

# Laboratory for Atmospheric and Space Physics



Activity Report  
2005  
University of Colorado at Boulder

## TABLE OF CONTENTS

A Message from the Director -----	2
LASP: A Brief History-----	3
LASP Timeline -----	4
LASP Appropriated Funding-----	5
Research Support -----	5
<b>LASP Faculty</b> -----	<b>6</b>
<b>Visiting Scholars</b> -----	<b>6</b>
<b>LASP Staff</b> -----	<b>7</b>
<b>2005 Graduates</b> -----	<b>8</b>
<b>Graduate Students</b> -----	<b>8</b>
<b>Undergraduate Students</b> -----	<b>9</b>
<b>Faculty Research Interests</b> -----	<b>9</b>
<b>Faculty Service Activities</b> -----	<b>14</b>
<b>Faculty Honors/Awards</b> -----	<b>20</b>
<b>Courses Taught by LASP Faculty</b> -----	<b>20</b>
<b>Colloquia and Informal Talks</b> -----	<b>21</b>
<b>Publications</b> -----	<b>23</b>
<b>Works in Progress</b> -----	<b>30</b>
<b>Papers Presented at Scientific Meetings</b> -----	<b>32</b>
<b>Sponsored Programs</b> -----	<b>40</b>

### **A Message from the Director\***

LASP continues to grow and evolve as a research institute. New scientific programs have been added and excellent staff members have joined the Lab. We can point with pride to the successful designing, building, and testing of new spacecraft instruments and to the exciting scientific results from numerous ongoing projects. The combination of experiments, data analysis, and theoretical investigations provides a remarkably complete scientific approach within LASP. Based on our widely recognized engineering, mission operations, and information systems work and our science leadership, we believe that LASP is nearly unique in its abilities as a space research enterprise.

In order to carry out the wide range of work undertaken by the Laboratory, it has been clear for some time that more office and laboratory space has been (and will be) necessary. We have been supported by the University administration to help meet these needs. I am very pleased that the Chancellor and others have helped to move aggressively toward meeting our office and laboratory space needs. We have now completed a new building adjacent to the original LASP Space Technology Building in the Research Park. This new facility provides new space nearly comparable in area to the present LSTR building and should allow us to move smoothly to the next level of engineering, operations, and science that we have been striving for.

We here at CU, and at LASP in particular, are very concerned about research and analysis funding, about smaller Principal Investigator-led missions, and other such NASA programs. We tend to think that these are among the most important programs that NASA undertakes. Consequently, we have already been working vigorously with our congressional delegation and with congressional staff to help assure proper federal budget directions. I have great optimism that we will be successful in producing good effects. By serving on NASA and National Research Council committees and panels, many of us in the Lab are helping to advise and steer NASA on a good course. I think we can do that in important ways and we will redouble our efforts toward this goal.

As was seen at the new building dedication in March 2006, LASP enjoys a very warm and special relationship with the Colorado Lt. Governor, the CU/Boulder Chancellor, and with countless partners in the Front Range community. LASP has never been busier, or more productive, or more capable than it is now. We are working diligently to get new programs and new missions – and I have every confidence we will do that. We have the best people, the best ideas, and the best facilities in the world.

## **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

## **In Memoriam**

Austin Barker, an AERO graduate student and employee of LASP for three years, died in a tragic climbing accident in Boulder Canyon on May 28, 2005.

Austin was an excellent student and researcher. An enthusiastic participant in life, he will be sorely missed and long remembered.

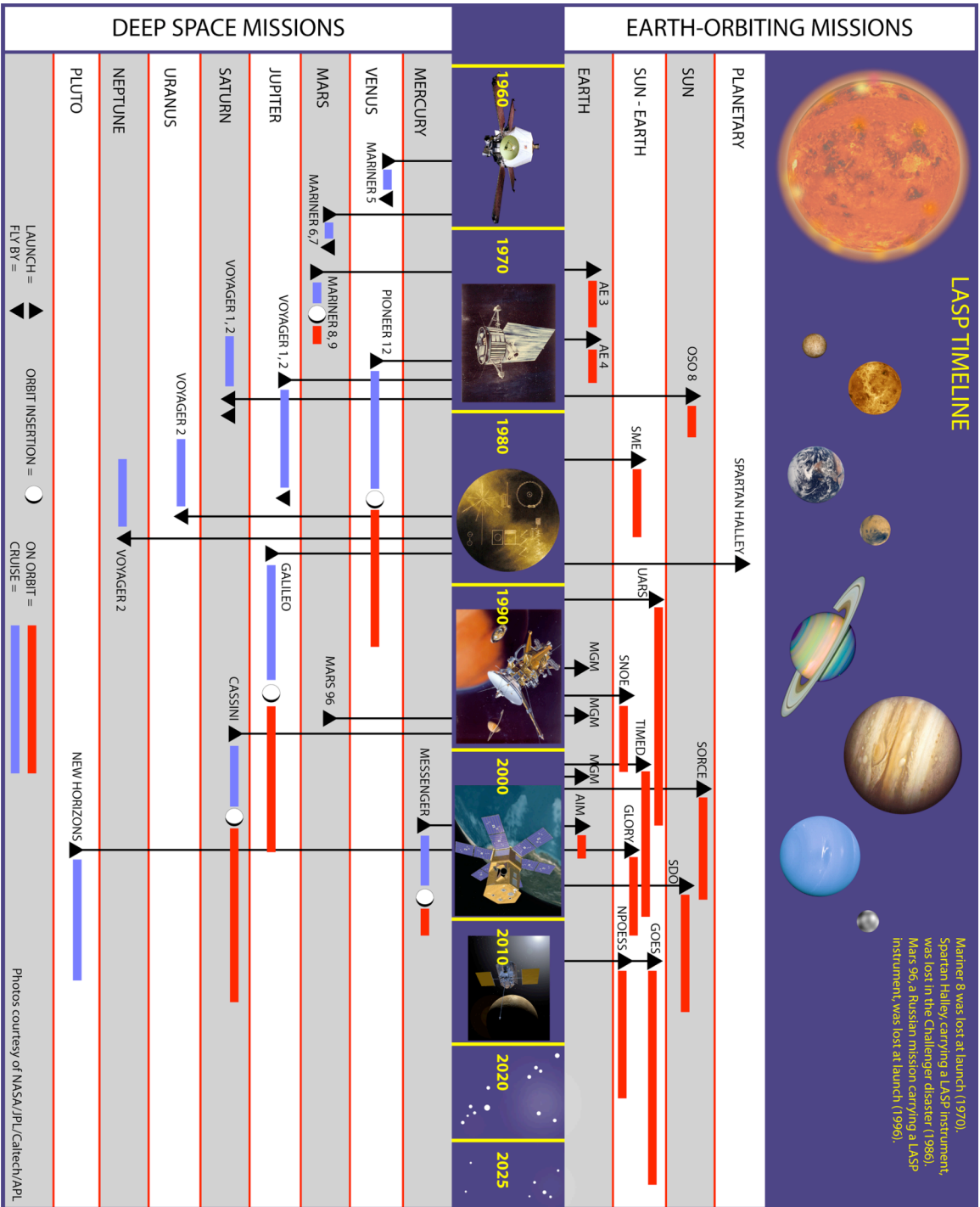
There are many challenges that must be confronted as an organization grows. Adding new people and facilities while maintaining the traditional LASP culture is a top concern for all of us. I have appreciated the strong support and thoughtful advice in these matters both by the University administration and by our External Advisory Committee. I have particularly appreciated the patience and good spirit of our tireless staff here at LASP.

I wish to express sincere appreciation to the University, to the local Boulder community, and to the national agencies for the continuing support that we receive. We look forward to working actively with the broad space research community in many new endeavors. 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>. For information about LASP's projects and missions, visit [http://lasp.colorado.edu/mission\\_history/index.htm](http://lasp.colorado.edu/mission_history/index.htm)**

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 1/1/2005 to 12/31/2005 LASP appropriated funding totaled \$50M for support of 113 grants and contracts.

### Research Support: 2005 Fiscal Year

Source of Funding	Total Grant Dollars
<b><i>Federal Agencies:</i></b>	
Department of Energy	\$125,000
NASA Cooperative Agreement	1,323,597
National Aeronautics and Space Administration	9,115,423
NASA Grant	10,803,480
NASA Training Grant	120,000
National Science Foundation	911,837
Federal Total	\$22,399,337
<b><i>Non-Federal Agencies:</i></b>	
Arizona State University	\$279,490
Ball Aerospace Systems Division	1,613,401
Boston University	615,000
Colorado School of Mines	27,610
Hampton University	20,585,092
Jet Propulsion Laboratory	1,018,216
Johns Hopkins University	38,554
Lockheed Martin	1,100,000
Northrop Grumman	1,287,050
Pennsylvania State University	16,916
Southwest Research Institute	722,132
Starsys	5,100
The Carnegie Institute of Washington	148,605
University of California at Los Angeles	10,000
University of Arizona	183,680
Non-Federal Total	\$27,650,846
<b>GRAND TOTAL</b>	<b>\$50,050,183</b>

**Daniel N. Baker**  
Director

**LASP Faculty**

Laila Anderssen	Kazunori Iwasaki	Sean Raymond
Linnea M. Avallone	Bruce M. Jakosky	Erik C. Richard
Frances Bagenal	Shri Kanekal	E. Joshua Rigler
Charles A. Barth	Greg Kopp	Gary J. Rottman
Phil Chamberlin	Kristopher Larsen	David W. Rusch
Emily CoBabe-Ammann	George M. Lawrence (Ret.)	Theodore Sarris
Joshua E. Colwell	Steven W. Lee	Nicholas M. Schneider
Peter Delamere	Xinlin Li	Jamison Smith
Scot Elkington	William E. McClintock	Martin Snow
Francis G. Eparvier	Tom McCollom	Miodrag Sremcevic
Robert Ergun	Sara Martinez-Alonzo	Zoltan Sternovsky
Stefan Eriksson	Michael Mellon	A. Ian F. Stewart
Larry W. Esposito	Michael Mills	Glen R. Stewart
Juan Fontenla	Steve Mojzsis	Yi-Jin Su
Jack Gosling	Keiji Ohtsuki	Gary E. Thomas (Ret.)
Janet C. Green	Robert T. Pappalardo	Feng Tian
Jerald W. Harder	Alexander Pavlov	O. Brian Toon
Lynn Harvey	William Peterson	Robert Weigel
Noel Hinners	Peter Pilewskie	Thomas N. Woods
Mihály Horányi	Cora E. Randall	
Brian Hynek	Mark P. Rast	

**Visiting Scholars**

Joseph Ajello, Jet Propulsion Laboratory, Pasadena, California  
Antal Juhasz, Research Institute for Particle and Nuclear Physics, Hungary  
Markus Landgraf, European Space Agency, Germany  
Wayne Pryor, Central Arizona College, Coolidge, Arizona  
Annika Seppala, Finland  
Chao Shen, China

## Research/Technical/Administrative Support Staff

Ann Alfaro  
Gregg Allison  
Michael D. Anfinson  
Judy Antman  
Richard Arnold  
Dennis L. Baker  
Susan Batiste  
Douglas Bausch  
Helmut P. Bay  
Kathryn Becker  
Christopher Belting  
Timothy Bendel  
Robert P. Biro  
Laura Bloom  
Bryce Bolton  
Mary Bolton  
James S. Bowers  
Brian D. Boyle  
John Boynton  
Shelley Bramer  
Catherine Brant  
Vanessa Briggs  
Nancy Brooks  
Jeff Brown  
Patrick Brown  
Chelsey Bryant  
Karen Beth Turk Bryant  
Michael T. Callan  
Zachary G. Castleman  
Tinapan Chanthawanich  
Zhangzhao Chen  
Matthew Chojnacki  
Wesley Cole  
Lillian Connelly  
Christopher Converse  
Pamela Crandall  
David Crotser  
Anita Davis  
Randal L. Davis  
Kip W. Denhalter  
Lindsay DeRemer  
Vincent Dols  
John Donnelly  
Sharon Dooley  
Michael Dorey  
Virginia Drake  
Peter Elespuru  
Steve Ericksen  
Brian Evans  
Phillip L. Evans  
Jack Faber  
Tawnya Ferbiak

Tim Flaherty  
Rodney Freeman  
David Gathright  
Michael Gehmeyr  
Vanessa George  
Judith (Dede) Gleason  
Jeff Graw  
Ken Greist  
Elizabeth Grogan  
Bonnie Kae Grover  
Roger Gunderson  
Scott Gurst  
David Harber  
Christine Hathaway  
Karl Heuerman  
Caroline Himes  
Rose A. Hoag  
Timothy Holden  
Bonnie W. Hotard  
Vaughn Hoxie  
Christian Jeppeson  
Edgar Johansson  
James Johnson  
Alain J. Jouchoux  
David E. Judd  
Michelle Kelley  
Marjorie K. Klemp  
Barry Knapp  
Richard Kohnert  
Jay Kominek  
Bret Lamprecht  
Mark R. Lankton  
Sally Lasater  
Ryan Lewis  
Kathy Lozier  
Debra McCabe  
Beth McGilvray  
Sherry McGlochlin  
Michael McGrath  
James Mack  
Melanie McKinney  
Deborah Marohnich  
Jack Marshall  
Patrick Meagher  
Willie Mein  
Hannah Meyer  
Marissa Meyer  
Nathaniel Miller  
Jerel Moffatt  
Steve P. Monk  
Aref Nammari  
Doan Nguyen

Brian Nuel  
Sara Ohrtman  
John M. Padgett  
Chris Pankratz  
Heather Passe  
Ann Perez de Tejada  
Norman C. Perish  
Nicole Ramos  
Thomas Reese  
Dwight Reinhardt  
Randy Reukauf  
Pat Ringrose  
Hans Rohner  
Timothy Ruske  
Marissa Rusinek  
Cynthia Russell  
Jill Ryan  
Sean Ryan  
Judith A. Salazar  
Patti Sicken  
John D. Smith  
Patrick Smith  
Thomas Sparn  
Stephen Steg  
Kenneth Stevens  
David Street  
Gail Tate  
Trenton Taylor  
Brian Templeman  
Feng Tien  
Wayne Tighe  
Susan Tower  
Matt Triplett  
Dale Troyer  
Scott A. Tucker  
Gregory Ucker  
Douglas Vincent  
Tracy Vincent  
Pamela J. Wagner  
Paul Weidmann  
Heather Weisacosky  
James Westfall  
Neil White  
Ann Williams  
Ann Windnagel  
Heather Reed Withnell  
Peter Withnell  
Donald Woodraska  
Mia Woody  
Ed Wullschleger

Alan Yehle  
Jason Young

Jennifer Young  
Torsten Zorn

## 2005 Graduates

Chamberlin, Phillip C., Ph.D., Aerospace Engineering Science  
December 16, 2005

*The Flare Irradiance Spectral Model (FISM)*  
Thesis Advisor: Thomas N. Woods

Gamblin, Brandy Elizabeth, Ph.D., Chemistry  
May 6, 2005

*Nitric acid condensation on upper tropospheric/lower stratospheric cirrus clouds*  
Thesis Advisor: Owen B. Toon

Segura, Teresa Lynn, Ph.D., Astrophysical, Planetary, and Atmospheric Sciences  
May 6, 2005

*Impact-triggered greenhouses on Mars*  
Thesis Advisor: Owen B. Toon

Steffl, Andrew J., Ph.D., Astrophysical, Planetary, and Atmospheric Sciences  
May 6, 2005

*The Io plasma torus during the Cassini encounter with Jupiter; Temporal, radial and azimuthal variations*  
Thesis Advisor: Frances Bagenal

Tian, Feng (Teddy), Ph.D., Astrophysical, Planetary, and Atmospheric Sciences  
May 6, 2005

*Hydrodynamic escape from planetary atmospheres*  
Thesis Advisor: Owen B. Toon

Weiss, John Wilfred, Ph.D., Astrophysical, Planetary, and Atmospheric Sciences  
May 6, 2005

*The physics of unconstrained edges in planetary rings*  
Thesis Advisor: Glen Stewart

## Graduate Students

Austin Barker  
Charles Bardeen  
Todd Bradley  
Jeremy Carnahan  
Nicole Cates  
Phillip Chamberlin  
Steve Chappell  
Seth Claudepierre  
Zane Crawford  
Christopher Cully  
Samik Dasgupta  
Sean Davis  
Tina (Tianyi) Fan

Nathan Farr  
Joe Flasher  
Alicia Frazier  
Brandy Gamblin  
Jennifer Gannon  
Brennan Gantner  
Damhnait Gleeson  
Anna Haugsjaa  
Alexa Halford  
Odelle Hoffman  
Monica Hoke  
Gregory Holsclaw  
Courtney Hoskins

David James  
Lars Kalnajs  
Bruce Kindel  
Ervin Krauss  
Lindsey Link  
Kevin McGouldrick  
Kevin McWilliams  
Lansing Madry  
Daniel Main  
Andrew Marshall



Rebecca Matichuk  
Patrick Meagher  
Colin Mitchell  
Nate Murphy  
Katherine Nauert  
Tania Nowell  
Heather Passe  
Radu Popescu  
Manny Presicci  
Than Putzig

Laurel Rachmeier  
Licia Ray  
Jason Reimuller  
Lonnie Riesberg  
Stuart Robbins  
Eric Schleicher  
Karen Schmidt  
Teresa Segura  
Supreet Kaur Sidhu  
Cynthia Shaw Singleton  
Karie Michelle Shipley

Hanna Sizemore  
Andrew Steffl  
Lin Su  
Sarah Thomas  
Heather Tollerud  
Dustin Trail  
Jennifer Uchida  
John Weiss  
Kaj Williams

## Undergraduate Students

John Adam  
Keegan Amyx  
Jeffrey Baxter  
Allyson Bieryla  
Brandon Bobian  
Michelle Bourgeois  
Lottie Brown  
Karen Beth Bryant  
Christopher Bunch  
Laura Bush  
Samuel Califf  
Bryan Callahan  
Anthony Carosa  
Rhain Carpenter  
Scott L. Chamberlin  
Matthew Chojnack  
Zane Crawford  
Jane Crayton  
Joshua Christofferson  
Sarah Cox  
Kimdao Dang  
Tera Dunn  
Jason Durrie  
Matthew Edwards  
Negar Ehsan  
Attila Elteto  
Neal Evans  
James Everton  
Nathan Farber  
David Goluskin

Jessica Harano  
Tyler Harrison  
Ryan Hickman  
Andrew Jenkins  
Matthew Kelly  
Lang Kenney  
Wendy Krauser  
Otto Krauss  
Davis Lawry  
Dustin Leverman  
Jacob Lilevjen  
Anthony Lindell  
Lucy Logan  
Kurt Lorhammer  
Jennifer Lowell  
Brooks Lustig  
Grant McGilvray  
Ben Marsh  
Danielle Massey  
David Motta  
McCall Mullen  
Larissa Myers  
Katherine Nauert  
John Neice  
Jacob Niece  
Jonathan Nikkel  
Kostas Pagratis  
Jason Patterson  
Brian Payne  
Michael Phan

Ryan Phillips  
Andrew Poppe  
Therese Possel  
Scott Potter  
Kathryn Rash  
Tyler Redick  
Lauren Roemer  
Alex Romanov  
Teresa L. Ross  
Patricia Rubi  
Joshua Rubin  
Crystal Salcido  
Peter Schwinn  
Molly Selting  
John Shelton  
Patrick Smith  
Jordan Spatz  
Jastsch Sud  
Timothy Sullivan  
Linda Te  
Edward Thiemann  
Dustin Trail  
Thu Yen Tran  
Melina Tremblay  
Veronica Vertucci  
Christopher White  
Geneva Wilkesanders  
Jennifer Wilson  
Tom Wisniewski

## Faculty 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.

### 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 modeling 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).  
*eparvier@colorado.edu, (303) 492-4546,  
<http://stripe.colorado.edu/~eparvier>*

## **Stefan Eriksson**

Space physics problems related to magnetic reconnection and its effects on the magnetosphere (convection, field-aligned currents, particle precipitation) as well as in the solar wind. The work involves data analysis as well as reconnection simulations using VORPAL (3-D electromagnetic fully kinetic particle code) in collaboration with Dr. Messmer at the Tech-X Corporation. The research is focused on magnetospheric and solar wind physics, such as magnetopause reconnection away from the subsolar region and the link between substorm onsets and tail reconnection. Examples include whether antiparallel merging for dominant IMF By conditions can explain high-latitude lobe cell convection and the related NBZ field-aligned current system in the polar cap, whether slow-mode shocks are observed at times of near-Earth tail reconnection and the analyses of solar wind reconnection events with Dr. Gosling.

*eriksson@lasp.colorado.edu (303) 492-8573*

## **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.

## **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 as-

teroids. 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*

## **Steven W. Lee**

Development of computer techniques for analysis and correlative study of multiple remote-sensing data sets; Digital image processing techniques; Physics of atmosphere/surface interactions; Mechanisms and rates of eolian sediment transport; Effects of topography on regional atmospheric circulation; Educational outreach: incorporating planetary science into K-12 curricula.

*steve.lee@lasp.colorado.edu (303) 492-5348*

## **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*

## **Michael Mills**

Research has focused on stratospheric sulfate aerosol. The current research tool is a 2D microphysical model of the troposphere, stratosphere, and mesosphere. A primary goal has been to assess the sources of the nonvolcanic stratospheric sulfate layer, and understand anthropogenic contributions. Because of the role of aerosol in stratospheric chemistry and radiative balance, this knowledge of its sources is critical to understanding global change. Recent efforts have attempted to understand discrepancies between observed and calculated aerosol mass at the top of the layer. Other work has examined the causes of observed particle nucleation in polar winter, the implications for aerosol of recently measured photolysis rates for H<sub>2</sub>SO<sub>4</sub> and SO<sub>3</sub>, and volcanic aerosol as a potential source for polar mesospheric clouds.  
*mills@colorado.edu (303) 492-7767*

## **Keiji Ohtsuki**

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

## **Robert T. Pappalardo**

Processes that have shaped the surfaces of icy outer planet satellites. The nature, origin, and evolution of bright grooved terrain on Jupiter's moon Ganymede, specifically the style of tectonism and implications for the satellite's geological history. The role of solid-state convection in the history of Europa, investigation of regions of separation and spreading of the Europa's icy lithosphere, and implications of the surface geology for lithospheric properties and the existence of a liquid water ocean beneath Europa's icy surface.  
*robert.pappalardo@lasp.colorado.edu (303)492-6423*

## **William K. Peterson**

Research Interests: (Missing on last years:) Obtaining and using observations from ground and space based instruments to characterize the Earth's plasma environment to test models and theories attempting to describe it.  
*Bill.Peterson@lasp.colorado.edu (303) 492-0686*

## **Cora E. Randall**

Remote sensing of the Earth's middle atmosphere focusing on satellite data analysis. Primary research areas include the effects of energetic particle precipitation on stratospheric ozone, polar mesospheric clouds, satellite data validation, and global chemistry-climate model validation.  
*cora.randall@lasp.colorado.edu (303) 492-8208*

## **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 spec-

troscopy 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](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*

## **Robert Weigel**

Dynamics and physics of solar wind/magnetosphere/ionosphere coupling. Modeling of high-energy electrons in the magnetosphere. Models of the dynamics of ground magnetic fields and their time derivatives based on the solar wind state. Prediction of temporal fluctuations in ground magnetic fields with high-dimensional nonlinear regression methods (neural networks). Low-dimensional physics-based models of geomagnetic storms and substorms. Characterization of the relaxation of ionospheric currents after passage of solar wind disturbance. Studies of short-time scale geomagnetic fluctuations and characterization of their probability distribution functions. Statistical and empirical model development for space weather prediction. Decision Theory applied to space weather forecasting problems.

*Robert.Weigel@lasp.colorado.edu (303-492-2159)*

## **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 SERVICE ACTIVITIES**

### **Aerospace Engineering Sciences Department (AES)**

Li, X. (Member; Graduate Committee on Curriculum)

Li, X. (Member; AES/LASP Cooperation Committee)

### **Air Force Technical Applications Center (AFTAC) Satellite Review Panel**

Baker, Daniel (Chair)

### **American Association for the Advancement of Science (AAAS)**

Gosling, John T., (Member)

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

### **Association of American Universities (AAU)**

Esposito, Larry (Member; Science Working Group)

### **American Geophysical Union (AGU)**

Avallone, Linnea (Member; Sullivan Award Committee)

Baker, Daniel (Past President; Space Physics and Aeronomy Section, 2004-2006)

Baker, Daniel (Chair; SPA Nominations Committee)

Baker, Daniel (Convenor; Special sessions)

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

Esposito, Larry (Main Organizer and Chair; AGU Chapman Conf. on Venus exploration)

Esposito, Larry (Session Organizer; 2005 Fall Meeting, Planetary Rings)

Gosling, John T. (Member)

Gosling, John T., (Member: Nominations Committee, Space Physics and Aeronomy)

Li, X., (Co-convenor of special session (2005 Fall Meeting))

## **American Meteorological Society (AMS)**

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

## **Asia Oceania Geosciences Society (AOGS)**

Li, X., (Co-convenor for 2005 Annual Meeting)

## **Astrophysical and Planetary Sciences Department (APS)**

Pappalardo, Robert (Department Representative, CU Geophysics Ph.D. Program)  
Pappalardo, Robert (Member; Admissions Committee)  
Pappalardo, Robert (Member; Course fees Committee)  
Schneider, Nicholas (Major and Minor Advisor)  
Schneider, Nicholas (Member; Telescope Allocation Committee)  
Schneider, Nicholas (Co-Chair; Colloquium)  
Schneider, Nicholas (Member; Newsletter Committee)  
Schneider, Nicholas (Member; Reappointment Committee)

## **Atmospheric and Oceanic Sciences (ATOC)**

Pilewskie, Peter (Member; Admissions Committee)  
Pilewskie, Peter (Member; Comprehensive Exams Committee)  
Pilewskie, Peter (Member; Distinguished Lecturers Committee)  
Toon, Owen B. (Director; Program in Atmospheric and Oceanic Science)

## **Committee on Space Research (COSPAR)**

Esposito, Larry (Main Scientific Organizer; COSPAR 34)

## **CIRES Earth Sciences Institute**

Avallone, Linnea (Lecturer)

## **CLUSTER Science Working Team**

Baker, Daniel (Member)

## **Editor**

Avallone, Linnea (Associate Editor; J. of Geophysical Research – Atmospheres)  
Baker, Daniel (Regional Editor: J. of Atmospheric and Solar Terrestrial Physics)  
Baker, Daniel (Associate Editor; Space Weather)  
Baker, Daniel (Co-Editor; Space Science Review Special Issue)  
Jakosky, Bruce (Member; Editorial Board – Geobiology, Astrobiology, International J. of Astrobiology)  
Pappalardo, Robert (Guest Editor; Special Issue Journal of Structural Geology)

## **Electronic Geophysical Year Steering Committee**

Baker, Daniel (Chair)

## **Global Chinese Aerospace Weather Science Meeting**

Li, X. (Co-convenor for 2005 meeting session)

## **Huntsville Conference on Space Physics**

Baker, Daniel (Member; Organizing Committee)

## **International Assoc. for Geomagnetism and Aeronomy (IAGA)**

Baker, Daniel (Ex Officio Member; Bureau)

Baker, Daniel (Chair; IGY+ 50 Task Force)

## **International Astronomical Union (IAU)**

Gosling, John T., (Member)

## **Institute of Geophysics and Planetary Physics (IGPP)**

Gosling, John T. (Member: Workshop on the Physics of Collisionless Shocks)

## **International Union of Geodesy and Geophysics (IUGG)**

Baker, Daniel (Member; IGY+50 Advisory Committee)

Baker, Daniel (U.S. Representative)

## **International Heliophysical Year Planning Group**

Baker, Daniel (Member)

## **International Probe Workshop**

Esposito, Larry (Member; Scientific Organizing Committee)

## **International Space Science Institute Working Group**

Baker, Daniel (Member)

## **International Space Weather Conference**

Baker, Daniel (Member; Organizing Committee)

## **Jupiter Icy Moon Orbiter, NASA Science Definition Team**

Pappalardo, Robert, Member

## **Laboratory for Atmospheric and Space Physics (LASP)**

### Business Committee

Baker, Daniel (Chair)

Davis, Randal

Himes, Caroline

Jakosky, Bruce

McGrath, Michael

Woods, Tom

### Computer Services Advisory Committee (CSAC)

Colwell, Josh (Chair)

Bardeen, Charles

Delamere, Peter

Elkington, Scot



Himes, Caroline  
Kopp, Greg  
Lankton, Mark  
Lewis, Ryan  
Pankratz, Chris

Education and Public Outreach Advisory Committee

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

Engineering Managers Meeting

McGrath, Michael (Chair)  
Anfinson, Mike  
Bolton, Mary  
Bramer, Shelly  
Drake, Ginger  
Himes, Caroline  
Lankton, Mark  
McGilvray, Beth  
Reed, Heather  
Sparr, Tom  
Tate, Gail  
Taylor, Trent  
Westfall, Jim  
Williams, Ann  
Woods, Tom

Executive Committee

Baker, Daniel (Chair)  
CoBabe-Ammann, Emily (Member)  
Colwell, Josh (Member)  
Davis, Randall (Member)  
Ergun, Robert (Member)  
Esposito, Larry (Member)  
Grover, Bonnie Kae (Member)  
Himes, Caroline  
Horanyi, Mihaly  
Jakosky, Bruce  
Li, Xinlin  
McClintock, William  
McGrath, Michael  
Randall, Cora  
Rottman, Gary  
Stewart, Ian  
Woods, Thomas

LASP Seminar Series

Andersson, Laila (Coordinator)

Library Committee

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

### Proposal Development Committee

Woods, Tom, (Chair)  
Anfinson, Mike  
Baker, Daniel  
CoBabe-Ammann, Emily  
Davis, Randal  
Ergun, Bob  
George, Vanessa  
Himes, Caroline  
Jakosky, Bruce  
Kopp, Greg  
McClintock, Bill  
McGilvray, Beth  
McGrath, Michael  
Pankratz, Chris  
Perez de Tejada, Ann  
Reed, Heather  
Richard, Erik  
Ryan, Sean  
Sparn, Tom  
Tate, Gail  
Westfall, Jim

### Self-Study Committee

Jakosky, Bruce (Chair)  
Bagenal, Fran  
Baker, Daniel  
CoBabe-Ammann, Emily  
Davis, Randal  
Esposito, Larry  
Himes, Caroline  
Horanyi, Mihaly  
McGrath, Michael  
Randall, Cora  
Rusch, David  
Schneider, Nick  
Woods, Tom

## **Langley Distributed Active Archive Center**

Randall, Cora (Member; User Working Group)

## **MESSENGER/Mercury Orbiter Science Working Team**

Baker, Daniel (Member)

## **National Academy of Science**

Baker, Daniel (Member; Space Studies Board)  
Baker, Daniel (Chair; NAS/NRC Committee on Solar and Space Physics)

## **National Aeronautics and Space Administration (NASA)**

Baker, Daniel (Member; NASA Magnetospheric Multiscale Mission, Science Team)  
Baker, Daniel (Advisor, Sun-Earth Connections Roadmap Committee)  
Jakosky, Bruce (Chair; Mars Exploration Program Analysis Group)  
Jakosky, Bruce (Member; MEPAG Mars Sample Return Science Steering Group)  
Jakosky, Bruce (Member; MEPAG Mars Pathways AdHoc Working Group)  
Jakosky, Bruce (Member; MEPAG Program Planning Science Analysis Group)  
Jakosky, Bruce (Convenor and Meeting Chair; Astrobiology Institute Biannual meeting)  
Pappalardo, Robert (Member; Astrobiology Institute Local Organizing Committee)  
Pappalardo, Robert (Member; Solar System Exploration Subcommittee)  
Pappalardo, Robert (Member; Solar System Exploration Strategic Roadmap Committee)  
Pappalardo, Robert (Member; Jupiter Icy Moon Orbiter, NASA Science Definition Team)  
Pappalardo, Robert (Member; Outer Planets Assessment Group – Europa Subgroup)  
Randall, Cora, (Chair; Validation session at NASA Solar Occultation Satellite Science Team (SOSST) annual meeting)  
Randall, Cora (Member; EOS/Aura education/outreach working group)  
Randall, Cora (Member, Solar Occultation Satellite Science Team Executive (SOSST) Committee)  
Toon, Owen B. (Member, Tropical Clouds Mission Organizing Committee)

## **National Center for Atmospheric Research (NCAR)**

Avallone, Linnea (Member; External Advisory Committee for Inst. For Integrative and Multidisciplinary Earth Sciences)

## **National Oceanic and Atmospheric Administration (NOAA)**

Baker, Daniel (Member; Strategic Planning Group (External))

## **National Science Foundation (NSF)**

Avallone, Linnea (Member; NSF Observing Facilities Advisory Panel (OFAP))  
Baker, Daniel (Member; Advisory Panel on Faculty Development)  
Peterson, William K. (Co-Chair: Global Environmental Modeling Magnetospheric-Ionospheric Campaign Working Group)

## **National Research Council (NRC)**

Pilewskie, Peter (Member; Space Studies Board (SSB), Comm. On Large Optical Systems in Space)  
Pilewskie, Peter (Member; Steering Committee, Achieving Satellite Instrument Calibration for Climate Change)

## **National Space Weather Program Assessment**

Baker, Daniel (Member; Joint Action Group)

## **Outer Planets Assessment Group – Europa Subgroup**

Pappalardo, Robert, Member

## **Phi Beta Kappa**

Gosling, John T., (Member)

## **Planetary Society**

Jakosky, Bruce (Member; Advisory Board)

## **Polar Science Working Team**

Baker, Daniel (Member)

## **Program in Atmospheric and Oceanic Sciences (PAOS)**

Randall, Cora (Member; PAOS graduate student admissions Committee)

Randall, Cora (Member; PAOS reappointment Committee for Peter Pilewskie)

## **Reviewer of Manuscripts, Grants, or Creative Work**

Andersson, Laila (manuscripts: Physics of Plasma, IEEE Transactions on Plasma Science, Planetary and Space Science, Geophys. Res. Letters, J. Geophys. Res.)

Andersson, Laila (proposals: NSF and NASA)

Avallone, Linnea (proposals: Natural Environmental Research Council Centers for Atmospheric Sciences (UK))

Avallone, Linnea (proposal: US Civilian Research and Development Foundation)

Avallone, Linnea (manuscripts: Geophysical Research Letters, J. of Atmospheric and Oceanic Technology)

Avallone, Linnea (Canadian Foundation for Climate and Atmospheric Sciences (CFCAS) proposal)

Baker, Daniel (Member; Space Physics Research lab (U. of Michigan) Review Committee)

Ergun, Robert (manuscripts: J. of Geophysical Research, Geophysical Research Letters, Phys. Plasmas; NASA and NSF proposals)

Stefan Erikksen (manuscripts: Annales Geophysicae, Advances in Space Research, Geophys. Res. Letters, J. of Geophys. Research, and Space Science Reviews)

Stefan Erikksen (proposals: National Science Foundation)

Esposito, Larry (manuscripts: J. of Geophysical Research, Phys. Plasmas, Nature, Icarus)

Horanyi, Mihaly (manuscripts: J. of Geophysical Research, Geophysical Research Letters, Icarus)

Horanyi, Mihaly (proposals: National Science Foundation, Dept. of Energy, and NASA)

Jakosky, Bruce (manuscripts: Icarus, J. Geophys. Research – Planets, Geology, Protostars and Protoplanets)

Jakosky, Bruce (proposal: NASA Mars Fundamental Research Program)

Li, Xinlin (proposals: NASA and NSF)

Li, Xinlin (manuscripts: J. of Geophysical Research, Geophysical Research Letters, Advanced Plasma Physics, J. of Advances in Geosciences, and J. of Space Weather)

Pappalardo, Robert (manuscripts: Nature, Icarus, Earth and Planetary Science Letters)

Pappalardo, Robert (proposals: NASA's Outer Planet Research Program and Planetary Geology and Geophysics Program)

Peterson, William K. (proposals: National Science Foundation)

Peterson, William K. (manuscripts: J. Geophys. Res., and Geophys. Res. Lett.)

Pilewskie, Peter (proposals: National Science Foundation and UK Natural Environmental Research Council)

Randall, Cora (proposals: Swedish National Space Board, NSF, NERC (UK))

Randall, Cora (manuscripts: J. Geophys. Rev. (Atmospheres), Space Physics; Adv. Space Research; J. Atmos. Science)

## **SAMPEX Science Working Team**

Daniel Baker (Member)

## Space Science Institute (SSI)

Schneider, Nicholas( Advisor; Museum exhibit on Giant Planets)

## University of Colorado

Avallone, Linnea (Member; BFA Committee on Women)  
Baker, Daniel (Member; Graduate School/Institute Directors Group)  
Baker, Daniel (Deputy Director; Center for Limb Atmospheric Sounding)  
Baker, Daniel (Member; External Advisory Board, Aerospace Engineering Department)  
Baker, Daniel (Member; Chancellor's Federal Relations Advisory Committee)  
Baker, Daniel (Chair; Boulder Matrix Space Advisory Group)  
Baker, Daniel (Member; VCR Research Cabinet)  
Esposito, Larry (Chair; BFA Compensation and Benefits Committee)  
Himes, Caroline (Member; BFA Budget and Finance Committee)  
Himes, Caroline (Co-Chair; Meetings of Institute Administrators)  
Horanyi, Mihaly (Member; Physics Department Undergraduate Committee)  
Horanyi, Mihaly (Chair; Comps Committee)  
Horanyi, Mihaly (Associate Chair; Physics Department, Graduate Studies)  
Horanyi, Mihaly (Member; BFA Library Committee)  
Jakosky, Bruce (Organizer and Moderator; CU Center for Astrobiology Symposium)  
McGilvray, Beth (Member: BFA Committee)  
Pilewskie, Peter (Member; BFA Academic Affairs Committee)

## Universities Space Research Association (USRA)

Baker, Daniel (Member; Astronomy and Space Physics Council)  
Baker, Daniel (Member; Council of Institutes)  
Baker, Daniel (Representative, Council of Institutes)  
Jakosky, Bruce (Member; Lunar and Planetary Institute Science Council)

## Faculty Honors/Awards

Avallone, Linnea (Recipient, NASA Goddard Space Flight Center Group Achievement Award, 2005)  
Esposito, Larry (Fellow; American Geophysical Union)  
Gosling, John T. (Listed in: Who's Who in Science and Technology, Who's Who in America and Who's Who in the World)  
Horanyi, Mihaly (SPS Physics Professor of the Year)  
Pilewskie, Peter (NASA Group Achievement Award, INTEX-NA Science Team)  
Randall, Cora (Certificate of Recognition, NASA Aura Project)  
Randall, Cora (NASA Group Achievement Award, NASA Aura Project)  
Rottman, Gary (University of Colorado Robert L. Stearns Award)  
Toon, Owen B. (NASA Group Achievement Award, NASA Aura Satellite)

## Courses Taught by LASP Faculty

### Spring 2005

Name	Course #	Description
Linnea Avallone	ATOC 6020	Group Meeting/Journal Club
Linnea Avallone	ATOC 5900	Independent study Advanced Atmospheric Chemistry
Emily CoBabe-Ammann	ATOC 6020	Teacher Professional Development Workshop on the Outer Planets
Robert Ergun	ASTR 6000	Seminar

Robert Ergun	ASTR 5140	Plasma Astrophysics
Larry Esposito	ASTR 5835	Graduate Seminar
Larry Esposito	ASTR 5830	Extrasolar planets
Mihaly Horanyi	PHYS 2210	Foundations of modern physics
Xinlin Li	ASEN 4010	Intro to Space dynamics
Robert Pappalardo	ASTR/GEOL 3300	Extraterrestrial Life
Peter Pilewskie	ATOC 6020-005	Remote sensing Seminar
Nick Schneider	ASTR 1010	Intro. Astronomy for Non-Science Majors
Owen Toon	ATOC 6020	Seminar on aerosols

## Fall 2005

Name	Course #	Description
Fran Bagenal	ASTR 1030	Accelerated Intro to Astronomy
Fran Bagenal/Robert Ergun	ASTR 5835	Planetary Seminar – Aurora
Robert Ergun	ASTR 1120	General Astronomy: Stars/Galaxy
Robert Ergun	ASTR 5835	Planetary Seminar
Larry Esposito	ASTR 3750	Planets, Moons, and Rings
Mihaly Horanyi	PHYS 2210	Mechanics and its Analytical Methods
Bruce Jakosky	GEOL 5700	Planetary Field Geology
Xinlin Li	ASEN 3113	Thermo and Heat transfer
Mike McGrath	GEEN 1400	Intro to Engineering Projects
Michael Mills	ATOC 3500	Air Chemistry and Pollution
Bob Pappalardo	ASTR 5800	Planetary Surfaces and Interior
Bob Pappalardo	GEOL 5700	Planetary Science Field Course
Nick Schneider	ASTR 1110	General Astronomy: Solar System
Owen Toon	ATOC 5600	Physics and Chemistry of Clouds and Aerosols

## Colloquia and Informal Talks

### Spring 2005

Fred C. Adams, U. of Michigan, The origin and fate of the universe

Stanley Awramik, UC/Santa Barbara, Life in the Balmy Waters of Lake Meentheena (Late Archean Tumbiana Formation, Western Australia)

Mark A. Bullock, (SwRI) and Jeffrey M. Moore, (NASA/Ames), Atmospheric Conditions on Early Mars and the Lack of Carbonate Deposits

Christopher F. Chyba, SETI Institute and Stanford University, Astrobiology, life, and civilization

**Emily CoBabe-Ammann**, CU / LASP, Education and Public Outreach: Moving Fast, Moving Forward, Moving...Where?

**Joshua Colwell**, CU / LASP, Cassini UVIS Observations of Saturn's Rings

Shelley D. Copley, CU/MCDB/CIRES, Center for Astrobiology, A Mechanism for the Association of Amino Acids with their Codons and the Origin of the Genetic Code

William (Ned) Friedman, CU/EPOB, Asteroid impacts, symbiosis, and the prevalence of subterranean plants

J. T. Gosling, Los Alamos National Laboratory, Magnetic Reconnection in the Solar Wind Near 1 AU

John F. Haught, Georgetown University, Astrobiology and cosmic purpose

Wesley T. Huntress, Jr., Carnegie Institute of Washington, The future of space exploration

**Brian M. Hynek**, CU/LASP, Unraveling the geological, hydrological, and geochemical histories of Meridiani, Mars: An abode for life?

Michael D. King, NASA GSFC, Spatial and Temporal Distribution of Tropospheric Clouds Observed by MODIS Onboard the Terra and Aqua Satellites

Kristopher Larsen, CU/LASP, Terrestrial Radar Observations of Mars

Charles Lineweaver, Planetary Science Institute, Australian National University, The Galactic Habitable Zone and the Age Distribution of Complex Life in the Milky Way

Gang Lu, HAO/NCAR, Corotating High-Speed Streams, Magnetic Clouds, and Interplanetary Shocks: A Study of Geoeffectiveness

**William E. McClintock**, CU / LASP, SOLSTICE II: A Progress Report on the SOLar STellar Irradiance Comparison Experiment

Diane M. McKnight, CU/INSTAAR and Dept. of Civil, Environmental, and Architectural Engineering, Glacial Meltwater streams in

## Fall 2005

**Linnea Avallone**, CU/LASP, Ozone chemistry in the high latitude boundary layer

**Fran Bagenal**, LASP/APS, Juno: How We Will Fly Over the Poles of Jupiter and Why

Nicholas Brummell, JILA/APS, Magnetic Field Transport in the Solar Dynamo(s)

**Scot Elkington**, CU/LASP, The Sun, the solar wind, and Earth's trapped radiation environment

**Stefan Eriksson**, CU/LASP, Ionospheric convection response to high-latitude reconnection: Cluster and SuperDARN observations

the McMurdo Dry Valleys: Ecosystems waiting for water

**Keiji Ohtsuki**, CU/LASP, Rotation of Moons and Particles in Planetary Rings

Norman R. Pace, CU/MCDB/Astrobiology, What Do Phylogenetic Trees Tell Us about the Origin and Evolutionary Course of Life?

Alfred M. Powell, Jr., NOAA/NESDIS, Camp Springs, MD, In Search of the Sun-Earth Connection

William Priedhorsky, Los Alamos National Laboratory Remote Detection of Proliferation: an Observational Science

John R. Spear, CU/MCDB/Astrobiology, What can we learn from microbial ecology in some extreme environments?

Ralf Srama, MPIK Heidelberg, Germany, Dust Measurements with Cassini

**Feng Tian**, CU/LASP, Hydrodynamic escape; hydrogen content in early Earth's atmosphere and Enhanced escape from Pluto

**Larry Esposito**, CU/LASP, Monte Carlo model of sputtering and other ejection processes within a regolith

**Damhnait Gleeson**, CU/LASP, Signs of life beneath the ice

**Brian Hynek**, CU/LASP, The Scales of Mars  
**Bruce Jakosky**, LASP/Geology, Mars volatile evolution: Emergence of a new paradigm?

Eric Jensen, NASA Ames, Impact of smoke particles on cumulonimbus cloud dynamics, microphysics, and radiative forcing

Giovanni Lapenta, Los Alamos National Laboratory, Interplay of flows and magnetic fields in solar and space environments

- K. D. Leka, NorthWest Research Associates, Inc., Colorado Research Associates Division, Are We There Yet?; The Journey to Understand and Predict Solar Energetic Events
- Mark Linton, Naval Res. Lab., Coronal mass ejections: Magnetic reconnection and flare loop formation
- Thomas McCollom**, CU/LASP, Exploring terrestrial analogs of potential biological habitats on other planets
- Ken Mankoff, NASA/GISS, Global Climate Model: An educational version
- Thomas Metcalf, Colorado Research Associates Division, NorthWest Research Associates, The Magnetic Free Energy in Solar Active Regions
- Robert Pappalardo**, CU/LASP, The search for Europa's ocean
- Eric Quemarais, CNRS (France), Studies of the interplanetary Lyman alpha background with the SWAN experiment on SOHO; What we learned on the Hydrogen Ionization rate, the solar flux spatial and temporal variations, and the heliospheric interface
- Markus Rapp, Stockholm University, Polar Mesospheric Clouds: Current Understanding of Microphysical Processes and Interpretation of Observations
- Mark Rast, HAO/NCAR, Solar variability: The role of photospheric flows
- Sebastian Schmidt**, CU/LASP, Quantifying the Effects of Cloud Heterogeneities on Spectral Solar Radiation
- Elizabeth Turtle, Lunar and Planetary Lab, Exploring the surface of Titan with Cassini-Huygens
- V. Uritsky, A. Klimas, St. Petersburg Univ., and D. Vassiliadis, NASA/GSFC, Scale-free dynamics of earth's magnetosphere: Observational signatures and predictability
- Tom Vonder Haar, CIRA Colorado State University, Earth's Radiation Budget: From Early Discoveries to Current Science Results and Questions
- Mel Zhang, National Astronomical Observatory, Chinese Academy of Sciences, Conservation and transport of magnetic helicity: The case of solar coronal mass ejections.

## Publications

- Ajello, Joseph M., Pryor, W., Esposito, L.W., Gustin, J., Clarke, J.T. The Cassini Campaign Observations of the Jupiter Aurora by the Ultraviolet Imaging Spectrograph and the Space Telescope Imaging Spectrograph. *Icarus*, 178 327-345, 2005.
- Andersson, L., W.K. Peterson, and K.M. McBryde, Estimates of the suprathermal O<sup>+</sup> outflow characteristic energy and relative location in the auroral oval, *Geophys. Res. Lett.*, 32, L09104, doi:10.1029/2004GL021434, 2005
- Asikainen, T., K. Mursula, R. Kerttula, R. Friedel, D. Baker, F. Soraas, J. Fennell, and J. Blake, Global view of energetic particles during a major magnetic storm, in *The Inner Magnetosphere: Physics and Modeling*, *AGU Monogr.* 155, 97-104, 2005.
- Avallone, L.M., Measurements of active chlorine in the high latitude boundary layer during springtime, being revised for submission to *Geophys. Res. Lett.*, February 2006.
- Bailey, S. M., A. W. Merkel, G. E. Thomas and J. N. Carstens, Observations of Polar Mesospheric Clouds by the SNOE Spacecraft, *J. Geophys. Res.*, 110, D13203, doi:10.1029/2004JD005422, 2005.



- Baker, D.N., Introduction to Space Weather, in *Space Weather: The Physics Behind a Slogan*, pp. 3-20, K. Scherer, Ed., Springer-Verlag, 2005.
- Baker, D.N., R.L. McPherron, and M.W. Dunlop, Cluster observations of magnetospheric substorm behavior in the near- and mid-tail region, *Adv. Space Res.*, 39, 10, 1809-1817, 2005.
- Baker, D.N., S. Elkington, X. Li, and M.J. Wiltberger, Particle acceleration in the inner magnetosphere, in *The Inner Magnetosphere: Physics and Modeling*, *AGU Monogr.* 155, 73-86, 2005.
- Baker, D.N., S.G. Kanekal, J.B. Blake, and J.H. Allen, Radiation belt responses to the solar events of October-November 2003, in *Global Physics of the Coupled Inner Magnetosphere*, *AGU Monogr.* 159., M. Schulz, H. Spence, and J.L. Burch, eds., 251-259, 2005.
- Barker, A. B., X. Li, and R. S. Selesnick, Case Study of Radiation Belt Electrons During Magnetic Storms Based on Solar Wind Measurements, *Space Weather*, Vol. 3, No. 10, S10003 10.1029/2004SW000118, 13 October 2005.
- Barr, A. C., and R. T. Pappalardo, Convection in the icy satellites: Implications for astrobiology, *Astrobiology*, 2, 304-305, 2005.
- Barr, A. C., and R. T. Pappalardo, Onset of convection in the icy Galilean satellites: Influence of rheology, *J. Geophys. Res.*, 110, E12005, doi:10.1029/2004JE002371, 2005.
- Barr, A. C., and R. T. Pappalardo. Convection in ice I with composite Newtonian/non-Newtonian rheology: Application to the icy Galilean satellites. *Proc. Lunar Planet Sci. Conf. XXXVI. Abstract #2146*, 2005.
- Begelman, M.C., R. E. Ergun, and M. J. Rees, Cyclotron Maser Emission from Blazer Jets?, *Astrophys. J.*, 625, 51, 2005.
- Blake, J.B., R. Mueller-Mellin, J.A. Davies, X. Li, and D.N. Baker, Global observations of energetic electrons around the time of a substorm on 27 August 2001, *J. Geophys. Res.*, 110, A06214, doi: 10.1029/2004JA010971, 2005.
- Chaston, C.C., R.E. Ergun, et al., Energy deposition by Alfvén waves into the day-side auroral oval: Cluster and FAST observations, *J. Geophys. Res.*, 110(A2), A02211, 2005.
- Christensen, P.R., B.M. Jakosky, et al., Evidence for magmatic evolution and diversity on Mars from infrared observations, *Nature*, doi: 10.1038/nature03639, 2005.
- Christensen, P.R., B.M. Jakosky, et al., Mars Exploration Rover candidate landing sites as viewed by THEMIS, *Icarus*, 187, 12-43, 2005.
- Colwell, J.E., A.A.S. Gulbis, M. Horányi, S. Robertson, Dust Transportation in Photoelectron Layers and the Formation of Dust Ponds on Eros, *Icarus*, 175, 159-169, 2005.
- Colwell, J.E., Gulbis, A.A.S., Horányi, M., Robertson, S., Dust transport in photoelectron layers and the formation of dust ponds on Eros, *Icarus*, 175, (1), 159-169, 2005.
- Crawford, Z., R. T. Pappalardo, A. Barr, D. Gleeson, M. Mullen, F. Nimmo, M. M. Stempel, and J. Wahr. Wavy lineaments on Europa: Fracture propagation into combined nonsynchronous and diurnal stress fields. *Proc. Lunar Planet Sci. Conf. XXXVI. Abstract #2042*, 2005.
- Curtis, D.B., B. Rajaram, O.B. Toon, and M.A. Tolbert, Measurement of the temperature-dependent optical constants of water ice in the 15-200 5m wavelength region, *Appl. Optics*, 44, 4012-4118, 2005.
- Curtis, D.B., et al., Laboratory studies of butane nucleation on organic haze particles: Application to Titan's cloud, *J. Phys. Chem.*, A109(7), 1382-1390, 2005.
- De Koning, C. A., J. T. Steinberg, J. T. Gosling, D. B. Reisenfeld, R. M. Skoug, O. C. St. Cyr, M. L. Malayeri, A. Balogh, A. Rees, and D. J. McComas, An Unusually Fast CME Observed by Ulysses at 5 AU on November 15, 2003, *J. Geophys. Res.*, 110, A01102, doi:10.1029/2004JA010645, 2005.

- Dubson, M., Schneider, N., and Osterman, S., Photon-by-photon post-processing correction of pointing errors in an orbiting satellite, Proc. SPIE, 5899, 589911, 2005.
- Elkington, S.R., D.N. Baker, and M. Wiltberger, Injection of energetic ions during the 31 March 0630 Substorm, in *The Inner Magnetosphere: Physics and Modeling*, AGU Monogr. 155, 147-154, 2005.
- Elliott, H. A., D. J. McComas, N. A. Schwadron, J. T. Gosling, R. M. Skoug, G. Gloeckler, and T. H. Zurbuchen, An Improved Expected Temperature Formula for Identifying Interplanetary Coronal Mass Ejections, J. Geophys. Res., 110, A04103, doi:10.1029/2004JA010794, 2005.
- Ergun, R.E., L. Andersson, Y.-J. Su, D. L. Newman, M. V. Goldman, W. Lotko, C. C. Chaston, and C. W. Carlson, Localized parallel electric fields associated with inertial Alfvén waves, Phys. Plasmas, 12, 072901, 2005.
- Eriksson, S., R.E. Ergun, et al., On the generation of enhanced sunward convection and transpolar aurora in the high-latitude ionosphere by magnetic merging, J. Geophys. Res. 110, A11218, doi:10.1029/2005JA011149, 2005.
- Esposito, L. W., et al., The Cassini Ultraviolet Imaging Spectrograph investigation. Space Sci. Rev., 115, 299-361, 2005.
- Esposito, L.W., et al., Ultraviolet Imaging Spectroscopy Shows an Active Saturnian System, Science, 307, 1251-1255, 2005.
- Frinak, E., et al., Infrared characterization of water uptake by low temperature Namontmorillonite: Implications for Earth and Mars, J. Geophys. Res., 110, doi: 10.1029/2004JD005647, 2005.
- Gannon, J.L., and X. Li, Electron Phasespace Density Analysis Based on Test-particle Simulation of Magnetospheric Compression Events, AGU Monograph 156, page 205-214, 10.1029/156GM23, 2005.
- Gleeson, D., Z. Crawford, A. C. Barr, M. Mullen, R. T. Pappalardo, L. M. Prockter, M. M. Stempel, and J. Wahr. Wavy and cycloidal lineament formation on Europa from combined diurnal and nonsynchronous stresses. Proc. Lunar Planet Sci. Conf. XXXVI. Abstract #2364, 2005.
- Goldstein, J., S.G. Kanekal, D.N. Baker, and B.R. Sandel, Dynamic relationship between the outer radiation belt and the plasmopause during March-May 2001, Geophys. Res. Lett., 32, L15104, doi:10.1029/2005GL023431, 2005.
- Gosling, J. T., Magnetic Reconnection in the Solar Wind: A Brief Overview, In *Proceedings of Solar Wind 11/SOHO 16, Connecting Sun and Heliosphere*, edited by B. Fleck and T. H. Zurbuchen, ESA SP-592, 249-254 2005.
- Gosling, J. T., R. M. Skoug, D. J. McComas, and C. W. Smith, Direct Evidence for Magnetic Reconnection in the Solar Wind, J. Geophys. Res., 110, A01107, doi:10.1029/2004JA010809, 2005.
- Gosling, J. T., R. M. Skoug, D. J. McComas, and C. W. Smith, Magnetic Disconnection From the Sun: Observations of a Reconnection Exhaust in the Solar Wind at the Heliospheric Current Sheet, Geophys. Res. Lett., 32, L05105, doi:1029/2005GL022406, 2005.
- Gosling, J. T., R. M. Skoug, D. K. Haggerty, and D. J. McComas, Absence of Energetic Particle Effects Associated with Magnetic Reconnection Exhausts in the Solar Wind, Geophys. Res., Lett., 32, L14113, doi:10.1029/2005GL023357, 2005.
- Harder, J., et al., The Spectral Irradiance Monitor: Measurement equations and calibration, Solar Physics, 230, 169-204, 2005.
- Harder, J., G. Lawrence, J. Fontenla, G. Rottman, and T. Woods, The Spectral Irradiance Monitor: Scientific requirements, instrument design, and operation modes, Solar Physics, 141-167, 2005.
- Heldmann, J. L., et al., Formation of martian gullies by the flow of simultaneously freezing and boiling liquid water, J. Geophys. Res. 110. E05004 10.1029/2004JE002261, 2005.
- Heldmann, J.L., et al., Annual development cycle of an icing deposit and associated

- perennial spring activity on Axel Heiberg Island, Canadian High Arctic, Arct. Antarct. Alpine Res., 37(1), 126-134, 2005.
- Jakosky, B.M., M.T. Mellon, E.S. Varnes, W.C. Feldman, W.V. Boynton, R.M. Haberle, Mars Low-Latitude Neutron Distribution: Possible Remnant Near-Surface Water Ice and a Mechanism for its Recent Emplacement, Icarus, 175, 58-67, 2005.
- Jakosky, B.M., R.M. Haberle, and R. E. Arvidson, The changing picture of volatiles and climate on Mars, Science, 310, 1439-1440, 2005.
- Janhunen, P., A. Olsson, W.K. Peterson, and J.D. Menietti, Latitude-energy structure of multiple ion beamlets in Polar/TIMAS data in plasma sheet boundary layer and boundary plasma sheet below 6  $R_E$  radial distance: basic properties and statistical analysis, Annales Geophysicae, Vol. 23, 867-876, 30-3-2005.
- Jian, L. C. T. Russell, J. T. Gosling, and J. G. Luhmann, Measurements of Heating at Stream-Stream Interactions, In *Proceedings of Solar Wind 11/SOHO 16, Connecting Sun and Heliosphere*, edited by B. Fleck and T. H. Zurbuchen, ESA SP-592, 491-494, 2005.
- Jian, L. C. T. Russell, J. T. Gosling, and J. G. Luhmann, Total Pressure Signature as a Qualitative Indicator of the Impact Parameter During ICMEs Encounters, In *Proceedings of Solar Wind 11/SOHO 16, Connecting Sun and Heliosphere*, edited by B. Fleck and T. H. Zurbuchen, ESA SP-592, 731-734, 2005.
- Kancler, E., P. Pilewskie, et al., Spectral observations and modeling of the Arctic surface radiation environment, J. Geophys. Res., 110, doi: 10.1029/2005JD005813, 2005.
- Kempf, S., Srama, R., Horányi, M., Burton, M., Helfert, S., Moragas-Klostermeyer, G., Roy, M., Grün, E., High-velocity streams of dust originating from Saturn, Nature, 433, 289-291, 2005
- Klimas, A.J., V.M. Uritsky, D. Vassiliadis, and D.N. Baker, A mechanism for the loading-unloading substorm cycle missing in MHD global magnetospheric simulation models, Geophys. Res. Lett., 32, L14108, doi: 10.1029/2005GL022916, 2005.
- Klimas, A.J., V.M. Uritsky, D. Vassiliadis, and D.N. Baker, Simulation study of SOC dynamics in driven current-sheet models, in *Nonequilibrium Phenomena in Plasmas*, Astrophysics and Space Science Library, vol. 321, pp. 71-89, A.S. Sharma and P.K. Kaw, eds., Springer, 2005.
- Kopp, G., and G. Lawrence, The Total Irradiance Monitor (TIM): Instrument design, Solar Physics, 230, 91-109, 2005.
- Kopp, G., G. Lawrence, and G. Rottman, The Total Irradiance Monitor (TIM): Science results, Solar Physics, 230, 129-139, 2005.
- Kopp, G., K. Heuerman, and G. Lawrence, The Total Irradiance Monitor (TIM): Instrument calibration, Solar Physics, 230, 111-127, 2005.
- Lean, J., et al., *SORCE contribution to new understanding of global change and solar variability*, Solar Physics, 230, 27-53, 2005.
- Lee, S., R. T. Pappalardo, and N. C. Makris, Mechanics of tidally driven fractures in Europa's ice shell. Icarus, 177, 367-379, 2005.
- Lee, S., R.T. Pappalardo, and N.C. Makris, Europa's Porous Ice Rheology and Implications for Ice-penetrating Radar Scattering Loss. Proc. Lunar Planet Sci. Conf. XXXVI. Abstract #2346, 2005.
- Lee, S., R.T. Pappalardo, and N.C. Makris, Mechanics of tidally driven fractures in Europa's ice shell and implications for seismic and radar profiling. Eos Trans. AGU, 86(52), Fall Meet. Suppl., Abstract P11B-0118, 2005.
- Lee, S., R.T. Pappalardo, and N.C. Makris, Surface generated cracks on Europa. Proc. Lunar Planet Sci. Conf. XXXVI. Abstract #2368, 2005.
- Li, X., D. N. Baker, M. Temerin, G. D. Reeves, R. Friedel, and C. Shen, Energetic electrons, 50 keV -- 6 MeV, at geosynchronous orbit: their responses to solar

- wind variations, Space Weather, 3, S04001, doi:10.1029/2004SW000105, 2005.
- Li, X., M. Temerin, B. T. Tsurutani, S. Alex, Modeling of 1-2 September 1859 super magnetic storm, Adv. Space Res., published online in August 2005 (hard copy will be available in 2006).
- Liang, M.-C., B. F. Lane, R. T. Pappalardo, M. Allen, and Y. L. Yung. Atmosphere of Callisto. J. Geophys. Res., 110, E02003, doi:10.1029/2004JE002322, 2005.
- Liang, M.C., B.F. Lane, R.T. Pappalardo, M. Allen, and Y.L. Yung, Atmosphere of Callisto, J. Geophys. Res., 110, E02003, 10.1029/2004JE002322, 2005.
- Lieber, M., Randall, C., Ayari, L., Schneider, N., Holden, T., Osterman, S., and Arboneaux, L., System verification of the JME X mission residual motion requirements with integrated modeling, Proc. SPIE 5899, pp 1-12, 2005.
- Link, L.S., B.M. Jakosky, and G.D. Thyne, Biological potential of low-temperature aqueous environments on Mars, Int. J. Astrobiology, 4, 155-164, 2005.
- Livingston, J., C.E. Randall, et al., Retrieval of ozone column content from airborne sun-photometer measurements during SOLVE II: Comparison with coincident satellite and aircraft measurements, Atmos. Chem. Phys., 5, 2035-2054, 2005.
- Manney, G.L., C.E. Randall, et al., Diagnostic comparison of meteorological analysis during the 2002 Antarctic winter, Monthly Weather Rev., 133(5), 1261-1278, 2005.
- Manney, G.L., C.E. Randall, et al., Simulations of dynamics and transport during the September 2002 Antarctic major warming, J. Atmos. Sci., 62, 690-707, 2005.
- Martinez-Alonso, S., B.M. Jakosky, M.T. Mellon, and N.E. Putzig, A Volcanic Interpretation of Gusev Crater Surface Materials from Thermophysical, Spectral, and Morphological Evidence, J. Geophys. Res., 110, E01003, doi:10.1029/2004JE002327, 2005.
- McClintock, W. E., G. J. Rottman, and T. N. Woods, Solar Stellar Irradiance Comparison Experiment II (SOLSTICE II): Instrument concept and design, Solar Physics, 230, 225-258, 2005.
- McClintock, W. E., M. Snow, and T. N. Woods, Solar Stellar Irradiance Comparison Experiment II (SOLSTICE II): Pre-launch and on-orbit calibrations, Solar Physics, 230, 259-294, 2005.
- Mills, M. J., O. B. Toon, and G. E. Thomas, Mesospheric sulfate aerosol layer, J. Geophys. Res., 110, D24208, doi:10.1029/2005JD006242, 2005.
- Mills, M.J., et al., Photolysis of sulfuric acid vapor by visible light as a source of the polar stratospheric CN layer, J. Geophys. Res., 110, doi: 10.1029/2004JD005519, 2005.
- Mills, M.J., et al., The mesospheric sulfate aerosol layer, J. Geophys. Res., 110, D24208, 2005.
- Mitchell, C. J., Colwell, J. E., Horányi, M., Tenuous ring formation by the capture of interplanetary dust at Saturn, J. Geophys. Res., 110, (A9), CiteID A09218 2005.
- Moore, T.E., M.-C. Fok, M.O. Chandler, C.R. Chappell, S.P. Christon, D.C. Delcourt, J.A. Fedder, M. Huddleston, M.W. Liemohn, W.K. Peterson, and S. Slinker, Plasma sheet and (nonstorm) ring current formation from solar and polar wind sources, J. Geophys. Res., Vol. 110, No. A2, A02210, 2005.
- Moore, T.E., M-C. Fok, M.O. Chandler, S.-H. Chen, S.P. Christon, D.C. Delcourt, J. Fedder, M. Liemohn, W.K. Peterson, S. Slinker, Ionospheric plasmas in the ring current, Geophys. Mono. Ser., 159, Am. Geophys. Res., ISBN 0-87590-424-6, p.179, 2005.

- Nimmo, F., R.T. Pappalardo, and W.B. Moore. Icy satellite shell thickening: Consequences for non-synchronous rotation rates and stresses. Eos Trans. AGU, 86(52), Fall Meet. Suppl., Abstract P22A-05, 2005.
- Ohtsuki, K., and D. Toyama, Local N-body simulations for the rotation rates of particles in planetary rings, Astron. J., 130, 1302-1310, 2005.
- Ohtsuki, K., Rotation Rates of Particles in Saturn's Rings, The Astrophysical Journal, 626, L61-L64, 2005.
- Orsolini, Y.J., C.E. Randall, et al., An upper stratospheric layer of enhanced HN<sub>3</sub> following exceptional solar storms, Geophys. Res. Lett., 32, doi: 10.1029/2004GL021588, 2005.
- Orsolini, Y.J., C.E. Randall, et al., The early breakdown of the southern hemisphere stratospheric vortex in 2002, J. Atmos. Sci., 62, 735-747, 2005.
- Pankratz, C., et al., The SORCE science data system, Solar Physics, 230-389-413, 2005.
- Pappalardo, R.T. and G.C. Collins, Strained Craters on Ganymede, J. Structural Geology, 27, 827-838, 10.1016/j.jsg.2004.11.010, 2005.
- Pappalardo, R.T. Miranda: Shattering an Image. Planetary Report, XXV (2), 14-18, 2005.
- Pappalardo, R.T., F. Nimmo, and J.M. Moore. Large icy diapirs and small icy satellites: Reorientation of mini-moons. Eos Trans. AGU, 86(52), Fall Meet. Suppl., Abstract P22A-06, 2005.
- Pappalardo, R.T., Z. Crawford, D. Gleeson, M. Mullen, and J. Wahr, Europa's lineament history: Combining nonsynchronous rotation and diurnal stresses, Astrobiology, 2, 315, 2005.
- Patterson G. W., J.W. Head III, G.C. Collins, R.T. Pappalardo, L.M. Prockter, and B.K. Lucchitta. Geological mapping of Ganymede. Proc. Lunar Planet Sci. Conf. XXXVI. Abstract #1068, 2005.
- Pavlov, A.A., A.K. Pavlov, M.J. Mills, V.M. Ostryakov, G.I. Vasilyev, and O.B. Toon, Catastrophic Ozone Loss During Passage of the Solar System Through an Interstellar Cloud, Geophys. Res. Lett., 32, L01815, 10.1029/2004GL021601, 2005.
- Pavlov, A.A., M.J. Mills, and O.B. Toon, Mystery of the volcanic mass-independent sulfur isotope fractionation signature in the Antarctic ice-core, Geophys. Res. Lett., 32, doi: 10.1029/2005GL022784, 2005.
- Pavlov, A.A., O.B. Toon, A.K. Pavlov, J. Bally, and D. Pollard, Passing through a giant molecular cloud snowball glaciations produced by interstellar dust, Geophys. Res. Lett., 32, L03705, doi:10.1029/2004GL021890, 2005.
- Pilewskie, P., G. Rottman, and E. Richard, An overview of the disposition of solar radiation in the lower atmosphere: Connections to the SORCE mission and climate change. Solar Phys., 203, 1, 55-69, 2005.
- Prockter, L. M., R. T. Pappalardo, and F. Nimmo. A Shear heating origin for ridges on Triton. Geophys. Res. Lett., 32, L14202, doi:10.1029/2005GL022832, 2005.
- Pryor, W. R., et al., Cassini UVIS observations of Jupiter's auroral variability, Icarus, 178, 312326, 2005
- Pulkkinen, T.I., N. Yu. Ganushkina, E. Donovan, X. Li, G. D. Reeves, C. T. Russell, H. J. Singer, Storm-Substorm Coupling During 16 Hours of Dst Steadily at 150 nT, AGU Monograph 155, page 155-161, 10.1029/155GM18, 2005.
- Putzig, N.E., M.T. Mellon, K.A. Kretke, R.E. Arvidson, Global Thermal Inertia and Surface Properties of Mars from the MGS Mapping Mission, Icarus, 173, 325-341, 2005.
- Randall, C.E., G.L. Manney, D.R. Allen, R.M. Bevilacqua, J. Hornstein, C. Trepte, W. Lahoz, J. Ajtic, and G. Bodeker, Reconstruction and Simulation of Stratospheric Ozone Distributions during the 2002 Austral Winter, J. of Atmospheric Sciences, 62, 748-764, 2005.

- Randall, C.E., V.L. Harvey, G.L. Manney, Y. Orsolini, M. Codrescu, C. Sioris, S. Brohede, C.S. Haley, L.L. Gordley, J.M. Zawodny, and J.M. Russell III, Stratospheric Effects of Energetic Particle Precipitation in 2003-2004, Geophys. Res. Lett., 32, L05802, 10.1029/2004GL022003, 2005.
- Rigler, E.J., D.N. Baker, and D. Vassiliadis, Solar wind-driven electron radiation belt response functions at 100-min time scales, Adv. Space Res., 36, 2401-2406, doi:10.1015/j.asr.2003.09.070, 2005.
- Rottman, G., et al., Preface, Solar Physics, 230, 1-2, 2005.
- Rottman, G., et al., The Spectral Irradiance Monitor (SIM): Early observations, Solar Physics, 230-205-224, 2005.
- Rottman, G., The *SORCE* Mission, Solar Physics, 230, 7-25, 2005.
- Russell, P., C.E. Randall, et al., Aerosol optical depth measurements by airborne Sun photometer in SOLVE II: Comparisons to SAGE III, POAM III and airborne spectrometer measurements, Atmos. Chem. Phys., 5, 1311-1339, 2005.
- 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., doi:10.1029/2005JA011391RR, 2005.
- Saka, O., S. Fujita, and D.N. Baker, The effect of magnetic mirror force on the field-aligned acceleration of plasmas, Adv. Polar Upper Atmos. Res., 19, 84-88, 2005.
- Sarris, T., and X. Li, Evolution of the dispersionless injection boundary associated with substorms, Annales Geophysicae, 23, 877-884, 2005.
- Sharma, A.S., D.N. Baker, and J.E. Borovsky, Nonequilibrium Phenomena in the Magnetosphere, in *Nonequilibrium Phenomena in Plasmas*, Astrophysics and Space Science Library, vol. 321, pp. 3-22, A.S. Sharma and P.K. Kaw, eds., Springer, 2005.
- Shemansky, D.E., A.I.F. Stewart, R.A. West, L. W. Esposito, J.T. Hallett, X. Liu, The Cassini UVIS Stellar Probe of the Titan Atmosphere, Science, 308, 978-982, 2005.
- Singleton, C.S., C.E. Randall, et al., 2002-2003 Arctic ozone loss deduced from POAM III satellite observations and the SLIMCAT chemical transport model, Atmos. Chem. Phys., 5, 597-609, 2005.
- Smiley, B., et al., Charge and size distribution of mesospheric aerosol particles measured inside NLC and PMSE during MIDAS MaCWAVE 2002, Journal of Atmospheric and Solar-Terrestrial Physics, 68, (1), 114-123, 2005.
- Snow, M., W. E. McClintock, G. J. Rottman, and T. N. Woods, Solar Stellar Irradiance Comparison Experiment II (SOLSTICE II): Examination of solar-stellar comparison technique, Solar Physics, 230, 295-324 2005.
- Snow, M., W. E. McClintock, T. N. Woods, O. R. White, J. W. Harder, and G. J. Rottman, The Magnesium II index from *SORCE*, Solar Physics, 230, 325-344, 2005.
- Solomon, S.C., B.M. Jakosky, et al., New perspectives on ancient Mars, Science, 307, 1214-1220, 2005.
- Spurn, T., et al., The *SORCE* spacecraft and operations, Solar Physics, 230, 71-89, 2005.
- Steinberg, J. T., J. T. Gosling, R. M. Skoug, and R. C. Wiens, Suprathermal Electrons in High-Speed Streams from Coronal Holes: Counterstreaming on Open Field Lines at 1 AU, J. Geophys. Res., 110, A06103, doi:10.1029/2005JA011027, 2005.
- Stempel, M. M., A. C. Barr, and R. T. Pappalardo, Model constraints on the opening rates of bands on Europa, Icarus, 177, 297-304, 2005.
- Strangeway, R. J., R. E. Ergun, et al., Factors controlling ionospheric outflows as observed at intermediate altitudes, J. Geophys. Res., 110, A03221, 10.1029/2004JA010829, 2005.

- 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, ACPD 5, 11617-11642, 2005.
- Thornton, B.F., D.W. Toohey, L.M. Avallone, A.G. Hallar, H. Harder, M. Martinez, J.B. Simpas, W.H. Brune, M. Koike, Y. Kondo, N. Takegawa, B.E. Anderson, and M.A. Avery, Variability of active chlorine in the lowermost Arctic stratosphere, J. Geophys. Res., 110, D22304, doi:10.1029/2004JD005580, 2005.
- Tian, T.F., and O.B. Toon, Hydrodynamic escape of nitrogen from Pluto, Geophys. Res. Lett., 18, L18201, 2005.
- Tian, T.F., et al., A hydrogen-rich early Earth atmosphere, Science, 308, doi:10.1126/science.1106983, 2005.
- Tian, T.F., O.B. Toon, A.A. Pavlov, and H. DeSterck, Transonic Hydrodynamic Escape of Hydrogen from Extrasolar Planetary Atmospheres, Astrophysical Journal, 621, 1049-1060, 2005.
- Trattner, K.J., S.A. Fuselier, T.K. Yeoman, C. Carlson, W.K. Peterson, A. Korth, H. Reme, J.A. Sauvaud and N. Dubouloz, Spatial and temporal cusp structures observed by multiple spacecraft and ground observations, in *Surveys in Geophysics*, edited by Ted Fritz, Publisher: Springer Science+Business Media B.V., DOI: 10.1007/s10712-005-1883-3, Volume 26, Numbers 1-3, 281 - 305, January 2005.
- Tsurutani, B. et al., The October 28, 2003 extreme EUV solar flare and resultant extreme ionospheric effects: Comparison to other Halloween events and the Bastille Day event, Geophys. Res. Lett., 32, L03S09, doi: 10.1029/2004GL021475, 2005.
- Vogiatis, I.I., T.A. Fritz, Q.-G. Zong, D.N. Baker, et al., Fine-time energetic electron behavior observed by Cluster/RAPID in the magnetotail associated with X-line formation and subsequent current disruption, Annales Geophysicae, 23, 2265-2280, 2005.
- Walker, K.A., C.E. Randall, et al., Initial validation comparisons for the Atmospheric Chemistry experiment (ACE-FTS), Geophys. Res. Lett., 32, doi: 10.1029/2005GL022388, 2005.
- Wendisch, M., P. Pilewskie, et al., Impact of cirrus crystal shape on solar spectral irradiance: A case study for subtropical cirrus, J. Geophys. Res., 110, doi: 10.1029/2004JD005294, 2005.
- Wiltberger, M., S.R. Elkington, T. Guild, D.N. Baker, and J.G. Lyon, Comparison of MHD simulations of isolated and storm time substorms, in *The Inner Magnetosphere: Physics and Modeling*, AGU Monogr. 155, 271-282, 2005.
- Woods, T. N., and G. Rottman, XUV Photometer System (XPS): Solar variations during the SORCE mission, Solar Physics, 230, 375-387, 2005.
- Woods, T. N., F. G. Eparvier, S. M. Bailey, P. C. Chamberlin, J. Lean, G. J. Rottman, S. C. Solomon, W. K. Tobiska, and D. L. Woodraska, The Solar EUV Experiment (SEE): Mission overview and first results, J. Geophys. Res., 110, A01312, doi: 10.1029/2004JA010765, 2005.
- Woods, T. N., G. Rottman, and R. Vest, XUV Photometer System (XPS): Overview and calibrations, Solar Physics, 230, 345-374, 2005.
- Young, D.T., et al., Composition and Dynamics of Plasma in Saturn's Magnetosphere, Science, 307, 1262-1266, 2005.

## Works in Progress

- 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, submitted, Geophys. Res. Lett., 2005.
- Baker, D.N., S.G. Kanekal, J.C. Green, T.G. Onsager, J.C. Foster, and J.B. Blake, High energy electron flux dropout events in the Earth's radiation belts: Relationships to plasmaspheric, ionospheric and atmospheric conditions, submitted, Geophys. Res. Lett., 2005.
- Chojnacki, M., B.M. Jakosky, and B.M. Hynes (2006). Surficial properties of landslides and surrounding units in Ophir Chasma, Mars, J. Geophys. Res., in press, 2005.
- Colwell, J. E., L. W. Esposito, and M. Sremcevic, Gravitational Wakes in Saturn's A ring measured by Stellar Occultations from Cassini. Geophys. Res. Lett., in press, 2006
- 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, in review with J. Atmos. Oceanic Technol., 2005.
- Davis, S.M., A. G. Hallar, L. M. Avallone, C. Twohy, and E. M. Weinstock, Comparisons of in situ measurements of cirrus cloud ice water content, to be submitted to J. Geophys. Res. in March 2006.
- Ergun, R. E., Y.-J. Su, L. Andersson, F. Bagenal, P. A. Delamere, R. L. Lysak, and R. J. Strangway, S-Bursts and the Jupiter ionospheric Alfvén resonator, J. Geophys. Res., accepted 2005
- Esposito, L.W., Maekiewicz, et al., Venus Monitoring camera for Venus express, Planet. Space Sci., in press, 2005.
- Gannon, J., X. Li, D. Heynderickx, Pitch Angle Distribution Analysis of Radiation Belt Electrons Based on CRRES MEA data, J. Geophys. Res., submitted, 2005.
- Grande, M., D.N. Baker, et al. The D-CIXS X-ray spectrometer on the SMART-1 mission to the Moon – First Results, submitted to Ann. Geophys., 2005.
- Hansen, C. J., L. W. Esposito, A. R. Hendrix, W. Pryor, A. I. F. Stewart, D. E. Shemansky, R. A. West, Cassini UltraViolet Imaging Spectrograph (UVIS) Investigation of Enceladus Water Vapor Plume. Science, in press, 2006.
- Jakosky, B.M., Astrobiology, Science, and Society, book manuscript in press, University of Arizona Press, to appear in 2006.
- Kalnajs, L.E., and L.M. Avallone, Frost flower influence on springtime boundary layer ozone depletion events and atmospheric bromine levels, to be submitted to Geophys. Res. Lett. in January 2006.
- Krauss, C.E., M. Horanyi, S. Robertson, Modeling the formation of electrostatic discharges on Mars, J. Geophys. Res., in press, 2005.
- Lopez, J.P., A. Fridlind, M. Loewenstein, A.S. Ackerman, T. Campos, E.M. Weinstock, D. Sayres, J. Smith, J. Pittman, A.G. Hallar, L.M. Avallone, S.M. Davis, and R.L. Herman, Subtropical CO signatures in convective clouds and anvils during CRYSTAL-FACE: Constraining entrainment rates with observations, J. Geophys. Res., in press, doi:10.1029/2005JD006104, 2005.
- Mitchell, C., M. Horanyi, O. Havnes, C. Porco: Saturn's Spokes: Lost and Found, Science, in press, 2005.
- 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, submitted, Annales Geophysicae, 2005.



- Patterson, G. W., J. W. Head, and R. T. Pappalardo. Plate motion on Europa and non-rigid behavior of the icy lithosphere: The Castalia Macula Region. J. Struct. Geol., in review, 2005.
- Peterson, W.K., H.L. Collin, O.W. Lennartson and A.W. Yau, Intensity and characteristic energy of upflowing ionospheric ions as a function of solar illumination during solar and geomagnetically quiet times, submitted, J. Geophys. Research, 2005.
- Richards, P.G., T. N. Woods and W. K. Peterson, HEUVAC: A new high resolution solar EUV proxy model, in press, Adv. Space Res. Available on line at: doi:10.1016/j.asr.2005.06.031
- Sarris, T., X. Li, and M. Temerin, Simulating radial diffusion of energetic (MeV) electrons through a model of fluctuating electric and magnetic fields, J. Geophys. Res., submitted, 2006.
- Shen, C., X. Li, M. Dunlop, Q. Q. Shi, Z. X. Liu, E. Lucek, Magnetic field rotation analysis and the applications, J. Geophys. Res., submitted, 2005.
- Shprits, Y.Y., R.M. Thorne, R.B. Horn, S.A. Gkeyertm, N. Cartwright, C.T. Russell, D.N. Baker, and S.G. Kanekal, Acceleration mechanism responsible for the formation of the new radiation belt during the 2003 Halloween solar storm, submitted, Geophys. Res. Lett., 2005.
- Sparling, L.C., J. C. F. Wei, and L. M. Avallone, Estimating the impact of small scale variability in satellite measurement validation, in review with J. Geophys. Res., 2005.
- Wiltberger, M., and D.N. Baker, End-to-end modeling of the solar terrestrial system, Space Sci. Rev., Kluwer, 1-16, submitted, 2005.

## Papers Presented at Scientific Meetings

- Andersson, L., Observations of linear and non-linear Alfvén waves, Fall AGU Meeting, San Francisco, December 2005.
- Andersson, L.; Peterson, W. K.; McBryde, and K. M., Dynamic coordinates for auroral ion outflow, FAST Workshop, Berkeley, CA, 2005.
- Andersson, L., W. K. Peterson, and K. M. McBryde, Estimates of the O<sup>+</sup> outflow characteristic energy and relative location in the auroral oval, IAGA meeting, Toulouse, France, 2005.
- Andersson, L., D. L. Newman, R.E. Ergun, and M. V. Goldman, Transition layers in the downward current region of the ionosphere-magnetosphere system, IPELS meeting, Tromsø.
- Andersson, L., How plasma-sheet type electron precipitation can influence the auroral downward current, IAGA meeting, session GAIII02, Toulouse, France, 2005
- Argall, M.R., M.J. Engebretson, J.E. Johnson, J.L. Posch, D.E. Rowland, S.-H. Chen, T.E. Moore, W.K. Peterson, T.G. Onsager, J.R. Johnson, M.R. Lessard, R.L. Arnoldy, and C. T. Russell, Pc 1-2 waves and associated ion distributions observed during three extended conjunctions between the Polar satellite and Antarctic ground stations, Fall AGU Meeting, San Francisco, CA, 5-9 December, 2005.
- Avallone L.M., and L. E. Kalnajs, Development of a fast-response ultraviolet absorption ozone sensor: Design and first results, poster presented at the Fall AGU Meeting, San Francisco, December 2005.
- Avallone, L.M., In situ measurement needs for studying chemistry in the high-latitude boundary layer, 2005 Polar Technology Conference, Mountain View, CA, April 2005.
- Bailey, S.M., J.M. Russell, D.N. Baker, and E.M. Rodgers, Tracing solar energy through the upper atmosphere: SNOE and

- TIMED observations of nitric oxide, Spring AGU Meeting, New Orleans, LA, 23-27 May 2005.
- Baker, D.N., and J.O. Burns, CU's possible role in the Los Alamos Consortium, Univ. of Colorado Regents Meeting, Boulder, CO 7 September 2005.
- Baker, D.N., C.A. Barth, S.G. Kanekal, C. Saetre, and S.M. Bailey, Observations of solar and magnetospheric particles during large storms and assessing their effects on the Earth's upper atmosphere, AOGS 2<sup>nd</sup> Annual Meeting, Singapore, 20-24 June 2005.
- Baker, D.N., Challenges of End-to-End solar-terrestrial modeling, Invited seminar, Finnish Meteorological Institute, Helsinki, 22 March, 2005.
- Baker, D.N., Cluster measurements of magnetospheric substorms and their implications for the near-Earth neutral line model, Fall AGU Meeting, San Francisco, CA, 5-9 December, 2005.
- Baker, D.N., E.J. Rigler, R.S. Weigel, and D. Vassiliadis, Data assimilation methods for characterizing and forecasting radiation belt properties, IAGA 2005 Conference, Toulouse, France, July 18-29, 2005.
- Baker, D.N., Effect of the space environment on spacecraft operations, Aerospace Seminar, U. of Colorado, Boulder, CO, 4 February 2005.
- Baker, D.N., Forecast modeling within CISM, All-Hands meeting, Boston, MA, 13 September 2005.
- Baker, D.N., How the storms affected the magnetosphere, AAAS Annual Meeting, Washington, DC, 20 February, 2005.
- Baker, D.N., Knowledge Transfer activities update, CISM meeting, Boston, MA, 13 September 2005.
- Baker, D.N., LASP Overview, Laboratory for Atmospheric and Space Physics, University of Colorado, Boulder, CO 4 March, 2005.
- Baker, D.N., N. Farr, S. Monk, P. Wu, Q Zhong, and T.A. Fritz, Cluster observations of magnetospheric substorm expansion and recovery phase features in the near- and mid-tail regions, IAGA 2005 Conference, Toulouse, France, July 18-29, 2005.
- Baker, D.N., Overview of Sun-Earth connections and E. Huttunen thesis disputation, Invited opponent, University of Helsinki, 23 March, 2005.
- Baker, D.N., Overview of the eGY, Invited talk, Electronic Geophysical Year Planning Meeting, University of Colorado, Boulder, 14 February, 2005.
- Baker, D.N., S.G. Kanekal, J.C. Green, T.G. Onsager, and J.C. Foster, Relativistic electron dropout events as observed concurrently by SAMPEX and GOES sensors: Relationships to plasmaspheric and ionospheric conditions, Spring AGU Meeting, New Orleans, LA, 23-27 May 2005.
- Baker, D.N., S.G. Kanekal, X. Li, and J.B. Blake, Solar cycle changes of energetic particle properties in the Earth's radiation belts, Spring AGU Meeting, New Orleans, LA, 23-27 May 2005.
- Baker, D.N., S.G. Kanekal, X. Li, and S. Elkington, Effects of coronal mass ejections and solar wind streams on the Earth's radiation belts, IAGA 2005 Conference, Toulouse, France, July 18-29, 2005.
- Baker, D.N., S.G. Kanekal, X. Li, S.P. Monk, J. Goldstein and J.L. Burch, Acceleration and extreme distortion within the Van Allen radiation belts during the Halloween solar storms of 2003, URSI, National Radio Science Meeting, University of Colorado at Boulder, 5-8 January 2005.
- Baker, D.N., S.P. Monk, S.G. Kanekal, X. Li, and J. Goldstein, Acceleration and extreme distortion within the Van Allen radiation belts during the Halloween solar storms of 2003, AOGS 2<sup>nd</sup> Annual Meeting, Singapore, 20-24 June 2005.
- Baker, D.N., Saving the 'Great Observatory' for Space Physics, Invited Lecture, ASTR 4800 Space Policy Class, University of Colorado, Boulder, 13 April 2005.
- Baker, D.N., Solar and space physics observations, end-to-end space weather models,

- and impacts on the NASA Exploration Vision, Invited Seminar at HAO/NCAR, Boulder, CO, 2 February, 2005.
- Baker, D.N., Space environment effects of the solar events of October-November 2003, Invited Colloquium, Ball Aerospace, Boulder CO, 28 January 2005.
- Baker, D.N., Space Weather: Effects on Human Technology, Space Seminar, U. of Colorado, Boulder, CO 25 October 2005.
- Baker, D.N., The electronic Geophysical Year (eGY) and the IGY+50 program, NSF Headquarters, Arlington, VA, 16 September 2005.
- Baker, D.N., The Vision for Space Exploration Report, SSPVSE Workshop, Wintergreen, VA, 20 October 2005.
- Baker, D.N., Tutorial on Radiation Belts, Invited, LWS/Coordinated Data Analysis Workshop, George Washington University, Fairfax, VA, 14-16 March, 2005.
- Baker, D.N., Using the Space Physics Great Observatory to study magnetospheric coupling: data-modeling closure, Fall AGU Meeting, San Francisco, CA, 5-9 December, 2005.
- Barth, C.A., S.M. Bailey, G. Lu, and D.N. Baker, Joule heating and nitric oxide in the thermosphere, Fall AGU Meeting, San Francisco, CA, 5-9 December, 2005.
- Barton, C., D. Baker, P. Berkman, E. CoBabe-Ammann, E. Kihn, H. Kroehl, V. Papatashvili, M. Parsons, W.K. Peterson, A. Rodger, e-Science for geoscience and the Electronic Geophysical Year, IAGA Meeting, Toulouse, France, July 2005.
- Chojnacki, M., B.M. Jakosky, and B.M. Hynek, Surficial properties of landslide units in Ophir Chasma, Mars, from remote-sensing data, Lunar Planet. Sci. Conf., Houston, 2005.
- Colwell, J.E., Horanyi, M., Robertson, S., Wheeler, P., Behavior of Charged Dust in Plasma and Photoelectron Sheaths. LPI Contributions 1280, 33, 2005.
- Davis, A.J., D.N. Baker, et al., The SAMPEX Data Center and user interface for the SEC community, Spring AGU Meeting, New Orleans, LA, 23-27 May 2005.
- Davis, S.M., and L. M. Avallone, Comparison of in situ measurements of cirrus ice water content during the MidCiX campaign, poster presented at the American Geophysical Union Meeting, New Orleans, May 2005.
- Davis, S.M., L. M. Avallone, A. G. Hallar, and W. Englom, Comparison of in situ measurements of cirrus cloud ice water content during the MidCiX field campaign, Fall AGU Meeting, San Francisco, CA, 5-9 December, 2005.
- Elkington, S.R., M. Wiltberger, A.A. Chan, and D.N. Baker, Radiation belt energization via interaction with ULF waves; MHD simulations of magnetospheric ULF activity, URSI, National Radio Science Meeting, University of Colorado at Boulder, 5-8 January 2005.
- Elkington, S.R., M.J. Wiltberger, D.N. Baker, and R.H. Friedel, Convective injection of energetic radiation belt electrons contrasted with diffusive loss in the outer zone: The net effect of radial transport, Fall AGU Meeting, San Francisco, CA, 5-9 December, 2005.
- Ergun, R.E., Particle Acceleration Associated with Large-Scale Current Systems, Fall AGU Meeting, San Francisco, December 2005.
- Ergun, R.E., S-Bursts and the Jupiter Alfvén Ionospheric Resonator, R.E. Ergun, Planetary Radio Emissions V, Graz, Austria, 2005.
- Ergun, R.E., The Jupiter-Io Electromagnetic Interaction: Differences and Similarities to Earth's Aurora, R. E. Ergun, Y.-J., Magnetospheres of the Outer Planets, Leicester, England, 2005.
- Ergun, R.E., The MMS Double Probe Electric Field Instrument, Fall AGU Meeting, San Francisco, December 2005.
- Ergun, R.E., The Modern Picture of Particle Acceleration by Parallel Electric Fields, R. E. Ergun, IPELS, Tromsø, Norway, 2005.

- Eriksson, S., et al., On the Generation of Enhanced Sunward Convection and Dayside Transpolar Aurora in the High-Latitude Ionosphere by Magnetic Merging, seminar, Los Alamos National Laboratory, Los Alamos, New Mexico, 11 April 2005.
- Eriksson, S., et al., On the Generation of Enhanced Sunward Convection and Dayside Transpolar Aurora in the High-Latitude Ionosphere by Magnetic Merging, invited presentation, IAGA, Toulouse, France, 20 July 2005.
- Eriksson, S., et al., Ionospheric Convection Response to High-Latitude Reconnection: Cluster and SuperDARN Observations, contributed presentation, Fall AGU Meeting, San Francisco, California, 5 December 2005.
- Eriksson, S., C. Mouikis, M.W. Dunlop, D.N. Baker, H. Reme, and A. Balogh, Slow-mode shocks associated with reconnection in the magnetotail, 4<sup>th</sup> International Astrophysics Conference on the Physics of Collisionless Shocks, Palm Springs, CA, Feb. 26 to March 3, 2005.
- Farr, N., D.N. Baker, S. Monk, M. Wiltberger, P. Wu, Q Zong, and T.A. Fritz, Cluster observations of magnetospheric substorm expansion and recovery phase features in the near- and mid-tail regions: Comparison with numerical simulations, Fall AGU Meeting, San Francisco, CA, 5-9 December, 2005.
- Fritz, T.A., Q. Zong, D.N. Baker, M. Goldstein, P. Daly, S. Fu, H. Frey, A. Balogh, and H. Reme, Earthward flowing plasmoid: Structure and its related auroral signature, Fall AGU Meeting, San Francisco, CA, 5-9 December, 2005.
- Goldstein, J., D.N. Baker, B.R. Sandel, J.L. Burch, and J.F. Fennell, Plasmaspheric influence on radiation belts during major geomagnetic storms, Spring AGU Meeting, New Orleans, LA, 23-27 May 2005.
- Gosling, J. T., Magnetic reconnection in the solar wind and the evolution of magnetic flux tubes in the heliosphere, APS, Division of Plasma Physics Meeting, Denver, CO, October 2005.
- Gosling, J. T., Magnetic reconnection in the solar wind near 1 AU, LASP, Boulder, CO, January 2005.
- Gosling, J. T., Magnetic reconnection in the solar wind, High Altitude Observatory, Boulder, CO, September 2005.
- Gosling, J. T., Magnetic reconnection in the solar wind, Southwest Research Institute, San Antonio, TX, January 2005.
- Gosling, J. T., Magnetic reconnection in the solar wind: An overview, Solar Wind 11/SOHO 16, Whistler, Canada, June 2005.
- Gosling, J. T., Magnetic reconnection in the solar wind: Implications for STEREO, STEREO/Solar B Workshop, Turtle Bay, Oahu, Hawaii, November 2005.
- Gosling, J. T., R. M. Skoug, D. J. McComas, and C. W. Smith, Magnetic disconnection from the Sun: Observations of a reconnection exhaust in the solar wind at the heliospheric current sheet, Spring AGU Meeting, New Orleans, LA, May 2005.
- Gosling, J. T., Reconnection in the solar wind and slow mode shocks, Conference on Collisionless Shocks, Palm Springs, CA, February 2005.
- Gosling, J. T., S. Eriksson, D. J. McComas, R. M. Skoug, and R. J. Forsyth, Reconnection exhausts in the solar wind well beyond 1 AU: Ulysses, Fall AGU Meeting, San Francisco, CA, December 2005.
- Green, J.C., S.G. Kanekal, R.S. Selesnick, D.N. Baker, and J.B. Blake, Energization of outer zone electrons: Spectral evolution and flux isotropization, Fall AGU Meeting, San Francisco, CA, 5-9 December, 2005.
- Green, J.C., T.G. Onsager, T.P. O'Brien, B.J. Fraser, H.J. Singer, A.J. Smith, D.N. Baker, S.G. Kanekal, E.J. Rigler, and R.H. Friedel, Relationship between the plasmasphere and relativistic electron flux depletions in Earth's outer radiation belt, Spring AGU Meeting, New Orleans, LA, 23-27 May 2005.

- Grün, E., et al., Prospects of a Dust Astronomy Mission. LPI Contributions 1280, 61, 2005.
- Grün, E., et al., Performance Tests of a Dust Telescope. Fall AGU Meeting, San Francisco, CA, 5-9 December, 2005.
- Grün, E., Srama, R., Rachev, M., Srowig, A., Sternovsky, Z., Horanyi, M., Amyx, K., Auer, S., Development and Tests of Elements of a Dust Telescope. AAS/Division for Planetary Sciences Meeting 2005.
- Gumbel, J., et al., 2005. The MAGIC rocket campaign: an overview. ESA SP-590: 17th ESA Symposium on European Rocket and Balloon Programs and Related Research 139-144, 2005.
- Hansen, K.C., et al., 2005. Rosetta-ISSI Comet 67P/Churyumov-Gerasimenko Environment Model. AAS/Division for Planetary Sciences Meeting, 2005.
- Harvey, L., C.E. Randall, R.J. Salawitch, C.R. Trepte, The correlation between anticyclone frequency and midlatitude ozone variability, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract A23B-0941, 2005.
- Horanyi, M., Dusty Plasma Effects in Planetary Rings. LPI Contributions 1280, 70, 2005.
- Horanyi, M., Cosmic Dust Input into the Atmosphere of the Earth, Fall AGU Meeting, San Francisco, CA, 5-9 December, 2005.
- Horanyi, M., Dusty Plasmas at Saturn, Symposium for G.E. Morfill's 60th birthday, Munich, Germany, August 2005.
- Horanyi, M., Dusty Plasmas in Saturn's magnetosphere: Cassini observations!, Int. Conf. on the Physics of Dusty Plasmas, Orleans, France, June 2005.
- Horanyi, M., Dusty Plasmas in Space, IPELS, Tromsø, Norway, August 2005.
- Horanyi, M., Dusty Plasmas in the Solar System, EGU, Vienna, Austria, April 2005.
- Horanyi, M., Planetary Rings, Dust in Planetary Systems, Hawaii, September 2005.
- Horanyi, M., The Student Dust Counter, Fall AGU Meeting, San Francisco, CA, 5-9 December, 2005.
- Jakosky, B.M., Astrobiology, science, and religion, seminar to Comm. on History and Philosophy of Science, CU, 17 Oct. 2005.
- Jakosky, B.M., Liquid water and the biological potential of Mars, seminar at Colorado State Univ., Ft. Collins, Dept. of Soil and Crop Science, 5 May 2005.
- Jakosky, B.M., Mars climate and volatile evolution: Emergence of a new paradigm?, Colorado School of Mines, 29 Sept. 2005
- Jakosky, B.M., Mars climate and volatile evolution: Emergence of a new paradigm?, CU APS/Astrobiology, 31 Oct. 2005.
- Juhász, A., Horanyi, M., Dynamics of Saturn E ring Particles. AGU Fall Meeting Abstracts 248, 2005.
- Juhász, A., Horanyi, M., The E Ring of Saturn: Models Versus Observations. LPI Contributions 1280, 87, 2005.
- Kalnajs, L., L. Avallone, and S. Davis, Ozone surface flux measurements over the Antarctic snow pack, talk presented at the American Geophysical Union Meeting, New Orleans, May 2005.
- Kalnajs, L., S. Davis, and L. Avallone, Analysis of halogens in Antarctic snow and their role in boundary layer ozone depletion events, poster presented at the American Geophysical Union Meeting, New Orleans, May 2005.
- Kalnajs, L.E., L. M. Avallone, and S. M. Davis, Evidence for local heterogeneous destruction of boundary layer ozone based on Antarctic field observations, Fall AGU Meeting, San Francisco, CA, 5-9 December, 2005.
- Kanekal, S.G., D.N. Baker, and J.B. Blake, Recent observations of relativistic electron energization in the Earth's magnetosphere, URSI, National Radio Science Meeting, University of Colorado at Boulder, 5-8 January 2005.
- Kanekal, S.G., D.N. Baker, J.B. Blake, and J. Goldstein, Energization of electrons to relativistic energies in the Earth's magnetosphere: Current understanding and open questions, AOGS 2<sup>nd</sup> Annual Meeting, Singapore, 20-24 June 2005.

- Kanekal, S.G., D.N. Baker, J.B. Blake, J. Fennell, and T. Onsager, Measurements of pitch angle evolution and flux isotropization during energization of electrons to relativistic energies, IAGA 2005 Conference, Toulouse, France, July 18-29, 2005.
- Kanekal, S.G., M.D. Looper, D.N. Baker, and J.B. Blake, Study of proton cutoffs during geomagnetically disturbed times, Fall AGU Meeting, San Francisco, CA, 5-9 December, 2005.
- Kanekal, S.G., R.S. Selesnick, D.N. Baker, and J.B. Blake, Observations of energy spectra and flux isotropization of relativistic electrons during energization events to relativistic energies, Spring AGU Meeting, New Orleans, LA, 23-27 May 2005.
- Kempf, S., Srama, R., Horanyi, M., Burton, M., Grün, E., Interaction of Saturnian Dust Streams with the Solar Wind. LPI Contributions 1280, 91, 2005.
- Kempf, S., Srama, R., Horanyi, M., CDA Science Team. Electrostatic potential of E ring particles. AAS/Division for Planetary Sciences Meeting. 2005.
- Klimas, A., V. Uritsky, D. Vassiliadis, and D.N. Baker, A mechanism for the loading-unloading substorm cycle missing in MHD global magnetospheric simulation models, Spring AGU Meeting, New Orleans, LA, 23-27 May 2005.
- Klimas, A.J., V. Uritsky, A. Viñas, D. Vassiliadis, and D.N. Baker, Intermittent turbulence and SOC dynamics in a 2-D driven current-sheet model, Spring AGU Meeting, New Orleans, LA, 23-27 May 2005.
- Kok, G.L., D. Baumgardner, L. M. Avallone, L. E. Kalnajs, R. L. Herman, M. N. Ross, T. L. Thompson, and D. W. Toohey, In situ microphysical measurements in rocket plumes with the Cloud and Aerosol Spectrometer (CAS), Fall AGU Meeting, San Francisco, CA, 5-9 December, 2005.
- Li, X., A. Barker, D.N. Baker, R. Selesnick, and R. Friedel, Modeling of the deep inward transport of radiation belt electrons during Oct-Nov magnetic storm of 2003, AOGS 2<sup>nd</sup> Annual Meeting, Singapore, 20-24 June 2005.
- Li, X., A. Barker, J. Gannon, D.N. Baker, S. Kanekal, and R. Selesnick, The correlation between the inner edge of outer radiation belt electrons and the location of plasma-pause, Spring AGU Meeting, New Orleans, LA, 23-27 May 2005.
- Li, X., Acceleration of Relativistic Electrons during Recurrent Storms, AGU Chapman Conference on Corotating Solar Wind Streams and Recurrent Geomagnetic Activity, Manaus, Brazil, 6-12 February 2005.
- Li, X., Contribution of radial transport to the deep penetration of outer belt electrons during Oct-Nov magnetic storm of 2003, Fall AGU, San Francisco, 5-9 December 2005.
- Li, X., Correlation between the inner edge of outer radiation belt and the inner most plasmopause location, Geospace Environment Modeling Workshop, Santa Fe, New Mexico, June 27-30, 2005.
- Li, X., Dst Prediction and its relation to ionospheric currents, Communication/Navigation Outage Forecasting System (C/NOFS) Science Workshop, 10-12 January 2005 at the Rocky Mountain Park Inn and Conference Center in Estes Park, Colorado.
- Li, X., Magnetospheric Response during the Carrington Event of 1859, Asia Oceania Geosciences Society, Singapore, June 20-24, 2005.
- Li, X., Magnetospheric Responses to the Solar Events, The International Space Weather Conference, Macau, China, 21-25, 2005.
- Li, X., Modeling of the deep inward transport of radiation belt electrons during Oct-Nov magnetic storm of 2003, Asia Oceania Geosciences Society, Singapore, June 20-24, 2005.
- Li, X., Modeling of the deep penetration of MeV electrons during the Oct-Nov 2003 magnetic storm, Geospace Environment Modeling Workshop, Santa Fe, New Mexico, June 27-30, 2005.

- Li, X., Pitch angle analysis of radiation belt electrons based on CRRES/MEA data, International Workshop on Energetic Electron Radiation Belt Dynamics, Hermanus Magnetic Observatory (HMO), Hermanus, South Africa, 7-11 March 2005.
- Li, X., Solar Wind Variations and Magnetospheric Responses, The International Space Weather Conference, Macau, China, 21-25, 2005.
- Li, X., The Global Interactions Between the Solar Wind and Magnetosphere, Asia Oceania Geosciences Society, Singapore, June 20-24, 2005.
- Li, X., The Interaction and Relationship of the Plasmasphere and Plasmasheet with the Radiation Belts, Spring AGU, New Orleans, LA, 23-27 May, 2005.
- Li, Z., A. Barker, D.N. Baker, R. Selesnick, and R. Friedel, Contribution of radial transport to the deep penetration of outer belt electrons during Oct-Nov magnetic storm of 2003, Fall AGU Meeting, San Francisco, CA, 5-9 December, 2005.
- Link, L.S., B.M. Jakosky, and G.D. Thyne, Low-temperature aqueous alteration on Mars and the potential for life, NASA Astrobiology Institute Biannual Meeting, Boulder, 2005.
- Link, L.S., B.M. Jakosky, and G.D. Thyne, Potential for life on Mars from low-temperature aqueous weathering, Lunar Planet. Sci. Conf., Houston, 2005.
- Lund, E.J., J.R. Jasperse, K.A. Lynch, C.W. Carlson, J.W. Bonnell, M. Bouhram, N.J. Grossbard, B. Basu, W.K. Peterson, J.D. Scudder, On the Closure Relations for Multimoment Fluid Models of the Long-Range Potential in Downward Auroral Current Regions, Fall AGU Meeting, San Francisco, CA, 5-9 December, 2005.
- Mauk, B.H., D.N. Baker, J.B. Blake, J.H. Clemmons, S. Livi, G.D. Reeves, and H.E. Spence, The energetic particle investigation for the SMART magnetospheric multiscale mission, Fall AGU Meeting, San Francisco, CA, 5-9 December, 2005.
- McNutt, R.L., et al., Innovative Interstellar Explorer (I2E). Fall AGU Meeting, San Francisco, CA, 5-9 December, 2005.
- Mitchell, C., Horanyi, M., Where Did the Spokes Go? Fall AGU Meeting, San Francisco, CA, 5-9 December, 2005.
- Mitchell, C.J., Horanyi, M., Where did the Spokes go?. Spring AGU Meeting, New Orleans, LA 23-27 May, 2005.
- Morishima, R., Salo, H., and Ohtsuki, K., Multilayer model for thermal infrared brightness of Saturn's rings revisited, DPS meeting, Cambridge, UK, 2005.
- Murphy, N.W., B.M. Jakosky, S.C.R. Rafkin, K. Larsen, N.E. Putzig, and M.T. Mellon, Thermophysical properties of the surface of Isidis Basin, Mars, Lunar Planet. Sci. Conf., Houston, 2005.
- Nardi, B., C.E. Randall, et al., HIRDLS ozone validation preliminary results, Eos Trans. AGU, 86(52), Fall Meet. Suppl., Abstract A41A-0001, 2005.
- Ohtsuki, K., Collisional and rotational evolution of planetary rings, Fall AGU Meeting, San Francisco, CA, 5-9 December, 2005.
- Ohtsuki, K., Rotation of moonlets and particles in planetary rings, LASP Seminar, May 5, 2005.
- Orsolini, Y., G.L. Manney, M.L. Santee and C.E. Randall, An upper stratospheric layer of enhanced HNO<sub>3</sub> following exceptional solar storms, IAGA, Toulouse, France, July 18-29, 2005.
- Peterson, W.K., L. Andersson, H.L. Collin, O.W. Lennartsson and A.W. Yau, Variations in the escaping flux and characteristic energies of O<sup>+</sup> and other ions as a function of solar illumination Fall AGU Meeting, San Francisco, CA, 5-9 December, 2005.
- Randall, C.E., Mesospheric influence on the stratosphere, Eos Trans. AGU, 86(18), Jt. Assem. Suppl., Abstract SA33A-04, 2005.
- Randall, C.E., Recent impacts of energetic particle precipitation on the stratosphere, Eos Trans. AGU, 86(18), Jt. Assem. Suppl., Abstract SA12A-04, 2005.

- Randall, C.E., et al., WACCM validation using satellite occultation data and UK Met Office analyses, Coupled Chemistry Climate Model Validation meeting, Boulder, CO, Oct. 17-19, 2005.
- Randall, C.E., Indirect effects of energetic particle precipitation on the stratosphere, NOAA Space Weather Mtg., Broomfield, CO, April, 2005.
- Randall, C.E., Update on the Solar Occultation Satellite Science Team unified data base and occultation intercomparisons, SOSST meeting, Columbia, MD, June 2005.
- Rigler, E.J., D.N. Baker, D. Vassiliadis, and S.G. Kanekal, Studying radiation belt electrons with linear state-space models, Fall AGU Meeting, San Francisco, CA, 5-9 December, 2005.
- Rigler, E.J., D.N. Baker, M.R. Presicci, R.S. Weigel, and D. Vassiliadis, Studying radiation belt electrons with adaptive linear state-space models, Spring AGU Meeting, New Orleans, LA, 23-27 May 2005.
- Robertson, S., Sternovsky, Z., Horanyi, M., Detecting Aerosols in the Polar Mesosphere. AGU Fall Meeting Abstracts A228, 2005.
- Rusch, D.W., C.E. Randall, D.E. Siskind, An investigation of the effect of particle ionization on the Earth's middle atmosphere using a two-dimensional model, Eos Trans. AGU, 86(18), Jt. Assem. Suppl., Abstract SA13A-01, 2005.
- Shprits, Y.Y., R. Thorne, R. Friedel, G.D. Reeves, J.F. Fennel, D. Baker, K. Shrikanth, and R. Horne, Radial diffusion as a potential source and loss mechanism of relativistic electrons in the outer radiation belt, Fall AGU Meeting, San Francisco, CA, 5-9 December, 2005.
- Singleton, C.S., C.E. Randall, et al., Comparison of Arctic ozone loss observations during the 2004-2005 winter, Eos Trans. AGU, 86(52), Fall Meet. Suppl., Abstract A13D-0982, 2005.
- Solomon, S.C., O. Aharonson, S.A. Hauck II, B.M. Jakosky, R.J. Phillips, and M.T. Zuber, Why the martian mantle is (mostly) wet, Lunar Planet. Sci. Conf., Houston, 2005.
- Sternovsky, Z., Horanyi, M., Amyx, K., Robertson, S., Bano, G., Grün, E., Srama, R., Auer, S., Development of the Large Area Mass Analyzer. LPI Contributions 1280, 138, 2005.
- Sternovsky, Z., Horanyi, M., Robertson, S., Amyx, K., Knappmiller, S., Bano, G., Grün, E., Srama, R., Auer, S., The Large Area Mass Analyzer: instrument to detect and analyze dust particles in space, Fall AGU Meeting, San Francisco, CA, 5-9 December, 2005.
- Swartz, W.H., C.E. Randall, et al., Validation of O3 and O2 column densities retrieved from airborne direct solar irradiance measurements and the effects of field inhomogeneity, Eos Trans. AGU, 86(52), Fall Meet. Suppl., Abstract A33B-0906, 2005.
- Toohey, D.W., M. N. Ross, L. M. Avallone, S. Baccus, D. Baumgardner, S. M. Davis, R. L. Herman, L. E. Kalnajs, G. L. Kok, T. L. Thompson, R. Troy, The PUMA 2004 and 2005 Campaigns: Overview and Motivation, Fall AGU Meeting, San Francisco, CA, 5-9 December, 2005.
- Trattner K.J., and W.K. Peterson, The Polar/TIMAS data set, LWS CDAW Meeting, George Mason University, Fairfax, VA, Mar. 2005.
- Wang, X., Robertson, S., Sternovsky, Z., Horanyi, M., Colwell, J., Investigating near-surface dusty environments of planetary objects, Fall AGU Meeting, San Francisco, CA, 5-9 December, 2005.
- Winick, J.R., P. P. Wintersteiner, R.H. Picard, M.J. Taylor, D.N. Baker, M.G. Mylnczak, J.M. Russell, III, and I. Gordley, Global statistics of OH layer heights and double layers from SABER Limb measurements of OH Meinel emission at 1.6 and 2.0  $\mu\text{m}$ , Fall AGU Meeting, San Francisco, CA, 5-9 December, 2005.
- Woods, Thomas N., Solar irradiance variability and its influence on Earth, NCAR ASP Seminar Series, Invited, 18 May 2005.



Wu, P., T.A. Fritz, R.S. Reed, R.H. Friedel, G. Reeves, D.N. Baker, and P. Daly, High resolution substorm energetic electrons seen in the magnetotail by all 4 Cluster satellites, Fall AGU Meeting, San Francisco, CA, 5-9 December, 2005.

Yau, A.W., T. Abe, H.G. James, and W.K. Peterson, Thermal and suprathermal ionospheric ion outflows from quiescence to superstorms, IAGA Meeting, Toulouse, France, July 2005.

Zong, Q., T. Fritz, D.N. Baker, S. Fu, L. Xie, P. Daly, A. Balogh, and H. Reme, Energetic particle modulation by ULF waves in the inner magnetosphere, Fall AGU Meeting, San Francisco, CA, 5-9 December, 2005.

Zong, Q.-G., T. A. Fritz, D.N. Baker, et al., Energy particle modulation in the inner magnetosphere, AOGS 2<sup>nd</sup> Annual Meeting, Singapore, 20-24 June 2005.

## SPONSORED PROGRAMS – 2005

<i>Andersson, Laila</i>	<i>Micro Physics of the downward current region of the aurora</i>
<i>Andersson, Laila</i>	<i>Parallel electric fields and Alfvén waves</i>
<i>Avallone, Linnea</i>	<i>SGER: Measurements in exhaust plumes of rocket</i>
<i>Bagenal, Frances</i>	<i>Mass and energy flow through the Io plasma torus</i>
<i>Bagenal, Frances</i>	<i>Solar wind interaction with Comet Borrelly</i>
<i>Bagenal, Frances</i>	<i>Pluto's escaping atmosphere</i>
<i>Bagenal, Frances</i>	<i>Exploring planets and their atmospheres using spectroscopy</i>
<i>Bagenal, Frances</i>	<i>Io's interaction with the magnetosphere of Jupiter</i>
<i>Baker, Daniel</i>	<i>Center for Integrated Space Weather (CISM) modeling</i>
<i>Baker, Daniel</i>	<i>Relativistic electrons: Understanding losses</i>
<i>Baker, Daniel</i>	<i>MESSENGER Mission: Phase E</i>
<i>Baker, Daniel</i>	<i>A new tenure-track solar physicists at CU/Boulder: Catalyst for change</i>
<i>Baker, Daniel</i>	<i>The CLUSTER rapid On-orbit operations and data verification</i>
<i>Baker, Daniel</i>	<i>CEPPAD: Research at the University of Colorado</i>
<i>Colwell, Joshua</i>	<i>Dynamics of charged dust near surfaces in space</i>
<i>Colwell, Joshua</i>	<i>Collisional and electrostatic transport of dust in the regolith of Eros</i>
<i>Colwell, Joshua</i>	<i>Mitigation of dust and electrostatic accumulation for human and robotic systems for lunar and Martian missions</i>
<i>Davis, Randal</i>	<i>QuickSCAT Mission Operations</i>
<i>Davis, Randal</i>	<i>Kepler photometer</i>
<i>Davis, Randal</i>	<i>Magnetospheric Multiscale (MMS)</i>

<i>Delamere, Peter</i>	<i>Variability of mass loss from Io: Chemical and physical evolution of the Io Torus</i>
<i>Elkington, Scot</i>	<i>GEM: Transport and trapping of energetic plasma sheet electrons in the outer zone radiation belts</i>
<i>Elkington, Scot</i>	<i>Global characteristics of the substorm particle injection process</i>
<i>Elkington, Scot</i>	<i>Radiation belt radial diffusion</i>
<i>Emery, William</i>	<i>Ocean wind and land surface student satellite</i>
<i>Ergun, Robert</i>	<i>Influence of double layers and electron holes on observed phenomena in the auroral downward current region</i>
<i>Ergun, Robert</i>	<i>MMS Bridge (with Boom Tip)</i>
<i>Ergun, Robert</i>	<i>Small and medium scale modeling of the auroral downward current region</i>
<i>Ergun, Robert</i>	<i>FAST satellite operations and data analysis</i>
<i>Ergun, Robert</i>	<i>Parallel electric fields in the upward current region of the aurora</i>
<i>Eriksson, Stefan</i>	<i>Flank magnetotail reconnection</i>
<i>Esposito, Larry</i>	<i>UVIS – Cassini; Mission Operations and Data Analysis</i>
<i>Gosling, John T.</i>	<i>Low-energy solar electron bursts</i>
<i>Gosling, John T.</i>	<i>Impact experiment work for stereo</i>
<i>Horanyi, Mihaly</i>	<i>Cassini CDA investigations</i>
<i>Horanyi, Mihaly</i>	<i>New Horizons Mission Student Dust Counter (SDC)</i>
<i>Horanyi, Mihaly</i>	<i>Mesospheric aerosol particle spectrometer</i>
<i>Horanyi, Mihaly</i>	<i>Mesospheric aerosol sampling spectrometer (MASS)</i>
<i>Hynek, Brian</i>	<i>Evolution of enigmatic Arabia Terra, mars, and global consequences</i>
<i>Jakosky, Bruce</i>	<i>Thermal imaging system</i>
<i>Jakosky, Bruce</i>	<i>University of Colorado Center for Astrobiology</i>
<i>Jakosky, Bruce</i>	<i>Workshop on Mars astrobiology science and technology support</i>
<i>Jakosky, Bruce</i>	<i>Astronomical detection of biosignatures from extrasolar terrestrial planets</i>
<i>Kanekal, Shrikanth</i>	<i>Study of proton cutoffs during SEP events</i>
<i>Kanekal, Shrikanth</i>	<i>Relativistic electron dynamics during geomagnetic storms: Energization, loss and global coherence</i>
<i>Kanekal, Shrikanth</i>	<i>Study of proton cutoffs during SEP events from 1992 to 2002</i>
<i>Kopp, Greg</i>	<i>GLORY project – TIM: Six ROM budget</i>
<i>Lee, Steven</i>	<i>MGS MOC global mapping of Martian albedo</i>

<i>Li, Xinlin</i>	<i>Source of radiation belt electrons</i>
<i>Li, Xinlin</i>	<i>Dynamics of radiation belt electrons associated with solar wind variations</i>
<i>Li, Xinlin</i>	<i>Quantitative forecast and specification of radiation belt electrons</i>
<i>McClintock, William</i>	<i>Science team support for the MESSENGER Mission</i>
<i>McClintock, William</i>	<i>MESSENGER Mission MASCS instrument engineering support</i>
<i>McCollom, Thomas</i>	<i>Experimental investigation of organic synthesis in submarine hydrothermal systems</i>
<i>McCollom, Thomas</i>	<i>Experimental study of geochemical processing of prebiotic organic compounds on the early earth, Mars and meteorites</i>
<i>McGrath, Michael</i>	<i>Student Dust Counter (SDC) New Horizons Mission</i>
<i>Mellon, Michael</i>	<i>Thermal inertia of Mars</i>
<i>Mellon, Michael</i>	<i>Electrical properties of Martian permafrost</i>
<i>Mellon, Michael</i>	<i>Geophysics of Martian periglacial processes</i>
<i>Mellon, Michael</i>	<i>Shallow ground ice on Mars</i>
<i>Mellon, Michael</i>	<i>Phoenix Mars Scout Mission</i>
<i>Ohtsuki, Keiji</i>	<i>Dynamical evolution of ring-satellite systems</i>
<i>Ohtsuki, Keiji</i>	<i>Formation and dynamical evolution of planets</i>
<i>Ohtsuki, Keiji</i>	<i>Collisional and rotational evolution of small asteroids</i>
<i>Ohtsuki, Keiji</i>	<i>Capture of small bodies by giant planets</i>
<i>Ohtsuki, Keiji</i>	<i>Rotation of moonlets and particles in planetary rings around giant planets</i>
<i>Pappalardo, Robert</i>	<i>Causes and consequences of faulting on Europa and other icy satellites</i>
<i>Pavlov, Alexander</i>	<i>Hazy Archean atmosphere</i>
<i>Pavlov, Alexander</i>	<i>The possible mediation of early microbial evolution by cyanide inhibition</i>
<i>Peterson, William K.</i>	<i>Travel support for Electronic Geophysical Year (eGY) Organizing Committee</i>
<i>Peterson, William K.</i>	<i>TIMAS operations and data analysis</i>
<i>Peterson, William K.</i>	<i>Photoelectron spectra from the FAST satellite</i>
<i>Pilewskie, Peter</i>	<i>Retrieval of cloud water path using visible and near-infrared remote sensing</i>
<i>Pilewskie, Peter</i>	<i>Analysis of solar spectral irradiance measured during NEAQS-ITCT</i>
<i>Pilewskie, Peter</i>	<i>Observations and analyses of the spectral radiative effects of aerosols and clouds</i>

<i>Pryor, Wayne</i>	<i>Heliospheric H and He from Ulysses, Galileo, and Cassini UV data</i>
<i>Randall, Cora</i>	<i>Assimilation of ozone data sets: Use of POAM III data in the SOLVE-S campaign</i>
<i>Randall, Cora</i>	<i>Derivation of ozone photochemical loss by combining satellite data and a 3-dimensional chemical transport model</i>
<i>Randall, Cora</i>	<i>SAGE III science and validation focused on the upper troposphere and lower stratosphere (UTLS)</i>
<i>Randall, Cora</i>	<i>Occultation data and inter-comparison and evaluation</i>
<i>Rottman, Gary</i>	<i>EOS Solstice</i>
<i>Rottman, Gary</i>	<i>SORCE/EOS Solstice</i>
<i>Rottman, Gary</i>	<i>SORCE science discovery</i>
<i>Rottman, Gary</i>	<i>Total Solar Irradiance Sensor (TSIS)</i>
<i>Rusch, David</i>	<i>Aeronomy of Ice in the Mesosphere (AIM)</i>
<i>Rusch, David</i>	<i>An investigation of the effect of solar variability and particle ionization on the Earth's middle atmosphere</i>
<i>Rusch, David</i>	<i>The Ice content of Polar Mesospheric Clouds derived from SNOE satellite measurements</i>
<i>Schneider, Nicholas</i>	<i>From Io's atmosphere to the plasma torus</i>
<i>Smith, Jamison</i>	<i>Simulation of the aging of smoke from African biomass burning plumes and implications for remote sensing of aerosols</i>
<i>Stewart, Glen</i>	<i>Dynamical models of planetary rings</i>
<i>Thomas, Gary</i>	<i>Solar-induced variations in Polar Mesospheric Clouds</i>
<i>Thomas, Gary</i>	<i>Polar Mesospheric cloud properties determined from SBUV and SBUV/2 measurements</i>
<i>Toon, Owen B.</i>	<i>Investigations of clouds on Venus, Mars, and Titan</i>
<i>Toon, Owen B.</i>	<i>Improving the NSA Ames Mars GCM simulation of global dust storms using MGS TES data</i>
<i>Toon, Owen B.</i>	<i>Numerical investigations of snow-covered slopes and polar laminae on Mars</i>
<i>Toon, Owen B.</i>	<i>Application of an aerosol model to simulate smoke and marine aerosols</i>
<i>Toon, Owen B.</i>	<i>Escape from planetary atmospheres</i>
<i>Toon, Owen B.</i>	<i>Evolution of the optical properties of biomass smoke plumes in a 3-dimensional transport model and comparisons to in situ and remote sensing observations</i>
<i>Toon, Owen B.</i>	<i>Detection characterization and modeling of polar stratospheric clouds using satellite data from POAM III, HIRDLES and TES</i>

*Woods, Thomas N.*

*Woods, Thomas N.*

*Woods, Thomas N.*

*TIMED Phase E – SEE Experiment*

*Extreme ultraviolet variability experiment (EVE)*

*Geostationary operation environmental satellite (GOES-R)*