

# THE PLASMA PHYSICS OF THE MAGNETOSPHERE

Bra-Pollenzo, Italy, 2<sup>nd</sup>-7<sup>th</sup> June 2019

## Sunday, June 2<sup>nd</sup>

6:30-7:30 PM **Registration**

7:30-9:30 PM **Welcoming Buffet**

## Monday, June 3<sup>rd</sup>

### Session 1 – morning

**Chair: Gian Luca Delzanno**

8:15-8:30 AM. **Gian Luca Delzanno**

Welcoming remarks

8:30-9:00 AM. **Larry Kepko**

The source, significance, and magnetospheric impact of periodic density structures within stream interaction regions

9:00-9:30 AM. **Pablo Moya**

Dispersion properties and stability of kinetic Alfvén waves in the Earth's magnetosphere and the solar wind

9:30-10:00 AM. **Rod Heelis**

Characteristics of the Poynting Flux in the high-latitude ionosphere.

10:00-10:20 AM. Coffee break

10:20-10:50 AM. **Giovanni Lapenta**

Topographical studies of turbulent reconnection

10:50-11:20 AM. **Mike Liemohn**

Earth's geopauses: What are they, where are they, and why do they matter

11:20-11:50 AM. **Jacob Bortnik**

The use of machine learning as a tool for understanding and predicting magnetospheric dynamics

### Session 2 – afternoon

**Chair: Joe Borovsky**

2:00-2:30 PM. **Giuseppe Consolini**

High-latitude polar ionosphere: turbulence and plasma inhomogeneity

2:30-3:00 PM. **Joachim Birn**

On the contribution of dipolarizing flux bundles to the substorm current wedge and to flux and energy transport

3:00-3:30 PM. **Steve Fuselier**

High-Density  $O^+$  in the Outer Magnetosphere

3:30-3:45 Break (without coffee!)

3:45-4:15 PM. **Greg Cunningham**

Drift-averaged pitch-angle diffusion coefficients in non-dipolar magnetic fields

4:15-4:45 PM. **Gian Luca Delzanno**

On the cold plasma in magnetospheric physics: impact, issues with measurements and new space missions

4:45-5:15 PM. **Andreas Keiling**

Assessment of global Alfvén wave power in the auroral zone  
5:15-6:15 PM. **Discussion 1** (Italian style)

**Which measurements do we need for future progress?**

**Moderators: Lauren Blum and Mike Henderson**

**Tuesday, June 4<sup>th</sup>**

**Session 3 – morning**

**Chair: Marina Stepanova**

8:30-9:00 AM. **Jean-Francois Ripoll**

How hiss waves and the plasmasphere drive the quiet decay of radiation belts electrons

9:00-9:30 AM. **Juan Valdivia**

Thermally induced electromagnetic fluctuations and quasi-stability in the magnetosphere

9:30-10:00 AM. **Craig Kletzing**

Chorus Element Properties: Statistics from Automated Detection

10:00-10:20 AM. Coffee break

10:20-10:50 AM. **Matina Gkioulidou**

On the accumulation of  $O^+$  in the plasma sheet and inner magnetosphere: when, where, how?

10:50-11:20 AM. **Stefano Markidis**

Electron heating by Debye scale turbulence in magnetic reconnection PIC simulations

11:20-11:50 AM. **Antonius Otto**

Bow shock transients and ULF waves caused by solar wind dynamic pressure depletions

**Session 4 – afternoon**

**Chair: Mick Denton**

3:00-3:30 PM. **Maria Elena Innocenti**

Fully kinetic, semi-implicit simulations of temperature-anisotropy driven instabilities in the expanding solar wind with EB-iPic3D

3:30-4:00 PM. **Jesper Gjerloev**

Relating observations to processes: How to avoid flying blind

4:00-4:30 PM. **Victor Muñoz**

Fractality study of an MHD shell model for turbulent plasma driven by solar wind data

4:30-4:45 PM. Break (without coffee!)

4:45-5:15 PM. **Andrei Runov**

The mystery of the magnetotail current sheet

5:15-5:45 PM. **Qiugang Zong**

Magnetospheric response to interplanetary shock impact: Causes and consequences

5:45-6:15 PM. **Vadim Roytershteyn**

Towards global hybrid-kinetic modeling of magnetosphere: Insights from simulations of transient dynamics under quasi-radial IMF conditions

6:15-7:15 PM. **Discussion 2** (Italian style)

**The cold plasmas: Do we know enough about them?**

**Moderators: Craig Kletzing and Reiner Friedel**

## Wednesday, June 5<sup>th</sup>

### Session 5 – morning

**Chair: Juan Valdivia**

8:20-8:50 AM. **Lunjin Chen**

Two-dimensional particle-in-cell simulation of magnetosonic wave excitation in a dipole magnetic field

8:50-9:20 AM. **Joe Borovsky**

Plasma Systems Science: The Magnetosphere

9:20-9:50 AM. **Tommaso Alberti**

On the chaotic/complex dynamics of the magnetosphere

9:50-10:10 AM. Coffee break

10:10-10:40 AM. **Lynn Wilson III**

Electron energy partition across interplanetary shocks near 1 AU

10:40-11:10 AM. **Shri Kanekal**

Recent results from Van Allen Probes in radiation belt physics

11:10-11:40 AM. **Gerhard Haerendel**

On the energetics of active auroral arcs

**Excursion to the Royal Palace of Venaria Reale.**

**Departure: 12:00 PM**

Lunch and dinner provided.

## Thursday, June 6<sup>th</sup>

### Session 6 – morning

**Chair: Maria Usanova**

8:30-9:00 AM. **Mary Hudson**

Investigating the loss of ultra-relativistic electrons combining EMIC waves at low pitch angles with scattering due to chorus waves at high pitch angles

9:00-9:30 AM. **Brian Walsh**

Uncertainty stemming from the use of solar wind measurements for geospace inputs

9:30-10:00 AM. **Larry Lyons**

Coordinated observations of flow channel control of substorm onset, onset eastward and westward expansion, and the westward traveling surge

10:00-10:20 AM. Coffee break

10:20-10:50 AM. **Wayne Keith**

Circuit Analysis in the Magnetosphere

10:50-11:20 AM. **Marina Stepanova**

Variation of plasma pressure during strong geomagnetic storms and the problem of electron acceleration

11:20-11:50 AM. **Raluca Ilie**

The contribution of inductive electric fields to particle energization

### Section 7 – afternoon

**Chair: Hannu Koskinen**

3:00-3:30 PM. **Maria Usanova**

EMIC waves in long-term VERB simulations

3:30-4:00 PM. **Linda Hunt**

Infrared Radiation in the Thermosphere from 2002 to 2019

4:00-4:30 PM. **Slava Pilipenko**

Fine structure of substorm and geomagnetically induced currents

4:30-4:45 Break (without coffee)

4:45-5:15 PM. **Marty Goldman**

Multibeam ion energy transport

5:15-5:45 PM. **Geoff Reeves**

Identifying and Classifying Radiation Belt Enhancement Events

5:45-6:15 PM. **Reiner Friedel**

Substorm injections as seen by multiple GPS satellites

6:15-7:15 PM. **Discussion 3**

**Do we understand the kinetic physics and how important it is for global magnetospheric dynamics?**

**Moderators: Therese Moretto Jorgensen and Bill Lotko**

8:30-??? **BANQUET**

**Friday, June 7<sup>th</sup>**

**Session 8 -morning**

**Chair: Raluca Ilie**

8:30-9:00 AM. **Bill Lotko**

Global consequences of auroral acceleration: Micro informs macro

9:00-9:30 AM. **Mike Henderson**

Energetic particle injection and ground magnetic signatures associated with auroral streamers, auroral contact and substorm onset breakups

9:30-10:00 AM. **Eftyhia Zesta**

Impact of magnetospheric energy input on the Earth's upper atmosphere during geomagnetic storms

10:00-10:20 AM. Coffee break

10:20-10:50 AM. **Lauren Blum**

Coupling between EMIC waves, plasma, and energetic particles in the inner magnetosphere: Observations from the dual Van Allen Probes

10:50-11:20 AM. **Therese Moretto Jorgensen**

How does the magnetosphere go to sleep?

11:20:11:50 AM. **Michael Hesse**

On the reversibility of collisionless magnetic reconnection

**Session 9 – afternoon**

**Chair: Pablo Moya**

2:00-2:30 PM. **Enrico Camporeale**

Estimation of radiation belts' phase space density using Bayesian inference and deep learning

2:30-3:00 PM. **Mick Denton**

An empirical electron and ion flux model to 20 Earth radii

3:00-3:30 PM. **Seth Claudepierre**

Empirically estimated electron lifetimes in the Earth's radiation belts

3:30-3:45 PM. Break (without coffee!)

3:45-4:15 PM. **Melvyn Goldstein**

Reflection of the solar wind strahl near Earth's bow shock

4:15-4:45 PM. **Elizaveta Antonova**

Main features of magnetospheric dynamics in the conditions of pressure balance

4:45-5:15 PM. **Hui Zhang**

Hot flow anomalies and their geoeffects

5:15-6:15 PM. **Discussion 4** (Italian style)

**What are the outstanding questions of magnetospheric plasma physics?**

**Moderators: Gerhard Haerendel and Mary Hudson**

6:15-6:30 PM. Next conference and closing remarks