

Directions in Ionosphere-Thermosphere-Mesosphere Research



"A Vision for Aeronomy in the Earth-Sun System"

The Portofino Hotel, Redondo Beach, Calif.

Feb. 10-12, 2009

Feb. 10

7:30 Registration and continental breakfast

Session I – Welcome and Opening Remarks

Presiding: James Clemmons, The Aerospace Corporation

8:30 Welcome

James Clemmons, The Aerospace Corporation

8:40 Opening remarks

David Gorney, The Aerospace Corporation

8:50 Remarks from NASA Headquarters

Mary Mellott, NASA Headquarters

9:00 Remarks from National Science Foundation

Robert Robinson, National Science Foundation

9:10 Space Situational Awareness – Space Weather Components

Jeffrey Carson, Air Force Space Command

9:20 Synopsis of Last Year's Conference and Goals for ITMR

James Clemmons, The Aerospace Corporation

9:40 Break

Session II – Fundamental Issues in ITM Research

Presiding: Jeffrey Thayer, University of Colorado

10:00 Space-Based IT Research Outcomes and Plans

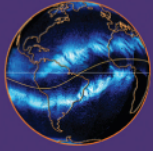
Jeffrey Thayer, University of Colorado

10:20 Thermosphere Energetics and Mass Transport

Arthur Richmond, National Center for Atmospheric Research



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- 10:45 Outstanding Issues in Electrodynamics of the Coupled ITM-Magnetosphere
Roderick Heelis, University of Texas at Dallas
- 11:10 Vertical Coupling by Dynamical and Chemical Processes
Richard Walterscheid, The Aerospace Corporation
- 11:35 Coupling the Regions of the Atmosphere by Energetic Particles
Scott Bailey, Virginia Polytechnic Institute and State University
- 11:50 Determining Technical Requirements for Ionosphere Observation and Forecast Accuracy to Meet Space Operations Requirements
Mark Storz, Air Force Space Command
- 12:05 Scientific Problems in Ionosphere-Thermosphere Research – 25 Years Beyond Dynamics Explorer
Daniel Weimer, Virginia Polytechnic Institute and State University
- 12:20 Lunch

Session III – Recent Results from ITM Research

Presiding: Janet Kozyra, University of Michigan

- 1:50 Results from the TIMED Mission
Sam Yee, Applied Physics Laboratory
- 2:10 Initial Results from the C/NOFS Mission
Odile de La Beaujardiere, Air Force Research Laboratory
- 2:30 The Aeronomy of Ice in the Mesosphere: Science Results After Three PMC Seasons
James Russell, Hampton University
- 2:50 Newly Discovered Upper Atmosphere Breathing Modes
Jeffrey Thayer, University of Colorado

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- 3:05 Aeronomic Measurements as an Early-Warning Detection of Tsunami-Driven Gravity Waves in the Thermosphere and Ionosphere
Michael Hickey, Embry-Riddle Aeronautical University
- 3:20 On New Ways to Think About I-T Coupling: Electrobuoyancy Waves and 2-D Turbulence
Michael Kelley, Cornell University
- 3:50 A Big-Picture View of the Causes, Processes, and Effects of Cold Plasma Recirculation in the ITM System
John Foster, MIT Haystack Observatory
- 4:05 Break

Session IV – Discussion and Writing

- 4:25 Group 1: Mass Transport and Energetics
Presiding: Jeffrey Thayer, Aaron Ridley, Janet Kozyra
- 4:25 Group 2: Electrodynamical Coupling
Presiding: Odile de La Beaujardiere, William Bristow, Phillip Anderson
- 4:25 Group 3: Chemical-Dynamical Coupling
Presiding: Richard Walterscheid, Thomas Immel, Stan Solomon
- 6:00 Adjourn to Welcome Reception

Feb. 11

- 7:30 Registration and continental breakfast

Session V – Review of Writing

Presiding: James Clemmons, The Aerospace Corporation



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Jeffrey Thayer, Aaron Ridley, Janet Kozyra

8:10 Group 2: Electrodynamic Coupling
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8:20 Group 3: Chemical-Dynamical Coupling
Richard Walterscheid, Thomas Immel, Stan Solomon

Session VI – ITM Research Implementation

Presiding: Robert Pfaff, NASA/Goddard Space Flight Center

8:30 The NASA Heliophysics 2009 Roadmap
Andrew Christensen, The Aerospace Corporation

9:00 Global-Scale Observations of the Limb and Disk (GOLD)
Richard Eastes, Florida Space Institute

9:20 Neutral-Ion Coupling Explorer (NICE)
Stephen Mende, University of California, Berkeley

9:40 New Perspectives on the Thermosphere and Ionosphere from the RAIDS Experiment on the ISS
Andrew Stephan, Naval Research Laboratory

9:55 Constellations, Arrays, and Mappers - Using Multiple Satellite Missions to Significantly Advance Our Knowledge of the Earth's Ionosphere and Thermosphere
Robert Pfaff, NASA/Goddard Space Flight Center

10:10 Satellite Constellations for Measurements of High-Latitude Energy Input
Charles Swenson, Utah State University

10:25 Break



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- 10:45 NSF Strategies for ITM Research
Robert Robinson, National Science Foundation
- 11:05 Future Plans and Direction for AMISR Systems Around the Globe
Anja Strømme, SRI International
- 11:25 Specification and Prediction of the Space Environment at AFWA
Joseph Reich, Air Force Weather Agency
- 11:45 Example ITM Applications to Space Situational Awareness
Kelly Hand, The Aerospace Corporation
- 12:00 SSA Environmental Monitoring
Donald Boucher, The Aerospace Corporation
- 12:10 UPC Exploration Carrier Usage in Ionosphere-Thermosphere Research
Bruce Milam, NASA/Goddard Space Flight Center
- 12:20 Operational and Organizational Issues for Space Weather Prediction Testbed (SWPT)
Kent Tobiska, Space Environment Technologies
- 12:35 Lunch

Session VII – Posters

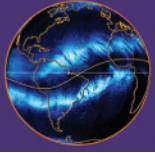
Presiding: James Clemmons, The Aerospace Corporation

- 2:00 Modeling the Eastward Equatorial Electric Field using CHAMP Magnetometer Data
Patrick Alken, National Oceanic and Atmospheric Administration

In-Depth Investigations by the RAIDS Instrument Suite
Rebecca Bishop, The Aerospace Corporation



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2:00 Mid-Latitude SuperDARN Radar Infrastructure for the Study of Ionospheric Electrodynamics and Atmospheric Processes on Global Scales
William Bristow, University of Alaska, Fairbanks

Paired Ionosphere-Thermosphere Orbiters (PITO): Science and Implementation
James Clemmons, The Aerospace Corporation

Validation of Ionospheric Measurements from the International Space Station (ISS)
Victoria Coffey, NASA/Marshall Space Flight Center

Periodic Modulations in Thermospheric Composition by Solar Wind High Speed Streams
Geoffrey Crowley, Atmospheric and Space Technology Research Associates

Andøya Rocket Range (ARR), Norway
Kolbjørn Dahle, Andøya Rocket Range

Horizontal Wind Model (HWM07)
Douglas Drob, Naval Research Laboratory

Modeling of Multiple Plausible Mechanisms for the Coupling of Atmospheric Tides to the F-Region Ionosphere
Scott England, University of California, Berkeley

Doppler Asymmetric Spatial Heterodyne (DASH) Spectrometers: A Novel Technique to Measure Atmospheric Winds
Christoph Englert, Naval Research Laboratory

Satellite Constellations for Measurements of High Latitude Energy Input
Chad Fish, Utah State University

Coordinated Incoherent Scatter Radar Support for ITM Initiatives
John Foster, MIT Haystack Observatory

Maintaining US Space Weather Capability after DMSP
Louise Gentile, Boston College Institute for Scientific Research



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2:00 Radiation Belt Storm Probe Mission – A Future IT Asset
Joseph Grebowsky, NASA/Goddard Space Flight Center

Modeling the Low-Latitude Neutral Wind Dynamo
Joseph Huba, Naval Research Laboratory

Poynting Flux Estimates During Intervals of Strong IMF and Solar Wind Variations
Delores Knipp, National Center for Atmospheric Research

The January 2005 Superstorm: A Case Study in Inter-Disciplinary Heliophysics Research
Janet Kozyra, University of Michigan

Radio Occultation Measurements from Global Navigation Satellite Systems: A Significant Resource for Ionosphere-Thermosphere Research
Anthony Mannucci, Jet Propulsion Laboratory

Magnetic Field Models for Navigation and Research in the Space and Geosciences
Stefan Maus, National Oceanic and Atmospheric Administration

Detecting Climate Change in the MLTI – A New Observation Paradigm
Martin Mlynczak, NASA Langley Research Center

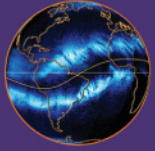
Outstanding Issues in Measuring Thermospheric Density and Composition
Kenneth Moe, Space Environment Technologies

A Virtual Observatory for Ionosphere-Thermosphere Research
Daniel Morrison, Applied Physics Laboratory

A New Paradigm for Magnetosphere-Ionosphere/Thermosphere Coupling
Paul Song, University of Massachusetts Lowell

CORISS Measurements of the Equatorial Ionosphere
Paul Straus, The Aerospace Corporation

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2:00 High-Latitude Solar Wind-Magnetosphere-Ionosphere Energy Coupling: Directly Drive and/or Unloading
Xiaoyan Zhou, Jet Propulsion Laboratory

Dayside Ionospheric Response to the Intense Interplanetary Shock: Observations from the Ground-based Digisonde Network
Qiu-Gang Zong, University of Massachusetts Lowell

4:00 Break

Session VIII – Discussion and Writing

4:20 Group 1: Mass Transport and Energetics
Presiding: Jeffrey Thayer, Aaron Ridley, Janet Kozyra

4:20 Group 2: Electrodynamical Coupling
Presiding: Odile, de La Beaujardiere, William Bristow, Phillip Anderson

4:20 Group 3: Chemical-Dynamical Coupling
Presiding: Richard Walterscheid, Thomas Immel, Stan Solomon

6:00 Adjourn

Feb. 12

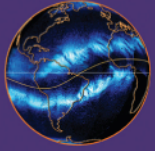
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Presiding: James Clemmons, The Aerospace Corporation

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8:40 Group 2: Electrodynamical Coupling
Odile de La Beaujardiere, William Bristow, Phillip Anderson

8:50 Group 3: Chemical-Dynamical Coupling
Richard Walterscheid, Thomas Immel, Stan Solomon

Session X – The Way Forward

Presiding: Larry Paxton, Applied Physics Laboratory

9:00 The Plan for "The Way Forward" Session
Larry Paxton, Applied Physics Laboratory

9:10 The Relationship between ITM Science and Heliophysics
Roger Smith, University of Alaska, Fairbanks

9:30 Conjectures about the Future of ITM Science
Andrew Christensen, The Aerospace Corporation

9:45 ITM in the Report on Severe Space Weather Events
Joseph Fennell, The Aerospace Corporation

10:00 Report on Heliophysics Performance Assessment
Roderick Heelis, University of Texas at Dallas

10:15 Break

10:35 Enabling Cross-Disciplinary Research through Virtual Organizations
Larry Paxton, Applied Physics Laboratory

10:55 The ITM in Sun-Earth Relations: Banks and Kockarts to the Heliophysics Text Book and Beyond
Richard Walterscheid, The Aerospace Corporation



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11:10 Getting the Word Out on ITM Research
Aaron Ridley, University of Michigan

11:30 ITM Action Group
James Spann, NASA/Marshall Space Flight Center

11:50 Divide into Groups
Larry Paxton, Applied Physics Laboratory

12:00 Lunch

Session XI – Decisions, Planning, and Products

Presiding: Larry Paxton, Applied Physics Laboratory

1:30 Group 1: Advancement of ITM Research Projects
Aaron Ridley, University of Michigan

1:30 Group 2: Vision Document for Future ITM Research
Larry Paxton, Applied Physics Laboratory

1:30 Group 3: Strengthening the ITM Community
James Spann, NASA/Marshall Space Flight Center

2:30 Decisions
Larry Paxton, Applied Physics Laboratory

3:00 Break

Session XII – Wrap-up and Writing

3:20 Plenary
Presiding: Larry Paxton, Aaron Ridley, James Spann

5:00 Adjourn