Laboratory for **A**tmospheric and **S**pace **P**hysics

Activity Report
2007
University of Colorado at Boulder

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A Message from the Director

The Laboratory for Atmospheric and Space Physics will celebrate its 60th anniversary in 2008. LASP traces its roots back to the Upper Air Laboratory that was founded in the University of Colorado Physics Department in the years after World War II. Looking back upon the past six decades, one can certainly conclude that LASP scientists, students, engineers, and staff have been involved in some of the most exciting and inspiring space exploits ever undertaken by humankind. Moreover, there is every indication that LASP will continue to work at the forefront of space exploration for the decades to come.

Another anniversary that will be celebrated in 2008 is the 50th anniversary of the founding of the National Aeronautics and Space Administration (NASA). From very early in NASA's existence as an agency, LASP and CU have been major players in sounding rockets, spacecraft missions, and theoretical research that have supported NASA and that have pushed back the frontiers of human inquiry.

When reaching decadal milestones, it is tempting to only look backward and to revel in past accomplishments. However, this is not the "culture" of LASP nor should it be. The Lab derives much (if not most) of its strength from constantly looking forward and seeking ways to improve products and processes. I am constantly amazed at the adaptability of LASP people in the face of changing external conditions and changing requirements. The secret to success – if there is one – I believe is to know what can be changed in an organization without tampering with the fundamentals that have made it the outstanding institute that it is.

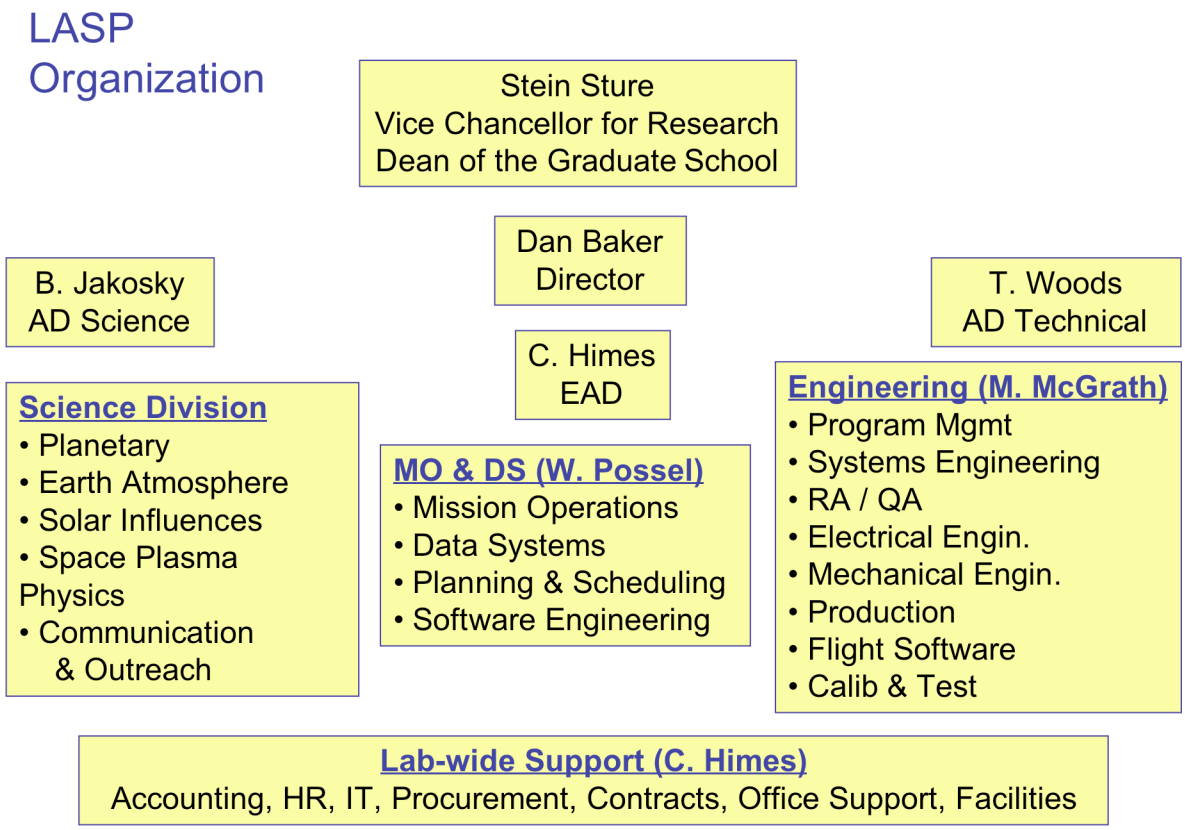
Although we work extensively and very productively with NASA, LASP has been greatly extending its relationship with the National Science Foundation (NSF), the National Oceanic and Atmospheric Administration (NOAA), and other entities. In diversifying its scientific, technical, and programmatic relationships, LASP is finding exciting ways to apply its expertise to solve problems of great national, and international, importance. I am delighted that all of our staff are constantly seeking – and meeting – new challenges. This certainly was the case in 2007 as you will read about in the sections of this report.

As I have noted in these pages in prior years, LASP can only succeed by having the trust and support of the CU administration. I want very publicly to thank the many people in contracts administration, procurement, facilities management, and countless other areas who really "get it" and who, thereby, 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 unflagging support of LASP, its mission, and its ambitious goals.

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

Daniel N. Baker

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



LASP: A Brief History

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

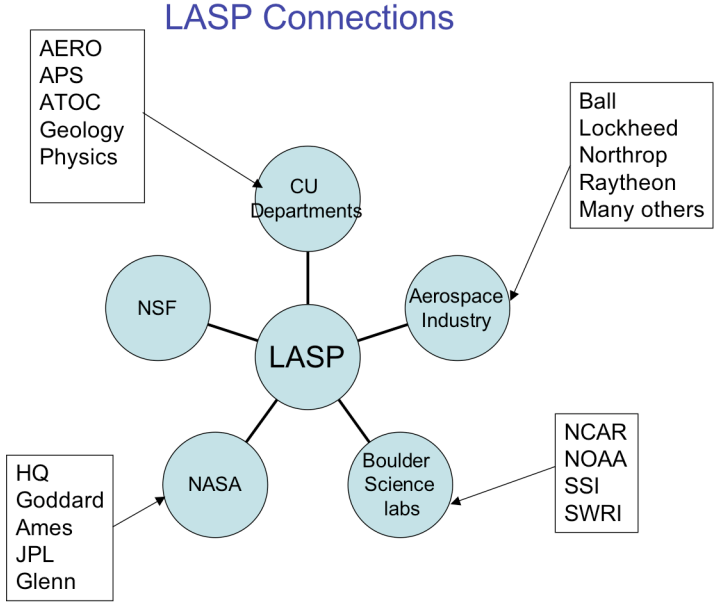
LASP Appropriated Funding

During the period 1/1/2007 to 12/31/2007 LASP appropriated funding totaled $45M for support of 177 grants and contracts.

Research Support: 2007 Calendar Year

Source of Funding	Total Grant Dollars
Federal Agencies:	
Department of the Interior – USGS	15,000
National Aeronautics and Space Administration	21,820,209
National Oceanic and Atmospheric Administration	161,189
National Science Foundation	1,575,579
Non-Federal Agencies:	
Arizona State University	103,190
Ball Aerospace Systems Division	3,331,136
Batelle Memorial	20,000
Boston University	1,299,835
Carnegie Institute of Washington	395,988
George Mason University	42,656
Hampton University	8,109,035
Jet Propulsion Laboratory	2,151,858
Johns Hopkins University	155,227
Lockheed Martin	1,578,858
Minority Engineering Association of Colorado	17,165
Northrop Grumman	25,000
Sarissa Technologies	35,000
Science Systems and Applications, Inc.	20,049
SETI Institute	21,000
Southwest Research Institute	552,399
Starsys	32,768
University Corporation for Atmospheric Research	77,663
University of Alaska	98,276
University of Arizona	187,496
University of California at Berkeley	960,787
University of Central Florida	739,737,
University of Michigan	100,000
University of Minnesota	145,134
University of New Hampshire	1,158,592
Totals:	$45,290,826

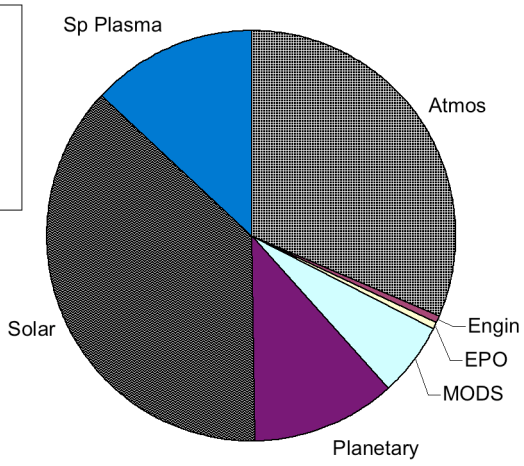
LASP Connections



FY07 Project Funding

$51.2 M in project awards

- top CU Boulder recipient of sponsored awards for FY 2007
- 18% of CU Boulder research awards
- 199% increase since 1997



Recent Grads have gone to:

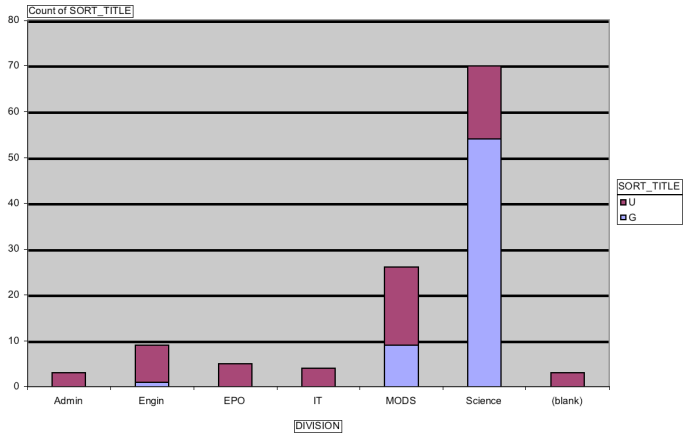
PhD grads

•LASP
•EPA
•Denver Museum
•Penn State.
•Northrop-Grumman Corp.
•Space Science Institute
•College Instructor
•IRF, Sweden
•SWRI in Boulder
•NSF

MO&DS grads

• United Space Alliance
•JPL
•Analytical Graphics Inc (STK development)
•Cessna
•Raytheon (Virginia)
•Lockheed Martin (Orion)
•Raytheon (Aurora)
•Lockheed Martin (Boulder)
•LASP

Student Employees



Currently 120 students at LASP
64 are Graduate Students

Key Accomplishments

Science - new observations and analyses at the Sun, Mercury, Earth, Mars, Jupiter, and Saturn and its satellites.

MO&DS – responded to AIM problems by making great advancements in spacecraft ops, 3 missions extended

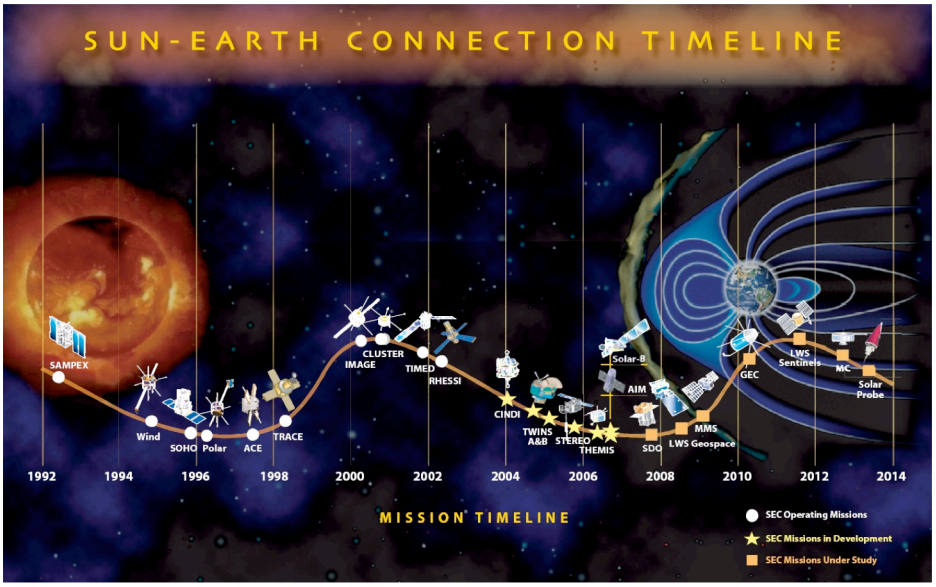
Engineering – EVE and Glory finished and shipped out, lots of proposals, now a period of relative calm

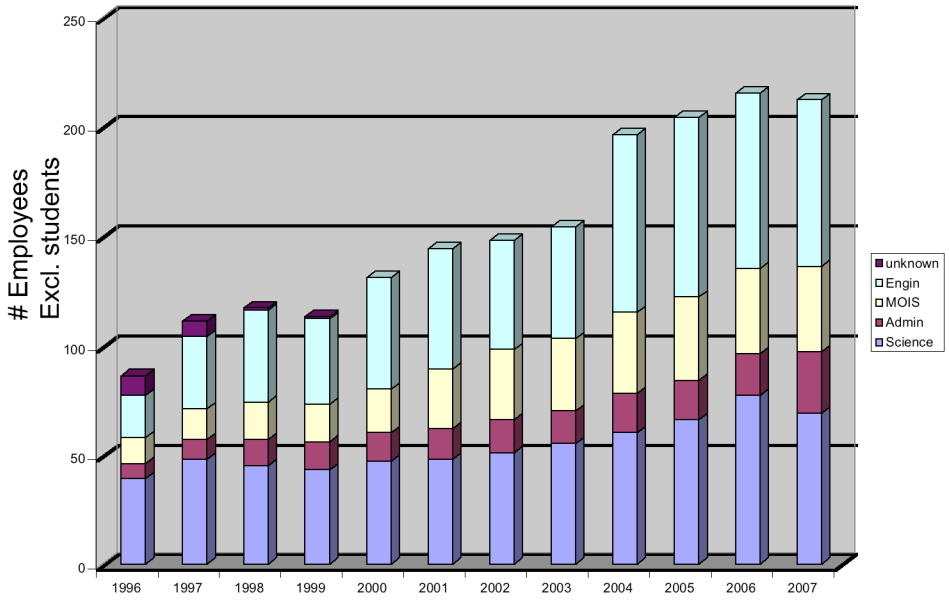
Administration – more solid IT infrastructure, changes in proposal systems, handling increased oversight from NASA and CU

NASA Earth Science Missions

- 4 instruments on SORCE mission
- Operating the SORCE, ICESat, and QuikSCAT missions at LASP
- Involved at some level with many of these missions

The Heliophysics Great Observatory




Employees
Excl. students
250
200
150
100
50
0
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
unknown
Engin
MOIS
Admin
Science

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
Phil Chamberlin
Emily CoBabe-Ammann
Yi-Juin Su Caton
Annamaria Cereti
Peter Delamere
Scot Elkington
Francis G. Eparvier
Stefan Eriksson
Juan Fontenla
Jack Gosling
Eberhard Grün
Jacques Gustin
Jerald W. Harder
Lynn Harvey
Noel Hinners
Greg Holsclaw
James E. Howard
Kyoung Joo Hwang
Kazunori Iwasaki
Andrew Jones
Shri Kanekal
Greg Kopp
Kristopher Larsen
George M. Lawrence (Ret.)
Wenlong Liu
William E. McClintock
Tom McCollom
Daniel Main
Sara Martinez-Alonzo
Michael Mellon
Aimee Merkel
Michael Mills
Steve Mojzsis
Keiji Ohtsuki
William Peterson
Erik C. Richard
Gary J. Rottman (Ret.)
David W. Rusch
Theodore Sarris
Sebastian Schmidt
Mindy Searls
Cynthia Shaw Singleton
Jamison Smith
Martin Snow
Miodrag Sremcevic
Zoltan Sternovsky
A. Ian F. Stewart
Glen R. Stewart
Takayuki Tanigawa
Gary E. Thomas (Ret.)
Thomas N. Woods

Visiting Scholars

Joseph Ajello, Jet Propulsion Laboratory, Pasadena, CA
Donald Brownlee, University of Washington, Seattle, WA
Yi-Jin Su Caton, University of Texas, Arlington, TX
Joshua E. Colwell, University of Central Florida, Orlando, FL
Serena Criscouli, Rome Observatory, University of Barcelona, Spain
Amanda Hendrix, Jet Propulsion Laboratory, Pasadena, CA
Antal Juhasz, KFKI Research Institute for Particle and Nuclear Physics, Budapest, Hungary
Mark Lewis, Trinity University, San Antonio, TX
Ada Otiz, Rome Observatory, University of Barcelona, Spain
Wayne Pryor, Central Arizona Coolidge, Coolidge, AZ
Chao Shen, Center for Space Science and Applied Research, Chinese Academy of Science, Beijing, China
Robert Weigel, George Mason University, Fairfax, VA
Oran White, Mancos, CO
Robert Winglee, Department of Earth and Space Sciences, University of Washington, Seattle, WA

Engineering/Missions Ops/Program Support/Science

Engineering:

Gregg Allison
Michael D. Anfinson
Richard Arnold
Haydar Arslan
Dennis L. Baker
Susan Batiste
Douglas Bausch
Helmut P. Bay
Christopher Belting
Bryce Bolton
Mary Bolton
James S. Bowers
Brian D. Boyle
Shelley Bramer
Catherine Brant
Vanessa Briggs
Jeff Brown
Patrick Brown
Chelsey Bryant
Valerie Bullock
Zachary G. Castleman
Steve Chappell
Christopher Converse
David Crotser
Kip W. Denhalter
Sharon Dooley
Virginia Drake
Tim Flaherty
David Gathright
Elizabeth Grogan
Roger Gunderson
Scott Gurst
David Harber
Karl Heuerman
Timothy Holden
Vaughn Hoxie
Edgar Johansson
James Johnson
Edith Knehans
Richard Kohnert
Bret Lamprecht
Mark R. Lankton
Ryan Lewis
Michael McGrath
James Mack
Jack Marshall
Nathaniel Miller
Aref Nammari
Gregory Newcomb
Brian Nuel
Sara Ohrtman
Heather Passe
Norman C. Perish
Thomas Reese
Dwight Reinhardt
Hans Rohner
Timothy Ruske
Judith A. Salazar
Patti Sicken
Thomas Sparn
Stephen Steg
David Street
Trenton Taylor
Wayne Tighe
Matt Triplett
Scott A. Tucker
Gregory Ucker
Douglas Vincent
Tracy Vincent
Pamela J. Wagner
James Westfall
Neil White
Ann Williams
Heather Reed Withnell
Peter Withnell
Ray Wrigley
Ed Wullschleger
Alan Yehle
Jason Young
Jennifer Young

Mission Ops:

R. Larry Bloom
Karen Beth Bryant
Michael Bryant
Heather Buck
Lillian Connelly
Pamela Crandall
Randal L. Davis
Michael Dorey
Peter Elespuru
Donald Elsborg
Jack Faber
Ken Greist
Barb Hahn
Jessica Harano
Christian Jeppeson
Alain J. Jouchoux
David E. Judd
Michelle Kelley
Barry Knapp
Jay Kominek
Sally Lasater
Douglas M. Lindholm
Debra McCabe
Jerel Moffatt
Steve P. Monk
Michael Packard
Chris Pankratz
Radu Popescu
Nicole Ramos
Jennifer Reiter
Randy Reukauf
Pat Ringrose
Stephen Roughton
Sean Ryan
Joan Shy
Patrick Smith
Gail Tate
Brian Templeman
Ann Windnagel
Donald Woodraska

Program Support:

Ann Alfaro
Judy Antman
Robert P. Biro
Nancy Brooks
Valerie Bullock
Kathleen Cirbo
Anita Davis
Steve Ericksen
Brian Evans
Phillip L. Evans
Jason Feickert
Karla Lefevre Frank
Judith (Dede) Gleason
Donald Gritzmacher
Matthew Groeninger
Bonnie Kae Grover
Cheryl Haugen
Caroline Himes
Rose A. Hoag
Bonnie W. Hotard
Erick Jasiak
Edith Knehans
Jason Laclair
Lindsay McCandless
Beth McGilvray
Melanie McKinney
Willie Mein
John M. Padgett
Ann Perez de Tejada
Marissa Rusinek
Gary Schut

John D. Smith
Lisa Sparhawk
Paul Weidmann

Science:

Kathryn Becker
Laura Bloom
Michael T. Callan
Matthew Chojnacki
Alexandra DeWolfe
Vincent Dols
Michael Gehmeyr
Vanessa George
Wenlong Liu
George Millward
Doan Nguyen
James K. Thomas
Heather Weisacosky
Erin Wood

2007 Graduates

Cully, Christopher Michael: Astrophysical, Planetary and Atmospheric Sciences
May 11, 2007
"*Space-based electric field measurements and the structure of the Earth's magnetotail*"
Thesis Advisor: Robert Ergun

McGouldrick, Kevin: Astrophysical, Planetary and Atmospheric Sciences
May 11, 2007
"*Microphysics and radiative-dynamical feedback in the near infrared brightness features in the Venus clouds*"
Thesis Advisor: Owen B. Toon

Madry, William Lansing: Astrophysical, Planetary and Atmospheric Sciences
May 11, 2007
"*Modeling the generation, transport, and radiative effect of sea salt aerosol*"
Thesis Advisor: Owen B. Toon

Graduate Students

Dewey Anderson
Charles Bardeen
Austin Barker
Suzanne Benze
Todd Bradley
Nicole Cates
Steve Chappell
Li Chen
Jay Chheda
Seth Claudepierre
Odelle H. Coddington
Zane Crawford
Christopher Cully
Samik Dasgupta
Bruce Davis
Sean Davis
Jason English
Tina (Tianyi) Fan
Nathan Farr
Bruce Ferguson
Jeffrey France
Damhnait Gleeson
Alexa Halford
Anna Haugsjaa
Brian Hinde
Rachel Hock
Monica Hoke
Gregory Holsclaw
Courtney Hoskins
David James
Lars Kalnajs
Bruce Kindel
Dongwon Lee
Patrick McBride
James McCollough
Kevin McGouldrick
Kevin McWilliams
Lansing Madry
Danielle Massey
Rebecca Matichuk
Patrick Meagher
Colin Mitchell
Margaret Mitter
Nate Murphy
Katherine Nauert
Trang Nguyen
Heather Passe
Radu Popescu
Manny Presicci
Amal Ramachandran Nair
Licia Ray
Ryan Rhodes
Lonnie Riesberg
Stuart Robbins
Chester Rubbo
Eric Schleicher
Karen Schmidt
Donald Schmit
Naresh Sen
Supreet Kaur Sidhu
Hanna Sizemore
David Steussy
Lin Su
Lindsey Link Tierney
Heather Tollerud
Weichao Tu
Drew Lawson Turner
Jennifer Uchida
Richard Urata
Vernon Volpe
Kaj Williams
Torsten Zorn

Undergraduate Students

John Adam
Keegan Amyx
Marcus Arnold
Jeffrey Baxter
Michael Beach
Ryan Behner
Shivali Bidaiah
Brandon Bobian
Nathaniel Bolt
Aaron Bornstein
Michelle Bourgeois
Benjamin Brown
Lottie Brown
Karen Beth Bryant
Christopher Bunch
Laura Bush
Samuel Califf
Bryan Callahan
Ross Callison
Christopher Carnahan
Rhain Carpenter
Michael Chaffin
Scott L. Chamberlin
Matthew Chojnack
Dain Cilke
Garrett Clark
Sherry Clune
Zane Crawford
Ransom Christofferson
Krystyna Dillard-Crawford
Nichole Dudley
Tera Dunn
Claire Duquennois
Jason Durrie
David Eason
Negar Ehsan
Joshua Elliot
Attila Elteto
Neal Evans
James Everton
Nathan Farber
Michael Ferenc
John French
John Gibbons
Nathan Goldbaum
David Goluskin
Brandon Gonzales
Stephen Greenbaum
Michael Habinsky
Jessica Harano
Brian Hasci
Ryan Hickman
Rachel Hoover
Rachel Humphrey
Paul Joos
Matthew Kelly
Kimberly Kroh
Jessica Kruse
Davis Lawry
Matthew Lenda
Dustin Leverman
Michael Levy
Adam Lightman
Hey Joo (Diane) Lim
Anthony Lindell
Christopher Lindholm
Lucy Logan
Kurt Lorhammer
Jennifer Lowell
Brooks Lustig
Dung Luu
Justin McHenry
Scott Mackey
Sarah McNamara
Neil Marks
Danielle Massey
Fabio Mezzalira
Taylor Mills
Dax Minary
David Motta
McCall Mullen
Burhan Muzzafar
Katherine Nauert
Vu Anh Nguyen
Jacob Niece
David Norton
Karina Ogilvie
Kostas Pagratis
Jason Patterson
Brian Payne
Michael Phan
Ryan Phillips
Andrew Poppe
Therese Possel
Scott Potter
Kathryn Rash
Lindsey Rice
Elliot Richerson
Ryan Rhodes
Lauren Roemer
Miranda Rohlfing
Crystal Salcido
Ryan Schilt
John Shelton
Abigale Shepard
Karie Shipley
Patrick Smith
Tiana Stastny
Kristina Stone
Janusz Strzepek
Jastsch Sud
Timothy Sullivan
Linda Te
Edward Thiemann
Vishal Thummalapally
Ali Toltz
Dustin Trail
Diem Thy Tran
Wiechao Tu
Melina Tremblay
Christopher Van Poolen
Veronica Vertucci
Brandon Werdel
Patrick Wessels
Donavan Wheeler
Christopher White
Geneva Wilkesanders
Jennifer Wilson
Tom Wisniewski
Robert Witoff
Portia Wolf
Alexander Woods
Courtney Wright
Chihoko Yamashita
Bryon Young

Scientific Research Interests

Laila Andersson

Kinetic processes in space plasmas such as double layers, electron phase space holes and Alfven 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

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

Mihaly Horanyi

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

Bruce M. Jakosky

Teaching and research activities focus on understanding the nature of planetary surfaces and atmospheres and the possibility for the existence of life in the universe. Specific activities include teaching undergraduate and graduate courses, training graduate students, research and grant activity pertaining to planetary science and exobiology, leading the campus effort in astrobiology, exploring the nature of the interactions between science and society, and outreach to the public.
bruce.jakosky@argyre.colorado.edu (303) 492-8004

Greg Kopp

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

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

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

David W. Rusch

The general fields of spectroscopy and aeronomy, emphasizing the measurements of minor constituents and aerosols in planetary atmospheres such as nitric oxide and ozone and the physical and chemical phenomena which determine their densities and temporal variations. Research in the atmospheric sciences including stratospheric, mesospheric, and thermospheric data analysis and modeling. Application of the principles of molecular and atomic spectroscopy in the measurement of ultraviolet, visible, and near-infrared emission and absorption features to obtain understanding of atmospheric phenomena. Current research involves the determination of atmospheric processes affecting ozone and the reevaluation of ozone trends from long-term satellite measurements.
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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.
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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.
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Gary E. Thomas

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

being monitored by instruments onboard the UARS.
gary.thomas@lasp.colorado.edu (303) 492-7022
http://lasp.colorado.edu/noctilucent_clouds

Owen B. Toon

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

Thomas N. Woods

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

FACULTY ACTIVITIES

American Geophysical Union (AGU)
Esposito, Larry (Session Convenor, Fall 2007)
Jakosky, Bruce (President-Elect, Planetary Sciences section)
Jakosky, Bruce (Member, Auditing and Legal Affairs Committee)
Toon, Owen B. (Member, Fellows selection committee)

Committee on Space Research (COSPAR)
Esposito, Larry (Main Scientific Organizer for "Planetary Atmospheres")

Division of Planetary Sciences
Esposito, Larry (Organizer, Program Committee)

Editor or Editorial Board Member
Esposito, (Editor, AGU Monograph)
Esposito, Larry (Advances in Space Research)
Jakosky, Bruce (Editor, Astrobiology)
Jakosky, Bruce (Editorial Board, International Journal of Astrobiology)
Jakosky, Bruce (Planetary Exploration Newsletter)

International Saturn Symposium
Esposito, Larry (Co-Convenor)

International Union of Geodesy and Geophysics (IUGG)
Esposito, Larry (Convenor at Perugia Conference0

Joint Faculty (Astrophysical and Planetary Sciences Department (APS))
Bagenal, Fran
Baker, Daniel
Ergun, Robert
Esposito, Larry W.
Rast, Mark
Schneider, Nicholas

Joint Faculty (Atmospheric and Oceanic Sciences Department (ATOC))
Avallone, Linnea
Pilewskie, Peter
Randall, Cora E.
Toon, Owen B., (Chair)

Joint Faculty (Geology Department)
Jakosky, Bruce

Joint Faculty (Physics Department)
Horanyi, Mihaly

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)
Colwell, Josh (Chair, Spring)
Greg Kopp (Chair, Fall)
Charles Bardeen (student representative)
Peter Delamere (Atmospheric, Cynewulf Users' Group chair)
Scot Elkington (Space Phys)
Caroline Himes (Admin)
Greg Kopp (Solar)
Mark Lankton (Eng. EE & FSW)
Ryan Lewis (Eng. ME)
Mike Mills (Planetary)
Chris Pankratz (Ops & Data Proc.)
Gary Schut (IT)

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

Executive Committee
Baker, Dan
CoBabe-Amman, Emily
Delamere, Peter
Esposito, Larry

Gosling, Jack
Haugen, Cheryl (ex-comm support)
Himes, Caroline
Jakosky, Bruce
Jones, Andrew
Kopp, Greg
McClintock, Bill
McGrath, Mike
Pilewskie, Peter
Possel, Bill
Randall, Cora
Stewart, Ian
Toon, Brian
Westfall, Jim
Woods, Tom

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

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

Merit Evaluation Committee
Esposito, Larry
Himes, Caroline
Jakosky, Bruce
Li, Xinlin
Randall, Cora
Woods, Thomas N.

Proposal Development Committee (PDC)
Woods, Tom (Chair)
Sparn, Tom (Co-chair)
Anfinson, Mike
Baker, Dan
CoBabe-Ammann, Emily
Drake, Ginger
Ergun, Bob
George, Vanessa
Himes, Caroline
Jakosky, Bruce
Kopp, Greg
McClintock, Bill
McGilvray, Beth
McGrath, Mike

Pankratz, Chris
Perez de Tejada, Ann
Possel, Bill
Reed, Heather
Richard, Erik
Ryan, Sean
Sternovsky, Zoltan
Tate, Gail
Westfall, Jim

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

Lunar and Planetary Institute (LPI)
Jakosky, Bruce (Member, Science Council)

National Academy of Sciences (NAS)
Esposito, Larry (Committee to assess solar system exploration)

National Aeronautics and Space Administration (NASA)
Ergun, Robert, Member, Science Definition Advisory Panel – Solar Probe Mission Electric Field Experiment
Esposito, Larry, Member VEXAG Steering Committee
Esposito, Larry, Chair, CDAP Rings Review Panel
Esposito, Larry, Chair, Cassini Public Relations Working Group
Jakosky, Bruce (Member, NASA Mars Exploration Program Analysis Group (MEPAG))
Toon, Owen B. (Project scientist: 2007 NASA Tropical Clouds Mission)
Toon, Owen B. (Venus Advisory Panel of future mission)
Woods, Tom, Member, Science Working Groups for TIMED, SDO, and SORCE missions

Planetary Society
Jakosky, Bruce (Member, Advisory Board)

National Research Council (NRC)
Jakosky, Bruce (Co-Chair, Committee on Origin and Evolution of Life (COEL), Space Studies Board
Jakosky, Bruce (Chair, Committee on Mars Astrobiology Strategy), Space Studies Board

National Science Foundation (NSF)
Ergun, Robert, Member, Global Electrodynamic Modeling Steering Committee

Reviewer of Manuscripts, Grants, or Creative Work
Esposito, Larry (Reviewed manuscripts for Science, Icarus, Geophys. Res. Lett., Reviewed proposals for NASA and NSF)
Fontenla, John (Reviewed manuscripts for Astrophys. Jo, and Astron. and Astro.; reviewed proposals for Argentinian national research council)
Horanyi, Mihaly (Reviewed manuscripts for JGR-Space, Physics of Plasmas, Nature, Icarus; reviewed proposals for NSF, DOE, and NASA)
Harder, Jerry (Reviewed proposal for Department of Energy)
Jakosky, Bruce (Reviewed manuscripts for Astrobiology; reviewed proposals for NASA)
Kopp, Greg (Reviewed manuscripts for Geophys. Res. Letters; reviewed proposals for NASA)
Rast, Mark (Reviewed manuscripts for Astrophysical Journal, Solar Physics; reviewed proposals for NASA and NSF)

Schmidt, Sebastian (Reviewed manuscripts for J. Atmos. Sci., and J. Geophys. Res.)
Snow, Martin (Reviewed manuscript for ApJ)

University of Colorado
Baker, Daniel (Principal Dissertation/Thesis Advisor)
Baker, Daniel (Member Dissertation/Thesis Committee)
Baker, Daniel (Member Masters or Ph.D. Qualifying Examination Committee)
Chamberlin, Phil (Principal Dissertation/Thesis Advisor)
Ergun, Robert (Principal Dissertation/Thesis Advisor)
Ergun, Robert (Member, Dissertation/Thesis Committee)
Esposito, Larry (Member, Dissertation/Thesis Committee)
Esposito, Larry (Member, Dissertation/Thesis Advisor)
Esposito, Larry (Chair, APS Exams Committee)
Esposito, Larry (Member, BFA Compensation and Benefits Committee)
Esposito, Larry (Supervisor, Independent Study/Research Study Groups)
Fontenla, John (Principal Dissertation/Thesis Advisor)
Himes, Caroline (Member, BFA Budget and Finance Committee)
Himes, Caroline (Member, Academic Affairs Budget Advisory Committee)
Himes, Caroline (Member, Dir. of Facilities Planning Search Committee)
Himes, Caroline (Member, Design and Construction Committee)
Horanyi, Mihaly (Principal Dissertation/Thesis Advisor)
Horanyi, Mihaly (Member of Dissertation/Thesis Committee)
Jakosky, Bruce (Principal Dissertation/Thesis Advisor)
Jakosky, Bruce (Member of Dissertation/Thesis Committee)
Jakosky, Bruce (Member Masters or Ph.D. Qualifying Examination Committee)
McClintock, Bill (Principal Dissertation Advisor)
Rast, Mark (Principal Dissertation/Thesis Advisor)
Rast, Mark (Member of Dissertation/Thesis Committee)
Rast, Mark (Member of Masters or Ph.D. Qualifying Examination Committee)
Rast, Mark (Member, Department Curriculum Development Committee)
Rast, Mark (Student Advisor)
Schmidt, Sebastian (Principal Dissertation/Thesis Advisor)
Sternovsky, Zoltan (Member, BFA Library Committee)
Toon, Owen B. (Principal Dissertation/Thesis Advisor)
Toon, Owen B. (Member, PRP committee, Chemistry Department)
Woods, Tom (Principal Thesis Advisor)
Woods, Tom (Member Dissertation/Thesis Committee)

FACULTY HONORS/AWARDS

Baker, Daniel N., Recipient of the Robert L. Stearns Award, U. of Colorado, 2007.
Horanyi, Mihaly, Recipient of the Humboldt Research Award, 2006-2007.

Courses Taught by LASP Faculty
Spring 2007

Name	Course #	Description
Esposito, Larry	ASTR 3720	Planets and their atmospheres
Horanyi, Mihaly	PHYS 3210	Mechanics and its mathematical methods I
Hynek, Brian	ASTR 1010	Introductory Astronomy
Jakosky, Bruce	GEOL 5830/ASTR 5830	Astrobiology
Li, Xinlin	ASEN 5335	Aerospace Environment
Li, Xinlin	ASEN 5519	Space Hardware 1: Design
Li, Xinlin	ASEN 6519	Space Hardware 2: Manufacture and Test
Randall, Cora	ATOC 6020	Middle Atmosphere Modeling and Data Analysis Seminar
Randall, Cora	ATOC 5235	Introduction to Remote Sensing and Radiative Transfer
Rast, Mark	ASTR 3760	Solar and Space Physics
Toon, Owen B.	ATOC 6020	Seminar on Aerosols
Toon, Owen B.	ATOC 6020	Seminar in clouds and aerosols

Fall 2007

Name	Course #	Description
Ergun, Robert	ASTR 1030	Introduction to Astronomy
Esposito, Larry	ASTR 3300	Extraterrestrial Life
Horanyi, Mihaly	PHYS 3210	Mechanics and its mathematical methods II
Hynek, Brian	GEOL/ASTR 5800	Planetary surfaces and interiors
Hynek, Brian	GEOL 5700-007	Graduate field course in Planetary Geology
Li, Xinlin	ASEN 6519	Space Hardware 2: Manufacture and Test
Randall, Cora	ATOC 1050	Introduction to Weather and the Atmosphere
Randall, Cora	ATOC 6020	Middle Atmosphere Modeling and Data Analysis Seminar

Rast, Mark	ASTR 5540	Mathematical Methods
Toon, Owen B.	ATOC 6020	Seminar on Aerosols
Toon, Owen B.	ATOC 5600	Physics and Chemistry of Clouds and Aerosols
Toon, Owen B.	ATOC 6020	Seminar in clouds and aerosols

Colloquia and Informal Talks Spring 2007

Nicole Albers, CU/LASP, Size Distributions of Asteroid Families and the Stories

Caspar Ammann, NCAR/UCAR, Climate Change Research Beyond IPCC: Where Does The Sun Fit In?

Linnea Avallone, CU/LASP and ATOC, Ozone Holes, Smog and Space Shuttles: Measuring Ozone Throughout the Atmosphere

John Armstrong, Weber State Univ., The Virtual Planetary Laboratory: Toward a Community Tool for Extrasolar Planet Modeling

Fran Bagenal, CU/LASP and APS, The Peculiar Role of Io in the Magnetosphere of Jupiter

Andrei Beloborodov, Columbia Univ., Neutron Stars with Ultra-Strong Magnetic Fields

Pat Brown, CU/LASP, The FIRST Robotics Competition

Don Brownlee, U. of Washington, The Stardust Mission - Return of Samples From a Comet

Shane Byrne, U. of Arizona, Landscape Evolution and the Reincarnation of the Residual CO2 Ice Cap of Mars

Chris Carilli , RAO, Radio Observations of Cosmic Reionization and the Most Distant Galaxies

John Carlstrom, Univ. of Chicago, More Cosmology with the Cosmic Microwave Background; the Sunyaev-Zeldovich Array the 10 meter South Pole Telescope

Phil Chamberlin, CU/LASP, Solar Flares

Seth Claudepierre, LASP/APPMD, Power Spectral Densities, Pitfalls and MHD Waves

Ben Clark, Lockheed Martin Space Exploration Systems, What is Mars Made Of, Really? The Emerging Compositional Diversity and Its Implications

Chris Cully, LASP/APS, THEMIS Launch

Chris Cully, LASP/APS, Kinetic Equilibrium Models of the Tail Current Sheet

Peter Delamere, CU/LASP, Rapidly rotating magnetospheres: a comparison of Saturn with Jupiter

Steven Desch, Arizona State Univ., Cryovolcanism on Kuiper Belt Objects

Steven D'Hondt, Univ. of Rhode Island, Microbial Activities in Deep Sea Sediments

Mausumi Dikpati, HAO, Predicting Upcoming Solar Cycle Features by Assimilating Surface Magnetic Data Into a Flux-Transport Dynamo Model

Vincent Dols, CU/LASP, Multi-Species Chemistry Model of Io's Local Interaction

Jerry Edelstein, Space Sciences Laboratory, Univ. of California, Berkeley, Cold, Warm and Hot: The Interstellar Medium Observed in Far UV Emission

Stefan Eriksson, CU/LASP, When Magnetic Fields Collide: A Journey From the Sun to the Earth

Michael Gehmeyr, CU/LASP/NOAA, The First Forecast Models from the Center for Integrated Space Weather Modeling

Marv Geller, Institute of Terrestrial and Planetary Atmospheres, Tropical Upwelling in the Lower Stratosphere

Andrea Ghez, UCLA, The Central Dark Mass at the Center of Our Galaxy

Paul Graf, President, Aerospace Solutions, LLC, Recurring Surprises in PI-led Space Missions

David Grinspoon, Astrobiology Curator, Denver Museum of Nature & Science, Astrobiology and the Exploration of Venus

Vanda Grubisic, Desert Research Institute, Reno, Nevada, Exploration of Atmospheric Rotors

Eberhard Grün, CU/LASP and MPI, The Dust Astronomy Mission Cosmic DUNE

Lars Hoffmann, Forschungszentrum Juelich, ICG-I, Germany, Envisat MIPAS Measurements of the Chlorofluorocarbons CFC-11 and CFC-12

Mary Hudson, Dartmouth College, Relationship of the Van Allen Radiation Belts to Solar Wind Drivers

Mary Hudson, Dartmouth College, Solar Energetic Particle Access and Trapping in the Earth's Magnetosphere

Brian Hynek, CU/LASP, The Youngest Features on Mars: Gullies and Craters

Brian Hynek, CU/LASP, Sulfur-Bearing Minerals on Mars: Implications for Water and Habitability

Phil Isenberg, Univ. of New Hampshire, Kinetic Cyclotron Resonant Generation of the Fast Solar Wind

Randy Jokipii, Univ. of Arizona, Tucson, Implications of Voyager Observations Near and Beyond the Solar-Wind Termination Shock

Lisa Kaltenegger, Harvard Univ., Center for Astrophysics, Search for Exo-Terrestrial Planets: Decoding the Spectra of an Evolving Earth-Like Planet

George Khazanov, NASA/MSFC, Self-Consistent Ring Current/Electromagnetic Ion Cyclotron Waves Modeling

Daniel Kirshbaum, Yale Univ., The Triggering of Quasi-Stationary Orographic Rainbands by Small-Scale Topography

John Kovac, Caltech, CMB Polarimetry with More Muscle: Cosmology with BICEP and QUAD

Kris Larsen, CU/LASP, Titan Unmasked: Cassini Sees the Cloudy Moon of Saturn

Xinlin Li, CU/LASP, NASA's THEMIS Mission

Lindsey Link, CU/LASP, Mars: Time for a New Chronology?

William Lotko, Dartmouth College, Spontaneous Resonances in Earth's Magnetosphere-Ionosphere System

Tom McCollom, CU/LASP, Habitats for life in the crusts of Earth and Mars

Aimee Merkel, CU/LASP, Taking AIM at Noctilucent Clouds

Robert Michell, Dartmouth College, Ground Camera and Radar Observations of Auroral Downward Current Region Processes

David O'Brien, PSI/Tucson, High-Resolution Modeling of Terrestrial Planet Formation

Terry Onsager, NOAA/SEC, Energetic Particles in the Magnetosphere: Old Problems, New Data

Terry Onsager, NOAA/SEC, Solar Energetic Proton Penetration into the Magnetosphere - A GOES Perspective

Alexander Pavlov, LPL, Univ. of Arizona, Modeling constraints on the evolution of the terrestrial planetary atmospheres

Bill Peterson, CU/LASP, Role of Ionospheric Ions During Geomagnetic Storms

Wayne Pryor, Central AZ College/Space Environment Tech, Cassini Ultraviolet imaging spectrograph observations of Saturn's auroras

Lisa Pratt, Indiana Univ., and T.C. Onstott, Princeton Univ., Radiolysis of Water as a Source of Bioavailable Energy in the Subsurface of Earth and Mars

Wayne Pryor, Central Arizona College, Cassini ultraviolet imaging spectrograph observations of Saturn's Auroras

Scot Rafkin, Southwest Research Institute, Radiative-Dynamic Feedback Between Atmospheric Dust Disturbances and the Surface of Mars

Licia Ray, CU/LASP & APS, The Effect of Field-Aligned Potentials on Magnetosphere-Ionosphere Coupling at Jupiter

Sean Raymond, CU/CASA, Formation and Habitability of Systems of Terrestrial Planets

Eric Richard, CU/LASP, Eight minutes to Earth: Understanding our Sun's variable radiation

Theodore Sarris, CU/LASP, Multipoint observations of a multiday Pc5 pulsation

Peter H. Schultz, Brown Univ., NASA's Oblique Impact Experiment: Results from Deep Impact

Alice Shapley, Princeton Univ., Star-Formation, Chemical Enrichment, and Feedback at z~2-3

Eric Shettle, NRL, Polar Mesospheric Cloud Measurements From POAM and SBUV

Paul Strother, Boston College, Cryptospores and the Origin of Land Plants

Melissa Trainer, CU/LASP, Searching for Heterogeneous Sinks of CH4 on Mars

Margaret C. Turnbull, Carnegie Institution of Washington, Observing Habitable Worlds Near and Far

Martin Van Kranendonk, Geological Survey of Western Australia, Volcanic degassing, hydrothermal circulation and the flourishing of early life on Earth: A review of the evidence from c. 3490-3240 Ma rocks of the Pilbara Supergroup, Pilbara Craton, Western Australia

Fall 2007

Joseph Ajello, JPL, Titan airglow spectra from Cassini UVIS and other outer planet observations

Ariel Anbar, Arizona State University, A Whiff of Oxygen Before the Great Oxidation Event

Fran Bagenal, CU/LASP/APS, Is There any Dungey Cycle at Jupiter?

Fran Bagenal, CU/LASP/APS, Exploring the Giant Magnetosphere of Jupiter

John Bally, CU/APS, Do Most Planetary Systems Originate in Star Clusters?

Rory Barnes, Univ. of Arizona,Tides and the Evolution of Planetary Habitability

Amy Barr, SwRI, Boulder, Constraints on Timing and Duration of Satellite Formation From the Interior States of Rhea and Callisto

William F. Bottke, SwRI, An Asteroid Breakup 160 My Ago as the Probable Source of the K-T Impactor

Phillip C. Chamberlin, CU/LASP, The Flare Irradiance Spectral Model (FISM) Contributions to Space Weather Research and Instrument Design

John Clarke, Boston University, The HST Auroral Campaign for Jupiter and Saturn - Constraints on the Overall Magnetospheric Dynamics Physics Researchers

Emily CoBabe-Ammann, CU/LASP, Astrobiology Education and Public Outreach: Why it's Important, how it's Changing and how to get Involved

Shelley Copley, CU, The origin of the RNA World: co-evolution of genes and metabolism

Peter Delamere, CU/LASP, Satellite-Magnetosphere Interactions: A Comparison of Io and Enceladus

Yue Deng, HAO/NCAR, Study of November 2004 Storm Using AMIE: Preliminary Results

Vincent Dols, CU/LASP, Auroral Footprint of Io on Jupiter: the Challenge to Explain the Multi-Spot Morphology

J.F. Drake, UC Berkeley and Univ. of Maryland, Production of energetic electrons and ions during magnetic reconnection

Jamie Elsila, NASA Goddard, Photochemistry of Organic Compounds in Interstellar Ices

Bob Ergun, CU/LASP/APS, Ion Outflow at Mars

Larry Esposito, CU/LASP, Cassini Mission Science Update

Yuhong Fan, HAO/NCAR, The Magnetic Nature of Coronal Mass Ejections

John Fontenla, CU/LASP, Solar Physics: Moving From Semi-Empirical Models to a Broader Physical Basis

Eric Gaidos, University of Hawaii, Dying Stars and Living Worlds: Short-Lived Radionuclides and the Abundance of Planetary Water

Michael Gausa, Andøya Rocket Range, Norway, Research Opportunities at the ALOMAR Observatory (69N 16E) and the Andøya Rocket Range

Jason Glenn, CU/CASA, An exciting opportunity for Colorado for 21st Century Ground-Based Astronomy: The Cornell-Caltech Aracama Telescope

John Gosling, CU/LASP, The solar wind

Margit Haberreiter, Physikalisch-Meteoro-logisches ium Davos Davos Dorf Switzerland, Radiative Transfer Calculations of the Solar Atmosphere

Nathan Kaib, Univ. of Washington, Oort Cloud Simulations: Constraining the Comet Impact Hazard and the Sun's Birthplace

Shri Kanekal, CU/LASP, The Near Earth Radiation Environment: Van Allen Belts, Solar Particles, Jovian Electrons and All That

Bodil Karlsson, Stockholm University, NLC Analysis from the Odin Satellite

Michael King, NASA Goddard, Observations of our changing world: The view from Space, Aircraft, and the Surface

Fred Lo, NRAO, Mega-Masers, Dark Energy, and the Hubble Constant

Scott McIntosh, HAO and SwRI, Alfven Waves in the Solar Atmosphere: An Old Solution to an Old Problem?

Jean-Pierre Macquart, Caltech, Radio Intra- Day Variability in Quasars

David Malaspina, Eigenmode Structure in Solar Wind Langmuir Waves

Wendell Mendell, NASA Johnson Space Center, NASA's Constellation Program: Implementation of the Vision for Space Exploration

George Millward (NOAA/SEC), Global modeling of the Earth's ionosphere-thermosphere system

Alessandro Morbidelli, Laboratoire Cassiopée, Observatoire de la Côte d'Azur, Nice, France, Formation of the Terrestrial Planets and Primordial Sculpting of the Asteroid Belt

Antonius Otto, Univ. Alaska, Physics and particle acceleration at the geomagnetic cusps

Norman Pace, CU/MCDB, Life in the Universe: The Expanding World of Microbial Diversity

Peter Pilewskie, CU/LASP & ATOC, Quantifying the Radiative Effects of Aerosols and Clouds on Climate from Airborne Field Studies

Gabrielle Provan, Multi-instrument study of magnetosphere-ionosphere coupling utilizing the SuperDARN radars, auroral imagers and spacecraft observations

David Rusch, CU/LASP, The Aeronomy of Ice in the Mesosphere Explorer: First Science Results

David Rusch, CU/LASP, AIM: A NASA Mission Exploring Clouds on the Edge of Space

Daniel Sauer, Max Planck Institute for Astrophysics, Radiative Transfer in Type Ia Supernova Ejecta

Nick Scoville, Caltech, Large Scale Structure and Galaxy Evolution in COSMOS

Mindi Searls, CU/LASP, Shape from Shading: Photoclinometry and its Applications

Rob Simcoe, MIT, Galaxy Formation, Feedback, and the Early Chemical Enrichment of Intergalactic Matter

John Spear, Colorado School of Mines, Microbial Diversity in a Mexican Cenote as Captured by DEPTHX

Brian Toon, CU/LASP and ATOC, First Results from the Tropical Composition, Clouds and Climate Coupling (TC4) Experiment

Weichao Tu, CU/LASP, Storm-dependent radiation belt dynamics

Drew Turner, CU/AES/LASP, Forecasting Relativistic Electron Flux at GEO Using Local Low Energy Electron Flux and Solar Wind Measurements

Robert Winglee, U. of Washington, Multi-Fluid/Multi-Scale Simulations of Reconnection and Flux Ropes in the Magnetosphere

Weichao Tu, CU/LASP/AES, Storm-dependent Radiation Belt Dynamics

Publications

Ajello, J.M, M.H. Stevens, I. Stewart, K. Larsen, L. Esposito, J. Colwell, W. McClintock, G. Holsclaw, J. Gustin, W. Pryor, Titan Airglow Spectra from Cassini UVIS: I. EUV Analysis, Geophys. Res. Lett., 34, L24204, doi:10.1029/2007GL031555, 2007.

Baker, D. N., S. G. Kanekal, R. B. Horne, N P. Meredith, and S. A. Glauert, Low-altitude measurements of 2–6 MeV electron trapping lifetimes at $1.5 \leq L \leq 2.5$, Geophys. Res. Lett., 34, L20110, doi:10.1029/2007GL031007, 2007.

Baker, D.N., and I.A. Daglis, Radiation belts and ring current, in Space Weather – Physics and Effects, V. Bothmer and I.A. Daglis, eds., Springer, 2007.

Baker, D.N., and J. Sojka, No small Feat (NSF): Student-led Spacecraft, Space News, p. 19, 24 September, 2007.

Baker, D.N., and S.G. Kanekal, Solar cycle changes, geomagnetic variations, and energetic particle properties in the inner magnetosphere, J. Atmos. and Solar-Terr. Phys., 70, 195-206, doi:10.1016/j.jastp. 2007.08.031, 2007.

Baker, D.N., et al., Space radiation hazards and the vision for space exploration, Space Weather, 5, #2, doi:10.1029/2007SW000313, 2007.

Baker, D.N., M.J. Wiltberger, R.S. Weigel, and S.R. Elkington, Present Status and Future Challenges of Modeling the Sun-Earth End-to-End System J. Atmos. and Solar-Terr. Phys., 69, 3-17, 2007.

Baker, D.N., Three top risks to NASA science programs, Space News, p. 27, 11 June 2007.

Brilliantov, N.V., N. Albers, F. Spahn, and T. Pöschel, Collision Dynamics of Granular Particles with Adhesion, Physical Review, E76, 051302-1, 2007

Brohede, S.M., C.E. Randall, et al., Validation of Odin/IOSIRIS stratospheric NO2 profiles, J. Geophys. Res., Vol. 112, D07310, doi:10.1029/2006JD007586, 2007.

Chamberlin, P., T. N. Woods, and F. G. Eparvier, New flare model using recent measurements of the solar ultraviolet irradiance, Adv. Space Res., doi:10.1016/j.asr.2007.09.009, 2007.

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Andersson, Laila	Parallel Electric Fields and Alfven Waves
Andersson, Laila	The De-Rotating Imaging System 'Monitor'
Avallone, Linnea	Comparison of In Situ and Remotely Sensed Measurements of Cirrus Cloud Properties
Avallone, Linnea	Collaborative Research: Stratosphere-Troposphere Analyses of Regional Transport (START) Experiment
Avallone, Linnea	In Situ Measurements of Cloud Ice Water Content During TC4 in Support of Satellite Validation
Bagenal, Frances	JUNO Science Support - Phase B Activities
Bagenal, Frances	New Horizon Pluto-Kuiper Belt Mission Phase B

Bagenal, Frances	Angular Momentum Coupling between Jupiter and its Magnetosphere (Graduate Student: Licia Ray)
Bagenal, Frances	IO's Interaction with the Magnetosphere of Jupiter
Bagenal, Frances	IO's Interaction with the Magnetosphere of Jupiter-EPO Supplement
Baker, Daniel	A New Tenure-Track Solar Physicist at CU-Boulder: Catalyst for Change
Baker, Daniel	CEPPAD Research at the University of Colorado
Baker, Daniel	Electronic Geophysical Year (eGY) Initiative
Baker, Daniel	Science Team Support for the MESSENGER Mission
Baker, Daniel	The Cluster Rapid On-Orbit Operations and Data Verification
Baker, Daniel	REU Site: An Interdisciplinary Undergraduate Research Experience in Solar and Space Physics
Baker, Daniel	VxO for S3C Data: The Virtual Radiation Belt Observatory (ViRBO)
Baker, Daniel	GBI Project
Baker, Daniel	Mission of Opportunity (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	The Center for Integrated Space Weather Modeling (CISM)
Baker, Daniel	The Cluster Rapid On-Orbit Operations and Data Verification
CoBabe-Ammann, Emily	New Horizons Phase E - E/PO
CoBabe-Ammann, Emily	REU Site: An Interdisciplinary Undergraduate Research Experience in Solar and Space Physics
CoBabe-Ammann, Emily	Colorado Project Astro-Geo (CPAG)
CoBabe-Ammann, Emily	WIRED Jump Start Grant
Colwell, Joshua	Evolution of the Topography and Mantles of Comet Nuclei
Colwell, Joshua	Lunar Regolith Simulant Testing
Delamere, Peter	The Influence of Saturn's Internal Plasma Sources on Magnetospheric Dynamics
Delamere, Peter	Variability of Mass Loss from IO: Chemical and Physical Evolution of the IO Torus
Delamere, Peter	Mass and Energy Flow Through Saturn's Inner Magnetosphere
Drake, Virginia	Starsys STTR Phase II: Characterizing Metal-Seal Test Samples
Elkington, Scot	Investigations of Global ULF Structure in Earth's Magnetosphere
Elkington, Scot	Global Characteristics of the Substorm Particle Injection Process
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	Electric Field and Waves (EFW) Instrument
Ergun, Robert	Electric Field and Search Coil (EFASC)
Ergun, Robert	JUNO Science Support - Phase B Activities
Ergun, Robert	Magnetospheric Multiscale (MMS) Fields Investigation Digital Signal Processor and Axial Double Probes: Phase A Bridge
Ergun, Robert	MMS Bridge (MMS Fields)
Ergun, Robert	Parallel Electric Fields in the Upward Current Region of the Aurora
Ergun, Robert	Small and Medium Scale Modeling of the Auroral Downward Current Region
Ergun, Robert	STEREO - Solar Terrestrial Relations Observatory Wave Phase E

Ergun, Robert	Time History of Events and Their Macroscopic Interactions During Substorms (THEMIS)
Ergun, Robert	FAST extended mission
Ergun, Robert	GEM: small- and medium-scale modeling of the auroral downward current region
Ergun, Robert	Magnetospheric multiscale (MMS) Mission: Solving magnetospheric acceleration, reconnection, and turbulence (SMART)
Ergun, Robert	Medium Explorer Program "Time history of events and their macroscopic interactions during substorms"
Ergun, Robert	Radiation Belt Storm Probes (RBSP) Electric Field and Waves (EFW) Digital Fields Board (DFB)
Ericksson, Stefan	Solar Wind Reconnection Typology
Esposito, Larry	Cassini Mission Operations and Data Analysis
Esposito, Larry	UV imaging spectrograph for Cassini
Fontenla, John	Understanding the Sources of the Solar Spectral and Total Irradiance Variability and Forecasting Tools
Gosling, John	IMPACT Experiment Work for STEREO
Gosling, John	Low-Energy Solar Electron Bursts
Gosling, John	Magnetic Reconnection in the Solar Wind
Harvey, Lynne	Dynamical Effects on Ozone Trends
Harvey, Lynne	Pan-Arctic Studies of the Coupled Tropospheric, Stratospheric and Mesospheric Circulation
Horanyi, Mihaly	CASSINI CDA Investigations
Horanyi, Mihaly	Dusty Plasma Issues for Surfaces in Space
Hynek, Brian	Global Analysis of Martian Valley Networks Using THEMIS Data
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
Jakosky, Bruce	Thermal Imaging System
Jakosky, Bruce	University of Colorado Center for Astrobiology
Jakosky, Bruce	Mars Atmosphere and Volatile EvolutioN Mission (MAVEN)
Kanekal, Shrikanth	Comprehensive Survey of Relativistic Electron Dynamics During Geomagnetic Storms Over a Complete Solar Cycle
Kanekal, Shrikanth	Dynamics of Energetic Electrons Fluxes in the Inner Magnetosphere
Kanekal, Shrikanth	Relativistic Electron Dynamics During Geomagnetic Storms: Energization, Loss and Global Coherence
Kanekal, Shrikanth	Interplanetary Sources and Influences of Energetic Proton Populations in the Earth's Magnetosphere
Kopp, Greg	Glory Project - TIM: Six ROM Budget
Li, Xinlin	Quantification of Radial Diffusion in Energizing MeV (Millions of Electron Volts) Electrons in the Magnetosphere
Li, Xinlin	Quantitative Forecast and Specification of Radiation Belt Electrons
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, Thomas	Collaborative Research: Organic Geochemical Investigation of the Rainbow Hydrothermal System, Mid-Atlantic Ridge
McCollom, Thomas	Collaborative Research: Modeling the Chemistry, Origin, and Evolution of Subduction Zone Fluids Rising Beneath the Mariana Forearc
McCollom, Thomas	Experimental Investigation of Potential Pathways for Abiotic Organic Synthesis on the Early Earth
McCollom, Thomas	Experimental Investigation of Prebiotic Organic Geochemistry in Hydrothermal Environments
Mellon, Michael	Electrical Properties of Martian Permafrost
Mellon, Michael	Phase E on the High Resolution Imaging Science Experiment (HiRISE)
Mellon, Michael	PHOENIX Mars Scout Mission
Mills, Michael	CEDAR: Investigation of Polar Mesospheric Clouds using the Whole Atmosphere Community Climate Model 3
Ohtsuki, Keiji	Rotation of Moonlets and Particles in Planetary Rings Around Giant Planets
Ohtsuki, Keiji	Capture of Small Bodies by Giant Planets
Ohtsuki, Keiji	Collisional and Rotational Evolution of Small Asteroids
Pappalardo, Robert	Fracture Formation on Europa and Other Icy Satellites
Pappalardo, Robert	ICY Satellite Geology: Computer Assisted Stratigraph Sorting and Exploring a Europa Arctic Analog
Pappalardo, Robert	Physical Models of Tectonic Resurfacing of Ganymede
Peterson, William	Support of the "Virtual Observatories In Geosciences (VOiG) 2007" Conference being held in Denver, Colorado June 11-15, 2007
Peterson, William	TIMAS Operations and Data Analysis
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	Shortwave Spectroradiometer Mentor
Possel, William	ICESat Mission Operations Delta Costs for the New Nominal Program
Possel, William	Magnetosphere Multiscale (MMS) Mission for Magnetospheric Acceleration, Reconnection and Turbulence (SMART) Investigation Phase B FY 05-06
Possel, William	NGST SCALE Based Micro-Satellite for Climate Sensing Mission
Possel, William	KEPLER Photometer
Possel, William	Mission Operations of the NASA QuikSCAT Satellite
Randall, Cora	Implications of Energetic Particle Precipitation for the Stratosphere
Randall, Cora	Expansion of the CU-LASP Climate Change Education Program to the Colorado MESA After School Program
Randall, Cora	Occultation Data Intercomparison and Evaluation
Rast, Mark	Precision Solar Photometric Telescope (PSPT) Operations and Data Analysis
Rast, Mark	Dynamics of Multi-scale Solar Convection: Exploring the Near-surface Shear Layer

Rottman, Gary	SORCE/EOS Solstice
Rusch, David	Aeronomy of Ice in the Mesosphere (AIM) Additional Staffing Hours, Materials and Equipment to Complete the CIPS Instrument
Rusch, David	The Ice Content of Polar Mesospheric Clouds Derived from SNOE Satellite Measurements
Schneider, Nicholas	Collaborative Research: A Comparative Study of Escaping Atmospheres Using AEOS/HiVIS
Schneider, Nicholas	From IO's Atmosphere to the Plasma Torus
Smith, Jamison	Aerosol Effects on Climate With Geos-5
Smith, Jamison	Simulation of the Aging of Smoke from African Biomass Burning Plumes and Implications for Remote Sensing of Aerosols
Sparn, Thomas	STUDY: TSIS Functional Description and Notional Implementation
Stewart, Glen	Dynamical Models of Planetary Rings
Stewart, Glen	N-Body Simulations of Density Waves in Planetary Rings
Thomas, Gary	Science Systems and Applications: Polar Mesospheric Cloud Properties Determined from SBUV and SBUV/2 Measurements
Toon, Owen B.	Aura Studies of PSCs and Subvisible Cirrus
Toon, Owen B.	Evolution of the Optical Properties of Biomass Smoke Plumes in a Three-Dimensional Transport Model and Comparisons to In Situ and Remote Sensing Observations
Toon, Owen B.	Detection, Characterization and Modeling of Polar Stratospheric Clouds Using Satellite Data from POAM III, HIRDLS and TES
Toon, Owen B.	Flight Planning and Mission Implementation Support for the Tropical Composition, Cloud and Climate Coupling Experiment in Costa Rica, July 2007
Woods, Thomas	Extreme Ultraviolet Variability Experiment (EVE)
Woods, Thomas	Geostationary Operation Environmental Satellite (GOES-R)
Woods, Thomas	Timed SEE Experiment - Phase E Extended Mission
Woods, Thomas	SORCE/EOS Solstice
Woods, Thomas	VxO for S3C Data: The Virtual Radiation Belt Observatory (ViRBO)