

Second Circular – Workshop of the International Space Science Institute (ISSI)  
15-04-2020

## **Probing the Earth's deep interior using in synergy observations of the Earth's gravity and magnetic fields, and of the Earth's rotation**

Date: 1 – 4 September 2020

Location: International Space Science Institute (ISSI), Hallerstrasse 6, 3012 Bern, Switzerland

Workshop website: <http://www.issibern.ch/workshops/deepearth/>

Conveners:

Aenny Cazenave	(ISSI, Switzerland & LEGOS, Toulouse, France)
Mioara Manda	(CNES, France)
Veronique Dehant	(Royal Observatory, Brussels, Belgium)
Lorena Moreira	(ISSI, Switzerland)

Local organisation: Alexandra Lehmann (secretary) – [Alexandra.Lehmann@issibern.ch](mailto:Alexandra.Lehmann@issibern.ch)  
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Summary and main objectives of the Workshop:

During the past two decades, space missions (e.g., GOCE, GRACE and Swarm) have been developed by space agencies in Europe and the USA to measure the Earth's gravity and magnetic fields, and their spatio-temporal variations. These successful missions have already provided a wealth of groundbreaking results about the permanent and time-variable gravity and geomagnetic fields of the Earth. However, more can be learned about the Earth's structure by combining data of the Earth's gravity and magnetic fields, together with Earth's rotation data routinely measured using space geodesy techniques. Using these data in synergy will represent a unique way to further investigate the physics of the deep Earth's interior. In addition to the well-known correlation between Earth rotation and magnetic field observed at decadal time scale, recent studies have reported unexpected correlation between spatio-temporal changes of the gravity field and of the magnetic field, also at decadal time scale, that may result from processes occurring in the liquid core and at the core-mantle boundary.

This workshop will be the opportunity to investigate emerging science in this field, bringing together scientists from different horizons and broad expertise, including in the domain of gravity and magnetic data analysis, the Earth's rotation, and geophysical modeling and interpretation of the observations in terms of the deep Earth' structure.

Outcomes of the Workshop:

An important outcome of the workshop is a book published in the Space Sciences Series of ISSI by Springer (SSSI, see [www.issibern.ch/publications](http://www.issibern.ch/publications)). This volume is not intended to be the proceedings of the Workshop, but a collection of in-depth peer-reviewed papers informed by the contributions and discussions at the Workshop. It should provide a coherent picture of the current state of the subject. The papers are both published in the hardcover book (in the Space Science Series of ISSI) and individually in a special issue of the *Surveys in Geophysics* journal as soon as they are reviewed and accepted. We aim for submitting the papers within 3-6 months after the workshop. While several oral presentations are allocated

to each session, we would like to encourage the production of broad overview papers on a few given topics, co-authored by the speakers who have contributed during the corresponding sessions. The journal issue and the SSSI volume are expected to appear about 12-15 months after the workshop.

#### Expectation of the participants:

We expect from you an oral presentation of about 20 minutes (+ 10 minutes for questions) and an active participation during plenary discussions. Participants are also expected to contribute to the writing of the overview/review papers to be published later on after the workshop in Surveys in Geophysics and the SSSI volume.

Attendance: This Workshop is by invitation only with a limited number of participants (maximum 40 to 45).

#### Early career research scientists

Under its special program for supporting early career research scientists, ISSI invites a few early career scientists, within two years of their PhD, to take full part in the Workshop.

Invitation letter: If you need an official invitation letter, please contact directly Alexandra Lehmann ([Alexandra.Lehmann@issibern.ch](mailto:Alexandra.Lehmann@issibern.ch)).

Funding: ISSI provides the subsistence costs (hotel and per diem to cover meals) to all participants while in Bern, and deals with all organizational matters such as reservations, reimbursements (please contact directly Alexandra Lehmann) and computer issues. However, except for conveners, ISSI is not in a position to cover travel expenses. There is also no registration fee for the Workshop.

#### 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 <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 minutes shuttle ride from the city center, 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 <http://www.rail.ch>. Also check out our website <http://www.issibern.ch> for a few more travel tips such as links to city maps of Bern, weather forecasts, tourist information.

#### Hotel reservations

A block booking has been made at the hotels Arabelle and Kreuz in city center for the Workshop. All participants at the workshop are requested to contact the workshop secretary, Alexandra Lehmann (Tel. +41-31-631-4896, Fax: +41-31-631-4897, email: [alexandra.lehmann@issibern.ch](mailto:alexandra.lehmann@issibern.ch)), to indicate their arrival and departure dates and times, as well as any special requests they may have (e.g. double room). A confirmation will be returned within a few days after your request. Please note that all hotel reservations have to be made by the ISSI Secretariat. 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:

<b>First Circular:</b>	<b>6 January 2020</b>
<b>Second Circular &amp; Final programme</b>	<b>15 April 2020</b>
<b>Registration &amp; Hotel Reservation Deadline:</b>	<b>15 May 2020</b>
<b>Workshop Date:</b>	<b>1 – 4 September 2020</b>