

Unsolved **P**roblems of **M**agnetospheric **P**hysics

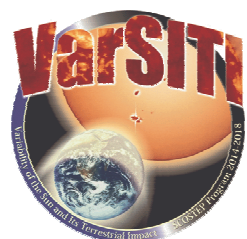
WORKSHOP • SCARBOROUGH, UK • SEPTEMBER 2015

PROGRAMME

Sunday 6th September to Saturday 12th September

CROWN SPA HOTEL, SCARBOROUGH, NORTH YORKSHIRE, UK

Meeting Kindly Sponsored by....



OVERVIEW

Sunday 6th September

- 16:00-18:00: **ARRIVAL AND CHECK IN**
- 18:00-20:00: **ICEBREAKER**

Monday 7th September

- 08:15-08:30: **WELCOME AND MEETING LOGISTICS**
- 08:30-12:30: **SESSION 1**
- 15:30-19:00: **SESSION 2**

Tuesday 8th September

- 08:30-13:00: **SESSION 3**
- 13:30-18:00: **EXCURSION TO CASTLE HOWARD**
- 18:30-19:30: **DISCUSSION SESSION**

Wednesday 9th September

- 08:30-12:30: **SESSION 4**
- 14:00-18:00: **SESSION 5**
- 19:00-LATE: **CONFERENCE BANQUET**

Thursday 10th September

- 09:00-13:00: **SESSION 6**
- 13:00-18:30: **FREE TIME / FISHING / PUB WALK**
- 18:30-19:30: **DISCUSSION SESSION (SPeCIMEN)**

Friday 11th September

- 08:30-12:00: **SESSION 7**
- 13:00-16:00: **SESSION 8**
- 17:00-19:00: **SEA CRUISE (WEATHER PERMITTING).**

Saturday 12th September

- 09:00-13:00: **SESSION 9**
- 13:00: **MEETING CLOSE**

Monday 7th September

08:15: Welcome and Meeting Logistics

Mick Denton

08:25: Meeting Aims: What Problems Need A Solution?

Joe Borovsky

▪ SESSION 1 (Mona Kessel and Michael Hartinger)

08:30: Do magnetospheric scientists take the magnetosheath for granted?

(25mins+5)

Drew Turner

09:00: The day-night connection: Extent of driving via meso-scale flow channels?

(20mins+5)

Larry Lyons

09:25: Things we don't yet understand about solar driving of the radiation belts

(20mins+5)

Mona Kessel

09:50: Break + Discussion (Chair: Mick Denton)

10:30: Understanding flow channels

(20mins+5)

John Lyon

10:55: On the relationship between geomagnetic storms and radiation belts dynamics: A Van Allen Probes study versus local time and geocentric distance during magnetic storms.

(20mins+5)

Pablo Moya Fuentes

11:20: The association of auroral streamers with substorm onsets

(20mins+5)

Mike Henderson

11:45: Cross-energy coupling: how is energy transferred from low- to high-energy particles in the magnetosphere?

(20mins+5)

Clare Watt

12:10-12:30: Discussion (Chair: Tom Moore)

▪ SESSION 2 (Juan Valdivia and Lauren Blum)

15:30: Communication between the nightside and the dayside magnetosphere

(25mins+5)

Stephen Fuselier

16:00: Energy dependent dynamics of keV and MeV electrons in the slot and inner zone

(20mins+5)

Geoff Reeves

16:25: Causes and consequences of radiation belt electron precipitation

(20mins+5)

Lauren Blum

16:50: How do solar wind and ionospheres interact via reconnection?

(20mins+5)

Tom Moore

17:15: What are the magnetospheric drivers of the observed coupling of geomagnetic activity to the atmosphere?

(20mins+5)

Mark Clilverd

17:40: Outstanding questions in Saturn's magnetosphere

(20mins+5)

Michelle Thomsen

▪ 18:05:19:00 Evening Discussion 1. (Chairs: Reiner Freidel and Mike Liemohn)

“IS MOST MAGNETOSPHERIC PHYSICS ALREADY KNOWN?”

Tuesday 8th September

08:30: Logistics and meeting information

▪ SESSION 3 (Vania Jordanova and Gian Luca Delzanno)

08:35: What causes auroral arcs and why we should care?

(25mins+5)

Larry Kepko

09:05: Impacts of inward and outward ULF wave radial diffusion on the Van Allen belts: In, out, in, out, you shake it all about..... that's what it's all about!

(20mins+5)

Ian Mann

09:30: Overcoming uncertainties in the relation between source and aurora

(20mins+5)

Gerhard Haerendel

09:55: **Break + Discussion** (Chair: **Dan Weimer**)

10:30: Relevance of the thermally induced fluctuations in the magnetosphere

(20mins+5)

Juan AlejandroValdivia

10:55: Challenges in the understanding of auroral physics?

(20mins+5)

Craig Kletzing

11:20: Does the magnetosphere go to sleep?

(20mins+5)

Michael Hesse

11:45: A study of storm-time ULF waves and radiation belt electrons during different solar wind drivers

(20mins+5)

Kyle Murphy

12:10: Auroral oval mapping and the main problems of magnetospheric dynamics

(20mins+5)

Elizaveta Antonova

12:35-13:00: **Discussion** (Chair: **Gerhard Haerendel**)

13:30-18:00 EXCURSION TO CASTLE HOWARD

▪ 18:30: Evening Discussion 2. (Chairs: Rod Heelis and Dan Welling)

**“COMPOSITION IN THE IONOSPHERE/MAGNETOSPHERE:
WHAT DO WE NEED TO KNOW?”**

Wednesday 9th September

08:30: Logistics and meeting information

▪ SESSION 4 (Natalia Ganushkina and Kyle Murphy)

- 08:35:** Unanswered questions regarding solar wind - magnetosphere interaction
(25mins+5) **Nikolai Østgaard**
- 09:05:** What causes substorm onset? (20mins+5) **Jonny Rae**
- 09:30:** What controls the dayside reconnection rate? (20mins+5) **Steve Milan**

09:55: Break + Discussion (Chair: Bob McPherron)

- 10:30:** Onset and cessation of reconnection in the magnetotail, relation to substorms
(20mins+5) **Joachim Birn**
- 10:55:** SMILE: The Solar wind Magnetosphere Ionosphere Link Explorer
(20mins+5) **David Sibeck**
- 11:20:** A few unresolved problems in magnetospheric Physics uncovered by Cluster
(20mins+5) **Arnaud Masson**
- 11:45:** The injection region's formation and evolution: large- or small-scale?
(20mins+5) **Christine Gabrielse**

12:10: Discussion (Chair: Larry Lyons)

▪ SESSION 5 (Marina Stepanova and Lois Sarno-Smith)

- 14:00:** What determines when and where tail reconnection begins?
(20mins+5) **Bob McPherron**
- 14:25:** Do we really understand solar-wind/magnetosphere coupling?
(20mins+5) **Joe Borovsky**
- 14:50:** Physical nature of near-Earth magnetotail reconnection events
(20mins+5) **Vytenis Vasyliūnas**

15:15: Break + Discussion (Chair: Mark Clilverd)

- 15:40:** The role (or lack there of) of the magnetosphere in solar wind-magnetosphere coupling
(20mins+5) **Brian Walsh**
- 16:05:** Unsolved problems in ionospheric conductivity
(20mins+5) **Dan Weimer**
- 16:30:** What is the origin of low-energy electrons in the inner magnetosphere?
(20mins+5) **Mick Denton**

▪ 16:55: Evening Discussion 3. (Chairs: David Sibeck and Mike Henderson)

“HOW IMPORTANT ARE MAGNETOSPHERIC FEEDBACK MECHANISMS TO THE DAYSIDE RECONNECTION RATE?”

19:00-LATE

CONFERENCE BANQUET

Thursday 10th September

08.55: Logistics and meeting information

▪ SESSION 6 (Gang Lu and Colin Forsyth)

- 09:00:** What processes influence plasmaspheric refilling?
(25mins+5) **Dennis Gallagher**
- 09:30:** Open questions in radiation belt physics
(20mins+5) **Shrikanth Kanekael**
- 09:55:** How the fusion between physics and systems science can help us to understand solar wind-magnetosphere coupling
(20mins+5) **Misha Balikhin**
- 10:20: Break + Discussion (Chair: Craig Kletzing)**
- 10:50:** What causes precipitation of radiation belt electrons into the atmosphere?
(20mins+5) **Craig Rodger**
- 11:15:** EPT observations of flux enhancements and depletion of particle in the Radiation Belts after the March 17 event.
(20mins+5) **Graciela López Rosson**
- 11:40:** Quiet time relativistic electron pitch angle distributions in the inner magnetosphere
(20mins+5) **Reiner Friedel**
- 12:05:** Some outstanding problems in radiation belt and waves physics
(20mins+5) **Jacob Bortnik**
- 12:30: Discussion (Chair: Michelle Thomsen)**

13:00-18:30: FREE TIME (PUB WALK / FISHING...)

▪ 18:30-19:30: Evening Discussion 4 (Chairs: Jacob Bortnik and Craig Rodger)

**“BEYOND CRYSTAL BALLS: PREDICTING THE INNER
MAGNETOSPHERIC SYSTEM RESPONSES”**

(SCOSTEP/VarSITI/SPeCIMEN Session)

Friday 11th September

08.30: Logistics and meeting information

▪ SESSION 7 (Joachim Birn and Jone Peter Reistad)

08:35: Unsolved magnetospheric problems and what we can learn from global MHD simulations
(25mins+5) **Ramón López**

09:05: Turbulent transport and evolution of kappa distribution in the plasma sheet
(20mins+5) **Marina Stepanova**

09:30: Ionospheric outflow and the magnetosphere: a poorly understood, non-linear relationship
(20mins+5) **Dan Welling**

09:55: **Break + discussion** (Chair: **Michael Hesse**)

10:30: Issues concerning polar cap electric potential (field) saturation.
(20mins+5) **Bob Clauer**

10:55: What is the difference between a wave and a transient, and why does it matter for solar
wind-magnetosphere-ionosphere coupling? (20mins+5) **Michael Hartinger**

11:20: **Discussion** (Chair: **Ian Mann**)

▪ SESSION 8 (Arnaud Masson and Nadine Kalmoni)

13:00: Particle acceleration through wave-particle interactions
(20mins+5) **Lynn Wilson III**

13:25: Substorm-associated effects in the variations of low energy electron fluxes in the inner
magnetosphere: Does the substorm's strength matter?
(20mins+5) **Natalia Ganushkina**

13:50: Ionospheric signatures of magnetospheric convection
(20mins+5) **Rod Heelis**

14:15: **Break + Discussion** (Chair: **Joe Borovsky**)

15:00: The challenges associated with near-Earth nightside magnetospheric current systems
(20mins+5) **Mike Liemohn**

15:25: Energetic and Dynamic Coupling of the Magnetosphere and Ionosphere During
Geomagnetic Storms (20mins+5) **Gang Lu**

15:35: Outstanding inner magnetospheric questions and problem areas
(20mins+5) **Vania Jordanova**

TBC **Coach departs Hotel at TBC or walk to harbour.**

17:00-19:00: SEA CRUISE: Boat departs at 17:00 from harbour wall.

Saturday 12th September

09:00: Logistics and meeting information

▪ **SESSION 9 (Clare Watt and Jonny Rae)**

09:05: Future beam experiments in space with plasma contactors: how do we get the charge off the spacecraft? (20mins+5) **Gian Luca Delzanno**

09:30: Turbulence and reconnection in the terrestrial magnetotail (20mins+5) **Bogdan Hnat**

09:55: Unresolved and underappreciated issues in plasmaspheric physics regarding ion composition, wave-particle interactions, and plasmopause boundary studies (20mins+5) **Lois Sarno-Smith**

10:20: Break + Discussion (Chair: Geoff Reeves)

11:10: Combining long-term datasets to tackle unsolved problems in the magnetosphere (20mins+5) **Colin Forsyth**

11:35: Are all substorm onset arcs created equal? (20mins+5) **Nadine Kalmoni**

12:00: Meeting Summary: Where Next? (Chair: Mick Denton)