



**Second Circular** – Workshop of the International Space Science Institute (ISSI) and EUROPLANET RI

## GIANT PLANET MAGNETODISCS AND AURORAE

**26-30 November 2012**

### Convenors

Nick Achilleos	(University College London)
Chris Arridge	(Mullard Space Science Laboratory, Holmbury St Mary)
Fran Bagenal	(Laboratory for Atmospheric and Space Physics, Boulder)
Michel Blanc	(IRAP, Toulouse)
Norbert Krupp	(MPI for Solar System Research, Katlenburg-Lindau)
Philippe Louarn	(IRAPI, Toulouse)
Karoly Szego	(Wigner Research Centre for Physics, Budapest)

**Local organisation:** Jennifer Zaugg, ISSI, [jennifer.zaugg@issibern.ch](mailto:jennifer.zaugg@issibern.ch)  
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### Objectives of the Workshop

This workshop is to review current understanding in the field of giant planet magnetodiscs and aurorae and to identify key areas of research, especially in connection with the scientific planning and use of future space missions.

Following discussions by the Convenors, it is proposed that the Workshop will cover the following main themes:

1. Characterise and understand mass and energy momentum transport in magnetodiscs
2. Characterise how the solar wind influences magnetodiscs and the auroral responses to solar wind-driven dynamics

3. Determine how magnetic reconnection works in magnetodiscs, what are the effects on plasma transport, and what are the associated auroral responses to magnetic reconnection
4. Characterise the spectral and spatial properties of auroral emissions produced by magnetodisc dynamics – are there significant differences between solar wind- and internally-driven dynamics?
5. Determine the sources of local-time asymmetries in magnetodiscs

Short presentations by those attending will be structured around the above headings. This list could, subject to discussion and assessment at the Workshop, become the set of chapter headings for the ISSI-EPN book. All of those attending will be expected to contribute to one or more of the chapters or for the discussions during the talks.

### **Workshop Program**

The draft programme of the workshop is attached.

The webpage of the workshop is: <http://www.issibern.ch/workshops/giantplanet/>

### **Product**

The very important goal of the workshop will be to produce a reference book on the subject, to be published in the “Space Sciences Series of ISSI”, which will be simultaneously published as a volume of Space Science Reviews. The members of the WS Scientific Organizing Committee will also serve as Editors for the book.

The printed volume will be published after the workshop in the Space Sciences Series of ISSI by Springer editor (see [www.issibern.ch/publications](http://www.issibern.ch/publications)). The volume will be issued both as a hardcover book in the ISSI series and also as an issue of the journal Space Science Reviews. It is expected that a total of about 5 sections, submitted to the usual refereeing process will be published in the book. Chapters will be based on talks presented at the Workshop and will reflect the discussions that will be held among the participants during the Workshop. We expect that papers will be due about 3 months after the workshop so they can reflect the discussions during the workshop. All papers will be peer reviewed, and the volume is expected to appear about 12 months after the workshop.

### **Advice to Speakers**

The conveners would like to remind the speakers that ISSI workshops differ in many ways from other, larger gatherings called "workshop". The guiding spirit of

the ISSI workshops is interaction between the attendees who are representing, in this case, all aspects of the workshop topics. The resulting multi-author chapters should provide a broad view of the current status of this important discipline but, the Workshop should focus bot on reviewing the state-of-the-art, and on the future directions of the subject – what we are seeking to achieve in the future and what we need to do to get there. This latter aspect includes new missions (e.g. JUICE), new instrumentation and observing methodologies, new analysis techniques and the development of theory. With this in mind, presenters are encouraged to spend a fraction of their talks in addressing future directions and challenges and the barriers that need to be overcome. We anticipate that the extended discussion sessions will seek to emphasise also these aspects.

### **Location**

The Workshop will be held at the International Space Science Institute, Hallerstrasse 6, 3012 Bern, Switzerland.

### **Attendance & Funding**

This will be by invitation only with ~ 40 participants maximum including young scientists. There is no registration fee. ISSI-Europlanet will cover subsistence costs (hotel and meals) while in Bern. ISSI will be the sole administrative officer for all local issues.

### **Travelling to Bern**

Bern can be reached easily from two international airports: [Zurich \(ZRH\)](#) and [Geneva \(GVA\)](#). Direct intercity trains to Bern depart every half hour from inside the airport buildings; see [www.rail.ch](http://www.rail.ch) for detailed departure times. The travel time is ~1.5 hours from Zurich airport and ~2 hours from Geneva airport.

There is also a local airport (Bern, BRN <http://www.flughafenbern.ch/>), located a 20 minute shuttle ride from the city centre, with direct connections to Munich, Berlin Schönefeld, Hamburg, Amsterdam, London City, Vienna and Paris Orly.

Bern is connected to many European cities by fast intercity trains (e.g. TGV Paris-Bern in 4.5 hours, or Frankfurt-Bern 5 hours). Timetable information of trains within and around Switzerland can be found at [www.rail.ch](http://www.rail.ch). Also check out our website [www.issibern.ch/](http://www.issibern.ch/) for a few more travel tips such as links to city maps of Bern, weather forecasts, tourist information etc...

## **Hotel reservations**

A block booking has been made in city centre hotels for the Workshop. All participants at the workshop have already been requested to contact the workshop secretary, Jennifer Zaugg (Tel. +41-31-631-4896, Fax: +41-31-631-4897, email: [Jennifer.Zaugg@issibern.ch](mailto:Jennifer.Zaugg@issibern.ch)), to indicate their arrival and departure dates and times, as well as any special requests they may have (e.g. double room). Please note that all hotel reservations have to be made by the ISSI Secretariat.

A confirmation will be returned within a few days. Block bookings have been made in nearby hotels; please see <http://www.issibern.ch/localguide/location.html> for maps that indicate the location of ISSI and of the hotels (go to “hotels”, and near the bottom of the page “map of hotels”).

Please consult the homepage of ISSI for local matters ([www.issibern.ch](http://www.issibern.ch)).

# ISSI-EUROPLANET Workshop on “GIANT PLANET MAGNETODISCS AND AURORAE” 26-30 November 2012

**PRELIMINARY PROGRAMME: October 18, 2012**

**MONDAY 26 November, 2012**

*Notice: All presentations are 45' slots include 15' of questions*

08:30-09:00	Registration in ISSI, Hallerstrasse 6, 1 <sup>st</sup> floor	
09:00-09:15	Welcome and Introduction to ISSI and Workshop	TBD (two names, ISSI and EPN)

### Set the scene I

09:15-10:00	Title TBD	Denis Grodent
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### Session 1      Characterise and understand mass and energy momentum transport in magnetodiscs

**Chairman: TBD**

10:00-10:45	Review Talk	Nick Achilleos
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10:45-11:15      *Coffee break*

11:15-12:00	The interchange instability	Nicolas André
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12:00-12:45	First discussion: THE BOOK	
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12:45-14:00      *Lunch*

14:00-14:45	The neutral – plasma interaction	Peter Delamere
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14:45-15:30	Simulation of interchange and other instabilities in the Kronian Magnetosphere.	Robert Winglee
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15:30-16:00      *Coffee break*

16:00-16:45	Energetic Neutral Atoms and Planetary Ring Currents	Pontus Brandt
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16:45-17:30	Observational wave signatures of mass-loading in magnetodisc systems	Xochitl Blanco-Cano
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17:30              *Welcome reception*

**TUESDAY 27 November, 2012**

**Session 2**      **Characterise how the solar wind influences magnetodiscs and the auroral responses to solar wind-driven dynamics**

**Chairman: TBD**

9:00-9:45	Review Talk	Fran Bagenal
9:45-10:30	Structures & Dynamics: Supra-thermals	Chris Paranicas
10:30-11:00	<i>Coffee break</i>	
11:00-11:45	Magnetopause boundary processes	Adam Masters
11:45-12:30	Dynamics of the Polar Aurora	Katerina Radioti
12:30-14:00	<i>Lunch</i>	
14:00-14:45	Dynamics of the Main/Rotation Aurora	Bertrand Bonfond
14:45-15:30	Ionosphere-Magnetosphere Coupling	Licia Ray
15:30-16:00	<i>Coffee break</i>	
16:00-16:45	Global modeling of Saturn's magnetosphere	Xianzhe Jia
16:45-17:30	Auroral Response to Solar Wind Forcing	Jonathan Nichols

**WEDNESDAY 28 November, 2012**

**Set the scene II**

09:00-10:45	<b>Title TBD</b>	<b>Margaret Kivelson</b>
<b>Session 3</b>	<b>Determine how magnetic reconnection works in magnetodiscs, what are the effects on plasma transport, and what are the associated auroral responses to magnetic reconnection</b>	
		<b>Chairman: TBD</b>
9:45-10:30	Review Talk	<b>Philippe Louarn</b>
10:30-11:00	<i>Coffee break</i>	
11:00-11:45	Reconnection in disc/tail (Saturn/Cassini)	<b>Caitriona Jackman</b>
11:45-12:30	Reconnection at Jupiter (Jupiter/Galileo)	<b>Satoshi Kasahara</b>
12:30-14:00	<i>Lunch</i>	
14:00-14:45	Numerical simulation, disc/tail, link with aurora	<b>Keiichiro Fukazawa</b>
14:45-15:30	Mapping Jupiter's auroral features to magnetospheric	<b>Marissa Vogt</b>
15:30-16:00	<i>Coffee break</i>	
16:00-16:45	Giant planet magnetodisk dynamics from sc current sheet crossings	<b>Nicolas André</b>
16:45-17:30	Transport in disc	<b>Elena Kronberg</b>
19:30	<i>Workshop Dinner</i>	

*Location/Restaurant will be announced at the Workshop*

**THURSDAY 29 November, 2012**

**Session 4**      **Characterise the spectral and spatial properties of auroral emissions produced by magnetodisc dynamics – are there significant differences between solar wind- and internally-driven dynamics?**

**Chairman: TBD**

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09:00-09:45	Review Talk	Norbert Krupp
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09:45-10:30	Response of the ionosphere to auroral forcing at the giant planets	Marina Galand
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*10:30-11:00 Coffee break*

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11:00-11:45	Modeling of Jupiter and Saturn auroral emissions	Chihiro Tao
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11:45-12:30	Spectral and spatial properties of the X-ray aurora of the giant planets	Graziella Branduardi-Raymont
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*12:30-14:00 Lunch*

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14:00-14:45	Saturn to Jupiter magnetospheric dynamics : a diagnosis from radio emissions	Laurent Lamy
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14:45-15:30	Open-closed field line boundaries	Sarah Badman
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*15:30-16:00 Coffee break*

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16:00-16:45	Simultaneous infrared and ultraviolet observations of Saturn's aurora	Henrik Melin
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**FREE TIME**

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FRIDAY 30 November, 2012

**Session 5**      **Determine the sources of local-time asymmetries in magnetodiscs**

**Chairman: TBD**

09:00-09:45	Review Talk	Chris Arridge
09:45-10:30	Auroral evidence for local-time asymmetries	Denis Grodent
10:30-11:00	<i>Coffee break</i>	
11:00-11:45	Modelling and observations of local-time asymmetries in magnetic fields and magnetospheric currents	Krishan Khurana
11:45-12:30	Local time asymmetries in energetic particles	Nick Sergis
12:30-13:15	Magnetospheric convection at Jupiter and Saturn	Mark Kane
13:15-13:45	Final discussion: THE BOOK	

End of Workshop