Laboratory for Atmospheric and Space Physics

Activity Report
2008
University of Colorado at Boulder

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Cover Photograph: "LASP At Dusk" (contributed by James L. Fanson, Project Manager, Kepler Mission, Jet Propulsion Laboratory)

LASP: A Brief History

In 1946-47, a handful of American universities joined with the military and with industry to initiate the era of space exploration. The University of Colorado was one of those pioneering universities. The first experiments to be performed in space were lofted by sub-orbital rockets. A key obstacle to these first rocket flights was providing a stabilized platform for cameras and other experiments. With support from the Naval Research Center and the Air Force Cambridge Research Laboratory (now the Phillips Laboratory), the University of Colorado formed a research group called the Upper Air Laboratory (UAL) to solve this problem. Their solution — called the biaxial pointing platform — cleared the way for some of the first major scientific discoveries made in space. Researchers and engineers from the UAL flew experiments into space on over 50 rocket flights before Sputnik. By 1965, the UAL had grown substantially. Along with this growth came a new building on campus and a new name: the Laboratory for Atmospheric and Space Physics. The public is invited to tour our facility and to observe the work that LASP does today.

A Message from the Director

The year 2008 has marked the election of a new U.S. president and the beginning of a very fresh federal administration. This exciting time is also marked, however, by virtually unprecedented fiscal and budgetary challenges in the U.S. (and around the world). Never in my memory have the executive and legislative branches of government looked so unflaggingly at science as the way to "jumpstart" our economy. Many science leaders and policy makers have proposed science as a core element of an economic revival, and it is gratifying to see the administration feature science (and engineering) at the center of their economic stimulus plan.

The recognition that science (and engineering) can be at the core of an economic revival is gratifying: This is, after all, the kind of assertion that many science leaders and policy makers have promulgated for decades. However, it is also a somewhat sobering prospect that science organizations (notably university entities) must now step up and carry out programs and projects with nimbleness and alacrity. The process of proposing, reviewing, and funding science programs normally has progressed at a deliberate (some might say "glacial") pace. Can scientific agencies act quickly and can the community respond effectively? These are key questions.

The secret to success (I contend) is to know what should be adapted in an organization without tampering with the fundamentals that have made it the outstanding institute that it is. As I have noted previously in these reports, LASP derives much (if not most) of its strength from constantly looking forward and seeking ways to improve products and processes. As your Director I've come to admire our adaptability in the face of changing external conditions and changing requirements. Insofar as space programs are concerned, I believe that LASP has maintained a culture that is nimble, flexible, and adaptable. Thus, it is an ideal institute to respond to current challenges and present national needs.

LASP continues its long and successful partnership with NASA. But we have also been greatly extending our relationship with the National Science Foundation (NSF), the National Oceanic and Atmospheric Administration (NOAA), and other agencies. In diversifying our scientific, technical, and programmatic relationships, we are finding exciting ways to apply our expertise to solve problems of crucial national, and international, importance. I am delighted that our staff is constantly seeking – and meeting – new challenges. This certainly was the case for the past year, as you will read about in the sections of this report.

LASP succeeds in large measure by having the trust and support of the CU administration. I want very much to thank the people in contracts administration, procurement, facilities management, and other support areas who help us do our very special job. I also want to thank the Vice Chancellor for Research, the Provost, and the Chancellor for their tireless and constant support of LASP, its mission, and its ambitious goals.

We also recognize that LASP resides in a remarkable geographical region and in a nearly unique domain for scientific inquiry. I express my sincere appreciation to the other institutes, national laboratories, dedicated centers, and special business partners with which we work on a daily basis. This broad community makes our job enjoyable and, indeed, much better. We look forward to working with the space research community in many new endeavors during the coming year. Thank you to the students, staff, and faculty of LASP for all their hard work. Special thanks go to Ann Alfaro for her thorough and careful efforts in preparing this report for 2008.

Daniel N. Baker

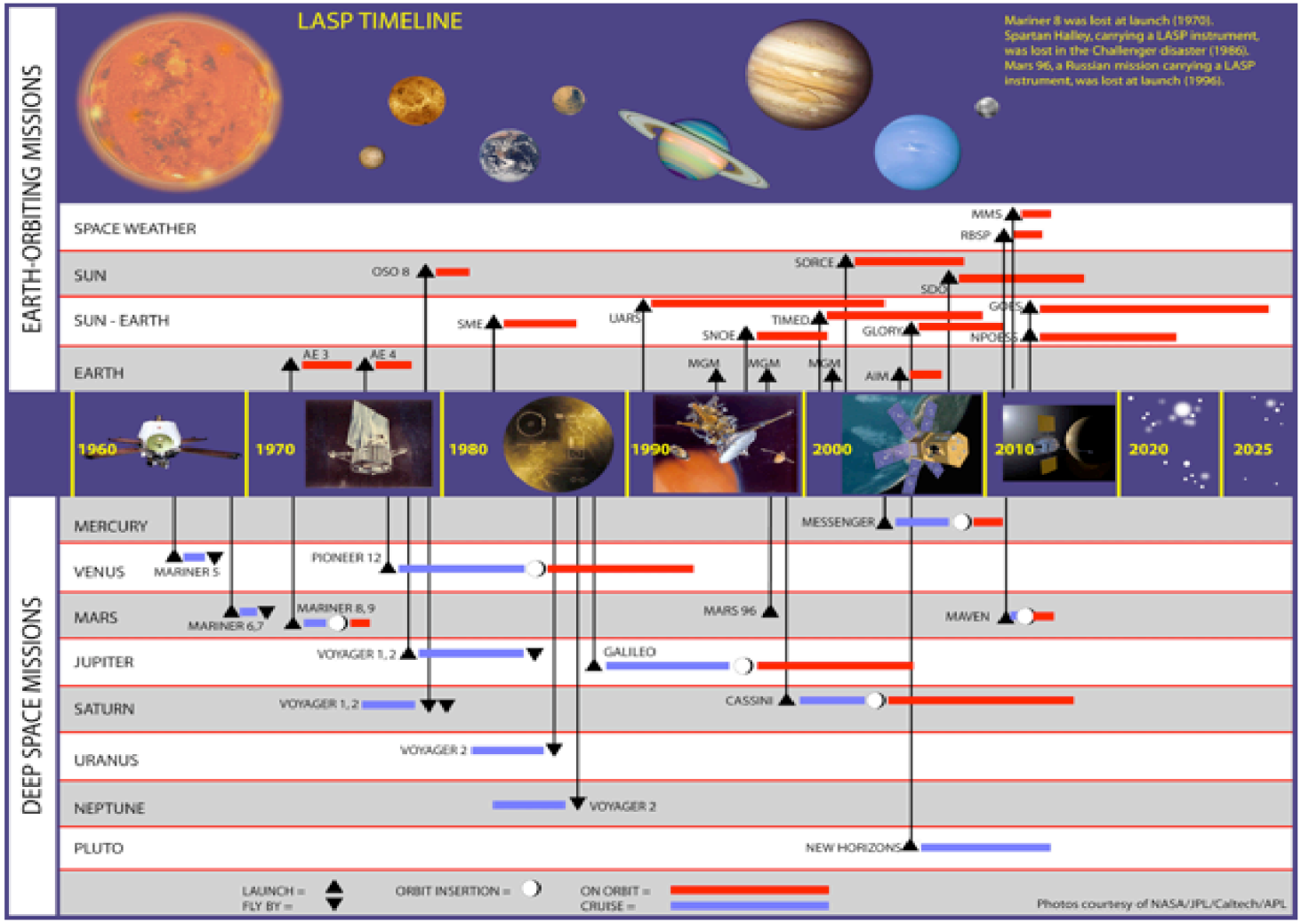
Please visit LASP's Website for the latest developments: **http://lasp.colorado.edu**.

LASP Appropriated Funding

During the period 1/1/2008 to 12/31/2008 LASP appropriated funding totaled $50,420,033 for support of 207 sponsored programs.

Source of Funding	Total Grant Dollars
Federal Agencies:	
Dept. of Commerce - NOAA	$192,067
Dept. of Defense - Air Force	$99,608
Dept. of Energy	$26,169
Jet Propulsion Laboratory	$1,698,039
National Aeronautics and Space Administration	$257,424
NASA - Ames Research Center	$1,107,387
NASA - Goddard Space Flight Center	$31,734,101
NASA - Langley	$95,000
National Science Foundation	$580,836
Total Federal Funds	$35,790,632
Non-Federal Agencies:	
Arizona State University	$101,190
Ball Aerospace Technology Corporation	$3,809,917
Boston University	$3,388,784
Carnegie Institution of Washington	$469,453
George Mason University	$43,910
Hampton University	$1,104,733
Johns Hopkins University	$28,372
Lockheed Martin Corporation	$2,039
Northrop Grumman Corporation	$40,000
NorthWest Research Associates (NORA)	$19,418
Science Systems and Applications, Inc.	$6,941
SouthWest Research Institute (SwRI)	$274,498
University of Alaska - Fairbanks	$97,540
University of Arizona	$468,854
University Center for Atmospheric Research	$81,543
University of California - Berkeley	$314,278
University of California - Los Angeles	$44,973
University of Central Florida	$300,000
University of Miami	$13,008
University of Michigan	$40,000
University of Minnesota	$498,793
University of New Hampshire	$3,481,157
Total Non-Federal Agencies	**$14,629,401**
TOTAL FUNDING	**$50,420,033**

LASP Space Mission Instruments



LASP has now sent instruments to every planet in the solar system and beyond (Voyager)

Daniel N. Baker, Director

LASP Scientists

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

Research Associates:
Nicole Albers
Laila Anderssen
Eike Bierwirth
Phil Chamberlin
Emily CoBabe-Ammann
Annamaria Cereti
Sean Davis
Peter Delamere
Gaetano DiAchille
Scot Elkington
Francis G. Eparvier
Stefan Eriksson
Xiaohua Fang
Juan Fontenla
John Gosling
Eberhard Grün
Margit Haberreiter
Jerald W. Harder
Lynn Harvey
Sebastien Hess
R. Richard Hodges
Greg Holsclaw
James E. Howard
Kyoung Joo Hwang
Tommy Johansson
Andrew Jones
Shri Kanekal
Bodil Karlsson
Michael King
Greg Kopp
Kristopher Larsen
George M. Lawrence (Ret.)
Wenlong Liu
William E. McClintock
Tom McCollom
Sara Martinez-Alonso
Michael Mellon
Aimee Merkel
Michael Mills
Keiji Ohtsuki
William Peterson
Erik C. Richard
Gary J. Rottman (Ret.)
David W. Rusch
Theodore Sarris
Sebastian Schmidt
Mindy Searls
Chao Shen
Hannah Sizemore
Jamison Smith
Martin Snow
Miodrag Sremcevic
Zoltan Sternovsky
A. Ian F. Stewart
Glen R. Stewart
Takayuki Tanigawa
Gary E. Thomas (Ret.)
John Williams
Thomas N. Woods

Visiting Scholars

Joseph Ajello, Jet Propulsion Laboratory, Pasadena, CA
Joshua E. Colwell, University of Central Florida, Orlando, FL
Antal Juhász, KFKI Research Institute for Particle and Nuclear Physics, Budapest, Hungary
Mark Lewis, Trinity University, San Antonio, TX
Makenzie Lystrup, NSF Post Doctoral Fellowship
Wayne Pryor, Central Arizona Coolidge, Coolidge, AZ

Engineering/Missions Ops/Program Support/Science

Engineering:

Michael McGrath (Director)
Gregg Allison
Michael D. Anfinson
Richard Arnold
Susan Batiste
Douglas Bausch
Helmut P. Bay (Ret.)
Ryan Behner
Christopher Belting
Bryce Bolton
Mary Bolton
James S. Bowers
Brian D. Boyle
Shelley Bramer
Catherine Brant
David Braun
Vanessa Briggs
Jeff Brown
Patrick Brown
Chelsey Bryant
Zachary G. Castleman
Steve Chappell
Wesley Cole
Christopher Converse
David Crotser
Kip W. Denhalter
Sharon Dooley
Virginia Drake
Joey Espejo
Seth Finkelstein
Tim Flaherty
David Gathright
Elizabeth Grogan
Roger Gunderson
Scott Gurst
David Harber
Karl Heuerman
Vaughn Hoxie
Karl Hubbell
Edgar Johansson
James Johnson (Ret.)
Mark Kien
Matthew King
Richard Kohnert
Vladimir Krneta
Bret Lamprecht
Mark R. Lankton
Ryan Lewis
James Mack
Jack Marshall
Aref Nammari
Gregory Newcomb
Darren O'Connor
Tammie Ogden
Heather Passe
Norman C. Perish
Brian Pyke
Joe Ramas
Thomas Reese
Dwight Reinhardt
Timothy Ruske
Judith Salazar
Durbin Seidel
Patti Sicken
Alan Sims
Thomas Sparn
Stephen Steg
David Street
Dwayne Sweiter
Trenton Taylor
Wayne Tighe
Matt Triplett
Scott A. Tucker
Gregory Ucker
Douglas Vincent
Tracy Vincent
Pamela J. Wagner
James Westfall
Neil White
Heather Reed Withnell
Peter Withnell
Shana Worel
Ray Wrigley
Ed Wullschleger
Alan Yehle
Michael Younce
Jason Young
Jennifer Young

Mission Ops:

Bill Possel (Director)
Robert P. Biro
R. Larry Bloom
Michelle Bourgeois
Karen Beth Bryant
Michael Bryant
Heather Buck
Pamme Crandall
Jason M. Dahl
Alexandra DeWolfe
Michael Dorey
Donald Elsborg
Jack Faber
Sasha Forsyth
Ken Greist
Jason Gurgel
Christian Jeppeson
Alain J. Jouchoux
David E. Judd
Michelle Kelley
Barry Knapp
Jay Kominek
Douglas M. Lindholm
Debra McCabe
Jerel Moffatt
Steve P. Monk
Michael Packard
Chris Pankratz
Radu Popescu
Nicole Ramos
Jennifer Reiter
Randy Reukauf
Lonnie Riesberg
Pat Ringrose
Stephen Roughton
Sean Ryan
Crystal Salcido
Joan Shy
Patrick Smith
Gail Tate
Brian Templeman
Blake Vanier
Anne Wilson
Donald Woodraska

Program Support:

Caroline Himes (Director)
Ann Alfaro (Ret.)
Judy Antman
Christina Barcilon
Nancy Brooks (Ret.)
Valerie Bullock
Anita Davis
Steve Ericksen
Brian Evans
Phillip L. Evans
Jason Feickert
Christin Gearhart
Kathleen Gilland
Judith (Dede) Gleason
Matthew Groeninger
Barb Hahn
Cheryl Haugen
Rose A. Hoag
Bonnie Hotard (Ret.)
Erick Jasiak
Gayle Jones
Edith Knehans
Mazn Kuldinow
Lindsay McCandless
Beth McGilvray
Greg Mecca
Debra Nastaj
John M. Padgett

Ann Perez de Tejada
Marissa Rusinek
Gary Schut
John D. Smith
Lisa Sparhawk
Heather Weisacosky
Sayuri West

Science:
Laura Bloom
Michael T. Callan
Kathleen Cirbo
Vincent Dols
Keith Drake
Bobby Fleshman

Michael Gehmyer
Vanessa George
George Millward
Erin Wood

2008 Retiree

Nancy Brooks

2008 Ph.D. Graduates

Bardeen, Charles Gaylord: Atmospheric and Oceanic Sciences
December 19, 2008
"*Three-Dimensional Numerical Simulations of Clouds and Aerosols in the Mesosphere Using WACCM/CARMA*"
Thesis Advisor: Owen B. Toon

Claudepierre, Seth: Applied Mathematics
August 9, 2008
"*Solar Wind Driving of Magnetospheric Ultra-Low Frequency Pulsations*"
Thesis Advisor: Scot Elkington

Kalnajs, Lars Erik: Atmospheric and Oceanic Sciences
December 19, 2008
"*Development of Rugged Ozone Instrumentation and its Application to Antarctic Tropospheric Ozone Depletion Events*"
Thesis Advisor: Linnea Avallone

Madry, William Lansing: Atmospheric and Oceanic Sciences
December 19, 2008
Modeling the Generation, Transport, and Radiative Effects of Sea Salt Aerosol
Thesis Advisor: Owen B. Toon

Sizemore, Hanna Gail: Astrophysics and Planetary Science
May 12, 2008
"The Role of Soils and Soil Heterogeneities in the Dynamics and Stability of Martian Ground Ice"
Thesis Advisor: Michael T. Mellon

Graduate Students

Trinity Allen
Dewey Anderson
Charles Bardeen
Suzanne Benze
Matthias Brakebusch
Laura Brower
Nicole Cates
Seth Claudepierre
Odelle H. Coddington
Bruce Davis
Mariel Desroche
Adrienne Dove
Attila Elteto
Jason English
Tina (Tianyi) Fan
Nathan Farr
Jeffrey France
Damhnait Gleeson
Dong Han
Rachel Hock
Monica Hoke
Laura Holt
Rachel Humphrey
David James
Lars Kalnajs
Bruce Kindil
Michael Klapetzky
Jessica Lovering
Anna Luebke
Patrick McBride
Scott Mackey
James McCollough
Lansing Madry
David Malaspina
Danielle Massey
Bonnie Meinke
Tyler Mitchell
Nate Murphy
Andrew Poppe
Laura Potter
Manny Presicci
Amal Ramachandran Nair
Licia Ray
Stuart Robbins
Yolanda Roberts
Donald Schmit
Zane Selvans
Karie Shipley
Hannah Sizemore
David Steussy
David Stokowski
Lin Su
Lindsey Link Tierney
Weichao Tu
Drew Lawson Turner
Richard Urata
Heather Walsh
Donovan Wheeler
Kaj Williams
Eric Wolf
Ryan Woolley

Undergraduate Students

Ian Aber
Kyle Allaire
Michael Beach
Andrew Berg
Shivali Bidaiah
James Binney
Nathaneal Bolt
Aaron Bornstein
Bryan Callahan
Christopher Carnahan
Dain Cilke
Ransom Christofferson
Daniel Dexter
Krystyna Dillard-Crawford
Nichole Dudley
David Eason
Joshua Elliott
James Everton
Michael Ferenc
Will Flanagan
John French
John Gibbons
Nathan Goldbaum
Duane Goodfellow
Michael Habinsky
Porter Haskins
Amanda Heaton
Joshua Hecht
Ryan Hickman
Rachel Hoover
Noah Husek
Vicki Hsu
Julie Keller
Karamjeet Khalsa
Jessica Kruse
Gina Lafferty
Matthew Lenda
Jenae Lestishen
Hey Joo (Diane) Lim
Anthony Lindell
Christopher Lindholm
Benjamin Link
Jonathan Loptien
William Lounsbury
Anna Luebke
Dung Luu
Shaun Lyle
Scott Mackey
Sarah McNamara
Neil Marks
John Martin
Louise Martinez
Mara Menahan
Fabio Mezzalira
Taylor Mills
David Morris
David Motta
Brenton Motz
Nathaniel Mutkus
Vu Anh Nguyen
Jacob Niece
David Norton
Karina Ogilvie
Therese Possel
Scott Potter
Kathryn Rash
Lindsey Rice
Elliot Richerson
Miranda Rohlfing
Anna Rudenko
Wayne Russell
Christopher Sawyer
Ryan Schilt
Michael Siegers
Sara Simon
Andrew Taggart
Cassandra Thao
Vishal Thummalapally
Allison Toltz
Melina Tremblay
Michael Tuthill
Christopher Van Poolen
Blake Vanier
Veronica Vertucci
Jih-Wang Wang
Brandon Werdel
Christopher White

Robert Witoff
Portia Wolf
Bryon Young
Malcolm Young
Peter Zhang

Scientific Research Interests

Laila Andersson

Kinetic processes in space plasmas such as double layers, electron phase space holes and Alfvén waves (anywhere where measurement has or will be made). Atmospheric loss through ion outflow for objects such as Earth and Mars. Instrumentation for space plasma missions, for the moment to develop new techniques for future missions.
laila.andersson@lasp.colorado.edu (303) 492-1689

Linnea Avallone

Experimental and theoretical studies of tropospheric and stratospheric chemistry, particularly of halogens and related species. Analyzing measurements of chemical species to understand dynamical processes in the stratosphere and troposphere. Development of instrumentation for autonomous in situ measurements of trace species related to understanding the lifetimes of anthropogenic pollutants.
avallone@miranda.colorado.edu (303) 492-5913

Frances Bagenal

Magnetic fields and plasma environments of solar system objects–mainly Jupiter and the Sun, but more recently, other planets, comets and asteroids.
bagenal@colorado.edu (303) 492-2598

Daniel N. Baker

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

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

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

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

Jerald Harder

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

Mihály Horányi

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

Bruce M. Jakosky

Teaching and research activities focus on understanding the nature of planetary surfaces and atmospheres and the possibility for the existence of life in the universe. Specific activities include teaching undergraduate and graduate courses, training graduate students, research and grant activity pertaining to planetary science and exobiology, leading the campus effort in astrobiology, exploring the nature of the interactions between science and society, and outreach to the public.
bruce.jakosky@lasp.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 (Ret.)

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

Xinlin Li

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

William E. McClintock

Observational Astrophysics - Ultraviolet observations of the outer atmospheres of cool stars and the very local (d<20pc) 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 H2SO4 and SO3, 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

Cora E. Randall

Primary interests include atmospheric chemistry and dynamics, mainly of the stratosphere, and secondarily of the mesosphere and troposphere. Work is experimental in nature, relying on data from remote sensing satellites. The emphasis is on ozone, NO2, and aerosol data from the Polar Ozone and Aerosol Measurement (POAM) instrument as well as from the Stratosphere Aerosol and Gas Experiment (SAGE). Measurements from instruments

on the Upper Atmosphere Research Satellite (UARS) and the Solar Mesosphere Explorer (SME) are also used. Other interests include the spectroscopy of comets and laboratory polarization measurements.
cora.randall@lasp.colorado.edu (303) 492-8208

Gary J. Rottman (Ret.)

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 (λ<300) irradiance, but emphasis has not extended to the visible and near-infrared. Application of ultraviolet spectroscopy and the development of new instrumentation for remote sensing.
gary.rottman@lasp.colorado.edu (303) 492-8324

David W. Rusch

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

Nicholas M. Schneider

The physics of planetary magnetospheres, particularly the interactions between planetary plasmas and the satellites of the outer planets. Extensive ground based 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 (Ret.)

Research concerning the middle atmosphere of Earth, in particular the mesosphere (50-100 km). Of interest are noctilucent clouds which occur in the high-latitude summertime mesopause region, around 83 km. These clouds were observed for five years by a CU LASP ultraviolet experiment onboard the LASP SME satellite, and more recently by instruments onboard the POAM II and UARS (Upper Atmosphere Research Satellite) spacecraft. In the last decade, interest involves global change in this region, possibly caused by anthropogenic emissions and by climate changes in the troposphere. Critical parameters studied are solar UV flux, water vapor, temperature and ozone which are being monitored by instruments onboard the UARS.
gary.thomas@lasp.colorado.edu (303) 492-7022
http://lasp.colorado.edu/noctilucent_clouds

Owen B. Toon

Theoretical studies of stratospheric aerosols; investigations of volcanic aerosols and studies of polar stratospheric clouds; theoretical studies of tropospheric clouds, aerosols and radiative transfer; experimental investigations of stratospheric and tropospheric phenomena; theoretical investigations of planetary atmospheres.
btoon@lasp.colorado.edu (303) 492-1534

Thomas N. Woods

Observational studies of the solar ultraviolet (UV) radiation, its variability, and its interaction with Earth's atmosphere. Principal investigator of NASA suborbital program to study the solar irradiance and thermospheric airglow. Principal investigator of the Solar EUV Experiment (SEE) on the TIMED mission. Co-investigator of the Solar Stellar Irradiance Comparison (SOLSTICE) experiment currently making solar UV irradiance measurements on the Upper Atmosphere Research Satellite (UARS) and planned for the Earth Observing System (EOS) missions.
tom.woods@lasp.colorado.edu (303) 492-4224

FACULTY ACTIVITIES

American Astronomical Association (AAA)

Bagenal, Frances (Editor of STATUS, Newsletter of Comm. on Status of Women in Astronomy)
Baker, Daniel (Member)

American Association for the Advancement of Science (AAAS)

Baker, Daniel (Member)

American Geophysical Union (AGU)

Bagenal, Frances (Member, Macelwane Medal Committee)
Baker, Daniel (Member)
Esposito, Larry (Member, Session Organizer "Planetary Rings")
Gosling, J.T. (Member, SPA/AGU Fellows Committee)
Horanyi, Mihaly (Fellow)
Jakosky, Bruce (Member)
Jakosky, Bruce (President, Planetary Sciences section)
Kopp, Greg (Meeting session co-chair, Fall 2008)
Hynek, Brian (Member)
Peterson, W.K. (Chair and organizer of special session at Spring 2008 meeting)
Toon, Owen B. (Member)
Woods, Thomas (Organizer of Session SH06: The Quiet Sun)

American Meteorological Society (AMS)

Avallone, Linnea (Chair of Committee on the Middle Atmosphere)
Avallone, Linnea (Co-Chair of 15th Conference on the Middle Atmosphere)

Asian Oceanic Geophysical Society (AOGS)

Li, Xinlin (Lead-convenor special session at 2008 AOGS Assembly)

Boulder Solar Alliance

Kopp, Greg (Secretary)

Carnegie Institute

McCollom, Tom (Session Chair, Deep Carbon Cycle Workshop)

Committee on Space Research (COSPAR)

Baker, Daniel (Member)
Esposito, Larry (Main Scientific Organizer "Planetary Atmospheres")

Editor or Editorial Board Member

Jakosky, Bruce (Member, Editorial Board, Astrobiology)
Jakosky, Bruce (Member, Editorial Board, International Journal of Astrobiology)
Jakosky, Bruce (Member, Editorial Board, Planetary Exploration Newsletter)
Li, Xinlin (Associate Editor for J. Geophys. Res. and J. Geophysical Physics)
Li, Xinlin (Member, Editorial Committee, J. of Chinese Space Sciences)
McCollom, Tom (Associate Editor, Geochimica et Cosmochimica Acta)
Mellon, Michael (Associate Editor for J. Geophys. Res. special Phoenix issue)

Geochemical Society

Hynek, Brian (Member)

Geological Society of America (Planetary Geology Division)

Hynek, Brian (Member)

Geospace Environment Modeling

Gosling, J.T. (Convenor and Chair for special session for June 2008 meeting)

International Academy of Astronautics

Baker, Daniel (Member)

International Association of Geomagnetism and Aeronomy (IAGA)

Baker, Daniel (Member)

International Space Science Institute (ISSI)

Snow, Martin (Member, Working group)
Harder, J.W. (Member, solar variability focus group)

International Union of Geodesy and Geophysics (IUGG)

Baker, Daniel (Member)

Joint Faculty (Aerospace Engineering (AERO))

Li, Xinlin

Joint Faculty (Astrophysics and Planetary Sciences Department (APS))

Bagenal, Frances
Baker, Daniel N.

Ergun, Robert (Graduate Admission Director)
Esposito, Larry
Rast, Mark
Schneider, Nicholas

Joint Faculty (Atmospheric and Oceanic Sciences Department (ATOC))

Avallone, Linnea
Pilewskie, Peter
Randall, Cora
Toon, O. Brian (Chair)

Joint Faculty (Geology Department (GEOL))

Hynek, Brian
Jakosky, Bruce

Joint Faculty (Physics Department)

Horányi, Mihály

Laboratory for Atmospheric and Space Physics (LASP)

Associate Director for Science
Jakosky, Bruce

Associate Director for Technical Divisions
Woods, Tom

Business Committee
Baker, Dan (Chair)
Himes, Caroline
Jakosky, Bruce
McGrath, Mike
Possel, Bill
Woods, Tom

Computer Support Advisory Committee (CSAC)
Greg Kopp, Chair (Solar, LSTB, Mac)
Charles Bardeen (student representative, Duane, PC)
Peter Delamere (Planetary, Duane, Mac)
Scot Elkington (Space Phys, LSTB, PC)
Caroline Himes (Admin, PC)
Mark Lankton (Eng., LSTB, Mac)
Ryan Lewis (Eng., LSTB, PC)
Chris Pankratz (Ops & Data Proc, LSTB, Mac)
Gary Schut (IT)

Data System Definition Committee (DSDC)
Woods, Tom (Chair)
Education and Public Outreach Advisory Committee

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

Executive Committee
Baker, Dan
CoBabe-Amman, Emily
Delamere, Peter
Gosling, Jack
Himes, Caroline
Jakosky, Bruce
Jones, Andrew
Kopp, Greg
McClintock, Bill
McGrath, Mike
Pilewskie, Peter
Possel, Bill
Randall, Cora
Stewart, Ian
Toon, Owen B.
Westfall, Jim
Woods, Tom
Haugen, Cheryl (ex-comm support)

LASP Seminar Series Committee
Chamberlin, Phil (Co-chair)
Sternovsky, Zoltan (Co-chair)

Library Committee
Snow, Marty (Chair)
Eparvier, Francis
George, Vanessa
Horányi, Mihály
Knapp, Barry
Simmons, Karen
Wullschleger, Ed

Planetary Journal Club
Albers, Nicole (Co-Organizer)
Ohtsuki, Keiji (Co-Organizer)

Proposal Development Committee (PDC)

Woods, Tom (Chair)
Sparn, Tom (Co-chair)
Baker, Dan
CoBabe-Ammann, Emily
Drake, Ginger
Ergun, Bob
George, Vanessa
Himes, Caroline
Jakosky, Bruce
McClintock, Bill
McGilvray, Beth
McGrath, Mike
Padgett, John
Pankratz, Chris
Perez de Tejada, Ann
Possel, Bill
Reed, Heather
Richard, Erik
Ryan, Sean
Sternovsky, Zoltan
Tate, Gail
Westfall, Jim

Social Committee
Bloom, Laura
Bryant, Chelsey
Bryant, Karen
Buck, Heather
Bullock, Valerie
Chamberlin, Phil
Davis, Bruce
Davis, Nina
DeNeen, Mathew
Gleason, Dede
Griest, Ken
Harvey, V. Lynn
Himes, Caroline
Hoag, Rose
McCabe, Dec
Osborne, Darren (Chair)
Possel, Bill
Reiter, Jennifer
Shy, Joan
Wagner, Pam

Sponsored Visitor Committee
Harder, Jerry (chair)
CoBabe-Amman, Emily
Elkington, Scot
McClintock, William

Rast, Mark
Rusch, Dave

Technology Workshop
Woods, Thomas (Organizer)

Tour Committee
Chamberlin, Phil
Eparvier, Francis
Jones, Andrew

National Academy of Sciences (NAS)

Baker, Daniel (Member)

National Aeronautics and Space Administration (NASA)

Bagenal, Frances (Chair, Outer Planets Assessment Group)
Bagenal, Frances (Vice Chair, Planetary Science Subcommittee of the Advisory Council)
Eparvier, Francis (Member, Living With a Star Panel Review)
Eparvier, Francis (Taught Space Weather class for 2008 Summer Undergraduate Research Experience)
Gosling, J.T. (Member, ACE and STEREO Science Working Team)
Horányi, Mihály (Co-Chair, Lunar Dust Toxicity Project Review Board)
Jakosky, Bruce (Member, NASA Mars Exploration Program Analysis Group (MEPAG)
Jakosky, Bruce (Participant, NASA and NRC "meeting of experts" on future of the NASA planetary exploration program)
Kanekal, S.G. (Member, NASA Living With a Star panel)
Woods, Thomas (Member, NASA Sounding Rocket Program Advisory Committee)

National Oceanic and Atmospheric Administration (NOAA)

Harder, J.W. (Member, Scientific Advisory Committee)

National Research Council (NRC)

Jakosky, Bruce (Co-Chair, Comm. on Origin and Evolution of Life (COEL))

Planetary Society

Jakosky, Bruce (Member, Advisory Board)

Reviewer of Manuscripts, Proposals, or Creative Work

Avallone, Linnea (NASA Postdoctoral Fellowship applications)
Avallone, Linnea (National Science Foundation proposals)
Avallone, Linnea (Proposal review for Marsden Fund, Royal Society of New Zealand)
Bagenal, Frances (Review Panel, NASA Planetary Atmospheres Program)
Bagenal, Frances (Review committee at Dartmouth College and Whitman College)
Bagenal, Frances (Review panel of Outer Planet Flagship studies)
DiAchille, Gaetano (Reviewed manuscript for J. Geophys. Res.)
Eparvier, Francis (Reviewed proposals for NASA and Canadian Space Agency)
Ergun, Robert (Reviewer of manuscripts for J. Geophys. Res., Geophys. Res. Lett., and Physics of Plasmas)

Eriksson, Stefan (Reviewer of manuscripts for J. Geophys. Res., J. Atmos. Solar-Terrestr. Phys., Annales Geophysicae, Geophys. Res. Lett.)
Fontenla, John (Reviewer of proposals for NSF, NASA, and FONYCET (Argentina))
Fontenla, John (Reviewer of manuscripts or Solar Physics and Astrophysical Journal)
Gosling, J.T. (Reviewer of proposals for NASA)
Gosling, J.T. (Reviewer of manuscripts for Geophys. Res. Lett., J. Geophys. Res., ApJ, J. Atmos. Solar-Terrestr. Phys., and Annales Geophysicae)
Haberreiter, Margit (Reviewer of proposals for NASA)
Horányi, Mihály (Reviewer of manuscripts for J. Geophys. Res., Physics of Plasmas, Nature, and Icarus)
Horányi, Mihály (Proposal reviewer for National Science Foundation, Department of Energy, and NASA)
Hynek, Brian (Reviewer of manuscripts for Nature, Nature Geosciences, J. Geophys. Res., Geophys. Res. Lett., and Icarus)
Hynek, Brian (Reviewer of proposals for NASA Planetary Geology and Geophysics, NASA Mars Fundamental Research Program, and NASA Mars Data analysis Program)
Jakosky, Bruce (External reviewer for proposals submitted to NASA Mars Fundamental Research Program)
Jakosky, Bruce (Reviewer of manuscript for Proceedings of the National Academy of Science)
Kanekal, Shri (Reviewer of manuscripts for J. Geophys. Res., J. Atmos. Solar-Terrestr. Phys.)
Kopp, Greg (Reviewer of manuscripts for Adv. in Space Res. and Astron. and Astrophys.)
Li, Xinlin (Reviewer of proposals for NASA, and NSF)
Li, Xinlin (Reviewer of manuscripts for J. Geophys. Res., Geophys. Res. Lett., and Space Weather Journal)
Mellon, Michael (Reviewer of manuscripts for J. Geophys. Res. and Icarus)
McClintock, William (External Reviewer for SAGE proposal)
McCollom, Tom (Reviewer of proposals for NSF, NASA, Petroleum Research Fund, American Mineralogist, Chemical Geology, Geochemical Journal, Geochimica et Cosmochimica Acta)
Peterson, W.K. (Reviewer for J. Geophys. Res., and Geophys. Res. Lett.)
Peterson, W.K. (Reviewer of proposals for NSF/GEM)
Richard, Erik (Reviewed proposals for NASA)
Snow, Martin (Reviewer of manuscripts for J. Geophys. Res., Solar Physics, New Astronomy, and Astrophysical Journal)
Sremcevic, Miodrag (Reviewer of manuscripts for Icarus)
Sternovsky, Zoltan (Reviewer of proposals for NASA and DoE)
Woods, Thomas (Reviewer of manuscripts for J. Geophys. Res., IJGA, Solar Physics, and Adv. Space Res.)
Woods, Thomas (Reviewer of proposal for NASA)

Scientific Committee on Solar-Terrestrial Physics (SCOSTEP)

Baker, Daniel (Member)

Sigma Xi

Daniel Baker (Member)

University of Colorado

Avallone, Linnea (Member, Boulder Faculty Assembly Committee on Diversity)
Avallone, Linnea (Speaker, Welcome Address to new CU students /parents)
Avallone, Linnea (Member, Provost's Faculty Achievement Award Committee)
Avallone, Linnea (Representative, Colorado Dept. of Higher Education's Faculty-to-Faculty Conference)
Avallone, Linnea (Member of Dissertation/Thesis Committee)
Avallone, Linnea (Member of Masters or Ph.D. Qualifying Examination Committee)
Avallone, Linnea (Student advisor)

Chamberlin, Phil (Student advisor)
Eparvier, Francis (Student advisor)
Eparvier, Francis (Supported Graduate Student recruiting for APS and ATOC departments)
Ergun, Robert (Dissertation/Thesis Advisor)
Ergun, Robert (Member, Dissertation/Thesis Committee)
Ergun, Robert (Member, Masters or Ph.D. Qualifying Examination Committee)
Esposito, Larry (Principal Dissertation/Thesis Advisor)
Fontenla, John (Dissertation/Thesis Advisor)
Gosling, J.T. (Member of Dissertation/Thesis Committee)
Harder, J.W. (Dissertation/Thesis Advisor)
Horányi, Mihály (Chair, Awards Committee, Physics Department)
Horányi, Mihály (Member, Chair Advisory Committee)
Horányi, Mihály (Member, Plasma Faculty Search Committee, Physics Department)
Horányi, Mihály: (Committee Chair, CU/Boulder– Award for Excellence in Research, Scholarly, and Creative Work)
Hynek, Brian (Member, Graduate Admissions Committee, Geological Sciences Department)
Hynek, Brian (Principal Dissertation/Thesis Advisor)
Hynek, Brian (Member of Dissertation/Thesis Committee)
Hynek, Brian (Member of Masters or Ph.D. Qualifying Exam Committee)
Hynek, Brian (Supervisor, Independent Study Group)
Jakosky, Bruce (Departmental mentor for Assistant Professor Brian Hynek)
Jones, Andrew (Principal Thesis/Dissertation Advisor)
Kopp, Greg (Student Advisor)
Li, Xinlin (Principal Thesis/Dissertation Advisor)
Li, Xinlin (Member of Masters or Ph.D. Qualifying Exam Committee)
Li, Xinlin (Member of Masters or Ph.D. Qualifying Exam Committee)
Li, Xinlin (Supervisor, Independent Study Group)
Li, Xinlin (Member, Program Committee, THEMIS Science Workshop)
Li, Xinlin (Chair, AERO graduate student recruitment and curricular committee)
Li, Xinlin (Lead reviewer, RA evaluations, LASP)
Li, Xinlin (Chair, Elkington Promotion Evaluation Committee, LASP)
Li, Xinlin (Chair, Kanekal Promotion Evaluation Committee, LASP)
Li, Xinlin (Member, Delamere Promotion Evaluation Committee, LASP)
Li, Xinlin (Member, AERO strategic planning committee on small satellite systems)
Li, Xinlin (Member, Undergraduate Teaching Curriculum Committee, AERO Engineering Department)
Li, Xinlin (Member, Search Committee for Senior Instructor, AERO Engineering Department)
Li, Xinlin (Chair, K.D. Wood Colloquium)
McCollom, Tom (Member of Dissertation/Thesis Committee)
Mellon, Michael (Principal Thesis/Dissertation Advisor)
Mellon, Michael (Member of Dissertation/Thesis Committee)
Pilewskie, Peter (Principal Dissertation/Thesis Advisor)
Pilewskie, Peter (Member of Dissertation/Thesis Committee)
Pilewskie, Peter (Member of Masters or Ph.D. Qualifying Exam Committee)
Pilewskie, Peter (Supervisor, Independent Study Group)
Pilewskie, Peter (Undergraduate Student Advisor)
Pilewskie, Peter (Grader, ATOC and APS classes)
Richard, Erik (Student advisor)
Richard, Erik (Committee chair for Sebastian Schmidt's RSII promotion)
Snow, Martin (Undergraduate Student Advisor)

Snow, Martin (Judge, Summit Middle School Science Fairs)
Snow, Martin (Contributor of articles to SORCE Newsletter)
Sternovsky, Zoltan (Main organizer 12th Workshop on the Physics of Dusty Plasmas (WPDP))
Woods, Thomas (Principal Dissertation/Thesis Advisor)
Woods, Thomas (LASP tours)

University of New Hampshire

Li, Xinlin (Co-Convenor of session at CLUSTER/THEMIS workshop)

University or Northern Iowa

Hynek, Brian (Member, External Advisory Board, Department of Earth Sciences)

Whole Heliosphere Interval (WHI)

Richard, Erik (Member, Science Team working group)
Snow, Martin (Member, Science Team)

FACULTY HONORS/AWARDS

Linnea Avallone: Recipient of NASA Group Achievement Award (Tropical Composition, Cloud and Climate Coupling Team)
Daniel N. Baker: Certificate of Appreciation, Univ. of Michigan Space Physics Research Lab (SPRL)
Daniel N. Baker: Awarded Certificate of Recognition (Commemorating IGY): Space Studies Board, National Research Council
John T. Gosling: Awarded 2008 Editor's Citation for Excellence in Refereeing, Geophys. Res. Lett., AGU)
Brian Hynek: Awarded the American Institute of Aeronautics and Astronautics (AIAA) Abe M. Zarem Educator Award)
Xinlin Li: Awarded NASA Group Achievement Award in recognition of outstanding contribution to the THEMIS mission, 2008.
Cora Einterz Randall: Awarded the Provost's Faculty Achievement Award, October 2008.
Cora Einterz Randall: Awarded the NASA Group Achievement Award (AIM Mission), April 2008.

Courses Taught by LASP Faculty

Name	Course #	Description
Avallone, Linnea	CHEM/ATOC 5151	Atmospheric Chemistry
Avallone, Linnea	ATOC 1060	Our Changing Environment
Bagenal, Frances	ASTR 5835	Giant Planet Interiors and Atmospheres
Bagenal, Frances	ASTR 1010	Introductory Astronomy
Ergun, Robert	ASTR 1030	Introduction to Astronomy
Ergun, Robert	ASTR 5140	Plasma Astrophysics
Esposito, Larry	ASTR 5830	Moons of the Outer Solar System
Horányi, Mihály	PHYS 2170	Foundations of Modern Physics
Horányi, Mihály	PHYS 5210	Graduate Mechanics
Hynek,Brian Hynek	GEOL 3050	GIS for Geologists
Jakosky, Bruce	GEOL 5700	Planetary Field Geology
Li, Xinlin	ASEN 5519	Space Hardware I: Design
Li, Xinlin	ASEN 6519	Space Hardware II: Manufacture and Test
Li, Xinlin	ASEN 3113	Thermal Dynamics and Heat Transfer
McGrath, Michael	ASEN 4148/5148	Spacecraft Design
Pilewskie, Peter	ATOC 6020	Atmospheric Radiation Seminar
Randall, Cora Einterz	ATOC 5235	Remote Sensing of. Atmospheres and Oceans
Randall, Cora Einterz	ATOC 6020	Atmospheric Radiation Seminar
Randall, Cora Einterz	ATOC 3500	Air Chemistry and Pollution
Rast, Mark	ASTR 3760	Solar and Space Physics
Rast, Mark	ASTR 1120	General Astronomy
Schneider, Nicholas	ASTR 1110	Planets, Moons and Rings
Stewart, Glen	ASTR 1110	General Astronomy: The Solar System
Stewart, Glen	ASTR 5835	Seminar in Planetary Science
Toon, Owen B.	ATOC 5810	Planetary Atmospheres
Toon, Owen B.	ATOC 6020	Clouds and Aerosols

Colloquia and Informal Talks
Spring 2008

Abramov, Oleg, CU/Geol. Sciences, Thermal modeling of the Earth's lithosphere during the late heavy bombardment: Implications for early life

Akasofu, Syun, U. of Alaska, Truth is nothing but what contemporary scientists agree upon

Andersson, Laila, CU/LASP, Ion Loss at Mars

Bagenal, Fran, CU/LASP, The Latest Spin on Saturn's Rotation

Benner, Steve, Yale University, Foundation for Applied Molecular Evolution, Four approaches to a general theory of life

Berger, Tom, Lockheed Martin, Buoyant Plumes in Solar Prominences: Hinode/SOT Observations of a new Phenomenon on the Sun

Bradac, Marusa, KIPAC Institute, Dark matter and highest redshift galaxies: Revealing the invisible with the "Bullet Cluster"

Brogl, Sandra, Florida Inst. of Tech, Studies of magnetotail dynamics and energy evolution during substorms using MHD simulations

Cash, Webster, CU/APS, The New Worlds Observer: A mission to open up detailed study of planetary systems

Centrella, Joan, NASA/GSFC, Binary Black holes, Gravitational waves, and numerical relativity.

Claudepierre, Seth, CU/LASP, Magnetospheric ULF pulsations driven by the Kelvin Helmholtz instability in the low-latitude boundary layer

Curdt, Werner, Max Plank Inst., The solar corona: New insights from spectroscopic observations

Deming, Jody and James Staley, U. of Washington, Earth's low temperature life: An analog for Mars and Europa?

Di Achille, Gaetano, International Research School of Planetary Sciences, Geology of Martian sedimentary deposits and paleolakes: A tool to study the history of water on the Red planet

Elkington, Scot, CU/LASP, Modeling energetic particle dynamics in Earth's magnetosphere

Eriksson, Stefan, CU/LASP, Evolution of dayside magnetopause reconnection exhaust regions and FTE Genesis: THEMIS observations

Esposito, Larry, CU/LASP, The history of Saturn's rings

Hoehler, Tori, NASA Ames, The Energetics of Habitability

Hoke, Monica, CU/LASP, evidence for an internal ocean within Titan

Hollenbach, David, NASA Ames, The effect of protoplanetary disk dispersal on planet formation

Horányi, Mihály, CU/LASP, Dusty plasmas in the solar system

Jakosky, Bruce, CU/LASP, Martian habitability

Johansson, Tommy, CU/LASP, Results from statistical studies of auroral electric fields using Cluster

Johnson, Kelsey, Univ. of Virginia, Are Super Star clusters actually Super?

Jones, Andrew, CU/LASP, Status of the GOES-R EXIS Instrument

Judd, David, CU/LASP, Java Beans

Kaltenegger, Lisa, CFA/Harvard, Assembing the puzzle: Atmospheric biosignatures on Exoplanets

Kanekal, Shri, CU/LASP, Dynamics of relativistic electrons in the Earth's Radiation Belts; Energization and loss mechanisms

Kivelson, Margaret, UCLA, Electromagnetic periodicities at Saturn

Kivelson, Margaret, UCLA, Saturation of the polar cap potential

Kress, Monika, San Jose State Univ., How do habitable planets acquire carbon?

Lankton, Mark, CU/LASP, The MESSENGER Mission

Lee, Jae, SUNY, Climate responses to solar variability in the northern annular mode (NAM) and in tropical circulation

Lindholm, Doug, CU/LASP, Our version control system of Choice, "Subversion"

Lyon, John, Dartmouth College, Multifluid simulations of the magnetosphere

Mitchell, Jonathan, Princeton, Understanding Titan from the perspective of Earth's climate

Mojzsis, Stephen, CU/GEOL, Astrobiology abroad: What I did on my sabbatical leave in France

Peterson, Bill, CU/LASP, Energetic upflowing ions: The quiet time problems

Raschke, Ehrhard, U. of Hamburg, Germany, Incoming solar radiation at top of the atmosphere – measurements and modeling

Ray, Licia, CU/LASP, Giant planet aurora

Robertson, Scott, CU/Physics, The MASS/-ECOMA Rocket Campaign into the polar summer mesosphere

Rosenlof, Karen, NOAA, Trends in the temperature and water vapor content of the tropical lower stratosphere: The sea-surface connection

Rutten, Robert J., Sterrekundig Inst. Utrecht, Observing, interpreting and using the H-Alpha Chromosphere

Schneider, Nicholas, CU/LASP, What you should know about Mercury

Snow, Marty, CU/LASP, The SOLSTICE Science sampler

Stern, Alan, NASA HQ, Planets and Planet definition, and whether an Earth should be a planet

Sternovsky, Zoltan, CU/LASP, Selected topics in cosmic dust research

Stodieck, Louis, CU/Aero Engineering, Maintaining Muscle Fitness during Long Duration Space Flight: The Challenge of "Use It or Lose It"

Stone, Edward, CalTech, The outer heliosphere: The termination shock and beyond

Trainer, Melissa, CU/LASP, Hazy skies on the early Earth: Lessons from Saturn's moon Titan

Villanueva, Geronimo, NASA/Goddard, Detection and mapping of Methane on Mars

Woods, Tom, CU/LASP, Maunder Minimum: How the cold period in the 1600s was influenced by solar activity

Woods, Tom, CU/LASP, SORCE Mission: Improving the Solar Irradiance Climate Record

Yelle, Roger, LPL, Titan's upper atmosphere: Surprises from Cassini

Colloquia and Informal Talks Fall 2008

Allen, Steve, Stanford, Cosmological constraints from X-ray studies of galaxy clusters

Andersson, Laila, CU/LASP, Thesis observations: What are electron phase space holes, where can they be found, and where does rapid reconfiguration of the magnetosphere occur?

Avallone, Linnea, CU/LASP, In situ measurements in rocket and space shuttle exhaust plumes; What we've learned about stratospheric chemistry and dynamics

Bardeen, Charles, CU/LASP, Microphysics of polar mesospheric clouds; Lessons from WACCM/CARMA simulations and comparisons with AIM

Barth, Erika, SwRI, Convection, clouds, and precipitation on Titan

Blake, David, NASA/Ames Res. Center, The CheMin mineralogical instrument on the MSL mission and the field-portable TERRA version available for NAI field campaigns

Burin Des Roziers, Edward, CU/LASP, Plasma sheet energetic electrons: Their relationship with the solar wind and geosynchronous electrons, and preliminary case studies of plasma sheet electron dropouts

Claudepierre, Seth, CU/LASP, Magnetospheric cavity modes driven by solar wind dynamic pressure fluctuations: Initial results from global MHD simulations

DANDE Team, U. of Colorado, The drag and atmospheric neutral density explorer (DANDE): an innovative student built satellite for upper atmospheric research

Delamere, Peter, CU/LASP, Europa's time varying plasma interaction

Delamere, Peter, CU/LASP, Hybrid code simulations of the solar wind interaction with Pluto

Domagel-Goldman, Shawn, CU/LASP, Searching for smelly planets: sulfur gases as anoxic biosignatures

Douglas, Trevor, Montana State Univ., Biomineralization and hyperthermophilic viruses; Significance to the origin of life

Eigenbrode, Jennifer, GSFC, Records of life in Ice

Ergun, Robert, CU/LASP, The past and future of space plasma research: the Devil's in the details

Eriksson, Stefan, CU/LASP, FTE Dynamics and Effects on Local and Remote Regions near the dayside magnetopause reconnection layer

Eriksson, Stefan, CU/LASP, IMF clock angle dependence of magnetic storm recovery transitions

Farr, Nathan, CU/LASP, Complexities of a 3-D plasmoid flux rope as shown by an MHD simulation

Gleason, Damhnait, CU/LASP, At arctic analog to Europa: Signs of life on the ice

Hess, Sebastien, CU/LASP, Acceleration processes above the Io footprint

Hoffman, L., ICG-1, Germany, New satellite measurements of stratospheric gravity waves

Judd, David, CU/LASP, Java authentication and authorization service (JAAS)

Karlsson, Bodil, CU/LASP, Noctilucent clouds – Shedding light on the atmosphere

King, Michael, CU/LASP, NASA's Earth observations of the Global Environment: our changing planet and the view from space

Koskinen, Hannu, U. of Helsinki, Toward quantitative understanding of space storm energetics

Li, Xinlin, CU/LASP, THEMIS mission, a miracle! (Low Cost and High Science Return)

Lindholm, Doug, "Agile" software development methodology

Liu, Wenlong, CU/LASP, Characterization of ULF pulsations observed by THEMIS

Liu, Zhengyu, U. of Wisconsin, Abrupt change of North Africa climate-ecosystem in the holocene: Modeling, mechanism and implications

Lu, Gang, CU/LASP, Global energy partition during the 21-22 January 2005 geomagnetic storm: Ring current energization

Malaspina, David, CU/LASP, Progress in the Eigenmode interpretation of solar wind Langmuir waves

Marsh, Dan, NCAR, Modeling clouds at the edge of space; WACCM simulations of PMC

Matthes, Katja, NCAR, Modeling solar cycle and QBO effects in the atmosphere

McPherron, Robert, UCLA/IGPP, THEMIS spacecraft and ground observations of substorms in the Earth's magnetotail

Meinke, Bonnie, CU/LASP, Tidally driven stress accumulation and shear failure of Enceladus' tiger stripes

Menou, Kristen, Columbia Univ., Electromagnetic counterparts of spacetime sirens

Murphy, Nate, CU/LASP, Habitable ice on Mars

Neish, Catherine, U. of Arizona, Prebiotic chemistry in aqueous solutions on the surface of Titan and serpentinization and early life

Pan, Laura, NCAR, Concept of the tropopause revisited

Park, Mijeong, NCAR, Transport pathways in the Asian monsoon anticyclone diagnosed from space-borne measurements and model simulations

Perna, Rosalba, CU/LASP, Neutron star spins: In lonely life and with companions

Purkayastha, Avi, Sicortex, An introduction to SiCortex system architecture

Quataert, Eliot, UC Berkeley, Models of short-duration Gamma-ray bursts

Randall, Cora, CU/LASP, Atmospheric effects of energetic particle precipitation

Rast, Mark, CU/LASP, Turbulent transport: Statistics of structures

Schaub, Hanspeter, CU/Aerospace Engr., Electrostatic spacecraft relative control applications

Schneider, Nicholas, CU/LASP, Disappearing atmospheres: When bad things happen to good planets

Schuab, Hanspeter, CU/Aero, Electrostatic spacecraft relative control applications

Searls, Mindi, CU/LASP, The Phoenix Lander dishes dirt on Mars: Discoveries from this long-awaited mission

Shirley, Yancy, U. of Arizona, Developing an evolutionary sequence for starless cores

Simmons, Roger, MIT, The great mass extinction _ a sudden event or a slow moving train-wreck?

Sleep, Norman, Stanford, Habitability of super-Earth

Spence, Harlan, Boston Univ., The lunar reconnaissance orbiter mission: From exploration vision to science reality

Szostak, Jack, Harvard, What can we learn about the origin of life from efforts to design an artificial cell?

Tilmes, Simone, NCAR, Impact of Geo-engineered Aerosols on the troposphere and stratosphere

Trainer, Melissa, CU/LASP, A closer look at the chemistry of organic hazes on Titan and the early Earth

Vaida, Veronica, CU/Chemistry, Sunlight initiated chemistry: Implications for synthesis on ancient Earth

Wiedinmyer, Christine, NCAR, Observations from a mountain site in Colorado: The storm peak aerosol and cloud characterization study

Wolfe, Art, UC/San Diego, Finding the gas and magnetic fields that make galaxies

Xie, Shang-Ping, U. of Hawaii, Climatic effects of the Tropical Indian Ocean

Publications

Ajello, J., et al., Titan airglow spectra from the Cassini Ultraviolet Imaging Spectrograph: FUY disk analysis, Geophys. Res. Lett., 35, doi:10.1029/2007GL032315, 2008.

Amyx, K., et al., In-situ measurement of smoke particles in the wintertime polar mesosphere between 80 and 85 km altitude, Journal of Atmospheric and Solar-Terrestrial Physics, Volume 70, Issue 1, 61-70., 2008.

Andersson, L., et al., Influence of suprathermal background electrons on strong auroral double layers: Observations, Phys. Plasma, Phys. Plasma, 15, 072901, 2008.

Angelopoulos, V., D. et al., First Results from the THEMIS Mission, Space Sci. Rev., 141, 453, 2008.

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Baker, D.N., The impacts of the President's FY09 budget request (and FY08 operating plan) on the NASA Heliophysics Program, Invited presentation, National Academy of Sciences, Washington, DC, 11 March 2008.

Baker, D.N., The International Living With a Star (ILWS) Program: Basic space science with a high public purpose, Keynote Lecture, 50 Years after IGY, Symposium, Tsukuba, Japan, 6-7 November 2008.

Baker, D.N., The Relativistic Electron-Proton Telescope (REPT) On Board the NASA Radiation Belt Storm Probe (RBSP) Mission, Invited Seminar, Space Weather Prediction Center, NOAA, Boulder, CO, 13 March 2008.

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Rast, Mark, The prediction, emergence, and consequence of large active regions, SHINE Workshop, Midway, Utah, 24 June 2008.

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SPONSORED PROGRAMS

Andersson, Laila	Ion Heating in Mars' Atmosphere
Andersson, Laila	Parallel Electric Fields and Alfvén Waves
Andersson, Laila	The De-Rotating Imaging System 'Monitor'
Avallone, Linnea	In Situ Measurements of Cloud Ice Water Content During TC4 in Support of Satellite Validation
Avallone, Linnea	Student Support for START08
Bagenal, Frances	Angular Momentum Coupling between Jupiter and its Magnetosphere (Graduate Student: Licia Ray)
Bagenal, Frances	IO's Interaction with the Magnetosphere of Jupiter-EPO Supplement
Bagenal, Frances	JUNO Science Support - Phase B Activities
Bagenal, Frances	New Horizon Pluto-Kuiper Belt Mission Phase B
Bagenal, Frances	NSF Astronomy and Astrophysics Post Doctoral Fellowship
Baker, Daniel	REU Site: An Interdisciplinary Undergraduate Research Experience in Solar and Space Physics
Baker, Daniel	A New Tenure-Track Solar Physicist at CU-Boulder: Catalyst for Change
Baker, Daniel	Electronic Geophysical Year (eGY) Initiative
Baker, Daniel	GBI Project
Baker, Daniel	Mission Opportunity Radbelt Experiment (MORE)
Baker, Daniel	Relativistic Electron-Proton Telescope (REPT) Instrument on the "Radiation Belt Storm Probes (RBSP) - Energetic Particle, Composition, and Thermal Plasma (ECT) Suite" (Phase A)
Baker, Daniel	Relativistic Electron-Proton Telescope (REPT) Instrument on the "Radiation Belt Storm Probes (RBSP) - Energetic Particle, Composition, and Thermal Plasma (ECT) Suite" (Phase B)
Baker, Daniel	Science Team Support for the MESSENGER Mission - Phase E
Baker, Daniel	The Center for Integrated Space Weather Modeling (CISM)
Baker, Daniel	The Cluster Rapid On-Orbit Operations and Data Verification

Baker, Daniel	The SAMPEX Data Center and User Interface for the SEC Community
Baker, Daniel	VxO for S3C Data: The Virtual Radiation Belt Observatory (ViRBO)
CoBabe-Ammann, Emily	CIRES/LASP REU COLLABORATIVE - Task III
CoBabe-Ammann, Emily	Project SPECTRA! Bringing Hands-on Engineering and Solar System Exploration Data Stories to Middle and High School Students
CoBabe-Ammann, Emily	REU An Interdisciplinary Undergraduate Research Experience in Solar and Space Physics
Colwell, Joshua	Dynamics of Interplanetary Dust in the Outer Solar System
Colwell, Joshua	Evolution of the Topography and Mantles of Comet Nuclei
Delamere, Peter	Mass and Energy Flow Through Saturn's Inner Magnetosphere
Delamere, Peter	The Influence of Saturn's Internal Plasma Sources on Magnetospheric Dynamics
Elkington, Scot	Global Characteristics of the Substorm Particle Injection Process
Elkington, Scot	Investigations of Global ULF Structure in Earth's Magnetosphere
Elkington, Scot	Radiation Belt Radial Diffusion
Eparvier, Francis	Extreme Ultraviolet and X-Ray Irradiance Sensors (EXIS) Geostationary Operational Environmental Satellites - R Series (GOES-R)
Ergun, Robert	Eigenmode Theory of Solar Wind Langmuir Waves (Student: David Malaspina)
Ergun, Robert	Electric Field and Waves (EFW) Instrument
Ergun, Robert	FAST Satellite Operations and Data Analysis
Ergun, Robert	JUNO Science Support - Phase B Activities
Ergun, Robert	Magnetospheric Multiscale (MMS) Fields Investigation Digital Signal Processor and Axial Double Probes:
Ergun, Robert	Nonlinear Structures in 2-D and 3-D Current-Driven Plasmas with Shear
Ergun, Robert	Parallel Electric Fields in the Upward Current Region of the Aurora
Ergun, Robert	STEREO - Solar Terrestrial Relations Observatory Wave Phase E
Ergun, Robert	Time History of Events and Their Macroscopic Interactions During Substorms (THEMIS)
Eriksson, Stefan	Solar Wind Reconnection Typology
Esposito, Larry	Cassini Equinox - Cassini Extended Mission
Esposito, Larry	Cassini Mission Operations and Data Analysis
Esposito, Larry	Surface-Atmosphere Geochemistry Explorer (SAGE)
Fang, Xiaohua	Particle Precipitation Into and Particle Escape from Mars Thermosphere and Exosphere
Fang, Xiaohua	Study of the Martian Ionospheric and Atmospheric Responses to Extreme Space Weather Events
Fontenla, John	Neutral Atmosphere Density Interdisciplinary Research (NADIR)
Fontenla, John	Understanding the Sources of the Solar Spectral and Total Irradiance Variability and Forecasting Tools
Gosling, John	Low-Energy Solar Electron Bursts
Gosling, John	Magnetic Reconnection in the Solar Wind

Gosling, John	Theory and Simulation of Basic Kinetic Physics of Magnetic Reconnection in Support of MMS
Grün, Eberhard	Development of an Electrostatic Lunar Dust Telescope
Grün, Eberhard	Interstellar Dust Instrumentation
Harvey, V. Lynn	Dynamical Effects on Ozone Trends
Harvey, V. Lynn	Pan-Arctic Studies of the Coupled Tropospheric, Stratospheric and Mesospheric Circulation
Harvey, V. Lynn	The role of the Mesospheric Polar Vortex in stratospheric effects of energetic particle precipitation
Horányi, Mihály	Cassini CDA Equinox Mission Science
Horányi, Mihály	CASSINI CDA Investigations
Horányi, Mihály	Dusty Plasma Issues for Surfaces in Space
Horányi, Mihály	Ionospheric Dusty Plasma in the Laboratory
Horányi, Mihály	Lunar Dust Transport
Horányi, Mihály	Mesospheric Aerosol Sampling Spectrometer (MASS)
Horányi, Mihály	New Horizons Mission Student Dust Counter (SDC) New Horizons Mission Phases C/D
Horányi, Mihály	The Dusty Plasma Environment of the Moon (Graduate Student: Andrew Poppe)
Hynek, Brian	Cerro Negro, Nicaragua: An Analog for Assessing the Potential for Life on Early Mars
Hynek, Brian	Geologic, Stratigraphic, and Thermophysical Analyses of Bedrocks in and around Terra Meridiani, Mars
Hynek, Brian	Understanding Lobate Craters on Mars: Keys to Subsurface Water (Student: Stuart James Robbins)
Jakosky, Bruce	Diviner Lunar Radiometer Experiment
Jakosky, Bruce	Mars Atmosphere and Volatile EvolutioN Mission (MAVEN)
Jakosky, Bruce	NASA Astrobiology Institute - Travel Augmentation
Jakosky, Bruce	Remote Sensing of Planetary Surfaces
Jakosky, Bruce	Thermal Imaging System
Jakosky, Bruce	University of Colorado Center for Astrobiology
Jakosky, Bruce	Workshop on Mars Astrobiology Science and Technology Support
Kanekal, Shri	Comprehensive Survey of Relativistic Electron Dynamics During Geomagnetic Storms Over a Complete Solar Cycle
Kanekal, Shri	Interplanetary Sources and Influences of Energetic Proton Populations in the Earth's Magnetosphere
Kanekal, Shri	Relativistic Electron Dynamics During Geomagnetic Storms: Energization, Loss and Global Coherence
Kanekal, Shri	Study of Proton Cutoffs During SEP Events from 1992 to 2002
Kopp, Greg	A Hyperspectral Imager to meet CLARREO Goals of High Absolute Accuracy and On-Orbit SI Traceability

Kopp, Greg	Glory Project - TIM: Six ROM Budget
Larsen, Kristopher	Surface RADAR Properties for MSL EDL CDP
Li, Xinlin	Quantification of Radial Diffusion in Energizing MeV (Millions of Electron Volts) Electrons in the Magnetosphere
McClintock, William	Global Scale Observations of the Limb and Disk (GOLD)
McClintock, William	MESSENGER Mission MASCS Instrument Engineering Support - Phase E
McClintock, William	Rocket Observations of Nitric Oxide in the Polar Night by Stellar Occultation (Collaborating Co-I Institution Proposal)
McClintock, William	Science Team Support for the MESSENGER Mission - Phase E
McCollom, Tom	Bringing the SETI Institute's Voyages Through Time Astrobiology Curriculum to the Space Science Teacher's Summit
McCollom, Tom	Collaborative Research: Organic Geochemical Investigation of the Rainbow Hydrothermal System, Mid-Atlantic Ridge
McCollom, Tom	Experimental Investigation of Prebiotic Organic Geochemistry in Hydrothermal Environments
McCollom, Tom	Hydrogen Generation in Serpentinizing Systems
McGrath, Mike	Student Dust Counter (SDC) New Horizons Mission
Mellon, Mike	Electrical Properties of Martian Permafrost
Mellon, Mike	Permafrost and Ground Ice on Mars
Mellon, Mike	Phase E on the High Resolution Imaging Science Experiment (HiRISE)
Mellon, Mike	PHOENIX Mars Scout Mission
Mills, Mike	CEDAR: Investigation of Polar Mesospheric Clouds using the Whole Atmosphere Community Climate Model 3
Ohtsuki, Keiji	Dynamical Evolution of Ring-Satellite Systems
Ohtsuki, Keiji	Dynamical Interactions Between Small Bodies and Giant Planets
Ohtsuki, Keiji	Dynamics of Spinning Ring Particles and Stability of Planetary Rings
Ohtsuki, Keiji	Rotation of Moonlets and Particles in Planetary Rings Around Giant Planets
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Peterson, William	An Active Archive of Data from the Toroidal Imaging Mass Angle Spectrograph (TIMAS) on NASA's Polar Satellite
Peterson, William	Investigations of the Ionospheric Source of the O+ Ring Current Population
Peterson, William	TIMAS Operations and Data Analysis
Pilewskie, Peter	Analysis of Solar Spectral Irradiance from Crystal-Face, INTEX-NA, INTEX-B: Influence of Clouds and Aerosols on the Solar Radiative Energy Budget
Pilewskie, Peter	CLARREO Visible-NIR Science Studies
Pilewskie, Peter	Measurement and Analysis of solar Spectral Irradiance in Support of the 2006 Gulf of Mexico Atmospheric Composition and Climate Study (GoMACCS)
Pilewskie, Peter	Measurement of Solar Spectral Irradiance in Support of the Tropical Composition, Cloud, and Climate Coupling Experiment
Pilewskie, Peter	Observations & Analyses of the Spectral Radiative Effects of Aerosols and Clouds

Pilewskie, Peter	Total Solar Irradiance Sensor (TSIS)
Possel, William	ICESat Mission Operations Delta Costs for the New Nominal Program
Possel, William	KEPLER Photometer
Possel, William	Magnetosphere Multiscale (MMS) Mission for Magnetospheric Acceleration, Reconnection and Turbulence (SMART) Investigation Phase B
Possel, William	Mission Operations of the NASA QuikSCAT Satellite
Randall, Cora	AIM Science
Randall, Cora	HIRDLS Science
Randall, Cora	Investigation of polar mesospheric clouds using WACCM
Randall, Cora	Rocket observations of Nitric Oxide in the polar night by stellar occultation
Randall, Cora	Expansion of the CU-LASP Climate Change Education Program to the Colorado MESA After School Program
Randall, Cora	Implications of Energetic Particle Precipitation for the Stratosphere
Randall, Cora	Long-Term Atmospheric Effects of Solar Proton Events and their Contribution to the Polar Solar Cycle Variations
Randall, Cora	Occultation Data Intercomparison and Evaluation
Randall, Cora	Stratospheric Chlorine, Polar Processes and Ozone Loss: Satellite Data Analysis and Modeling
Rast, Mark	Dynamics of Multi-scale Solar Convection: Exploring the Near-surface Shear Layer
Rast, Mark	Precision Solar Photometric Telescope (PSPT) Operations and Data Analysis
Rast, Mark	Solar Dynamo Probed with Simulations of Turbulent Convection, Magnetism and Shear
Rottman, Gary	EOS Solstice
Rottman, Gary	SORCE Science Discovery
Rusch, David	Aeronomy of Ice in the Mesosphere (AIM) Additional Staffing Hours, Materials and Equipment to Complete the CIPS Instrument
Schmidt, Sebastian	Measurement of Solar Spectral Irradiance in Support of ARCTAS 2008
Schneider, Nicholas	Collaborative Research: A Comparative Study of Escaping Atmospheres Using AEOS/HiVIS
Schneider, Nicholas	From IO's Atmosphere to the Plasma Torus
Smith, John	Simulation of the Aging of Smoke from African Biomass Burning Plumes and Implications for Remote Sensing of Aerosols
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Sparn, Tom	TSIS- Accommodation Study
Sternovsky, Zoltan	Chemical Composition Measurements of Cosmic Materials Using in-situ Instrumentation
Stewart, Glen	Dynamical Models of Planetary Rings
Stewart, Glen	N-Body Simulations of Density Waves in Planetary Rings
Thomas, Gary	Polar Mesospheric Cloud Properties Determined from SBUV and SBUV/2 Measurements

Toon, Owen	Aura Studies of PSCs and Subvisible Cirrus
Toon, Owen	Application of an Aerosol Model to Simulate Smoke and Marine Aerosols
Toon, Owen	Numerical Investigations of Snow-Covered Slopes and Polar Laminae on Mars (Kaj Williams)
Toon, Owen	Numerical Models of Noctilucent Clouds Using the WACCM/CARMA Model in support of AIM
Toon, Owen	Stimulating Martian Climate Evolution with a New GCM (Graduate Student, Richard A. Urata)
Toon, Owen	Studies of Gully Formation on Mars (Student: Adrienne Dove)
Toon, Owen	Studies of Martian Snowfields
Toon, Owen	Studies of Polar Stratospheric Clouds, Tropical Stratospheric Clouds and Tropospheric Aerosols Using “Calypso” Data; Science Team Participation, Modeling and Laboratory Support
Toon, Owen	Three Dimensional Models for Clouds and Aerosols on Titan
Wood, Erin	Laboratory Studies of Heterogeneous Chemistry Relevant to the Martian Atmosphere: Focus on Methane
Woods, Tom	Timed SEE Experiment - Phase E Extended Mission
Woods, Tom	Extreme Ultraviolet Variability Experiment (EVE)
Woods, Tom	Geostationary Operation Environmental Satellite (GOES-R)
Woods, Tom	SORCE/EOS Solstice