lasp.colorado.edu (303-735-5589)

Cora E. Randall

Primary interests include atmospheric chemistry and dynamics, mainly of the stratosphere, and secondarily of the mesosphere and troposphere. Work is experimental in nature, relying on data from remote sensing satellites. The emphasis is on ozone, NO₂, and aerosol data from the Polar Ozone and Aerosol Measurement (POAM) instrument as well as from the Stratosphere Aerosol and Gas Experiment (SAGE). Measurements from instruments on the Upper Atmosphere Research Satellite (UARS) and the Solar Mesosphere Explorer (SME) are also used. Other interests include the spectroscopy of comets and laboratory polarization measurements.
cora.randall@lasp.colorado.edu (303) 492-8208

Mark Rast

Lagrangian statistics in turbulent flows, scale selection in solar convection simulations, shear propagation in a stratified fluid, and the magnetic structure of the solar chromosphere. Continued involvement in the development of VAPOR, an integrated analysis and visualization tool for three-dimensional simulations. Instrument scientist for the PSPT (Precision Solar Photometric Telescope) and continued data service for that instrument in-

cluding the establishment of an operational web based data interface. Educational activities include the development of a new undergraduate course on Solar and Space Physics.
mark.rast@lasp.colorado.edu (303) 735-1038

Gary J. Rottman

Accurately measure the solar spectral irradiance (Principal Investigator on sounding rockets, UARS, EOS, SORCE, TSIM, and GLORY and Co-Investigator on SME, TIMED, and SDO). Special emphasis is given to solar variability on all time scales and to comparisons of the solar irradiance with the output of other late type stars. Past work has concentrated on the ultraviolet ($\lambda < 300$) irradiance, but emphasis has not extended to the visible and near-infrared. Application of ultraviolet spectroscopy and the development of new instrumentation for remote sensing.
gary.rottman@lasp.colorado.edu (303) 492-8324

David W. Rusch

The general fields of spectroscopy and aeronomy, emphasizing the measurements of minor constituents and aerosols in planetary atmospheres such as nitric oxide and ozone and the physical and chemical phenomena which determine their densities and temporal variations. Research in the atmospheric sciences including stratospheric, mesospheric, and thermospheric data analysis and modeling. Application of the principles of molecular and atomic spectroscopy in the measurement of ultraviolet, visible, and near-infrared emission and absorption features to obtain understanding of atmospheric phenomena. Current research involves the determination of atmospheric processes affecting ozone and the reevaluation of ozone trends from long-term satellite measurements.
rusch@sertan.colorado.edu (303) 492-8627
<http://lasp.colorado.edu/~rusch/dwr.html>

Nicholas M. Schneider

The physics of planetary magnetospheres, particularly the interactions between planetary plasmas and the satellites of the outer planets. Extensive groundbased observations of the Jupiter/Io system, especially imaging and spectroscopy of the Io atmosphere and plasma torus. Program has been expanded to include Hubble Space Telescope observations. Designing and building of a spacecraft to study the Jupiter/Io system.

nick.schneider@lasp.colorado.edu (303) 492-7672
http://ganesh.colorado.edu/nick

Martin Snow

Primary research interests include ultraviolet spectroscopy of stars and the sun and the interaction of comets with the solar wind. The SOLSTICE instruments on UARS and SORCE provide a wealth of information about solar activity in the 115-300 nm range on a variety of timescales, ranging from minutes (solar flares) to decades (solar cycle). Understanding the variation in the solar output will lead to understanding its influence on the Earth. The interaction of comets with the solar wind is best studied using wide-field photography. Both amateur and professional astronomers contribute to this effort, and one research activity has been to help coordinate the interaction of the two groups.

marty.snow@lasp.colorado.edu 303-735-2143

A. Ian F. Stewart

The investigation by ultraviolet emissions of the aeronomy of planetary and satellite atmospheres, cometary comae, and Io's plasma torus.

stewart@viralf.colorado.edu (303) 492-4630

Glen R. Stewart

Origin and evolution of the solar system, with an emphasis on modeling the solid-body accretion of the terrestrial planets and the solid cores of the giant planets. Accretion of the Moon after a giant impact on the Earth. Modeling of satellite wakes and spiral density waves in planetary rings. Nonlinear dynamics of the three-body problem as applied to problems in solar system dynamics.

glen.stewart@lasp.colorado.edu (303) 492-3737

Gary E. Thomas

Research concerning the middle atmosphere of Earth, in particular the mesosphere (50-100 km). Of interest are noctilucent clouds which occur in the high-latitude summertime mesopause region, around 83 km. These clouds were observed for five years by a CU LASP ultraviolet experiment onboard the LASP SME satellite, and more recently by instruments onboard the POAM II and UARS (Upper Atmosphere Research Satellite) spacecraft. In the last decade, interest involves global change in this region, possibly caused by anthropogenic emissions and by climate changes in the troposphere. Critical parameters studied are solar UV flux, water vapor, temperature and ozone which are being monitored by instruments onboard the UARS.

gary.thomas@lasp.colorado.edu (303) 492-7022
http://lasp.colorado.edu/noctilucent_clouds

Owen B. Toon

Theoretical studies of stratospheric aerosols; investigations of volcanic aerosols and studies of polar stratospheric clouds; theoretical studies of tropospheric clouds, aerosols and radiative transfer; experimental investigations of stratospheric and tropospheric phenomena; theoretical investigations of planetary atmospheres.

btoon@lasp.colorado.edu (303) 492-1534

Thomas N. Woods

Observational studies of the solar ultraviolet (UV) radiation, its variability, and its interaction with Earth's atmosphere. Principal investigator of NASA suborbital program to study the solar irradiance and thermospheric airglow. Principal investigator of the Solar EUV Experiment (SEE) on the TIMED mission. Co-investigator of the Solar Stellar Irradiance Comparison (SOLSTICE) experiment currently making solar UV irradiance measurements on the Upper Atmosphere Research Satellite (UARS) and planned for the Earth Observing System (EOS) missions.

tom.woods@lasp.colorado.edu (303) 492-4224

FACULTY ACTIVITIES

Air Force Technical Applications Center (AFTAC)

Baker, Daniel (Chair, Satellite Review Panel)

American Astronomical Society (AAS)

Bagenal, Frances (Member, DPS Committee)

Bagenal, Frances (Editor of STATUS, Newsletter on the Status of Women in Astronomy of the American Astronomical Association)

Bagenal, Frances (Member, Education Board)

American Association for the Advancement of Science (AAAS)

Jakosky, Bruce (Member, Advisory Committee, Program on Dialogue on Science, Ethics, and Religion)

American Association of Universities (AAU)

Esposito, Larry (Working Group Member)

American Geophysical Union (AGU)

Baker, Daniel (Past President Space Physics and Aeronomy Section)

Baker, Daniel (Convenor, Special Sessions at AGU annual meeting)

Baker, Daniel (Chair, SPA Nominations Committee)

CoBabe-Ammann, Emily (Secretary, SPA-EPO working group)

Ergun, Robert (Member, Press and Public Affairs Committee)

Esposito, Larry (Session Organizer, Planetary Rings, Fall 2006 AGU meeting)

Esposito, Larry (Fellow)

Jakosky, Bruce (President-Elect, Planetary Sciences section)

Jakosky, Bruce (Member, Auditing and Legal Affairs Committee)

American Institute of Aeronautics and Astronautics (AIAA)

Eparvier, Francis (Member, Solar Irradiance Poster Working Group)

American Meteorological Society (AMS)

Avallone, Linnea (Member, Committee on the Middle Atmosphere)

Atmospheric and Oceanic Sciences Department (ATOC)

Esposito, Larry (Chair, Examinations Committee)

Pilewski, Peter (Member, Admissions Committee)

Pilewski, Peter (Graduate Student Advisor)

Randall, Cora (Member, graduate student admissions committee)

Randall, Cora (Member, computer committee)

Randall, Cora (Member, comprehensive exam committee)

Randall, Cora (Member, search committee for mesoscale meteorology faculty)

Randall, Cora (Faculty peer review/visitation)

Toon, O.B. (Chair)

Boulder Solar Alliance (BSA)

CoBabe-Ammann, Emily (Secretariat)

Eparvier, Francis (Member)

Rast, Mark (Member, Executive Committee)

Boulder Solar Variability Group (SVG)

Eparvier, Francis (Member)

Climate And Weather of the Sun-Earth System (CAWSES)

Eparvier, Francis (Member, Working Group)

Cluster

Baker, Daniel (Member, Cluster Science Working Team)

Colorado Space Business Roundtable

Himes, Caroline (Member)
Johansson, Edgar (Member)

Colorado Space Coalition

Himes, Caroline (Member)
Johansson, Edgar (Member)

Colorado Space Grant

CoBabe-Ammann, Emily (Member, Advisory Group)

Committee on Space Research (COSPAR)

Esposito, Larry (Main Scientific Organizer of COSPAR 34)
Dissertation/Thesis Advisor/Committee Member

Avallone, Linnea (Advisor to Sean Davis, Lars Kalnajs, and Alicia Frazier)
Avallone, Linnea (Dissertation/Thesis Committee for Alicia Frazier, Diane Strassberg, Cynthia Singleton, and Florence Bocquet)
Bagenal, Frances (Thesis advisor for Licia Ray; Dissertation/Thesis committee for Laurel Rachmeier)
Chamberlin, Phil (Member, Dissertation Committee for Dongwon Lee)
Eparvier, Francis (Advisor to Rachel Hock, Phil Chamberlin and Ed Thieman)
Ergun, Robert (Member of Thesis Committee for Naresh Sen; Thesis Advisor to Daniel Main, Chris Cully, Research Advisor to David Malispina)
Esposito, Larry (Advisor to Bonnie Meinke; Member of Dissertation Committee for John Weiss, Todd Bradley, Colin Mitchell, and Dmitry Veras)
Fontenla, Juan (Thesis Advisor for Samik Dasgupta)
Horanyi, Mihaly (Colin Mitchell, Amyx Keegan, Daniel Main, Naresh Sen, David James, Jennifer Gannon, Samik Dasgupta, Nathan Farr, Manny Presicci, and Andrew Poppe)
Jakosky, Bruce (Dissertation advisor for Lindsey Link (Geol) and Nate Murphy (APS))
Jakosky, Bruce (Member, Dissertation Committee for Hannah Sizemore, Damnhait Gleeson, James Roberts, Dominic Papineaux, and Nathaniel Putzig)
Li, Xinlin (Dissertation Advisor for Edward Burin Des Rozier, Wenlong Liu, Weichao Tu, and Drew Turner)
Li, Xinlin (Thesis Committee for Chris Cully)
Li, Xinlin (Academic Advisor for Dongwon Lee)
Pilewski, Peter (Advisor for Odele Coddington, Bruce Kindel, Patrick McBride, and Brian Hinde)
Randall, Cora (Advisor for Cynthia Singleton, Susanne Benze, and Chester Rubbo)
Rast, Mark (Advisor for Serena Criscuoli and Dewey Anderson)
Stewart, Glen (Advisor for Stuart Robbins; Thesis committee for Dimitri Veras)
Toon, Owen B. (Advisor for Kevin McGouldrick, Lansing Madry, Kaj Williams, Attila Elteto, Rebecca Matchuk, Charles Bardeen, Tianyi Fan, Lin Su, Jason, English, Richard Urata, Melissa Trainer, and Courtney Mashburn)
Woods, Tom (Advisor for Phil Chamberlin, Ed Thiemann, Dongwon Lee and Rachel Hock)

Editor or Editorial Board member

Eparvier, Francis (Guest Editor for Advances in Space Research)
Esposito, Larry (AGU Monograph, Advances in Space Research)
Jakosky, Bruce (Astrobiology and International Journal of Astrobiology)

Electronic Geophysical Year (eGY)

Baker, Daniel (Chair, Steering Committee)
CoBabe-Ammann, Emily (EPO Lead)
CoBabe-Ammann, Emily (Member, Executive Committee)

High Altitude Observatory (HAO)

Rast, Mark (Instrument Advisory Group)

Huntsville Conference on Space Physics

Baker, Daniel (Member, Organizing Committee)

Independent Study Groups Supervised

Toon, Owen B. (Weekly group meeting on clouds and aerosols)

International Association for Geomagnetism and Aeronomy (IAGA)

Baker, Daniel (Member IAGA Bureau)
Baker, Daniel (Chair, IGY Task Force)
CoBabe-Ammann, Emily (EPO Lead)

International Heliophysical Year (IHY)

Baker, Daniel (Member, Planning Group)

International Space Science Institute

Baker, Daniel (Member, Working Group)

International Space Weather Conference

Baker, Daniel (Member, Organizing Committee)

International Union for Geodesy and Geophysics (IUGG)

Baker, Daniel (Member IGY+50 Advisory Committee)

Laboratory for Atmospheric and Space Physics (LASP)

Business Committee

Baker, Dan (Chair)
Himes, Caroline
Jakosky, Bruce
McGrath, Mike
Pospel, Bill
Woods, Tom

Computer Services Advisory Committee (CSAC)

Colwell, Josh (Chair)
Bardeen, Charles
Delamere, Peter

Elkington, Scot
Himes, Caroline
Kopp, Greg
Lankton, Mark
Lewis, Ryan
Mills, Mike
Pankratz, Chris
Schut, Gary

Education and Public Outreach Advisory Committee

Eparvier, Frank (Chair)
Avallone, Linnea
Bagenal, Fran
CoBabe-Ammann, Emily
Himes, Caroline
Li, Xinlin
Randall, Cora
Reed, Heather
Stewart, Glen
Stewart, Ian

Executive Committee

Baker, Dan (Chair)
CoBabe-Ammann, Emily
Colwell, Josh
Ergun, Bob
Esposito, Larry
Grover, Bonnie Kae
Himes, Caroline
Horanyi, Mihaly
Jakosky, Bruce
Li, Xinlin
McClintock, Bill
McGrath, Mike
Possel, Bill
Randall, Cora
Stewart, Ian
Woods, Tom

LASP Seminar Series Committee

Chamberlin, Phil (Co-chair)
Sternovsky, Zoltan (Co-chair)

Library Committee

Snow, Marty (Chair)
Eparvier, Frank
George, Vanessa
Horanyi, Mihaly
Knapp, Barry
Rohner, Hans
Simmons, Karen
Wullschleger, Ed

Proposal Development Committee

Woods, Tom (Chair)
Sparn, Tom (Co-chair)
Anfinson, Mike
Baker, Dan
CoBabe-Ammann, Emily

Drake, Ginger
Ergun, Bob
George, Vanessa
Himes, Caroline
Jakosky, Bruce
Kopp, Greg
McClintock, Bill
McGilvray, Beth
McGrath, Mike
Pankratz, Chris
Perez de Tejada, Ann
Possel, Bill
Reed, Heather
Richard, Erik
Ryan, Sean
Tate, Gail
Westfall, Jim

LASP Sponsored Visitor Committee

Harder, Jerry (chair)
CoBabe-Amman, Emily
Elkington, Scot
Grover, Bonnie Kae
McClintock, Bill
Rast, Mark
Rusch, Dave

Other LASP Faculty Activities

Avallone, Linnea (Member, Promotion Committee for Aimee Merkel)
Avallone, Linnea (Member, Reappointment committee for Cora Randall)
Chamberlin, Phil (Member, Tour Guide Committee)
Eparvier, Francis (Chair, EPS Advisory Committee)
Eparvier, Francis (Member, CoBabe-Ammann Promotion Committee)
Eparvier, Francis (Contributor, LASP Rocket EPO video)
Eparvier, Francis (Supporter, LASP's 29th Street Rocket EPO Effort)
Eparvier, Francis (Science Team Liaison to EVE EPO program)
Esposito, Larry (Member, Merit Evaluation Committee)
Esposito, Larry (Member, Self Study Committee)
Esposito, Larry (Supervisor of Planetary Rings Independent study Group)
Jakosky, Bruce (Associate Director for Science)
Jakosky, Bruce (Member, Planetary Sciences faculty search committee)
Li, Xinlin (Member AES/LASP Cooperation Committee)
Li, Xinlin (Member, Graduate School China initiative)
Li, Xinlin (Member, LASP/AERO initiative for Hands-on Education and Research)
Li, Xinlin (Member, Promotion committee for T.E. Sarris)
Pilewski, Peter (ATOC Faculty representative, CU NRC Research Doctoral Study Committee)
Pilewski, Peter (Chair, Laboratory and Facilities Committee)
Pilewski, Peter (Member, Cora Randall reappointment committee)
Randall, Cora (Atmospheric science contribution to Capacity and Competency Document)
Randall, Cora (Lead diversity section of Self-Study)
Rast, Mark (Joint Chair, Colloquium Committee)
Rast, Mark (Curriculum and undergraduate majors Committee)
Rast, Mark (Newsletter Committee)
Rast, Mark (Ad Hoc graduate curriculum committee)
Woods, Tom (Associate Director for Technical Divisions)
Woods, Tom (Manager, Solar Influence Group (SIG))
Woods, Tom (Member, MO&DS Division Director Search Committee)
Woods, Tom (Member, IT Manager Search Committee)

Lunar and Planetary Institute (LPI)

Jakosky, Bruce (Member, Science Council)

MESSENGER/Mercury Science Working Team

Baker, Daniel (Member)

National Academy of Sciences (NAS)

Baker, Daniel (Member, Space Studies Board)
Baker, Daniel (Chair, Committee on Solar and Space Physics)
Esposito, Larry (Member, Committee to assess solar system exploration)

National Aeronautics and Space Administration (NASA)

Bagenal, Frances (Chair, Outer Planets Assessment Group)
Bagenal, Frances (Vice Chair, Planetary Science subcommittee of the NASA Advisory Council)
Baker, Daniel (Advisor, Sun-Earth Connections Roadmap Committee)
Baker, Daniel (Member, Science Team, Magnetospheric Multiscale Mission)
CoBabe-Ammann, Emily (Co-Chair, NASA Science Definition Team on Student Collaboration)
Eparvier, Francis (Member, LSW 2007 Workshop Science Organizing Committee)
Ergun, Robert (Member, Science Definition Advisory Panel – Solar Probe Mission Electric field Experiment)
Esposito, Larry (Member, Science Organizing Committee for the International Probe Workshop)
Jakosky, Bruce (Member, Mars Advanced Planning Group)
Jakosky, Bruce (Member, Mars Exploration Program Analysis Group (MEPAG))
Rast, Mark (Member, Living with a Star program steering committee)
Stewart, Glen (Member NASA Outer Planets Research program proposal review panel)
Toon, O.B. (Project scientist for NASA Tropical clouds mission)

National Center for Atmospheric Research (NCAR)

Avallone, Linnea (Member, Search committee (Atmospheric Chemistry Division))
Avallone, Linnea (Member, Facilities Assessment Study Committee)
Rast, Mark (Procurement Scientific Advisory Panel)

National Oceanic and Atmospheric Administration (NOAA)

Baker, Daniel (Member, External Strategic Planning Group)

National Research Council (NRC)

Jakosky, Bruce (Co-Chair, Committee on Origin and Evolution of Life (COEL))
Jakosky, Bruce (Chair, Committee on Mars Astrobiology Strategy)
Jakosky, Bruce (Member, Ad Hoc Panel on Assessment of the NASA Science Program, Space Studies Board)
Pilewski, Peter (Member Space Studies Board, Committee on Large Optical Systems in Space)

National Science Foundation (NSF)

Ergun, Robert (Member, NSF Global electrodynamic modeling steering committee)

Naval Research Laboratory (NRL)

Pilewski, Peter (Member, Review Panel for the Marine Meteorology Division)

Pale Blue Dot III

CoBabe-Ammann, Emily (Lead, Media Organizing Committee)

Planetary Society

Jakosky, Bruce (Member, Advisory Board)

Polar Science Working Team

Baker, Daniel (Member)

Reviewer of Manuscripts, Grants, or Creative Work

Avallone, Linnea (Reviewed manuscripts for Geophysical Research Letters, Atmospheric Environment, Journal of Atmospheric and Oceanic Technology and proposals for NSF Office of Polar Programs)

Eparvier, Francis (Manuscripts for Advances in Space Research; Proposals for NASA Solar and Heliospheric Physics Review Board)

Ergun, Robert (Review Panel for NASA Geospace SR&T and Low-cost access to Space and NSF GEM))

Esposito, Larry (Reviewed manuscripts for Science, Icarus, GRL and proposals for NASA and NSF)

Gosling, John (Reviewed manuscripts for Space Science Reviews, J. Geophys. Res., Geophys. Res. Lett., Solar Physics, and Astrophysical Journal.

Horanyi, Mihaly (JRG-Space, Physics of Plasmas, Nature, Icarus, NSF, DOE, and NASA)

Jakosky, Bruce (Reviewed proposals for NASA Mars Reconnaissance Orbiter participating science program)

Jakosky, Bruce (Manuscripts for Icarus, Space Science Reviews, and an upcoming book on Mars' surface)

Li, Xinlin (Proposals for NASA, NSF, manuscripts for J. Geophys. Res., Geophys. Res. Letters, J. of Space Weather, Advanced Geophysics, and Space Weather).

Pilewski, Peter (Reviewer of manuscripts for J. Atmospheric and Oceanic Technology, Geophysical Research Letters, J. of Atmospheric and Solar-Terrestrial Physics, J. of Geophysical Research, Optical Engineering, J. of Atmospheric Sciences)

Randall, Cora (Manuscripts for Annales Geophysicae, Geophysical Res. Letters, J. of Geophysical Res., Advances in Space Research; Proposals for NSF)

Rast, Mark (Manuscripts for J. Geophys. Res. – Space Physics, Astronomy and Astrophysics, The Astrophysical Journal, Proposals for NASA)

Stewart, Glen (Proposals for NASA)

Woods, Tom (Reviewer for Geophys. Res. Lett, and Advances in Space Research)

Scientific Committee on Solar-Terrestrial Physics (SCOSTEP)

Eparvier, Francis (Member, CAWSES Working Group)

Solar Anomalous and Magnetospheric Particle Explorer (SAMPEX)

Baker, Daniel (Member, Science Working Team)

University of Colorado

Avallone, Linnea (Member, Committee to address diversity issues in the sciences)

Avallone, Linnea (Member, Energy Education Committee)

Avallone, Linnea (Reviewer of proposals for Packard Fellowships)

Avallone, Linnea (Member, Graduate Part-Time Instructor Teaching Award Review Committee)

Avallone, Linnea (Member, Academic Administrator for Student Information System Replacement Project)

Ergun, Robert (Chair, APAS Exams Committee)

Esposito, Larry (Chair, BFA Compensation and Benefits Committee)

Himes, Caroline (Member, Boulder Faculty Assembly Budget and Finance Committee)

Horanyi, Mihaly (Member, Boulder Faculty Assembly Library Committee)

Horanyi, Mihaly (Associate Chair for Physics Department Graduate Studies)

Li, Xinlin (AERO department representative to planetary graduate student admission)

Li, Xinlin (Member, AERO graduate student recruit and curricular committee)

Pilewski, Peter (Member, Masters or Ph.D. Examination qualifying committee)

Pilewski, Peter (Member, Boulder Faculty Assembly, Academic Affairs Committee)

Randall, Cora (Proposal participant: Training Graduate Students in the Responsible Conduct of Research)

University of Michigan

Baker, Daniel (Member, Space Physics Research Lab Review Committee)

University Space Research Association (USRA)

Baker, Daniel (Representative, Council of Institutes)

Utah State University

Pilewski, Peter (Member, Steering Committee on Achieving Satellite Instrument Calibration for Climate Change (ASIC3))

FACULTY HONORS/AWARDS

American Association for the Advancement of Science (AAAS)

Baker, Daniel (Elected Fellow)

European Space Agency (ESA)

Li, Xinlin (European Space Agency Award for outstanding contribution made to Cluster's exploration of Geospace)

National Aeronautics and Space Administration (NASA)

Eparvier, F.G., (Recipient, GSFC UARS Team Group Achievement Award)

Li, Xinlin (Project Recognition for outstanding contribution to the Science Support)

National Science Foundation (NSF)

Avallone, Linnea (Recipient of Antarctic Service Medal 2002-2004)

Courses Taught by LASP Faculty

Name	Course #	Description
Bagenal, Frances	ASTR 4010	Senior practicum
Bagenal, Frances	ASTR 1010	Introductory Astronomy with labs
Baker, Daniel	ASTR 4800	Space Science – Practice and Policy
CoBabe-Ammann, Emily		IDL course at LASP
Ergun, Robert	ASTR 2800	Introduction to Scientific Data Analysis and Computer
Esposito, Larry	ASTR 3300	Extra-Terrestrial Life
Esposito, Larry	ASTR 3750	Planets, Moons, and Rings
Horanyi, Mihaly	PHYS 3210	Mechanics and its Mathematical Methods II
Jakosky, Bruce	GEOL 5810/ASTR 5810/ATOC 5810	Planetary Atmospheres
Jakosky, Bruce	GEOL 5835	Planetary Sciences seminar
Pilewski, Peter	ATOC 5235	Intro to atmospheric radiative transfer and remote sensing
Randall, Cora	ATOC 4800-5000	Policy Implications of Climate Controversies.
Randall, Cora	ATOC 1050	Weather and the Atmosphere
Randall, Cora	ATOC 6020	Seminar in Atmospheric and Oceanic Sciences
Rast, Mark	ASTR 5540	Mathematical methods

Stewart, Glen	ASTR 1110	Introduction to Astronomy – The Solar System
Toon, Owen B.	ATOC 6020	Seminar on aerosols
Woods, Tom	ATOC 1050	Lecture: Solar influence on climate
Woods, Tom	ATOC 1050	Lecture: Solar influence on climate
Xinlin Li	ASEN 4010	Introduction to Space Dynamics
Xinlin Li	ASEN 5050	Spaceflight Dynamics

Colloquia and Informal Talks Spring 2006

Oleg Abramov: Impact-induced Hydrothermal Activity on Early Earth and Mars

Tayeb Aiouaz, HAO, Toward a coherent view of the magnetic structures and plasma properties throughout the solar atmosphere

David Anderson, NOAA, Interplanetary Electric Fields and Their Relationship to Low-Latitude Electric Fields Under Quiet and Disturbed Conditions

Linnea Avallone, CU/LASP, Tropospheric Ozone Depletion Events: What We've Learned in the Past Decade

Mary Bolton, CU/LASP, AIM

Marjorie Chan, U. of Utah, Red Rock and Red Planet Diagenesis: Comparisons of Earth and Mars Concretions

Seth Claudepierre, CU/LASP, Parametric Studies of ULF Wave Power in the Earth's Magnetosphere

Randy Davis, CU/LASP, Remoter Control: A History of Mission Operations at LASP

Edward Burin Des Roziers, CU/LASP, Statistical Study of the Correlation Between Energetic Plasmasheet Electrons and the Solar Wind

Attila Elteto, CU/LASP, Modeling Meteor Ablation in the Venesian Atmosphere

Larry Esposito, CU/LASP, Planetary Science at LASP

Marilyn Fogel, Carnegie Inst. of Washington, Geophysical Lab., Mars Analogue Studies in Cold Environments

Michael Gehmeyr, (LASP/SEC), The First CISM Forecast Models

Nicholas Gross, Boston University, Co-Director of Education for CISM, The CISM Education Program

Odelle Hofmann, CU/ATOC, The MILAGRO Field Campaign and Airborne Measurements of the Radiative Impact of Pollution Aerosols

Bruce Jakosky, CU/LASP, Videotape of meeting with NASA AA for Science

David Jewitt, Inst. for Astronomy, U. Hawaii, The New Outer Solar System

Andrew Jones, University of Southern California, EUV Solar Spectrometry Using Transmission Gratings

Shri Kanekal, CU/LASP, The Radiation Belts as an Unbounded Dynamical System: A Theoretical Discourse on Hamiltonian Methods in Relativistic Electron Dynamics

Hannu Koskinen, University of Helsinki, Geoeffectivity of Coronal Mass Ejections

Markus Landgraf, European Space Agency, Space Science and Exploration made in Europe

Tom McCollom, CU Center for Astrobiology/LASP, The Origin of Sulfate-rich Bedrock at Meridiani Planum on Mars: Sedimentary Evaporite, Impact, or Volcanic?

Lansing Madry, CU/PAOS, Sea Salt Aerosol Source Function Review and Model Results

Daniel Main, CU/LASP, Double Layers, Ion Holes, and Other Non-Linear Structures in the Auroral Upward Current Region

Ward (Chip) B. Manchester, Univ. of Michigan, The Source of Magnetic Shear that Drives Flares and Coronal Mass Ejections

Naomi Maruyama, NOAA, Modeling Storm-Time Electric Field in the Ionosphere

Tobin Munsat, CU Physics, A Laboratory Experiment for Turbulence, Magnetic Reconnection, and Confinement Studies

Bob Pappalardo, CU/LASP, The Hidden Ocean of Europa

John L. Phillips, Astronaut, NASA Johnson Space Center, The International Space Station: Another Laboratory for Atmospheric and Space Physics?

Roger Phillips, Washington Univ., St. Louis, MO, Sounding Radars at Mars

Tuija I. Pulkkinen, Los Alamos National Laboratory, Storms in the Inner Magnetosphere: Magnetic configuration and Ring Current Acceleration

Cora Randall, CU/ PAOS & LASP, Topic: Sun-Earth Coupling by Energetic Particles

Licia Ray, CU/LASP, The Interaction of the Atmosphere of Enceladus With Saturn's Plasma

Sean Raymond, CU/LASP, The Origin of Planetary Impactors in the Inner Solar System

Karen Remick, CU/LASP, Statistical Modeling of Storm-Level Kp Occurrences

Scott Sandford, NASA Ames Research Center, The Stardust Discovery Mission - Returning Unique Samples of Early Solar System Organics

Hanna Sizemore, CU/LASP, Detecting Seasonality on Terrestrial Extra-Solar Planets?

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Laila Andersson, CU/LASP, GOLD – Accepted for Phase-A study in response to the Radiation Belt Storm Probes Investigation and Geospace-Related Missions of Opportunity

Daniel Baker, CU/LASP, Space weather and its effects on human technology

Gerd Baumgarten, Univ. of Rostock, Germany, Noctiluscent Clouds Above ALOMAR: Highly Resolved Particle Properties in the Context of Multiannual Observations

John Bally, CU/APS, Recent Results in Star and Planet Formation

Stan Solomon, UCAR, Who Cares About Flares?

Tom Sparn, CU/LASP, Glory/TIM

Alan Stern, SwRI, New Horizons: Reconnoitering Pluto and the Kuiper Belt

Glen Stewart, CU/LASP, Can Large Planetesimals Form in a Turbulent Solar Nebula?

Owen Toon, CU/LASP & PAOS, Consequences of Regional Scale Nuclear Conflicts and Acts of Individual Nuclear Terrorism

Lesley Warren, McMaster Univ., Canada, Biologically induced geochemical fingerprints in acid mine drainage: expanding the astrobiological biosignature probe set

Jeffrey Weiss, CU/Department of Atmospheric and Oceanic Sciences, Coherent Structures in Geophysical Turbulence

Tom Woods, CU/LASP, Overview of LASP's Solar Influence Group

S. Pete Worden, Univ. of Arizona, Prospects for Optical Astronomy from the Moon

William Bottke, SwRI, Dust showers in the late Miocene and Eocene: Produced by asteroid breakups?

John Cassano, CU/ATOC Assistant Professor and CIRES, Self-Organizing Maps: A New Tool for Weather and Climate Analysis

Phil Chamberlin, CU/LASP, Up in 100 Seconds: The Past, Present and Future of Sounding Rockets at LASP

Steve Chappell, Haughton-Mars Project 2006: Overview of a Human Exploration Contingency Simulation

Josh Colwell, CU/LASP, and Richard Dissly, Ball Aerospace, What's New (and Old) on the Moon: Lunar Dust Dynamics and an Update on NASA's Lunar Exploration Architecture Planning

- Josh Colwell**, CU/LASP, Running Rings around Saturn
- Darren Croton, UC Berkeley, Galaxy Formation: Why the Devil Really is in the Detail
- Brad Dalton, NASA Ames Research Center, The surface composition of Europa
- Peter Delamere**, CU/LASP, Transport and acceleration of plasma in the magnetospheres of Earth and Jupiter and expectations for Saturn
- Robert Ergun**, CU/LASP & APS, The Role of Plasma Waves in Mars' Atmospheric Loss
- Juan Fontenla**, CU/LASP, The Solar Photosphere Elemental Abundances, FIP Separation, and Related Topics
- Michael Gehmeyr**, SEC/LASP, The Making of the CISM Ap/ap Forecast Model
- Peter Gilman, HAO, A 42-year quest to understand the solar dynamo and predict solar cycles
- J.T. Gosling**, CU/LASP, Magnetic reconnection in the solar wind
- Ken Griest**, CU/LASP, Planning & Scheduling: A Systematic Approach to Spacecraft Operations
- Tristan Guillot, Observ. de la Cote d'Azur, Clues on Giant Planets' formation from their compositions
- Fabian Heitsch, U. Michigan, Flows, Filaments and Fragmentation: Toward a Theory of Dynamical Star Formation
- Seth Hornstein, UCLA, A Keck Study of Infrared Emission Associated with the Supermassive Black Hole at the Galactic Center
- Joo Hwang**, CU/LASP, Structure, Evolution, and Boundary Conditions for Downward Current Region Potential Drops
- Bruce Jakosky**, CU/LASP, A Defining Moment in Planetary Science -- is Pluto a Planet?
- Bruce Jakosky**, CU/LASP, MAVEN proposal
- Raymond Jeanloz, UC/Berkeley, From Earth to Stars: Toward Gigabar Pressures and Kilovolt Chemistry
- Geonhwa Jee, HAO/NCAR, On the Ionospheric Data Assimilation Initialization of a Coupled Thermosphere-Ionosphere Model
- Jose-Luis Jimenez, CU/CIRES, Insights into Aerosol Sources and Processes from Real-Time High-Resolution Measurements
- Lloyd Knox, University of California at Davis, Future Probes of Cosmic Acceleration
- Hiroshi Kobayashi, Nagoya University, A Ring Formation due to ice Sublimation in Circumstellar Dust-Debris Disks
- Xinlin Li**, CU/LASP, The relation between plasmasphere and outer radiation belt electrons
- Jialin Lin, NOAA/ESRL and CIRES Climate Diagnostic Center, Understanding the Tropical Biases in GCMs: Double-ITCZ, ENSO, MJO and Convectively Coupled Equatorial Waves
- Robert McPherron, IGPP/UCLA, Solar cycle and seasonal dependence of relativistic electrons at synchronous orbit
- Kevin Marvel, AAS, Astronomy Policy: The Current Situation and How to Change It
- Tom Megeath, Univ. of Toledo, Star formation in the nearest kiloparsec: The view from Spitzer
- Robert Meier, George Mason Univ., Remote sensing of the thermospheric composition and temperature with TIMED/GUVI
- Mark Miesch, NCAR, Thunderous Turning Within: A Look into the Turbulent Dynamics of the Solar Interior
- Stephen Mojzsis, CU/Geol, Trace Elements in Hadean Minerals: They Are What They Ate
- Jon Nichols, Boston University, Solar Wind-Magnetosphere-Ionosphere Coupling at Jupiter
- Eldar Z. Noe Dobrea, Cornell, Outcrops of the Chaotic Terrain Mineralogical Constraints, Morphology, and Stratigraphic Relationships
- Keiji Ohtsuki**, CU/LASP, Karin Cluster Formation by Asteroid Impact
- Scott Palo, AeroEngr, Meteors, meteor radar and mesospheric winds
- Derek Posselt, Department of Atmospheric Science, CSU, Non-Gaussian Model Error and Parameter Estimation for Atmospheric

- Data Assimilation and Retrieval Applications
- Manny Presicci**, CU/LASP & Physics, Can The Cross-Correlation for the (SHO) Stochastic Harmonic Oscillator model the Electron Flux Impulse Response?
- Cora Randall**, CU/LASP & ATOC, Impacts of Energetic Particle Precipitation on the Stratosphere
- Scott Ransom, NRAO, A Millisecond Pulsar (and Basic Physics) Jackpot with the GBT
- Sean Raymond**, CU/LASP and Avi Mandell, NASA/GSFC, Formation of Habitable Planetary Systems: Are We Normal?
- Josh Rigler, HAO/NCAR, Multivariate statistical models of magnetospheric dynamic
- Bob Rosner, U. Chicago, Astrophysical Flames, Burning in my Office ...
- David W. Rusch**, CU/LASP, The Study of the Earth's Atmosphere at LASP: From the Troposphere to the Thermosphere and Back Again
- Theodore Sarris**, LASP/Demokritos University of Thrace, Multipoint Observations of a Multi-day Pc5 Pulsation
- Naresh Sen, CU/Physics, Double Layers in the Auroral Downward Current Region: Electron Holes, Waves and Ion Heating
- Gary Schut**, CU/LASP IT Manager, Gary will talk about some of the recent problems, his plans for IT and get input from the scientists
- Amy Solomon, NOAA, The Impact of Latent Heat Release in Extra-tropical Cyclones on Polar Climate
- Sabine Stanley, University of Toronto, A Study of Planetary Magnetic Field Morphologies
- Gary Thomas**, CU/LASP, Mesospheric clouds: I've looked at clouds from both sides now
- Brian Toon**, CU/ATOC & LASP, Tropical Composition, Cloud and Climate Coupling (TC4) Mission
- Veronica Vaida, ATOC/Chemistry and Biochemistry, Sun Light Initiated Atmospheric Chemistry
- Dimitri Veras, CU/APS, On the orbits of the satellites of the Pluto-Charon system
- Daniel Wang, U. Mass/Amherst, The Hot Gaseous Halos of Disk Galaxies
- J. Watzin, NASA GSFC, Thoughts on Revitalizing Small-Sat Based Missions
- John Weiss, CICLOPS/SSI, Recent Ring-Related Results from Cassini ISS
- Ellen Zweibel, Univ. of Wisconsin, The primordial generation of magnetic fields

Publications

- Aiouaz, T., and M.P. Rast, Expansion of the supergranular magnetic network through the solar atmosphere, Ap.J., 647, L 183, 2006.
- Andersson, L. and R.E. Ergun, Acceleration of Anti-Earthward Electron Fluxes in the Auroral Region, J. Geophys. Res., 111, A07203, 10.1029/2005JA011261, 2006.
- Bagenal, F., Saturn's mixed magnetosphere, Nature, 433, 695-6, 2006.
- Bailey, S., T. Woods, E. Rodgers, S. Solomon, and F. Eparvier, Observations of the solar soft X-ray irradiance by the Student Nitric Oxide Explorer (SNOE), Adv. Space Res., 37, doi: 10.1016/j.asr.2005.07.039, 209-218, 2006.
- Baker, D.N., et al., National Research Council, Space Radiation Hazards and the Vision for Space Exploration, Report of a Workshop, National Academies Press, 2006.
- Baker, D.N., Exploration without explorers?, Space News, 24 April 2006.
- Baker, D.N., M.J. Wiltberger, R.S. Weigel, and S.R. Elkington, Present status and future challenges of modeling the Sun-Earth

- end-to-end system, J. Atmos. and Solar-Terr. Physics, doi: 10.1016/j.jastp.2006.
- Baker, D.N., The true cost of CU Athletics is more than dollars and cents, Boulder Daily Camera, Guest opinion column, 11 April 2006.
- Barth, E.L., and O.B. Toon, Methane, ethane, and mixed clouds in Titan's atmosphere; Properties derived from microphysical modeling, Icarus, 182, 230-250, 2006.
- Baumgarten, G. and G.E. Thomas, The Importance of Ice Particle Shape on UV Measurements of Polar Mesospheric Clouds: SBUV/2 Observations, J. Solar Atm. Solar Terr. Res., 68, 78-84, 2006.
- Blake, J.B. and X. Li, et al., Global observations of energetic electrons around the time of a substorm on 27 August 2001, J. Geophys. Res., 110, A06214, doi:10.1029/2004JA010971, 2006.
- Burin Des Roziers, E., and X. Li, Specification of >2 MeV geosynchronous electrons based on solar wind measurements, Space Weather, 4, S06007, doi: 10.1029/2005SW000177, 2006.
- Chamberlin, P. C., T. N. Woods, and F. G. Eparvier, Flare Irradiance Spectral Model (FISM) use for Space Weather Applications, ILWS proceedings, Goa, India, Feb 2006.
- Chamberlin, P. C., T. N. Woods, and F. G. Eparvier, Rocket Extreme ultraviolet Grating Spectrometer (EGS): Calibrations and results of the solar irradiance on February 8, 2002, Opt. Eng., 45(06), 063605, 2006.
- Chaston, C. C., V. Genot, J. W. Bonnell, C. W. Carlson, J. P. McFadden, R. E. Ergun, R. J. Strangeway, E. J. Lund, K. J. Hwang, Ionospheric erosion by Alfvén waves, J. Geophys. Res. 111, A03206, 2006.
- Chojnacki, M., B.M. Jakosky, B.M. Hynek, Surficial Properties of Landslides and Surrounding Units in Ophir Chasma, Mars, J. Geophys. Res., 111, E04005, 10.1029/2005JE002601, 2006.
- Colwell, J.E., L.W. Esposito, and M. Sremčević, Self-Gravity Wakes in Saturn's A Ring Measured by Stellar Occultations from Cassini, Geophys. Res. Lett., 33, L07201, 10.1029/2005GL025163, 2006.
- Davis, M. S., T. D. Phan, J. T. Gosling, and R. M. Skoug, Detection of Oppositely Directed Reconnection Jets in a Solar Wind Current Sheet, Geophys. Res. Lett., 33, L19102, doi:10.1029/2006GL026735, 2006.
- De Koning, C. A., J. T. Gosling, R. M. Skoug, and J. T. Steinberg, Widths of Suprathermal Pitch-Angle Distributions During Solar Electron Bursts: ACE Observations, J. Geophys. Res., 111, A04101, doi:10.1029/2005JA011326, 2006.
- De Koning, C.A., J. T. Gosling, R. M. Skoug, J. T. Steinberg, Energy Dependence of Electron Pitch-Angle Distribution Widths in Solar Bursts, J. Geophys. Res., 112, A04101, doi:10.1029/2006JA011971, 2006.
- DeLand, M. T., E.P. Shettle, G E. Thomas, and J.J. Olivero, A Quarter-Century of Satellite Polar Mesospheric Cloud Observations, J. Solar Atm. Solar Terr. Res., 68, 9-29, 2006.
- DeLand, M.T. .E.P. Shettle, G.E. Thomas, and J.J. Olivero, Spectral Measurements of PMCs from SBUV/2 Instruments, J. Solar Atm. Solar Terr. Res., 68,65-77, 2006.
- Elkington, S.R., A Review of ULF Interactions With Radiation Belt Electrons AGU, Geophysical Monograph Series, 169, 177-193, 10.1029/169GM12, 2006.
- Ergun, R. E., Y.-J. Su, L. Andersson, F. Bagenal, P. A. Delemere, R. L. Lysak, and R. J. Strangeway, S bursts and the Jupiter ionospheric Alfvén resonator, J. Geophys. Res. 111, A06212, 2006.
- Ergun, R.E., L. Andersson, W.K. Peterson, D. Brain, G.T. Delory, D.L. Mitchell, R.P. Lin, and A.W. Yau, The role of Plasma Waves in Mars' Atmospheric Loss, Geophys. Res. Lett., 33, L14103, 10.1029/2006GL025785, 2006.
- Eriksson, S., G. Provan, F. J. Rich, M. Lester, S. E. Milan, S. Massetti, J. T. Gosling, M. W. Dunlop, and H. Reme, Electrodynamics of a Split-Transpolar Aurora, J. Geo-

- phys. Res., 111, A11319, doi:10.1029/2006JA011976, 2006.
- Esposito, Larry W., Planetary Rings, Cambridge Press, 2006.
- Feingold, G., P. Pilewski, et al., Aerosol indirect effect studies at Southern Great Plains during the May 2003 intensive operations period: Optimal estimation of drop-size from multiple instrument, J. Geophys. Res., 111, D05S14, doi:10.1029/2004JD005648, 2006.
- Fontenla, J.M., E. Avrett, G. Thuillier, and J. Harder, Semiempirical Models of the Solar Atmosphere. I. The Quiet- and Active Sun Photosphere at Moderate Resolution, The Astrophysical Journal, 639, 441-458, 2006.
- Gamblin, B., O.B. Toon, et al., Nitric acid condensation of ice: 1. Non-HNO₃ constituent of NO_y condensing on low temperature on upper tropospheric cirrus cloud particles, J. Geophys. Res., 111, D21203, 2006.
- Gannon, J.L., X. Li, and M. Temerin, Parametric study of shock-induced transport and energization of relativistic electrons in the magnetosphere, J. Geophys. Res., 110, A12206, doi:10.1029/2004JA010679, 2006.
- Gosling, J. T., D. J. McComas, R. M. Skoug, and C. W. Smith, Magnetic Reconnection at the Heliospheric Current Sheet and the Formation of Closed Magnetic Field Lines in the Solar Wind, Geophys. Res. Lett., 33, L17102, doi:10.1029/2006GL027188, 2006.
- Gosling, J. T., S. Eriksson, and R. Schwenn, Petschek-Type Magnetic Reconnection Exhausts in the Solar Wind Well Inside 1 AU: Helios, J. Geophys. Res., 111, A10102, doi:10.1029/2006JA011863, 2006.
- Gosling, J.T., S. Eriksson, R.M. Skoug, D.J. McComas, and R.J. Forsyth, Petschek-Type Reconnection Exhausts in the Solar Wind Well Beyond 1AU: ULYSSES, The Astrophysical Journal, 644, 613-621, 2006.
- Gustin, J., W.H. Cowley, J.-C. Gérard, G.R. Gladstone, D. Grodent, and J.T. Clarke, Characteristics of Jovian Morning Bright FUV Aurora from Hubble Space Telescope/Space Telescope Imaging Spectrograph Imaging and Spectral Observations, J. Geophys. Res., 111, A09220, 10.1029/2006JA011730, 2006.
- Hansen, C.J., L. Esposito, A.I.F. Stewart, J. Colwell, A. Hendrix, W. Pryor, D. She-mansky, R. West, Cassini UltraViolet imaging Spectrometer (UVIS) Investigation of Enceladus' Water Vapor Plume, Science, 311, 1422-1425, 2006.
- Horanyi, M., C.J. Mitchell, Saturn's rings: a dusty plasma laboratory, Journal of Plasma and Fusion Research 82, #2, 98-102, 2006.
- Hwang, K.-J., K.A. Lynch, C.W. Carlson, J.W. Bonnell, and W.J. Peria, Fast Auroral Snapshot Observations of Perpendicular DC Electric Field Structures in Downward Current Regions: Implications, J. Geophys. Res., 111, A09206, 10.1029/2005JA011472, 2006.
- Iwasaki, K. and K. Ohtsuki, Orbital Stability of Protoplanetary Systems in Nebular Gas and Implications for Terrestrial Planet Formation, The Astrophysical Journal, 131, 3093-3099, 2006.
- Jakosky, B.M., and J. Bell, Science and exploration must work together in NASA, Space News, 20 Nov. 2006.
- Jakosky, B.M., B.M. Hynek, S.M. Pelkey, M.T. Mellon, S. Martinez-Alonso, N.E. Putzig, N. Murphy, and P.R. Christensen, Thermophysical Properties of the MER and Beagle II Landing Site Regions on Mars, J. Geophys. Res., 111, E08008, 10.1029/2004JE002320, 2006.
- Jakosky, B.M., Science, Society, and the Search for Life in the Universe, Univ. of Arizona Press, Tucson, 2006.
- Jakosky, Bruce, Is anybody else out there?, Chronicle of Higher education, B14-B15, 6 Oct, 2006.
- Kalnajs, L.E., and L.M. Avallone, Frost flower influence on springtime boundary-layer ozone depletion events and atmospheric bromine levels, Geophys. Res. Lett., 33, doi: 10.1029/2006/GL025809, 2006.

- Kempf, S.; Beckmann, U.; Srama, R.; Horanyi, M.; Auer, S.; Grun, E.; The electrostatic potential of E ring particles; Planetary and Space Science 54, Issue 9-10, p. 999-1006, 2006.
- Krauss, C.E., M. Horanyi, S. Robertson, Modeling the Formation of Electrostatic Discharges on Mars, J. Geophys. Res. 111, Issue E2, doi:10.1029/2004JE002313, 2006.
- Kruger, H. and Horanyi, M., et al., Five years of Ulysses dust data: 2000-2004; Planetary and Space Science 54, Issue 9-10, p. 932-956, 2006.
- Kruger, H. and Horanyi, M., et al., Galileo dust data from the Jovian system: 1997-1999; Planetary and Space Science 54, Issue 9-10, p. 879-910, 2006.
- Kruger, Harald and Horanyi, M., et al., Ulysses jovian latitude scan of high-velocity dust streams originating from the jovian system; Planetary and Space Science 54 Issue 9-10, p. 919-931, 2006.
- Lanzerotti, L.J., and D.N. Baker, Where are the "Killer Electrons" of the declining Phase of Solar Cycle 23?, Space Weather, 2006.
- Lean, J., P. Pilewski, T. Woods, and V. George, SORCE 4th annual Science Team Meeting, The Earth Observer, 18, 6, 2006.
- Li, X., D.N. Baker, T.P. O'Brien, L. Xie, and Q.G. Zong, Correlation Between the Inner Edge of Outer Radiation Belt Electrons and the Innermost Plasmapause Location, Geophys. Res. Lett., 33, L14107, 10.1029/2006GL026294, 2006.
- Li, X., The Role of Radial Transport in Accelerating Radiation Belt Electrons AGU, Geophysical Monograph Series 167, 10.1029/167GM13, 2006.
- Lopez, J.P., et al., Subtropical CO signatures in convective clouds and anvils during CRYSTAL-FACE: Constraining entrainment rates with observations, J. Geophys. Res., 111, doi:10.1029/2005JD006104, 2006.
- Lumpe, J., C.E. Randall, et al., Validation of polar ozone and aerosol measurement (POAM) III version 4 stratospheric water vapor, J. Geophys. Res., 111, D11301, doi:10.1029/2005JD006763, 2006.
- Main, D. S., D. L. Newman, and R. E. Ergun, Double Layers and Ion Phase-Space Holes in the Auroral Upward-Current Region, Phys. Rev. Lett., 97, 18, 2006.
- Martinez-Alonso, S., M.T. Mellon, B.C. Kindel, B.M. Jakosky, Mapping Compositional Diversity on the Surface of Mars: The Spectral Variance Index, J. Geophys. Res., 111, E01004, 10.1029/2005JE002492, 2006.
- McComas, D. J., H. A. Elliott, J. T. Gosling, and R. M. Skoug, Ulysses Observations of Very Different Heliospheric Structure During the Declining Phase of Solar Activity Cycle 23, Geophys. Res. Lett., 33, L09102, doi:10.1029/2006GL025915, 2006.
- McNutt, Ralph L. and Horanyi, M., et al., Innovative interstellar explorer, in Physics of the Inner Heliosheath: Voyager Observations, Theory, and Future Prospects; 5th Annual IGPP International Astrophysics Conference. AIP Conference Proceedings, Volume 858, pp. 341-347, 2006.
- Mitchell, C., M. Horanyi, O. Havnes, C.C. Porco, Saturn's Spokes: Lost and Found, Science, 311, 5767, pp. 1587-1589, 2006.
- Mitchell, C.J., M. Horányi, O. Havnes, and C.C. Porco, Saturn's Spokes: Lost and Found, Science, 311, 1587-1589, 2006.
- Ohtsuki, K., Rotation Rate and Velocity Dispersion of Planetary Ring Particles with Size Distribution I. Formulation and Analytic Calculation, Icarus, 183, 373-383, 2006.
- Ohtsuki, K., Rotation Rate and Velocity Dispersion of Planetary Ring Particles with Size Distribution II. Numerical Simulation for Gravitating Particles, Icarus, 183, 384-395, 2006.
- Palmroth, M., P. Janhunen, G. Germany, D. Lummerzheim, K. Liou, D.N. Baker, et al., Precipitation and total power consumption in the ionosphere: Global MHD simulation results compared with Polar and SNOE

- observations, Annales Geophysicae, 24, 861-872, 2006.
- Peterson, W.K., H.L. Collin, O.W. Lennartson, and A.W. Yau, Quiet Time Solar Illumination Effects on the Fluxes and Characteristic Energies of Ionospheric Outflow J. Geophys. Res., 111, A11S05, 10.1029/2005JA011596, 2006.
- Phan, T. D., J. T. Gosling, M. Davis, R. M. Skoug, M. Oieroset, R. P. Lin, R. Lepping, D. J. McComas, C. W. Smith, H. Reme, and A. Balogh, A Magnetic Reconnection X-line Extending More Than 390 Earth Radii in the Solar Wind, Nature, 439, 175-178, 2006.
- Pilewski, P., J. Lean, and T. Woods, SORCE Solar Spectral Irradiance and Climate Modeling Workshop, The Earth Observer, 18, 5, 2006.
- Randall, C.E., V.L. Harvey, C.S. Singleton, P.F. Bernath, C.D. Boone, and J.U. Kozyra, Enhanced NO_x in 2006 Linked to Strong Stratospheric Arctic Vortex J. Geophys. Res., 33, L18811, 10.1029/2006GL027160, 2006.
- Rapp, M. and G. E. Thomas, Modeling the microphysics of mesospheric ice particles: Assessment of Current Capabilities and Basic Sensitivities, J. Solar Atm. Solar Terr. Res., 68, #7, 715-744, 2006.
- Raymond, S.N., T. Quinn, J.I. Lunine, High-Resolution Simulations of the Final Assembly of Earth-Like Planets I. Terrestrial Accretion and Dynamics, Icarus, 183, 265-282, 2006.
- Redemann, J., P. Pilewski, et al., Airborne measurements of spectral direct aerosol radiative forcing in the Intercontinental Chemical Transport Experiment/Intercontinental Transport and Chemical Transformation of Anthropogenic Pollution, J. Geophys. Res., 111, D14, 2006.
- Richards, P. G., T. N. Woods, and W. K. Peterson, HEUVAC: a new high resolution solar EUV proxy model, Adv. Space Res., 37, doi:10.1016/j.asr.2005.06.031, 315-322, 2006.
- Robock, A., L. Oman, G.L. Stenchikov, O.B. Toon, C. Bardeen, and R.P. Turco, Climatic consequences of regional nuclear conflicts, Atmos. Chem. Phys. Discuss., 6, 11817-11843, 2006.
- Rodgers, E. M., S. M. Bailey, H. P. Warren, T. N. Woods, and F. G. Eparvier, Soft X-ray irradiances during a solar flare observed by TIMED-SEE, J. Geophys. Res., 111, A10S13, doi: 10.1029/2005JA011505, 2006.
- Rottman, G.J., T.N. Woods, W. McClintock, SORCE Solar UV Irradiance Results, Advances in Space Research, 37, 201-208, 2006.
- Saetre, C., D.N. Baker, et al., Comparisons of electron energy deposition derived from observations of lower thermospheric nitric oxide and from X-ray bremsstrahlung measurements, J. Geophys. Res., 111, A04302, doi:10.1029/2005JA011391, 2006.
- Saitoh, N., et al., Intercomparison of ILAS-II version 1.4 aerosol extinction coefficient at 780 nm with SAGE II, SAGE III, and POAM III, J. Geophys. Res., 111, D11S05, doi:10.1029/2005JD006315, 2006.
- Sarris, T.E., X. Li, and M. Temerin, Simulating radial diffusion of energetic (MeV) electrons through a model of fluctuating electric and magnetic fields, Ann. Geophys., 24, 1-16, 2006.
- Schmidtke, G., F. G. Eparvier, S. Solomon, W. K. Tobiska, and T. N. Woods, Introduction to the TIGER (Thermospheric/Ionospheric Geospheric Research) Program, Adv. Space Res., 37, doi: 10.1016/j.asr.2005.02.088, 194-198, 2006.
- Shilling, J.E., M.A. Tolbert, O.B. Toon, E.J. Jensen, B.J. Murry, and A.K. Bertram, Measurements of the vapor pressure of cubic ice and their implications for atmospheric ice clouds, Geophys. Res. Lett., 33, L17801, 2006.
- Shprits, Y.Y., R.M. Thorne, R.B. Horn, S.A. Gkayertm, N. Cartwright, C.T. Russell, D.N. Baker, and S.G. Kanekal, Acceleration

- tion mechanism responsible for the formation of the new radiation belt during the 2003 Halloween solar storm, Geophys. Res. Lett., doi:10.1029/2005GL02456, 2006.
- Sizemore, Hanna G. and M.T. Mellon, Effects of Soil Heterogeneity on Martian Ground-Ice Stability and Orbital Estimates of Ice Table Depth, Icarus, 185, 358-369, 2006.
- Skoug, R. M., J. T. Gosling, D. J. McComas, C. W. Smith, and Q. Hu, Suprathermal Electron 90° Pitch Angle Depletions at Reverse Shocks in the Solar Wind, J. Geophys. Res., 111, A01101, 10.1029/2005JA011316, 2006.
- Smiley, B., M. Rapp, T.A. Blix, S. Robertson, M. Horanyi, R. Latteck and J. Fiedler, The charge and size distribution of mesospheric aerosol particles measured inside NLC and PMSE during MIDAS MacWAVE2002, Journal of Atmospheric and Solar Terrestrial Physics, 68, Issue 1, pp. 114-123, 2006.
- Smith, J.A., A.S. Ackerman, E.J. Jensen, and O.B. Toon, Role of Deep Convection in Establishing the Isotopic Composition of Water Vapor in the Tropical Transition Layer, Geophys. Res. Lett., 33, L06812, 10.1029/2005GL024078, 2006.
- Sparling, L.C., J.C.F. Wei, and L.M. Avallone, Estimating the impact of small scale variability in satellite measurement validation, J. Geophys. Res., 111, doi:10.1029/2005JD006943, 2006.
- Srama, R. and Horanyi, M., et al., Grun, E.; In situ dust measurements in the inner Saturnian system; Planetary and Space Science, 54, Issue 9-10, p. 967-987, 2006.
- Steffl, A.J., P.A. Delamere, F. Bagenal, Cassini UVIS Observations of the Io Plasma Torus III. Observations of Temporal and Azimuthal Variability, Icarus, 180, 124-140, 2006.
- Su, Y.-J., S. T. Jones, R. E. Ergun, F. Bagenal, S. E. Parker, P. A. Delemere, and R. L. Lysak, Io-Jupiter interaction: Alfvén wave propagation and ionospheric Alfvén resonator, J. Geophys. Res., 111, A06211, 2006.
- Sugita, T., et al., Ozone profiles in the high-latitude stratosphere and lower mesosphere measured by the Improved Limb Atmospheric Spectrometer (ILAS)-II: Comparison with other satellite sensors and ozone sondes, J. Geophys. Res., D11S02, doi:10.1029/2005JD006439, 2006.
- Sutton, E. K., J. M. Forbes, R. S. Nerem, and T. N. Woods, Neutral density response to the solar flares on October and November 2003, Geophys. Res. Lett., 33, L22101, doi:10.1029/2006GL027737, 2006.
- Swartz, W.H., C.E. Randall, et al., Comparison of high-latitude line-of-sight ozone column density with derived ozone fields and the effects of horizontal inhomogeneity, Atmospheric Chemistry and Physics, 6, 1843-1852, 2006.
- Temerin, M. and X. Li, Dst Model for 1995-2002, J. Geophys. Res., 111, A04221, 10.1029/2005JA011257, 2006.
- Thayer, J.P. and G.E. Thomas, Special Issue on Phenomena of the Summertime Mesosphere, J. Solar Atm. Solar Terr. Res. 68, 1-4, 2006.
- Thomason, L.W., L.R. Poole, and C.E. Randall, SAGE III aerosol extinction validation in the Arctic winter: Comparisons with SAGE II and POAM II, Atmos. Chem. Phys. Discuss., 6, 11357-11389, 2006.
- Tian, F., et al., Monte Carlo simulations of the water vapor plume on Enceladus, Icarus, 2006.
- Tian, F., O.B. Toon, and A.A. Pavlov, Response to comment on a hydrogen-rich early Earth atmosphere, Science, 311, 5757, 2006.
- Toon, O.B., et al., Atmospheric effects and societal consequences of regional scale nuclear conflicts and acts of individual terrorism, Atmos. Chem. Phys. Discuss., 11745-11816, 2006.
- Trainer, M.G., et al., Organic haze on Titan and early Earth, Proc. National Academy of Science, 103, 18035-18042, 2006.

- Wang, L., R. P. Lin, S. Krucker, and J. T. Gosling, Evidence for Double Injections in Scatter-Free Solar Impulsive Electron Events, Geophys. Res. Lett., 33, L03106, doi:10.1029/2005GL024434, 2006.
- Wang, X., R. Eastes, S. Weichecki Vergara, S. Bailey, C. Valladares, and T. Woods, On the short term relationship between solar soft X-ray flux and equatorial Total Electron Content (TEC), J. Geophys. Res., 111, A10S15, doi:10.1029/2005JA011488, 2006.
- Weigel, R., T. Detman, E.J. Rigler, and D.N. Baker, Decision theory and the analysis of rare event space weather forecasts, Space Weather, 3, S05002, doi: 10.1029/2005SW000157, 2006.
- Wimmer-Schweingruber, R. F., N. U. Crooker, A. Balogh, V. Bothmer, R. J. Forsyth, P. Gazis, J. T. Gosling, T. Horbury, A. Kilchenmann, I. G. Richardson, J. D. Richardson, P. Riley, L. Rodriguez, R. von Steiger, P. Wurz, and T. H. Zurbuchen, Understanding Interplanetary Coronal Mass Ejection Signatures, Space Sci. Revs., 123, 177-216, 2006.
- Woods, T. N., et al., The EUV Variability Experiment (EVE) aboard the Solar Dynamics Observatory (SDO), International Living with a Star Workshop, Goa, India, Feb 2006.
- Woods, T. N., G. Kopp, and P. C. Chamberlin, Contributions of the Solar Ultraviolet Irradiance to the Total Solar Irradiance During Large Flares, J. Geophys. Res., 111, A10S14, doi: 10.1029/2005JA011507, 2006.
- Woods, T. N., J. L. Lean, and F. G. Eparvier, The EUV Variability Experiment (EVE): Science plans and instrument overview, International Living With a Star (ILWS) Proceedings, Goa, India, edited by N. Gopalswamy and A. Bhattacharyya, ISBN 81-87099-40-2, p. 145, 2006.
- Woods, T.N., F.G. Eparvier, Solar Ultraviolet Variability During the TIMED Mission, Advances in Space Research, 37, 219-224, 2006.
- Woods, T.N., G. Kopp, and P.C. Chamberlin, Contributions of the Solar Ultraviolet Irradiance to the Total Solar Irradiance During Large Flares, J. Geophys. Res., 111, A10S14, 10.1029/2005JA011507, 2006.
- Xie, L., and X. Li, et al., Auroral equatorward boundary observed by the NOAA-17 satellite, Adv. Geosciences, 2, 219-228, 2006.
- Zheng, Y., A.T. Lui, X. Li, and M. Fok, Characteristics of 2-6 MeV electrons in the slot region and inner radiation belt, J. Geophys. Res., 111, A10204, doi: 10.1029/2006JA011748, 2006.

Works in Progress

- Andersson L. and R. E. Ergun, "Acceleration of Anti-Earthward Electron Fluxes in the Auroral Region" accepted to J. Geophys. Res., 2005JA011261, 2006.
- Andersson, L., D. L. Newman, R. E. Ergun, and M. V. Goldman, Influence of Hot Background Electrons on Strong Double Layers: Observations, submitted to Physics of Plasmas, 2006.
- Baker, D.N., et al., Space radiation hazards and the vision for space exploration, Space Weather, in press, 2006.
- Brohede, S.M., et al., validation of Odin/IOSIRIS stratospheric NO2 profiles, J. Geophys. Res., submitted, 2006.
- Chamberlin, P.C., T.N. Woods, and F.G. Eparvier, Flare Irradiance Spectral Model (FISM): Flare component algorithms and results, J. Geophys. Res., in preparation, 2006.
- Chamberlin, P.C., T.N. Woods, and F.G. Eparvier, Flare irradiance Spectral Model (FISM): Daily component algorithms and results, J. Geophys. Res., in preparation, 2006.
- Colwell, J. E., S. Batiste, M. Horanyi, S. Robertson, S. Sture, The Lunar Surface: Dust Dynamics and Regolith Mechanics, Reviews of Geophysics, 2006
- Colwell, JE, LW Esposito, M Sremcevic, GR Stewart, WE McClintock, Self gravity

- wakes and radial structure of Saturn's B ring. Icarus, in press.
- Davis, S.M., A.G. Hallar, L.M. Avallone, and W. Engblom, Measurements of ice water content with a tunable diode laser hygrometer: Calibration procedure and inlet analysis, J. Atmos. Oceanic Tech., in press, 2006.
- Davis, S.M., L.M. Avallone, et al., Comparisons of in situ measurements of cirrus cloud ice water content, submitted, 2006.
- Des Marais, D.J., B.M. Jakosky, and B.M. Hynek, Astrobiological implications of Mars surface composition and properties, in Mars Surface Composition, Mineralogy, and Physical Properties, J.F. Bell III, ed., Cambridge Univ. Press, in press, 2006.
- Ergun, R. E. , L. Andersson, E. K. Peterson, D. Brain, G. T. Delory, D. L. Mitchell, and A. W. Yau, The role of plasma waves in Mars' atmospheric loss, Accepted Geophys. Res. Lett., 2006.
- Eriksson, S., G. Provan, F. J. Rich, S. Massetti, M. Lester, and J. T. Gosling, Electrodynamics of a Split-Transpolar Aurora, Geophys. Res. Lett., manuscript in prep., 2006.
- Eriksson, S., J. T. Gosling, D. Krauss-Varban, R. M. Skoug, D. J. McComas, and C. W. Smith, Asymmetric out-of-plane magnetic field rotation within a solar wind reconnection exhaust, Geophys. Res. Lett., manuscript in prep., 2006.
- Esposito, Larry, et al., Clumps and moonlets in Saturn's F ring, Icarus, submitted, 2006.
- Esposito, Larry, Venus Monitoring Camera for Venus express, Planetary and Space Sciences, in press, 2006.
- Gannon, J., X. Li, D. Heynderickx, Pitch angle distribution analysis of radiation belt electrons based on CRRES MEA data, J. Geophys. Res., in press, 2006.
- Horanyi, M., et al., The Student Dust Counter on the New Horizons Mission, Space Sci. Rev., in press, 2006.
- Jakosky, B.M., F. Westall, and A. Brack, Mars, in Astrobiology (J. Baross and W. Sullivan, eds.), in press, 2006.
- Juhász, A., M. Horanyi, G. Morfill, Signatures of the Enceladus plumes in Saturn's E-ring, Geophys. Res. Lett., 2006.
- Kar, J., et al., Initial comparison of ozone and NO₂ profiles from ACE-MAESTRO with balloon and satellite data, J. Geophys. Res., submitted, 2006.
- Kinnison, D.E., et al., Sensitivity of chemical tracers to meteorological parameters in the MOZART-3 chemical transport model, J. Geophys. Res., submitted, 2006.
- Li, X., K.S. Oh, and M. Temerin, Prediction of AL index using solar wind parameters, J. Geophys. Res., in press, 2006.
- Mills, F.P., L.W. Esposito, and Y.L. Yung, Atmospheric composition, chemistry and clouds, in Exploring Venus as a terrestrial planet, AGU Monograph, in press, 2006.
- Newman, D. L., L. Andersson, M. V. Goldman, R. E. Ergun, and N. Sen, Influence of hot background electron on double layers: Simulations and Theory, submitted to Physics of Plasmas, 2006.
- Pilewski, P., J. Harder, J. Fontenla, and E. Richard, Variability of spectral irradiance on heating on the lower atmosphere, in preparation, 2006.
- Randall, C.E., Energetic particle precipitation effects on the southern hemisphere stratosphere in 1992-2005, J. Geophys. Res., submitted, 2006.
- Rapp, M. and G. E. Thomas, Modeling the microphysics of mesospheric ice particles: Assessment of Current Capabilities and Basic Sensitivities, J. Solar Atm. Solar Terr. Res, 68, in press, 2006.
- Sarris, T.E., X. Li, et al., Narrow-band geomagnetic ULF pulsations, Ann. Geophys., under review, 2006.
- Schmidt, K.S., P. Pilewski, et al., Reproducing cloud microphysical and irradiance measurements using three 3-D cloud generators, Q.J.R. Meteor. Soc., in press, 2006.
- Schmidt, K.S., P. Pilewski, et al., Comparing 3-D irradiance fields derived from MAS cirrus cloud retrievals with SSFR measurements, J. Geophys. Res., submitted, 2006.

- Shen, C., X. Li, et al., Magnetic field rotation analysis and the applications, J. Geophys. Res., in press, 2006.
- Shen, C., X. Li, et al., New approach for determining the normal of the bow shock based on Cluster 4-point magnetic measurements, J. Geophys. Res., in press, 2006.
- Singleton, C.S., C.E. Randall, et al., Quantifying Arctic ozone loss during the 2004-2005 winter using satellite observations and a chemical transport model, J. Geophys. Res., in press, 2006.
- Sternovsky, Z., K. Amyx, G. Bano, M. Landgraf, M. Horanyi, S. Knappmiller, S. Robertson, E. Grun, R. Srama, S. Auer, Large area mass analyzer (LAMA) instrument for the chemical analysis of interstellar dust particles, Nuclear Instruments and Methods, 2006.
- Tian, F., A.I.F. Stewart, Owen B. Toon, Kristopher Larsen, Larry W. Esposito. Monte Carlo Simulations of the water vapor plume on Enceladus. Icarus, in press.
- Wang, X., J. Colwell, M. Horanyi and S. Robertson, Charge of dust on surfaces in plasma, IEEE Transactions on Plasma Science, 2006.
- Zong, Q.-G., X. Li, et al., Energetic particle modulation in the inner magnetosphere, Geophys. Res. Lett., under review, 2006.

Papers Presented at Scientific Meetings

- Amyx, K.; Sternovsky, Z.; Horanyi, M.; Knappmiller, S.; Robertson, S.; Landgraf, M.; Grün, E.; Srama, R.; Auer, S., Calibration of the Large Area Mass Analyzer (LAMA) instrument for the detection of cosmic dust, Fall AGU Meeting, San Francisco, CA, December, 2006.
- Avallone, L.M., et al., The weather outside our window: Teacher education through inquiry-based case studies on Rocky Mountain Front Range weather, 7th International Conference on School and Popular Meteorological and Oceanographic Education, Boulder, CO, 5 July 2006.
- Bagenal, F., Magnetic field morphology of the jovian main aurora, Fall AGU meeting, San Francisco, CA, December 2006.
- Bagenal, F., P. Delamere, and R. Ergun, Magnetosphere-Ionosphere coupling at Jupiter, Spring AGU meeting, Baltimore, MD, May 2006.
- Bagenal, F., The magnetosphere of Jupiter: Coupling the equator to the poles, Yosemite Conference, February 2006.
- Bagenal, F., The peculiar role of Io in the magnetosphere of Jupiter, Space Physics Seminar, Montana State University, Bozeman, MT, April 2006.
- Bagenal, F., The peculiar role of Io in the magnetosphere of Jupiter, Physics Dept. Colloquium, Univ. of Texas at Arlington, September 2006.
- Bagenal, F., Women in Physics and Astronomy, Physics Department Colloquium, Montana State University, Bozeman, MT, April 2006.
- Baker, D.N., A Remembrance of James A. Van Allen, International Symposium on Recent Observations and Simulations of the Sun-Earth System (ISROSES), Varna, Bulgaria, 17-22 September, 2006.
- Baker, D.N., A.J. Klimas, D. Vassiliadis, and V. Uritsky, Nonlinear dynamics in the magnetosphere, ICS-8, Banff, Canada, 27-31 March, 2006.
- Baker, D.N., A.J. Klimas, D. Vassiliadis, and V. Uritsky, Nonlinear dynamics in the magnetosphere, ICS-8 meeting, Banff, Canada, 27-31 March, 2006.
- Baker, D.N., A.J. Klimas, D. Vassiliadis, and V. Uritsky, Nonlinear dynamics in the magnetosphere, Aegean Conference "20 Years of nonlinear dynamics in Geo-

- science", Rhodes, Greece, 11-6 June, 2006.
- Baker, D.N., C.E. Randall, C.A. Barth, S. G. Kanekal, C. Saetre, and S.M. Bailey, Observations of magnetospheric particles during large storms and assessing their effects on the Earth's atmosphere, 36th COSPAR Scientific Assembly, Beijing, China, 16-23 July, 2006.
- Baker, D.N., Connections from the Sun to the Earth's atmosphere, Invited talk, Ed Stone Symposium, California Institute of Technology, Pasadena, CA, 10 February 2006.
- Baker, D.N., Creating new science in the Information Age: eGY, Special meeting at COSPAR, Beijing Institute of Technology, Beijing, China, 20 July 2006.
- Baker, D.N., Decadal surveys and Solar and Space Physics plans, Invited presentation, Space Studies board Workshop, Irvine, CA, 15 November 2006.
- Baker, D.N., Ed Stone and Magnetospheric Research, E. Stone Dinner Talk, Caltech, Pasadena, CA, 11 February 2006.
- Baker, D.N., eGY and IGY: Past, present and future, Press Conference, Spring AGU Meeting, San Francisco, CA 23-26 May, 2006.
- Baker, D.N., Free and open exchange of data: The legacy of IGY and the goal of eGY, Spring AGU Meeting, San Francisco, CA 23-26 May, 2006.
- Baker, D.N., Introduction to Boulder Solar day: Alan Title, Univ. of Colorado, Boulder, 20 March 2006.
- Baker, D.N., Knowledge transfer goals and accomplishments, CISM Advisory Committee Meeting (via Access Grid), Boston University, Boston, MA, 23 February 2006.
- Baker, D.N., N. Farr, T.I. Pulkkinen, and M. Wiltberger, Multi-spacecraft measurements of magnetospheric substorms and their implications for the near-Earth neutral line model, ICS-8, Banff, Canada, 27-31 March, 2006.
- Baker, D.N., N. Farr, T.I. Pulkkinen, and M. Wiltberger, Multi-spacecraft measurements of magnetospheric substorms and their implications for the near-Earth neutral line model, 36th COSPAR Scientific Assembly, Beijing, China, 16-23 July, 2006.
- Baker, D.N., Nimble and flexible responses to CU/Boulder research objectives, presentation at CU Institute Director's Retreat, Boulderado Hotel, Boulder, CO, 17 November 2006.
- Baker, D.N., Outer radiation belt changes during storms and high-speed solar wind streams: Relationships to the ring current and plasmasphere, Huntsville 2006 Workshop, Challenges to Modeling the Sun-Earth System, Nashville, TN, 2-6 October, 2006.
- Baker, D.N., Outer radiation belt changes during storms and substorms; Relationships to the ring current and plasmasphere, Western Pacific Geophysics Meeting (WPGM), Beijing, China, 24-27 July, 2006.
- Baker, D.N., Overview of eGY activities and plans, Opening talk, Electronic Geophysical Year planning meeting, Boulder, CO, 13 March 2006.
- Baker, D.N., Overview of the electronic Geophysical Year (eGY), International Year Session, Asian Oceania Geosciences Society (AOGS), Singapore, 13 July, 2006.
- Baker, D.N., Remarks at the SPA Dinner, Fall AGU Meeting, San Francisco, CA, 12 December, 2006.
- Baker, D.N., S.G. Kanekal, X. Li, Solar cycle changes of energetic particle properties in the inner magnetosphere, Asian Oceania Geosciences Society (AOGS), Singapore, 10-14 July 2006.
- Baker, D.N., Small spacecraft programs and the Laboratory for Atmospheric and Space Physics, Invited talk, Google HQ, Mountain View, CA, 11 December 2006.
- Baker, D.N., Solar cycle changes, geomagnetic storms, and energetic particle properties in the inner magnetosphere, International Symposium on Recent Observations and Simulations of the Sun-Earth System

- (ISROSES), Varna, Bulgaria, 17-22 September, 2006.
- Baker, D.N., Solar wind streams, recurrent geomagnetic storms, and relativistic electron enhancements in the outer magnetosphere: Multi-spacecraft coordinated measurements, Western Pacific Geophysics Meeting (WPGM), Beijing, China, 24-27 July, 2006.
- Baker, D.N., Space Hazards and Space Weather, Western Pacific Geophysics Meeting (WPGM), Beijing, China, 24-27 July, 2006.
- Baker, D.N., Space Weather and its effects on human technology, Invited Talk, Boulder Astronomy and Space Society, Boulder, CO, 15 April, 2006.
- Baker, D.N., Space Weather and its effects on Human technology, Iowa State University, 26 May, 2006.
- Baker, D.N., Space Weather and its Effects on Human Technology, LASP Seminar Series, Boulder, CO, 18 August 2006.
- Baker, D.N., Space Weather and the Vision for Space Exploration, Invited Lecture, Astrophysics Department (ASTR 4800), U. of Colorado, Boulder, 6 December 2006.
- Baker, D.N., Space weather effects and human technology, American Meteorological Society, 86th Annual meeting, Atlanta, 29 January, 2006.
- Baker, D.N., The Earth's Radiation Belts, Union Lecture, SPA Tutorial, Fall AGU Meeting, San Francisco, CA, 10 December, 2006.
- Baker, D.N., The FY 07 Budget Impacts on Solar and Space Physics, Briefing to Office of Management and Budget and to OSTP, Exec. Off. Of the President, Washington DC, 29 March 2006.
- Baker, D.N., The FY 07 NASA Budget and its impacts on Heliophysics, National Academy of Sciences, Washington, DC, 24 February 2006.
- Baker, D.N., The impacts of the NASA budget on Solar and Space Physics, Invited talk, Space Studies board, National Academy of Sciences, Washington, DC, 7 March 2006.
- Baker, D.N., The Mission of Opportunity Radiation Belt Experiment (MORE), Canadian Space Agency Headquarters, St. Hubert, Canada (Montreal), 4 December 2006.
- Baker, D.N., X. Li, S.R. Elkington, J.F. Fennell, H. Spence, L. Kistler, S.G. Kanekal, and J.R. Wygant, The Mission of Opportunity Radbelt Experiment (MORE) for the RBSP Program, Fall AGU Meeting, San Francisco, CA, 11-15 December 2006.
- Barton, C., D.N. Baker, E. CoBabe-Ammann, P. Fox, E. Kihn, and W.K. Peterson, Open exchange of data: The eGY pathway toward capacity building, 36th COSPAR Scientific Assembly, Beijing, China, 16-23 July, 2006.
- Chamberlin, P. C., T. N. Woods, and F. G. Eparvier, New Flare Model Using Recent Measurements of the Solar Ultraviolet Irradiance, 00395, COSPAR, Beijing, China, July, 2006
- Chamberlin, P. C., T. N. Woods, and F. G. Eparvier, The Flare Irradiance Spectral Model (FISM) as an Operational Space Weather Product, Fall AGU meeting, San Francisco, CA, December 2006.
- Chamberlin, P.C., Up in 100 Seconds, the Past, Present, and Future of Sounding Rockets at LASP, LASP Seminar Series, Boulder, CO, November 2006.
- Colwell, J. E., Esposito, L. W., Sremcevic, M., McClintock, W. E., and Stewart, G. R., Self-Gravity Wakes in Saturn's Rings from Stellar Occultations, Pasadena, 2006 DPS meeting.
- Davis, S.M., et al., Comparison of in situ and satellite measurements of cirrus microphysical and radiative properties, Fall AGU meeting, San Francisco, CA, December 2006.
- Delamere, P., and F. Bagenal, Plasma interaction between Pluto's escaping atmosphere and the solar wind, Fall AGU meeting, San Francisco, CA, December 2006.
- Dols, V., P. Delamere, and F. Bagenal, Io's local interaction: Chemistry, role of So₂, So

- and importance of Mass loading, Spring AGU meeting, Baltimore, MD, May 2006.
- Dols, V., Pl Delamere, and F. Bagenal, Multispecies chemistry approach of Io's local interaction, Fall AGU Meeting, San Francisco, CA December 2006.
- Eastes, R., W. McClintock, A. Aksnes, D. Anderson, L. Andersson, A. Burns, M. Codrescu, R. Daniell, F. Eparvier, J. Harvey, A. Krywonos, J. Lumpe, G Prölss, A. Richmond, D. Rusch, S. Solomon, D. Strickland, and T. Woods, Global-scale Observations of the Limb and Disk (GOLD): Science Objectives, Fall AGU meeting, San Francisco, CA, December 2006.
- Eastes, R., W. McClintock, L. Andersson, W. McClintock, A. Aksnes, D. Anderson, A. Burns, M. Codrescu, R. Daniell, F. Eparvier, J. Harvey, A. Krywonos, M. Lankton, J. Lumpe, G Prölss, A. Richmond, D. Rusch, S. Solomon, D. Strickland, and T. Woods, Global-scale Observations of the Limb and Disk (GOLD): Continuous, Global-scale Ultraviolet Observations of Earth, Fall AGU meeting, San Francisco, CA, December 2006.
- Elkington, S.R., M. Wiltberger, and D.N. Baker, Convective and substorm injection of energetic plasmasheet particles into the inner magnetosphere, Western Pacific Geophysics Meeting, Beijing, China, 24-27 July, 2006.
- Eparvier, F.G., R.A. Hock, and T.N. Woods, How TIMED-SEE uses other FUV irradiance data, SORCE Solar Spectral Irradiance Workshop, SORCE Science Team Meeting, Orcas Island, WA, September 2006.
- Eparvier, F.G., Solar spectral irradiance measurements by LASP, Science Consortium for SWAP/LYRA, ISSI, Berne, June 2006.
- Eparvier, F.G., T.N. Woods, and P.C. Chamberlin, Solar EUV irradiance: where have we been and where are we going? 02121, COSPAR, Beijing, China, July, 2006.
- Ergun, R.E., Localized Parallel Electric Fields Associated with Inertial Alfvén Waves, FAST 10th Anniversary Workshop, Bodega Bay, CA, 2006.
- Ergun, R.E., The Role of Plasma Waves in Mars' Atmospheric Loss, Colloquium, University of California at Los Angeles, Department of Earth and Planetary Sciences, 2006.
- Ergun, R.E., The Role of Plasma Waves in Mars' Atmospheric Loss, LASP Seminar, University of Colorado at Boulder, 2006.
- Farr, N., D.N. Baker, and M. Wiltberger, Analysis of the substorm recovery phase using a multi-satellite view and LFM MHD simulation, Fall AGU Meeting, San Francisco, CA, 11-15 December 2006.
- Gehmeyr, M., N. Arge, L. Mayer, D. Odstrcil, M. Owens, J. Rigler, D. Vassiliadis, R. Weigel, and D.N. Baker, Space weather forecast models from the Center for Integrated Space Weather Modeling, International Symposium on Recent Observations and Simulations of the Sun-Earth System (ISROSES), Varna, Bulgaria, 17-22 September, 2006.
- Gehmeyr, M., R. Weigel, N. Arge, D. Odstrcil, L. Mayer, J. Rigler, and D.N. Baker, The First CISM Forecast models, Space Weather Week, Boulder, CO, 25-28 April 2006.
- Gille, J., et al., High resolution measurements of the tropical tropopause region by HIRDLS, Fall AGU meeting, San Francisco, CA, December 2006.
- Goldstein, J., B.R. Sandel, R.A. Wolf, and D.N. baker, Relative timing of nightside and dayside plasmasphere erosion, International Symposium on Recent Observations and Simulations of the Sun-Earth System (ISROSES), Varna, Bulgaria, 17-22 September, 2006.
- Goldstein, J., D.N. Baker, B. Sandel, and S. Kanekal, Plasmaspheric influence on radiation belts during major geomagnetic storms, Western Pacific Geophysics Meeting, Beijing, China, 24-27 July, 2006.
- Gosling, J.T., D. J. McComas, R. M. Skoug, and C. W. Smith, Magnetic Reconnection at the Heliospheric Current Sheet and the

- Formation of Closed Magnetic Field Lines in the Solar Wind, American Geophysical Union Fall Meeting, San Francisco, CA, December 2006.
- Gosling, J.T., Magnetic Reconnection in Solar and Space Physics: Consequences – A Personal Journey, Student Tutorial, SHINE Workshop, Zermatt, Utah, July 2006.
- Gosling, J.T., Magnetic Reconnection in the Solar Wind, Seminar, Laboratory for Atmospheric and Space Physics, Boulder, CO, Feb. 14, 2006.
- Gosling, J.T., Magnetic Reconnection in the Solar Wind, Seminar, University of Colorado, Astrophysical and Planetary Sciences Department Colloquium, Boulder, CO, August 2006.
- Gosling, J.T., Magnetic Reconnection in the Solar Wind, Seminar, University of California, Space Science Laboratory, Berkeley, CA, October 2006.
- Gosling, J.T., Magnetic Reconnection in the Solar Wind, The Physics of Solar Wind/Magnetosphere Coupling, Puerto Vallarta, Mexico, November 2006.
- Gosling, J.T., Petschek-Type Reconnection in the Solar Wind: Implications for the Magnetosphere, GEM Workshop, Snowmass, CO, June 2006.
- Gosling, J.T., Sudden and Semi-Permanent Flow Speed Decreases as a Source of Roughly Radial Magnetic Fields in the Heliosphere, SHINE Workshop, Zermatt, Utah, July 2006.
- Green, J.C., T.G. Onsager, P. O'Brien, B. Fraser, H.J. Singer, A. Smith, D.N. Baker, R.H. Friedel, G. Reeves, and Y. Fei, Identifying the cause of relativistic electron flux depletions in Earth's outer radiation belt, Fall AGU Meeting, San Francisco, CA, 11-15 December 2006.
- Grün, E.; Srna, R.; Horanyi, M.; Sternovsky, Z.; Auer, S.A Dust Observatory on the Lunar Surface, Fall AGU Meeting, San Francisco, CA, December, 2006.
- Haig, C., J.C. Green, T.G. Onsager, H. Singer, and D.N. Baker, Can drift out the magnetopause account for the rapid loss of relativistic electrons from Earth's radiation belts?, Fall AGU Meeting, San Francisco, CA, 11-15 December 2006.
- Harvey, V.L., C.E. Randall and C.S. Singleton, Analysis of ILAS-II data at CU, ILAS-II science meeting, Japan, February 2006.
- Harvey, V.L., C.E. Randall, and C.S. Singleton, ACE in Colorado, ACE science team meeting, Waterloo, Canada, 1-3 May 2006.
- Harvey, V.L., et al., Low-ozone pockets in stratospheric anticyclones as a process-oriented diagnostic of coupled chemistry-climate models, Fall AGU meeting, San Francisco, CA December 2006.
- Horanyi, M., Dusty Plasmas in Planetary Rings, European Planetary Science Congress, Berlin, Germany, Sept 2006.
- Horanyi, M.; Aim Science Team, The AIM Mission, COSPAR 2006.
- Horanyi, M.; Andersson, L.; Colwell, J.; Ergun, R.; Grün, E.; McClintock, B.; Peterson, W. K.; Robertson, S.; Sternovsky, Z.; Wang, X., Dusty Plasmas on the Lunar Surface, Fall AGU Meeting, San Francisco, CA, December, 2006.
- Horanyi, M.; Colwell, J.; Robertson, S.; Sternovsky, Z.; Wang, X., Dusty Plasma Effects on Surfaces in Space, COSPAR, 2006.
- Horanyi, M.; Morfill, G. E., Steps Towards Understanding the Spokes in Saturn's B Ring, Fall AGU Meeting, San Francisco, CA, December, 2006.
- Juhász, A.; Horanyi, M., Modeling the E ring of Saturn. Fall AGU Meeting, San Francisco, CA, December, 2006.
- Kanekal, S.G., M.D. Looper, D.N. Baker, J.B. Blake, Study of proton cutoffs during geomagnetically disturbed times, 36th COSPAR Scientific Assembly, Beijing, China, 16-23 July, 2006.
- Kanekal, S.G., R.S. Selesnick, D.N. Baker, and J.B. Blake, Energetic electron spectra and flux isotropization during different phases of solar cycle, Fall AGU Meeting, San Francisco, CA, 11-15 December 2006.

- Kanekal, S.G., R.S. Selesnick, D.N. Baker, J.B. Blake, Evolution of electron spectra and flux isotropization during electron energization in the inner magnetosphere, 36th COSPAR Scientific Assembly, Beijing, China, 16-23 July, 2006.
- Klimas, A., V. Uritsky, D.N. Baker, Modeling the Self-organized critical behavior of Earth's plasma sheet reconnection dynamics, Spring AGU Meeting, San Francisco, CA 23-26 May, 2006.
- Knappmiller, S.; Robertson, S.; Sternovsky, Z.; Horanyi, M., Calibration of a Rocket-borne Probe for Aerosol Particles in the Polar Mesosphere, Fall AGU Meeting, San Francisco, CA, December, 2006.
- Kozyra, J., et al., Changes in the Upper/Middle atmosphere during powerful high speed streams in 2003: A new pathway for forcing long-term variability, 2nd International symposium on space climate, Romania, September, 2006.
- Landgraf, M.; Grün, E.; Srama, R.; Helfert, S.; Kempf, S.; Morgas-Klostermeyer, G.; Rachev, M.; Srowig, A.; Auer, S.; Horanyi, M.; Sternovsky, Z.; Harris, D The Sky in Dust - Methods and Prospects of Dust Astronomy, LPSC Spring 2006.
- Laursen, S., et al., Weather outside our window: Data-Rich, Inquiry-based case studies on Rocky Mountain Front Range weather, American Meteorological Society Meeting, 29 January 2006.
- Lewis, M. C. and Stewart, G. R., Simulating the Keeler Gap in Saturn's Rings: Wake and Edge Dynamics, Pasadena: 2006 DPS meeting.
- Li, X., D.N. Baker, P. O'Brien, L. Zie, and Q Zong, Correlation between the inner edge of outer radiation belt electrons and the innermost plasmopause location, Western Pacific Geophysics Meeting, Beijing, China, 24-27 July, 2006.
- Li, X., On the relation between plasmopause and outer radiation belt electrons, Western Pacific Geophysics Meeting, Beijing, China, 24-28 July 2006.
- Li, X., Pitch angle distributions of outer radiation belt electrons based on the CRRES MEA measurements and their implications, COSPAR, Beijing, China, 16-23 July, 2006.
- Li, X., Plasmasphere and outer radiation belt electrons, LASP seminar series, Boulder, CO 12 September, 2006.
- Li, X., Radial transport in energizing radiation belt electrons in the magnetosphere, COSPAR, Beijing, China, 16-23 July, 2006.
- Li, X., Solar wind and geomagnetic activity, Fall AGU meeting, San Francisco, CA 13 December, 2006.
- Li, X., Solar wind and geomagnetic storms, ILWS Workshop, Goa, India, 19-24 Feb 2006.
- Li, X., Sun, solar wind, and geomagnetic storms, Western Pacific Geophysics Meeting, Beijing, China, 24-28 July 2006.
- Li, X., The correlation between the inner edge of the outer radiation belt electrons and the minimum plasmopause location, GEM meeting, Snowmass, CO 26-30 June, 2006.
- Li, X., The correlation between the minimum plasmopause location and the inner edge of outer radiation belt electrons, Space Weather Team of Academy of Sinica, Beijing, China, 29 July, 2006.
- Li, X., The relation between plasmasphere and outer radiation belt, Chinese Academy of Sciences, Beijing, 11 May 2006.
- Li, X., The role of radial transport in accelerating radiation belt electrons, NCAR/HAO, Boulder, CO, 6 December, 2006.
- Li, X., THEMIS' contribution to radiation belt study, Space Sciences Lab, Berkeley, CA, 16 December, 2006.
- Lumpe, J. D., L. Floyd, M. Snow, and T. Woods, Thermospheric Remote Sensing by Occultation: Comparison of SUSIM and SOLSTICE O2 Measurements, Fall AGU meeting, San Francisco, CA, December 2006.
- Mann, I.R., D.N. Baker, et al., The Outer Radiation Belt Injection, Transport, Acceleration and Loss Satellite (ORBITALS): A

- Canadian mission to the inner magnetosphere, Fall AGU Meeting, San Francisco, CA, 11-15 December 2006.
- McClintock, W., M. Lankton, R. Eastes, A. Aksens, D. Anderson, L. Andersson, M. Codrescu, A. Burns, R. Daniell, F. Eparvier, J. Harvey, A. Krywonos, J. Lumpe, G. Prolss, T. Woods, A. Richmond, D. Rusch, S. Solomon, and D. Strickland, Global-scale Observations of the Limb and Disk (GOLD): Mission Implementation, Fall AGU meeting, San Francisco, CA, December 2006.
- Mlynczak, M., F. Martin-Torres, B. Marshall, R. Thompson, J. Williams, T. Turpin, D. Kratz, J. Russell, T. Woods, L. Gordley, Solar cycle influence on the infrared energy budget of the thermosphere, European Geophys. Union, Spring Meeting, 2007.
- Perroomian, V., D.N. Baker, and R. Chappell, Outstanding problems in particle connection modeling, Huntsville 2006 Workshop, Challenges to Modeling the Sun-Earth System, Nashville, TN, 2-6 October, 2006.
- Peterson, W. K., P. C. Chamberlin, T. N. Woods, and P. G. Richards, Variations of the Solar flux in the 1 to 50 nm range over a solar rotation inferred from observations of photoelectrons with energies from 0.01 to 1 keV from the FAST satellite, 02017, COSPAR, Beijing, China, July, 2006.
- Pilewski, P. SORCE, Glory, RSIS and the importance of solar spectral variability, Sun-climate Center Seminar Series, NASA Goddard Space Flight Center, May 2006.
- Pilewski, P., et al., A new solar irradiance reference spectrum, Proceedings of the 16th Atmospheric radiation Measurement (ARM) Science Team Meeting, Albuquerque, NM, March 2006.
- Pilewski, P., et al., A new solar irradiance reference spectrum, American Meteorological Society 12th Conference on Atmospheric Radiation, Madison, WI, July 2006.
- Pilewski, P., Solar radiation, clouds and climate: A multi-spectral view from the surface to the top of the atmosphere, Univ. of Arizona, November 2006.
- Pilewski, P., Validation of satellite cloud remote sensing via airborne spectral irradiance, International EUFAR Workshop, Paris, 13-15 September 2006.
- Pulkkinen, T.I., C.C. Goodrich, J. Lyon, D.N. Baker, M.J. Wiltberger, Tail current sheet under strong driving: MHD simulations and in-situ observations compared, Spring AGU Meeting, San Francisco, CA 23-26 May, 2006.
- Randall, C.E., Development of the PMC historical data base for AIM, AIM science team meeting, 7-9 March 2006.
- Randall, C.E., Energetic particle precipitation effects on the stratosphere, Ball Aerospace, 20 October 2006.
- Randall, C.E., Energetic particle precipitation: effects on the middle atmosphere, Conference on Earth-Sun System Exploration, Kona, HI, January 2006.
- Randall, C.E., et al., Coupling the thermosphere to the stratosphere via energetic particle precipitation, Huntsville Workshop, Oct 2006.
- Randall, C.E., et al., EEP indirect effect, SOLARIS meeting, 4 October 2006.
- Randall, C.E., et al., HIRDLS data validation, Boulder, CO, April 2006.
- Randall, C.E., et al., Validation of HIRDLS NO₂, NASA/Aura science team meeting, Boulder, CO September 2006.
- Randall, C.E., Impacts of energetic particle precipitation on the stratosphere, ATOC/LASP seminar, October 2006.
- Randall, C.E., Sun-Earth coupling by energetic particles, ATOC/LASP seminar, 1 March 2006.
- Rast, Mark, Lagrangian statistics in point vortex flows, U. of Colorado Department of Mathematics, April 2006.
- Rast, Mark, Oscillation excitation, HMI/AIA Science Team Meeting, Monterey, CA, February 2006.
- Rast, Mark, Supergranulation: Self-organization in the surface shear, AAS Solar Physics Division meeting, Durham, NH, June 2006.

- Rast, Mark, Turbulent scale selection and transport in the solar photosphere, Advanced Study Program, NCAR, Boulder, CO March 2006.
- Rast, Mark, Turbulent scale selection and transport on the Sun and in the lab, Freiburg, Germany, June 2006.
- Rast, Mark, VAPOR: Interactive analysis and visualization of very large data volumes, COSBOLD workshop, Freiburg, Germany, June 2006.
- Rast, Mark, Photospheric flows and structures, Local Helioseismology Comparison Group meeting, Boulder, November 2006.
- Ray, L., R. Ergun, P. Delamere, F. Bagenal, and C. Cully, Effects of non-linear field-aligned potentials on Jupiter's aurora, Fall AGU Meeting, San Francisco, CA, December 2006.
- Robertson, S.; Wang, X.; Colwell, J.; Horanyi, M.; Peterson, W. K.; Sternovsky, Z., Measuring and Modeling the Plasma Environment at the Lunar Surface, Fall AGU Meeting, San Francisco, CA, December, 2006.
- Rodgers, E., S. M. Bailey, H. H. Warren, T. N. Woods, and F. G. Eparvier, Solar flare soft x-ray irradiance and its impact on the Earth's upper atmosphere, Spring AGU meeting, Baltimore, May 2006.
- Rodgers, E., S. M. Bailey, H. H. Warren, T. N. Woods, and F. G. Eparvier, Thermospheric Nitric Oxide Density Enhancement due to Solar Flares, Fall AGU meeting, San Francisco, CA, December 2006.
- Saetre, C., J. Stadsnes, N. Ostgaard, C.A. Barth, S.M. Bailey, G. Germany, and D.N. Baker, Chemical effects of electron precipitation – Modeled thermospheric nitric oxide, 36th COSPAR Scientific Assembly, Beijing, China, 16-23 July, 2006.
- Shen, C., Z. Liu, Q. Xhi, X. Li, M. Dunlop, A. Balogh, E. Lucek, D.N. Baker, and M. Hapgood, Energetic electron pitch angle distributions measured by the Polar satellite, Western Pacific Geophysics Meeting, Beijing, China, 24-27 July, 2006.
- Shprits, Y., R. Thorne, R. Friedel, G. Reeves, J. Fennell, D.N. Baker, and S. Kanekal, Outward radial diffusion during the main phase of a storm, 36th COSPAR Scientific Assembly, Beijing, China, 16-23 July, 2006.
- Shprits, Y.Y., R.M. Thorne, G.D. Reeves, R. Friedel, J. Fennell, and D.N. Baker, Radial diffusion as a loss and source process of the relativistic electrons, International Symposium on Recent Observations and Simulations of the Sun-Earth System (ISROSES), Varna, Bulgaria, 17-22 September, 2006.
- Singleton, C.S., Arctic ozone loss climatology from solar occultation and microwave limb sounding instruments, Fall AGU meeting, San Francisco, CA December, 2006.
- Smith, D. C., E. R. Talaat, J. Yee, T. Woods, R. G. Roble, and G. Crowley, Examination of Cadence of Solar Soft X-ray Flux on the Ionosphere and Thermosphere, Fall AGU meeting, San Francisco, CA, December 2006.
- Snow, M. D. Woodraska, W. E. McClintock, T. N. Woods, and G. Kopp, Solar Irradiance Data for Space Weather from SORCE and TIMED-SEE, Fall AGU meeting, San Francisco, CA, December 2006.
- Spence, H.E., D.N. Baker, et al., The Radiation Belt Storm Probes (RBSP) Energetic Particle, Composition, and Thermal Plasma (ECT) Instrument Suite, Fall AGU Meeting, San Francisco, CA, 11-15 December 2006.
- Sternovsky, Z.; Horanyi, M.; Colwell, J. E.; Robertson, S.; Wang, X., Near-Surface Dusty Environments of Planetary Objects, LPSC Spring 2006.
- Sternovsky, Z.; Robertson, S.; Horanyi, M.; Colwell, J., The photoelectric layer near the surface of Mars, Fall AGU Meeting, San Francisco, CA, December, 2006.
- Stewart, Glen R. and Petersen, M. R., Hydrodynamic Instability of Radially Stratified Protoplanetary Disks, Pasadena: 2006 DPS meeting.

- Vassiliadis, D., D.N. Baker, S.F. Fung, S.G. Kanekal, E.J. Rigler, R.S. Selesnick, and R.S. Weigel, A modular radiation-belt electron flux model, Fall AGU Meeting, San Francisco, CA, 11-15 December 2006.
- Wang, X., Q. Sun, R. Eastes, S. Bailey, B. Reinisch, C. Valladares, and T. Woods, The Short-term Relationship of Ionospheric Electron Density with Solar Irradiance and Geomagnetic Activity in Daily Observations, Fall AGU meeting, San Francisco, CA, December 2006.
- Withers, P., J. Wroten, M. Mendillo, P. Chamberlin, and T. Woods, Modeling the effects of solar flares on the ionosphere of Mars, European Geophys. Union, Spring Meeting, 2007.
- Woods, T. N., J. L. Lean, and F. G. Eparvier, The EUV Variability Experiment (EVE): Science plans and instrument overview, International Living With a Star (ILWS) Workshop, Goa, India, INVITED, March 2006
- Woods, T. N., Overview of LASP's Solar Influence Group, LASP Seminar, INVITED, 4 May 2006.
- Woods, T. N., P. Chamberlin, F. Eparvier, W. McClintock, and M. Snow, Solar Cycle Variation of the Solar Ultraviolet Irradiance: Recent Observations from SORCE and TIMED, Fall AGU meeting, San Francisco, CA, December 2006.
- Woods, T. N., Recent advances in observations and modeling of solar ultraviolet and x-ray spectral irradiance, *COSPAR / TIGER-6*, Beijing, China, INVITED, July 2006.
- Woods, T. N., The 4 Ws of the SDO Mission, Boulder Solar Alliance's Solar Day, INVITED, 21 March 2007.
- Woods, Thomas N., Solar irradiance variability and its influence on Earth, NCAR ASP Seminar Series, Invited, 18 May 2006.
- Wygant, J.R., C.A. Cattell, J. Dombeck, J. Bonnell, F. Mozer, S. Bale, C. Chaston, B. Ergun, D.N. Baker, X. Li, M.K. Hudson, R. Strangeway, J. Alpert, D. Brautigam, I. Mann, and J. Foster, The Electric Field Wave instrument on the Radiation Belt Storm Probe Mission, Fall AGU Meeting, San Francisco, CA, 11-15 December 2006.
- Zong, Q., T. Fritz, D.N. Baker, X. Li, A. Balogh, and H. Reme, Energetic particle modulation in the radiation belt region, Spring AGU Meeting, San Francisco, CA 23-26 May, 2006.
- Zong, Q., T. Fritz, S. Fu, G. Parks, D.N. Baker, M. Dunlop, J. Davies, A. Kirth, P. Daly, and H. Reme, Plasmoid, flux rope and BBF in the tail: Cluster and double star observation, Western Pacific Geophysics Meeting, Beijing, China, 24-27 July, 2006.

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Andersson, Laila
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Parallel electric fields and Alfvén waves
The de-rotating imaging system monitor
Comparison of in situ and remotely sensed measurements of cirrus cloud properties
Io's interaction with the magnetosphere of Jupiter
Juno science support
New horizon Pluto-Kuiper belt mission
Pluto's escaping atmosphere

Bagenal, Frances	Project Spectra! Exploring planets and their atmospheres using spectroscopy
Bagenal, Frances	Solar wind interaction with Comet Borrelly
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Baker, Daniel	Electronic Geophysical Year (eGY) initiative
Baker, Daniel	Mission of Opportunity Radbelt Experiment (MORE)
Baker, Daniel	Relativistic Electrons; understanding losses
Baker, Daniel	The Center for Integrated Space Weather Modeling (CISM)
Baker, Daniel	The Cluster rapid o-orbit operations and data verification
Baker, Daniel	The SAMPEX data center and user interface for the SEC community
Colwell, Joshua	Dynamics of interplanetary dust in the outer solar system
Colwell, Joshua	Evolution of the topography and mantles of comet nuclei
Colwell, Joshua	Lunar Regolith Simulant Testing
Davis, Randal	Kepler photometer
Davis, Randal	Mission operations of the NASA Quikscat satellite
Drake, Ginger	STARSYS STTR Phase II: Characterizing Metal-seal test samples
Duncan, Douglas	Bring knowledge of planet Earth to a wider audience, and bringing a diverse new group to careers in science teaching
Elkington, Scot	Global characteristics of the substorm particle injection process
Elkington, Scot	Radiation belt radial diffusion
Ergun, Robert	FAST satellite operations and data analysis
Ergun, Robert	MMS Bridge
Ergun, Robert	Nonlinear structures in 2-D and 3-D current-driven plasmas with shear
Ergun, Robert	Parallel electric fields in the upward current region of the aurora
Ergun, Robert	Small and medium scale modeling of the auroral downward current region
Eriksson, Stefan	Flank magnetopause reconnection, the sash and lobe convection
Eriksson, Stefan	Parallel electric fields in the upward current region of the aurora
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Gosling, John T.	Low-energy solar electron outbursts
Gosling, John T.	Magnetic reconnection in the solar wind
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Horanyi, Mihaly	Mesospheric aerosol sampling spectrometer (MASS)
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Hynek, Brian	Global analysis of Martian valley networks using THEMIS data
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Jakosky, Bruce	Center for Astrobiology
Jakosky, Bruce	Diviner lunar radiometer experiment
Jakosky, Bruce	Remote sensing of planetary surfaces
Jakosky, Bruce	Thermal imaging system
Kanekal, Shrikanth	Study of proton cutoffs during SEP events from 1992 to 2002
Kopp, Greg	Glory Project – TIM
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McClintock, William	MESSENGER mission MASCS instrument engineering support
McClintock, William	Science team support for the MESSENGER Mission
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Mellon, Michael	HiRISE experiment
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Rottman, Gary	Total solar irradiance sensor (TSIS)
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Thomas, Gary	Polar mesospheric cloud properties determined from SBUV and SBUV/2 measurements
Toon, Owen B.	Application of an aerosol model to simulate smoke and marine aerosols
Toon, Owen B.	Detection characterization and modeling of polar stratospheric clouds using satellite data from POAM III, HIRDLES and TES

Toon, Owen B.	Evolution of the optical properties of biomass smoke plumes in a three-dimensional transport model and comparisons to in situ and remote sensing observations
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