Magnetosphere-Ionosphere Coupling in the Solar System
Magnetosphere-Ionosphere Coupling in the Solar System
Yosemite National Park, California, USA
9–14 February 2014

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Vanderbilt University

Bob Schunk
Lead Institution
Utah State University

Andy Nagy*
University of Michigan

Peter Banks*
Local Organizer in California

Jim Burch
Southwest Research Institute

Dan Baker
University of Colorado

*Organizer of original Yosemite meeting in 1974

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Magnetosphere-Ionosphere Coupling in the Solar System

Meeting At A Glance

Sunday, 9 February
5:30 P.M. – 7:00 P.M. Welcome Reception
(Yosemite Lodge – Cliff/Falls Room)

Monday, 10 February
8:00 A.M. - 8:45 A.M. Welcome & Opening Remarks – Rick Chappell, Vanderbilt University
Magnetosphere-Ionosphere Coupling – History and Future – Jim Burch, Southwest Research Institute
8:45 A.M. – 10:00 A.M. The Earth’s Ionosphere as a Source I
(Yosemite Lodge – Cliff/Falls Room)
10:00 A.M. - 10:15 A.M. Break
10:15 A.M. - 12:20 P.M. The Earth’s Ionosphere as a Source II
(Yosemite Lodge – Cliff/Falls Room)
12:20 P.M. – 4:30 P.M. Lunch and activities on your own
4:30 P.M. – 7:40 P.M. The Earth’s Ionosphere as a Source III
(Yosemite Lodge – Cliff/Falls Room)

Tuesday, 11 February
(Yosemite Lodge – Cliff/Falls Room)
10:05 A.M. - 10:20 A.M. Break
(Yosemite Lodge – Cliff/Falls Room)
12:15 P.M. – 4:30 P.M. Lunch and activities on your own
4:30 P.M. - 7:25 P.M. Role of Currents and Electric/Magnetic Fields in Coupling Ion/Mag
(Yosemite Lodge – Cliff/Falls Room)

Wednesday, 12 February
8:00 A.M. – 10:05 A.M. Unified Global Modeling of Ionosphere and Magnetosphere at Earth I
(Yosemite Lodge – Cliff/Falls Room)
10:05 A.M. - 10:20 A.M. Break
10:20 A.M. - 12:15 P.M. Unified Global Modeling of Ionosphere and Magnetosphere at Earth II
(Yosemite Lodge – Cliff/Falls Room)
12:15 P.M. – 4:30 P.M. Lunch and activities on your own
4:30 P.M. – 7:10 P.M. Unified Global Modeling of Ionosphere and Magnetosphere at Earth III
(Yosemite Lodge – Cliff/Falls Room)
Thursday, 13 February
8:00 A.M. - 9:55 A.M. The Coupling of the Ionosphere and Magnetosphere at Other Planets and Moons in the Solar System I
(Yosemite Lodge – Cliff/Falls Room)
9:55 A.M. - 10:10 A.M. Break
10:10 A.M. - 12:15 P.M. The Coupling of the Ionosphere and Magnetosphere at Other Planets and Moons in the Solar System II
(Yosemite Lodge – Cliff/Falls Room)
12:15 P.M. – 4:30 P.M. Lunch and activities on your own
4:30 P.M. - 6:45 P.M. The Coupling of the Ionosphere and Magnetosphere at Other Planets and Moons in the Solar System III
(Yosemite Lodge – Cliff/Falls Room)
6:45 P.M. – 8:15 P.M. Break
8:15 P.M. - 10:00 P.M. Banquet Dinner
(Ahwahnee Hotel – Ahwahnee Solarium)

Friday, 14 February
8:00 A.M. - 10:05 AM The Unified Modeling of the Ionosphere and Magnetosphere at Other Planets and Moons in the Solar System I
(Yosemite Lodge – Cliff/Falls Room)
10:05 A.M. - 10:20 A.M. Break
10:20 A.M. - 12:15 P.M. The Unified Modeling of the Ionosphere and Magnetosphere at Other Planets and Moons in the Solar System II
(Yosemite Lodge – Cliff/Falls Room)
12:15 P.M. Box lunches available
12:45 P.M. - 2:40 P.M. Future Directions for MI Coupling Research
(Yosemite Lodge – Cliff/Falls Room)
2:40 P.M. - 2:45 P.M. Closing Remarks

Schedule as of January 24, 2014
SCIENTIFIC PROGRAM

SUNDAY, 9 FEBRUARY

5:30 p.m. – 7:00 p.m.  Registration and Welcome Reception
                        Cliff/Falls Room

MONDAY, 10 FEBRUARY

8:00 a.m. – 8:45 a.m.  Welcome and Opening Remarks
                        Presiding: Rick Chappell
                        Cliff/Falls Room
                        Jim Burch | Magnetosphere-Ionosphere Coupling—Past and Future

The Earth’s Ionosphere as a Source I
Presiding: Rick Chappell
Cliff/Falls Room

8:45 a.m. – 8:50 a.m.  Video - Ian Axford
8:50 a.m. – 9:00 a.m.  Remarks - Peter Banks
9:00 a.m. – 9:30 a.m.  Andrew W. Yau | Measurements of Ion Outflows from the Earth’s
                        Ionosphere (Invited)
9:30 a.m. – 10:00 a.m.  Stein Haaland | Cold Ion Outflow from the Polar Cap
                        Region:Cluster Results (Invited)

10:00 a.m. – 10:15 a.m.  Morning Break (Monday)

The Earth’s Ionosphere as a Source II
Presiding: Jerry Goldstein
Cliff/Falls Room

10:15 a.m. – 10:20 a.m.  Video - Bill Hanson
10:20 a.m. – 10:50 a.m.  Roderick A. Heelis | Ionospheric Convection at High Latitudes
                        (Invited)
10:50 a.m. – 11:20 a.m.  Asgeir Brekke | IRS - the ultimate instrument for upper polar
                        atmosphere research (Invited)
11:20 a.m. – 11:50 a.m.  Gang Lu | Global Dynamic Coupling of the Magnetosphere-
                        Ionosphere-Thermosphere System (Invited)
11:50 a.m. – 12:20 p.m.  **John C. Foster** | Cold Plasma Redistribution in the Coupled Ionosphere-Magnetosphere System (Invited)

12:20 p.m. – 4:30 p.m.  **On Your Own (Monday)**

12:20 p.m. – 4:30 p.m.  **The Earth’s Ionosphere as a Source III**
Presiding: Thomas E. Moore
Cliff/Falls Room

4:30 p.m. – 4:35 p.m.  Video - Dick Johnson
4:35 p.m. – 4:40 p.m.  Remarks - Rick Chappell
4:40 p.m. – 5:10 p.m.  **Lynn M. Kistler** | Impacts of O+ Abundance In the Magnetosphere (Invited)
5:10 p.m. – 5:25 p.m.  **Naritoshi Kitamura** | Very-low-energy O+ ion outflows during geomagnetic storms
5:25 p.m. – 5:55 p.m.  **Robert McPherron** | The Possible Role of Magnetosphere-Ionosphere Coupling in Substorms (Invited)
5:55 p.m. – 6:25 p.m.  **Michael W. Liemohn** | Ionospheric Contribution to Magnetospheric Ion Density and Temperature Throughout the Magnetotail (Invited)
6:25 p.m. – 6:55 p.m.  **Jerry Goldstein** | Imaging the Magnetosphere (Invited)
6:55 p.m. – 7:25 p.m.  **Naritoshi Kitamura** | Photoelectron flow and field-aligned potential drop in the polar wind (Invited)
7:25 p.m. – 7:40 p.m.  **Iurii Cherniak** | The plasmaspheric electron content variations during geomagnetic storms

**TUESDAY, 11 FEBRUARY**

**Effect of Low Energy Plasma on the Stability of Energetic Plasmas I**
Presiding: Louis J. Lanzerotti
Cliff/Falls Room

8:00 a.m. – 8:05 a.m.  Video - Richard Thorne
8:05 a.m. – 8:35 a.m.  **Richard M. Thorne** | How whistler-mode waves and thermal plasma density control the global distribution of diffuse auroral precipitation and the dynamical evolution of radiation belt electrons (Invited)
8:35 a.m. – 9:05 a.m.  **Daniel N. Baker** | Gradual Diffusion and Punctuated Enhancements of Highly Relativistic Electrons: Van Allen Probes Observations (Invited)
9:05 a.m. – 9:20 a.m. Zhao Li | Modeling gradual diffusion and prompt changes in radiation belt electron phase space density for the March 2013 Van Allen Probes case study

9:20 a.m. – 9:50 a.m. Mary K. Hudson | Simulated Magnetopause Losses and Van Allen Probe Flux Dropouts (Invited)

9:50 a.m. – 10:05 a.m. Alexa J. Halford | Summary of the BARREL 2013 Campaign and Early Results from the 2014 Campaign

10:05 a.m. – 10:20 a.m. Morning Break (Tuesday)

Presiding: Mary K. Hudson
Cliff/Falls Room

10:20 a.m. – 10:25 a.m. Video - Chung Park

10:25 a.m. – 10:30 a.m. Remarks - Don Carpenter

10:30 a.m. – 11:00 a.m. Louis J. Lanzerotti | Ring Current Measurements from the Van Allen Probes Mission (Invited)

11:00 a.m. – 11:30 a.m. George B. Hospodarsky | Plasma Wave Measurements from the Van Allen Probes (Invited)

11:30 a.m. – 12:00 p.m. Vania K. Jordanova | Modeling Wave Generation Processes in the Inner Magnetosphere (Invited)

12:00 p.m. – 12:15 p.m. Yiqun Yu | Studying Subauroral Polarization Streams (SAPS) During the March 17, 2013 Magnetic Storm: Comparisons between RAM Simulations and Observations

12:15 p.m. – 4:30 p.m. On Your Own (Tuesday)

Role of Currents and Electric/Magnetic Fields in Coupling Ion/Mag
Presiding: Roderick A. Heelis
Cliff/Falls Room

4:30 p.m. – 4:35 p.m. Video - George Reid

4:35 p.m. – 4:40 p.m. Remarks - Bob McPherron

4:40 p.m. – 5:10 p.m. Robert Strangeway | Ion Outflows: Causes, Consequences, and Comparative Planetology (Invited)

5:10 p.m. – 5:40 p.m. William Lotko | Ionospheric Control of Magnetic Reconnection (Invited)
5:40 p.m. – 5:55 p.m.  Michael W. Liemohn  | Nonlinear Magnetosphere-Ionosphere Coupling in Near-Earth Space via Closure of the Partial Ring Current

5:55 p.m. – 6:10 p.m.  Ian J. Cohen  | Sounding rocket observations of precipitation and effects on the ionosphere and model comparisons

6:10 p.m. – 6:40 p.m.  Robert L. Lysak  | Coupling of Magnetosphere and Ionosphere by Alfvén Waves at High and Mid-Latitudes (Invited)

6:40 p.m. – 6:55 p.m.  Yan Song  | Generation of Alfvénic Double Layers and Formation of Discrete Auroras by Nonlinear Electromagnetic Coupling between Magnetosphere and Ionosphere

6:55 p.m. – 7:10 p.m.  Stephen R. Kaeppler  | Closure of Field-Aligned Current Associated with a Discrete Auroral Arc

7:10 p.m. – 7:25 p.m.  Patricia H. Reiff  | Testing MHD Models by Conjugate Aurora Imaging

WEDNESDAY, 12 FEBRUARY

Unified Global Modeling of Ionosphere and Magnetosphere at Earth I
Presiding: Daniel N. Baker
Cliff/Falls Room

8:00 a.m. – 8:05 a.m.  Video - Peter Banks

8:05 a.m. – 8:35 a.m.  Robert W. Schunk  | Magnetosphere-Ionosphere Coupling: Past, Present, and Future (Invited)

8:35 a.m. – 9:05 a.m.  Shasha Zou  | Formation of Storm Enhanced Density (SED) during Geomagnetic Storms: Observation and Modeling Study (Invited)

9:05 a.m. – 9:35 a.m.  Michael W. Liemohn  | The Superthermal Electrons Ionosphere-Magnetosphere Transport and Their Role in the Formation of Ion Outflows (Invited)

9:35 a.m. – 10:05 a.m.  Alex Glocer  | Coupling Ionospheric Outflow to Magnetospheric Models (Invited)

10:05 a.m. – 10:20 a.m.  Morning Break (Wednesday)

Unified Global Modeling of Ionosphere and Magnetosphere at Earth II
Presiding: Peter Banks
Cliff/Falls Room

10:20 a.m. – 10:25 a.m.  Video - Dick Wolf
10:25 a.m. – 10:55 a.m. Richard Wolf | Forty five years of the Rice Convection Model (Invited)

10:55 a.m. – 11:25 a.m. Daniel T. Welling | Recent Advances in Ionosphere-Magnetosphere Mass Coupling in Global Models (Invited)

11:25 a.m. – 11:55 a.m. Roger Varney | Review of global simulation studies of the effect of ionospheric outflow on the magnetosphere-ionosphere system dynamics (Invited)

11:55 a.m. – 12:25 p.m. Mei-Ching H. Fok | The Role of Ring Current in Magnetosphere-Ionosphere Coupling (Invited)

12:25 p.m. – 4:30 p.m. On Your Own (Wednesday)

Unified Global Modeling of Ionosphere and Magnetosphere at Earth III
Presiding: Daniel T. Welling
Cliff/Falls Room

4:30 p.m. – 4:35 p.m. Video - Don Fairfield

4:35 p.m. – 4:40 p.m. Remarks - Jim Slavin

4:40 p.m. – 5:10 p.m. Vahe Peroomian | Large-Scale Kinetic Simulations of Geomagnetic Storms with Realistic Ionospheric Ion Outflow Models (Invited)

5:10 p.m. – 5:25 p.m. William K. Peterson | A quantitative assessment of the role of soft electron precipitation on global ion upwelling

5:25 p.m. – 5:40 p.m. Jonathan Krall | How the Ionosphere-Thermosphere System Shapes the Quiet-Time Plasmasphere

5:40 p.m. – 5:55 p.m. Tian Luo | Effects of Polar Wind Outflow on the Storm-time Ring Current

5:55 p.m. – 6:10 p.m. Paul Song | Inductive-dynamic coupling of the ionosphere with the thermosphere and the magnetosphere

6:10 p.m. – 6:25 p.m. Roger H. Varney | Modeling the Interaction Between Convection and Cusp Outflows

6:25 p.m. – 6:40 p.m. Vahe Peroomian | An MHD Study of Geoeffectiveness of a CIR/HSS Storm Event

6:40 p.m. – 6:55 p.m. John Meriwether | Storm-time response of the mid-latitude thermosphere: Observations from a network of Fabry-Perot interferometers

6:55 p.m. – 7:10 p.m. Matthew O. Fillingim | Observations of Ionospheric Oxygen in the Vicinity of the Moon
THURSDAY, 13 FEBRUARY

The Coupling of the Ionosphere and Magnetosphere at Other Planets and Moons in the Solar System I
Presiding: Andrew Coates
Cliff/Falls Room

8:00 a.m. – 8:10 a.m. Video & Remarks - Andy Nagy

8:10 a.m. – 8:40 a.m. Fran Bagenal | Sources of Plasma for Jupiter’s Magnetosphere (Invited)

8:40 a.m. – 9:10 a.m. Melissa A. McGrath | Planetary Aurora across the Solar System (Invited)

9:10 a.m. – 9:40 a.m. James Slavin | An Overview of Mercury’s Plasma and Magnetic Field Environment (Invited)

9:40 a.m. – 9:55 a.m. Larry Kepko | The Substorm Current Wedge at Earth and Mercury

9:55 a.m. – 10:10 a.m. Morning Break (Thursday)

The Coupling of the Ionosphere and Magnetosphere at Other Planets and Moons in the Solar System II
Presiding: Andrew Nagy
Cliff/Falls Room

10:10 a.m. – 10:15 a.m. Video - Ferd Coroniti

10:15 a.m. – 10:45 a.m. Margaret Kivelson | An Overview of the Field and Plasma Environment of Jupiter and Saturn (and how an ionosphere can wag the tail and everything else) (Invited)

10:45 a.m. – 11:15 a.m. George B. Hospodarsky | Plasma wave observations with Cassini at Saturn (Invited)

11:15 a.m. – 11:45 a.m. Andrew Coates | Plasma Measurements at Non-Magnetic Solar System Bodies (Invited)

11:45 a.m. – 12:15 p.m. Joseph H. Westlake | The Coupling Problem at Titan: Where are the Magnetospheric Influences to Titan’s Complex Ionosphere? (Invited)

12:15 p.m. – 4:30 p.m. On Your Own (Thursday)
The Coupling of the Ionosphere and Magnetosphere at Other Planets and Moons in the Solar System III
Presiding: Margaret Kivelson
Cliff/Falls Room

4:30 p.m. – 5:00 p.m. Thomas Cravens | Coupling of the Ionosphere and Magnetosphere at Other Planets and Moons in the Solar System (Invited)

5:00 p.m. – 5:30 p.m. Ray Walker | Simulation Studies of Magnetosphere Ionosphere Coupling in Outer Planet Magnetospheres (Invited)

5:30 p.m. – 5:45 p.m. Zachary Girazian | Characterizing the V1 layer in the Venus ionosphere using VeRa observations from Venus Express

5:45 p.m. – 6:00 p.m. Paul Withers | The morphology of the topside ionosphere of Mars under different solar wind conditions: Results of a multi-instrument observing campaign by Mars Express in 2010

6:00 p.m. – 6:15 p.m. Laila Andersson | Solar Wind Erosion of Mars Ionosphere

6:15 p.m. – 6:30 p.m. Thomas Cravens | Magnetosphere-Ionosphere Coupling at Jupiter and Saturn: Evidence from X-Ray Emission

8:15 p.m. – 10:00 p.m. Banquet Dinner
Ahwahnee Hotel

FRIDAY, 14 FEBRUARY

The Unified Modeling of the Ionosphere and Magnetosphere at Other Planets and Moons in the Solar System I
Presiding: Jim Burch
Cliff/Falls Room

8:00 a.m. – 8:05 a.m. Video - Tom Hill and Pat Reiff

8:05 a.m. – 8:35 a.m. Thomas W. Hill | Modeling M-I Coupling at Jupiter and Saturn (Invited)

8:35 a.m. – 9:05 a.m. Xianzhe Jia | Global Modeling of the Space Environments of Jupiter and Saturn (Invited)

9:05 a.m. – 9:35 a.m. Ingo Mueller-Wodarg | Simulation of the Magnetosphere-Ionosphere Connection at Saturn (Invited)

9:35 a.m. – 10:05 a.m. Jared M. Bell | 3-D Modeling of the Magnetosphere-Ionosphere Interaction in the Outer Solar System (Invited)

10:05 a.m. – 10:20 a.m. Morning Break (Friday)
The Unified Modeling of the Ionosphere and Magnetosphere at Other Planets and Moons in the Solar System II
Presiding: James F. Spann
Cliff/Falls Room

10:20 a.m. – 10:25 a.m. Video - Don Williams
10:25 a.m. – 10:30 a.m. Remarks - TBD
10:30 a.m. – 11:00 a.m. Ying-Dong Jia | Characterizing the Enceladus torus by its contribution to Saturn’s Magnetosphere (Invited)
11:00 a.m. – 11:30 a.m. Carol S. Paty | From Ionospheric Electrodyamics at Mars to Mass and Momentum Loading at Saturn: Quantifying the Impact of Neutral-Plasma Interactions using Plasma Dynamic Simulations (Invited)
11:30 a.m. – 12:00 p.m. Yingjuan Ma | The Interaction of Rapidly Flowing Plasmas with Venus, Mars and Titan (Invited)
12:00 p.m. – 12:15 p.m. Jan Paral | Global Simulations of the Asymmetry in Forming Kelvin-Helmholtz Instability at Mercury
12:15 p.m. – 12:45 p.m. Break - Grab Box Lunch

Future Directions for MI Coupling Research
Presiding: Robert W. Schunk
Cliff/Falls Room

12:45 p.m. – 12:50 p.m. Video - Erwin Schmerling and Larry Kavanagh
12:50 p.m. – 12:55 p.m. Remarks - Peter Banks
12:55 p.m. – 1:25 p.m. Thomas E. Moore | Requirements for a Mission to study Thermosphere-Magnetosphere Coupling (Invited)
1:25 p.m. – 1:40 p.m. James F. Spann | A Novel Concept to Explore the Coupling of the Solar-Terrestrial System
1:40 p.m. – 2:40 p.m. Panel - Future Directions for MI Coupling in the Solar System (Ray Walker, Dave Klumpar)
2:40 p.m. – 2:45 p.m. Closing Remarks - Rick Chappell and Andy Nagy
Cliff/Falls Room

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