

Second Circular – Workshop of the International Space Science Institute (ISSI)

18 November 2014

Solar magnetic fields: from measurements towards understanding

Convenors:

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Date: 12 – 16 January 2015

Context:

- At a Forum on "Solar activity and the solar cycle: future developments and applications" held in November 2012, the International Space Science Institute (ISSI) considered how it can contribute to a better understanding of the physics of the solar activity cycle. Two workshops were recommended for implementation to the Directorate of ISSI. The first, "The solar activity cycle: physical causes and consequences" was held in November 2013. Plans for the second Workshop were presented to the Science Committee of ISSI in November 2013. The Directorate of ISSI agreed to hold this Workshop under the title "Solar magnetic fields: from measurements towards understanding" in early 2015.

Objective of the Workshop:

- Solar activity is driven by the solar magnetic field. The Workshop will focus on the observational and measurement techniques of magnetic fields and the complex processes that control the variability of solar magnetic phenomena. The objective is to review the current status of the field and to identify the links between the observational capabilities and the elaboration of accurate and predictive models of solar variability on all temporal and spatial scales.

The topics covered in the Workshop:

- History of solar magnetic observations from Hale to the present
- Basic physics of solar magnetic field measurements
- Photospheric, chromospheric and coronal magnetic field measurements - techniques, interpretation, capabilities and limitations
- Coronal magnetic field models - Potential Field Source Surface models and beyond and the extension to the heliosphere
- Heliospheric magnetic field measurements
- Magnetoconvection as a mechanism for creating fine scale structure, sunspots, turbulent fields (local dynamo)
- Flux emergence and decay, large-scale flows and magnetic field transport, (meridional circulation), diffusion, active regions evolution, polarity reversals
- Origin and variability of the solar magnetic field, status and perspectives of dynamo theories (global vs local dynamos)
- Requirements and perspectives for solar magnetic field measurements

A draft programme is included with this First Circular. Invited authors are requested to propose more explicit titles for their talks.

Product of the Workshop

Following the Workshop, its output will be published as a volume in the Space Science Series of ISSI by Springer, in parallel with the publication of the papers in Space Science Reviews. It is expected that a total of about 15 to 20 review style and quality papers, submitted to the usual refereeing process will be published in the book. Papers will be based on talks presented at the Workshop and will reflect the discussions that are encouraged to be held among the participants during the Workshop, with emphasis on interdisciplinarity. During the Workshop, the Convenors will encourage the participants to formulate proposals for the review papers and to suggest a list of authors. There will be time for informal get-togethers of collaborators. By the conclusion of the Workshop, it is expected that a list of papers, with provisional titles and authors will be agreed by the participants. A realistic schedule for the publication of the contributions will be confirmed at the conclusion of the Workshop, but the deadline is expected to be end of June 2015.

Advice to the speakers

The convenors 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 interdisciplinarity - contributors are invited from a range of communities to interact during the workshop, so that the broad synthesis of the topics covered can emerge in the published contributions the ISSI volume of the workshop. In your talks we would like you to focus both on the topic we have asked you to speak on (as opposed to the topic it is easiest for you to speak on), and to consider broad implications of your topic for the cyclic nature of solar activity, with special emphasis on

the 11- and 22 year cycles. Longer term variability is also of interest, but primarily in shedding light on the cyclic activity. While many of the attendees will not be entirely familiar with your own work, all the attendees are solar physicists and will have views on how your work can relate to other problems. Take a bit of time to outline what we don't know, and how this lack of knowledge may be resolved. Please make sure that your talk is NO LONGER than 25 minutes, so that at least three or four immediate questions can be asked. The Workshop's environment is suitable for off-line discussions.

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

Attendance: by invitation only, ~ 40 participants maximum.

Young scientists: Under its special programme of supporting young scientists, ISSI will invite (in addition) 4 to 6 early career scientists, within 2 years of their PhD, to take a full part in the Workshop.

Funding: ISSI will provide the subsistence costs (hotel and a per diem to cover meals) to all participants, but not the travel costs. There will be no registration charge for the Workshop.

Equipment available at ISSI

The ISSI Seminar Room, where the Workshop will be held, is equipped with a computer, a projector for electronic presentations with a big screen, a video/DVD player, an overhead projector and a whiteboard. The seminar room has high-speed wireless connection (either using EDUROAM or ISSI's own credentials) and the standard Ethernet connection using RJ45 cables. The institute provides a heterogeneous workstation environment with several computers available to be used by our visitors (Windows, Macintosh and Linux). A photocopy machine, two scanners, two printers and TV are also available as well as a range of electrical adapters for the Swiss system.

Participants who wish to bring their own notebook computers will be able to connect with the Internet using one of the options mentioned above. You will also be able to connect with the projector from your own notebook. If you have any questions or need help in computer related matters, please contact Saliba F. Saliba saliba@issibern.ch.

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 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 at a 20 minute shuttle ride from the city centre, with (seasonally dependent) direct connections to Munich, Berlin Schönefeld, Hamburg, Amsterdam, Vienna and Paris Orly and others.

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. Also check out our website 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 are requested to contact the workshop secretary, Jennifer Fankhauser (Tel. +41-31-631-4896, Fax: +41-31-631-4897, email: Jennifer.Fankhauser@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 done 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").

Schedule:

Formal invitations and First Circular:	15 June 2014
Registration deadline:	31 July 2014
Second Circular and final program:	18 November 2014
Workshop:	12 - 16 January 2015
Contributions will be due:	30 June 2015