

Perugia, Italy July 2-13 2007

SECOND CIRCULAR



Ministry of the Environment
and Land Protection



Umbria Region



Province of Perugia



City of Perugia



Research Institute of Oceanography
and Experimental Geophysics



Regional Tourist Board



Umbria Fiere S.p.A.

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Introduction

The Italian scientific community under the aegis of the National Research Council and with the patronage of relevant national, regional and local authorities will have the pleasure to host the XXIV General Assembly of the International Union of Geodesy and Geophysics in the city of Perugia scheduled for July 2-13, 2007.

The Local Organising Committee is working hard to endow the proverbial Italian touch to the Assembly by creating an atmosphere of originality which will combine the well-known historical Etruscan and Roman heritage with a modern flair.

The present Second Circular is an update of the First Circular and introduces the Program of the General Assembly, including the call for papers. It also provides preliminary information on conference arrangements including a general description of the city of Perugia and its environs, session venues, travel guidelines, grant application and registration procedures. The circular is being delivered through hard copies and posted at the official website; it is also linked to other relevant sites of IUGG for subsequent online updates.

The Third Circular will follow in due course with full details regarding schedules of meetings and sessions, registration, accommodation, scientific field trips, accompanying persons programs, social events and various touring facilities.

If you have any requests and comments, feel free to contact us at:

Secretariat of IUGG2007
c/o Research Institute for Geo-Hydrological Protection
National Research Council
Via della Madonna Alta 126
06128 Perugia ITALY
Fax: +39 75 5014420

e-mail: secretary@iugg2007perugia.it
Website: www.iugg2007Perugia.it

The IUGG2007 Secretariat

The Secretariat of IUGG2007 is located at the Research Institute for Geo-Hydrological Protection of the Italian National Research Council (IRPI-CNR) in Perugia.

The CNR is the coordinating focal point for all activities carried out in Italy for the diffusion of initiatives by international institutions operating in the sector of water resources and soil conservation (UN, UNESCO, FAO, WMO, WHO, IAHS, ICID, IAEA, IUGG), and it promotes international projects and programs in their relative sectors of competence.

Local Organizing Committee

The Local Organising Committee (LOC) consists of members representing many different scientific and political institutions. Among them:

- Italian National Research Council (CNR),
www.cnr.it
- Research Institute for Geo-Hydrological Protection - CNR,
www.irpi.cnr.it
- University of Perugia,
www.unipg.it
- Ministry of Environment and Land Protection,
www.minambiente.it
- Umbria Region,
www.regione.umbria.it
- Province of Perugia,
www.provincia.perugia.it
- City of Perugia,
www.comune.perugia.it
- Research Institute of Oceanography and Experimental Geophysics,
www.ogs.trieste.it
- Regional Turist Board,
www.umbria-turismo.it
- Umbria Fiere S.p.a.
www.umbriafiere.it

Chairman Lucio Ubertini
Director of Research Institute for Geo-Hydrological Protection - CNR

HOSTING INSTITUTIONS AND PATRONAGES

At the National Level:

The National Research Council (CNR) is a public organization which plays a central role in the field of scientific and technological research in Italy and whose original institution goes back to the year 1923. www.cnr.it.

Local level at Perugia

Research Institute for Geo-Hydrological Protection (IRPI) of the National Research Council; research activities and study programs of IRPI comprise prediction and mitigation of natural risks, evaluation of environmental quality and the control of degradation processes, prediction of medium and long term changes.

University of Perugia;

the University of Perugia was founded in MCCCVIII and it is one of the most ancient Italian Universities. In 2008 the University will be celebrating its VII century of activity.

Official Support and Patronage:

- Government of Italy through its relevant ministries such as:
 - Ministry of the Environment and Land Protection,
 - Ministry of Education, University and Research,
- Regional Government of Umbria,
- Provincial Government of Perugia,
- Perugia Municipal Council.

THE CITY OF PERUGIA

Perugia City and its Environs

Perugia, the capital city of the region of Umbria, is a lovely hill-town which lies at the center of Italy. Perugia has easy access from Florence and Rome as well as from Ancona and the Adriatic Coast by road and rail. Umbria is affectionately regarded to as "the green heart of Italy". Perugia is a city with a great past, antique history and illustrious traditions. At the



THE CITY OF PERUGIA - CONFERENCE VENUES
venues@iugg2007perugia.it

same time, it has been projected towards the future, thanks to an innovative and original model of development, as for example in the decisive sector of mobility.

The history of Perugia is embedded into the roots of the various cultures of the first peoples who inhabited Central Italy. It was an Etruscan city, after Roman, are then a free medieval Commune, then again part of the State of the Church, up to the Unitary State of Italy. Every historical époque left important architectural imprints: hydraulic works and



the Etruscan walls, Roman gates, up to the Great Fountain and the Palace of the Priors (the most important structure of the Middle Age) and to the pictorial Renaissance works of Collegio del Cambio (College of Change). In reality, the historical Center of Perugia, in its entirety, is a splendid epitome of arts and civility of Italy. It combines natural beauty with both medieval and modern architectural interest. There are many important museums, amongst which are: the Archaeological Museum and the National Gallery, with a collection of Umbrian and Tuscan paintings from the Middle Ages to the Renaissance and considered as one of the most important and richest in Italy.

Perugia has progressed well in the last decades while still perserving the beauty of its landscape, the comfortable hospitality of its countryside, many artistic testimonies spread all over its territory which is characterized, in an atypical manner, by the presence of historical centers defined as "Minor". Minor, may be by dimension but certainly not by their aesthetic and historical values. Perugia is also the central heart of Umbria, a territory which comprises realities like Assisi, the Trasimeno lake, Gubbio, Todi, Spello, just a few minutes' drive away.

Perugia today is an important cultural center with two universities: the University of Perugia which is looking forward to the celebration of its 700th anniversary in 2008 and the University for Foreigners which makes Perugia a crossroad for students of all nationalities and races. It is a vivacious and a hospitable city, attentive at cultural cohesion. It is a city where many choose to live and work intrigued by its human dimension and measure, by its efficient services and by the quality of life. Finally, it is a city which offers remarkable attractions for a pleasant stay for work or for tourism. Perugia and the Umbria region are abound with a wide variety of entertainment and concerts (Umbria Jazz in Perugia and The Festival of Two Worlds in Spoleto) as well as theatres, cinemas, exhibitions and other cultural events.

The Venues

The entire city of **Perugia** will feel the impact of the General Assembly. The conference events (sessions, workshops, lectures, symposia) will take place on the campus of the University of Perugia. The Rectorship, the Faculties and the Multifunctional center will be mainly involved.

Rocca Paolina is an underground fort built as residence of the Pope's governor during the State of the Church and presently serves as an exhibition space and also, through a series of escalators, as a connecting conduit between lower Perugia and the higher city center. The space here shall be used for poster sessions and will offer the populace the occasion to become familiar with the conference.

Umbria Fiere is an Exhibition Complex outside the city which will serve as a converging point mainly for evening social events as supplementary activities after the expected heavy day at the conference center. Such activities can include special exhibitions on both antique and modern equipment and also for special local and regional gourmet dinners at very affordable prices.



CONFERENCE VENUES
venues@iugg2007perugia.it



THE INTERNATIONAL UNION OF GEODESY AND GEOPHYSICS (IUGG)

The International Union of Geodesy and Geophysics (IUGG) is a non-governmental, scientific organization, established in 1919. The shape of the Earth, its gravitational and magnetic fields, the dynamics of the Earth as a whole and of its component parts, the Earth's internal structure, composition and tectonics, the generation of magmas, volcanism and rock formation, the hydrological cycle including snow and ice, all aspects of the oceans, the atmosphere, ionosphere, magnetosphere and solar-terrestrial relations, and analogous problems associated with the Moon and other planets. IUGG encourages this knowledge to the aid of society fosters, such as mineral resources, mitigation of natural hazards and environmental preservation.



IUGG
www.iugg.org

Rationale

Life depends on the bounties of the Earth, oceans, and atmosphere, yet often these elements turn against us. Each year natural disasters, and disturbances in the Earth's magnetic field can trigger slight disturbances to mass destruction upon society. Studies of the Earth and its environment in space are helping scientists anticipate and warn about such natural disasters to help keep people out of harm's way. Studies revealing the secrets of the Earth's natural resources can improve the quality of life for our growing populations. Indeed scientific understanding of the Earth's processes can help us reduce our own destructive impact on the environment and help promote sustainable management of its resources.

Objectives and Activities of IUGG

IUGG encompasses seven semi-autonomous International Associations that address different disciplines of earth science. Through these Associations, IUGG promotes and enables research in the geosciences by providing a framework for collaborative research and information exchange. Scientific meetings allow geodesists and geophysicists from all countries of the world to discuss their respective methodologies, results, and hypotheses and to plan collaborative research projects. Publications, schools, and videos instruct researchers, students, technicians, and the public on issues such as environmental protection and human safety. The IUGG statute provides rules of scientific definition, procedure, and practice, international reference systems, and free exchange of data. And finally, resolutions passed by assemblies of IUGG and its International Associations promote issues of science policy on which members agree. IUGG is one of more than 25 scientific unions adhering to the International Council for Science (ICSU). ICSU provides a global forum for scientists to exchange ideas and information and to develop standard methods and procedures for all fields of research. IUGG brings expertise on Earth studies from researchers in its International and Inter-Association Commissions. As a member of ICSU, IUGG strongly supports its policy of non-discrimination by affirming the rights and freedom of scientists throughout the world to engage in international scientific activity without limitation by such factors as citizenship, religion, creed, political stance, ethnic origin, race, colour, language, age, or gender.

Research Topics and Structure of IUGG

By their very nature, physical, chemical, and mathematical studies of the Earth and its environment in space require a high degree of international co-operation as well as effective central co-ordination.

As the co-ordinating body among the seven semiautonomous International Associations, IUGG has initiated and supported collaborative scientific studies about the shape of the Earth; the nature of its gravitational and magnetic fields; the dynamics of the Earth and its component parts; the Earth's internal structure, composition, and tectonics; the generation of magmas; volcanism and rock formation; the hydrological cycle, including snow and ice; the physics and chemistry of the oceans; the atmosphere, the ionosphere, the magnetosphere, and solar-terrestrial relations; and analogous problems associated with the Moon and other planets.



IUGG is supported by its Member Countries but is open to all scientists studying any aspect of the Earth as a physical system. Member countries are distributed throughout the world including Africa, the Americas, Asia, Europe, and Oceania. In 2000, the 75 member countries of IUGG reaped the benefits of representation at ICSU and all the activities conducted by the associations.

Most Member Countries set up an IUGG National Committee within their national academy of science or other scientific body. The National Committees name official correspondents to the Associations and select national delegates to meetings of the IUGG Council. The Council meets during the General Assemblies (held every four years) and conducts IUGG business such as electing officers (the Bureau), approving the quadrennial budget, processing new member applications, and enacting changes to the IUGG Statutes and By-Laws.

Scientists from Member Countries, who are chosen by their peers, volunteer their time to administer IUGG and its seven International Associations. Any scientist may attend Research Symposia and General Assemblies where scientists meet face-to-face to discuss topics of common interest. They share new scientific insights, technical successes and difficulties, and explore opportunities for new research and mutual scientific advancement. Several interdisciplinary committees are also convened to address problems spanning several research areas. IUGG helps bring together young researchers from developing countries to many of these meetings.

THE INTERNATIONAL ASSOCIATIONS OF IUGG

IUGG provides member countries with representation to ICSU and co-ordinates activities among seven semi-autonomous International Associations, including:

International Association of Geodesy (IAG)

www.iag-aig.org

International Association of Geomagnetism and Aeronomy (IAGA)

www.iugg.org/IAGA/

International Association of Hydrological Sciences (IAHS)

www.cig.ensmp.fr/~iahs/

International Association of Meteorology and Atmospheric Sciences (IAMAS)

www.iamas.org

International Association for the Physical Sciences of the Oceans (IAPSO)

www.iugg.org/iapso/

International Association of Seismology and Physics of the Earth's Interior (IASPEI)

www.iaspei.org

International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI)

www.iavcei.org

Owing to the interactive nature of the subject fields addressed by the Union's Associations, a number of Union Commissions have been established that promote the study of particular interdisciplinary problems. At present, the following bodies are active and are actively contributing to the 2007 Scientific Program. Commission on Geophysical Risk and Sustainability (GeoRisk); Commission on Mathematical Geophysics (CMG); Committee on the Study of Earth's Deep Interior (SEDI); Commission on Cryospheric Sciences (UCCS). Web sites for each Commission are listed on the IUGG website.

IUGG and its International Associations and Commissions reach out to scientists across the boundaries of country and discipline to increase scientific understanding of the Earth and to apply that knowledge for the benefit of society. In addition to serving science, as all professional societies do, IUGG and the Associations also work to enable science.

Participants enable science under IUGG in a number of ways. They form a consensus on the best investigations to promote our understanding, given natural and political constraints. The International Associations of IUGG work to set standards for research and agree on definitions and algorithms, such as the Manual of Seismological Observatory Practice or the Guide for Magnetic Repeat Station Surveys. Participants pass resolutions on important issues where all agree, such as the vote to support the Nuclear Test Ban Treaty. Associations make research visible to the international scientific community, to government agencies, to industry, and to the public in general through their education activities.

These activities include classes, workshops, handbooks, manuals, guides for accepted practice, maps, videos, and published surveys. In addition, several associations work to have important printed materials translated into several languages to increase their applicability. In these ways, IUGG and the Associations enable science by justifying public support for research in Earth systems.

The Associations also play a special role in bringing state-of-the-art science to all the countries of the world. This is done primarily through meetings, workshops, and assemblies that are often held in countries that do not normally host such scientific meetings, for example, Vietnam or Ecuador. The Associations attract young scientists, particularly those from developing countries, and nurture their participation as scientists and as leaders by subsidizing their participation in Symposia and General Assemblies.

The Associations convene their own General Assemblies and Symposia, often in partnership with one another, and, like IUGG, are managed by a Bureau and Executive Committee whose members are elected during their General Assemblies. Through IUGG, Association representatives help direct worldwide interdisciplinary projects such as the ICSU Scientific



Committee on the Lithosphere (SCL) and the International Lithosphere Program (ILP). Scientists from Member Countries serve on IUGG Regional Co-ordinating Committees including the Himalayas, Andean, and Europrobe Committees. They can also serve on the Co-ordinating Committee on Continental Drilling, the International Commission for Earth Sciences in Africa, and the Committee on Interdisciplinary Lithospheric Surveys.

Benefits to Member Countries of IUGG include representation on international interdisciplinary bodies established under ICSU, UNESCO, and other scientific organizations.

Opportunities for international leadership includes establishing scientific policy, setting standards, guiding programs, and convening symposia benefit from publications and educational activities of International Associations Professional enrichment, personal contacts, cultural exchange.



General Assemblies of the IUGG

IUGG holds General Assemblies at four-year intervals, and each of its Associations organises Scientific Assemblies as well as topical symposia in the intervals between General Assemblies. The first General Assembly of the Union was held in 1922. IUGG is committed to the principle of free exchange of data and knowledge among nations, and encourages unreserved scientific participation by all peoples.

IUGG Administration

The Bureau of the Union

President: Uri SHAMIR (ISRAEL)
 Vice President: Tom BEER (AUSTRALIA)
 Secretary General: JoAnn JOSELYN (USA)
 Treasurer: Aksel W. HANSEN (DENMARK)
 Members: Yun-tai CHEN (CHINA)
 Harsh GUPTA (INDIA)
 Ali A. A. TEALEB (EGYPT)

Not voting Members of the Bureau

Assistant Secretary Gen.: Katina ROGERS (USA)
 Assistant Treasurer: Anders SVENSSON (DENMARK)

Executive committee

Past President: Masaru Kono (JAPAN)
 The Presidents of the Associations:
 IAG: Gerhard BEUTLER (SWITZERLAND),
 IAGA: Charles BARTON (AUSTRALIA),
 IAHS: Arthur J. ASKEW (AUSTRALIA),
 IAMAS: Michael C. MacCRACKEN (USA),
 IAPSO: Shiro IMAWAKI (JAPAN),
 IASPEI: E. Robert ENGDAHL (USA),
 IAVCEI: Oded NAVON (ISRAEL).

Secretaries General of the Associations

IAG: C. Christian TSCHERNING (DENMARK)
 IAGA: Bengt HULTQVIST (SWEDEN)
 IAHS: Pierre HUBERT (FRANCE)
 IAMAS: Roland LIST (CANADA)
 IAPSO: Fred CAMFIELD (USA)
 IASPEI: Peter SUHADOLC (ITALY)
 IAVCEI: Steve McNUTT (USA)

XXIV IUGG GENERAL ASSEMBLY

Welcoming Ceremony

The XXIV IUGG General Assembly will be held in Perugia from July 2nd to July 13th 2007. There are currently many proposals for the venue of the opening ceremony. Among the many fascinating locations the mostly likely venue at the moment are: the Palaevangelisti sports Stadium, S. Giuliana Stadium and the Umbria Fiere Exhibition Center. All these locations can accommodate conferences and events of several thousands in size. The opening ceremony will be followed by a reception to welcome all participants.

Venues

The entire city of Perugia will feel the impact of the General Assembly. The conference events (sessions, workshops, lectures, symposia) will take place on the campus of the University of Perugia. The Rectorship, the Faculties and the Multifunctional center will be mainly involved. The poster session and special events will take place in the historical center of the city: Rocca Paolina, City Hall, etc.

Accommodation

Various standards of accommodation will be available in Perugia. Accommodation ranges from tourist class hotels, to 5-star rating hotels. A full listing with costs and booking conditions will be made available in the upcoming Third Circular.

Accompanying Persons Program

A varied social program will be available to all accompanying persons. The wonderful cultural and natural resources of the city and its surrounding towns (Assisi, Spello, Orvieto, Spoleto and others) will be some of the destination sites. Details will be announced in the Third Circular.

Poster Session

The Poster session will be held in the halls of Rocca Paolina, a medieval fort in the center of Perugia, after the oral sessions. Details will be announced in the Third Circular.

Exhibition

The General Assembly will feature an exhibition with displays of instrumentation equipment, computer software programs and books as well as booths of various associations.

Multifunctional Info Center

A fully-equipped Multifunctional Info Center and Registration point will be set up in the recreational area "100dieci" located beneath the Cafeteria of the Campus.



XXIV GENERAL ASSEMBLY INFORMATION
secretary@iugg2007perugia.it

TRAVEL AND VISA INFORMATION

Please bear in mind that these are mere guidelines, for more thorough information contact the Italian Embassy or Consulate in your country and/or the local Authorities.

Passport and Visa

As of October 26, 1997, Italy adheres to the Schengen Agreement.

Citizens of countries not adhering to this agreement may be allowed entry to Italy on the following conditions:

- Entry must be at regular customs,
- Valid passport or equivalent travel documents acknowledged by Italian authorities,
- Papers proving the purpose of the voyage and stating means of transportation,
- Financial information must be provided as to how travel, accommodation and local expenses will be met,
- Valid visa, where necessary, for entry or transit,
- Exclusion from "persona non grata" lists of the Schengen system,
- Exclusion from international lists considered to be socially dangerous,

N.B. a foreign resident of a Schengen member state holding a valid stay permit is exempt from obtaining a visa provided that entry to Italy is not sought for hired work, independent work, or apprenticeship.

Any foreigner, although holding a valid visa, who cannot provide ALL of the above requirements can be turned down even at customs.

Financial information can be proven by showing cash, bank or insurance bonds, shares, prepaid service receipts or legalized papers showing revenue sources in Italy. All foreigners must prove accommodation in Italy and the appropriate amount of money to return home (a return ticket is sufficient). These requirements are not only necessary to obtain a valid visa but they are also necessary at moment of entry. Failure to provide all of the above requirements will cause entry permission to be revoked.

Apply early: visa applicants are advised to apply as soon as they decide to attend the conference. Please allow at least 90 days for visas to be issued.

Visa applicants should consult the Italian Embassies in their own countries concerning requirements to travel to Italy.

Please bear in mind that although letters notifying that attendees' papers have been accepted may suffice, sometimes a more personalized letter is needed. Should a letter of invitation be required, please send a request form as soon as possible including the following information:

- name, date of birth, and passport number,
- name of organization you belong to,
- information on transportation and accommodation,
- information on how transportation, accommodation and local expenses are to be funded.

Duty Free Import

Personal effects and professional equipment can be brought into Italy duty free as long as the customs officer deems their contents and quantities reasonable. Delegates from European Union countries can easily bring in goods without any limit or formal measures. Below is the list of items allowed without taxes for non EU residents, total market price of which should be less than Euro 1.500 or its equivalent.



TRAVEL AND VISA
travel@iugg2007perugia.it
visa@iugg2007perugia.it

Insurance

The organizer cannot accept responsibility for accidents that might occur in connection with the General Assembly or the field trips. Delegates are encouraged to purchase travel insurance before leaving their home country. Insurance policies, such as EUROP ASSISTANCE, typically cover accidental loss of belongings, medical costs in case of injury or illness, and other possible risks of international travel.

Climate

The temperature in Perugia during the period of the conference ranges between 21°C (70°F) and 33°C (91,5°F).

Currency Exchange

Euro is the currency in use accepted at regular stores and restaurants. Credit cards are widely accepted at almost all hotels, restaurants and souvenir shops. You can at foreign exchange banks and other authorized money exchange upon presentation of your passport.

Travellers' Checks and Credit Cards

Travellers' checks are accepted only by leading banks and major hotels in principal cities, but the use of travellers' checks in Italy is not always convenient. VISA, MasterCard, Diners Club, and American Express are widely accepted credit cards at hotels, department stores, shops, restaurants.

Electricity

The electrical current is 220-230V, AC, 50 Hz throughout Italy including Perugia. Leading hotels in major cities have two outlets of 110 and 220 volts but usually with two-leg plugs only.

Shopping

Shops and other sales outlets in Italy are generally open on weekdays and Saturdays from 08:00 to 20:00 but closed on Sundays and national holidays. Delegates residing outside the European Union can reclaim the Value Added Tax (VAT) they pay if they spend more than 175 € in the same shop.

Field Trips and Excursions

A series of scientific field trips are being arranged and are open to all participants. You are encouraged to let us know your interest in any of these trips via IUGG2007 portal. More details will be provided in the Third Circular.



TRAVEL AND VISA
travel@iugg2007perugia.it
visa@iugg2007perugia.it

From

Roma (180 km)

car	2h 30m
coach	2h 15m
train	2h 30m

Firenze (160 km)

car	2h
coach	2h
train	2h 15m

Milano (450 km)

car	4h 30m
coach	5h
train	5h
plane	1h 30m

Pisa (230 km)

car	3h
coach	3h 30m
train	3h 30m

Siena (100 km)

car	1h 45m
coach	2h
train	3h

Ancona (120 km)

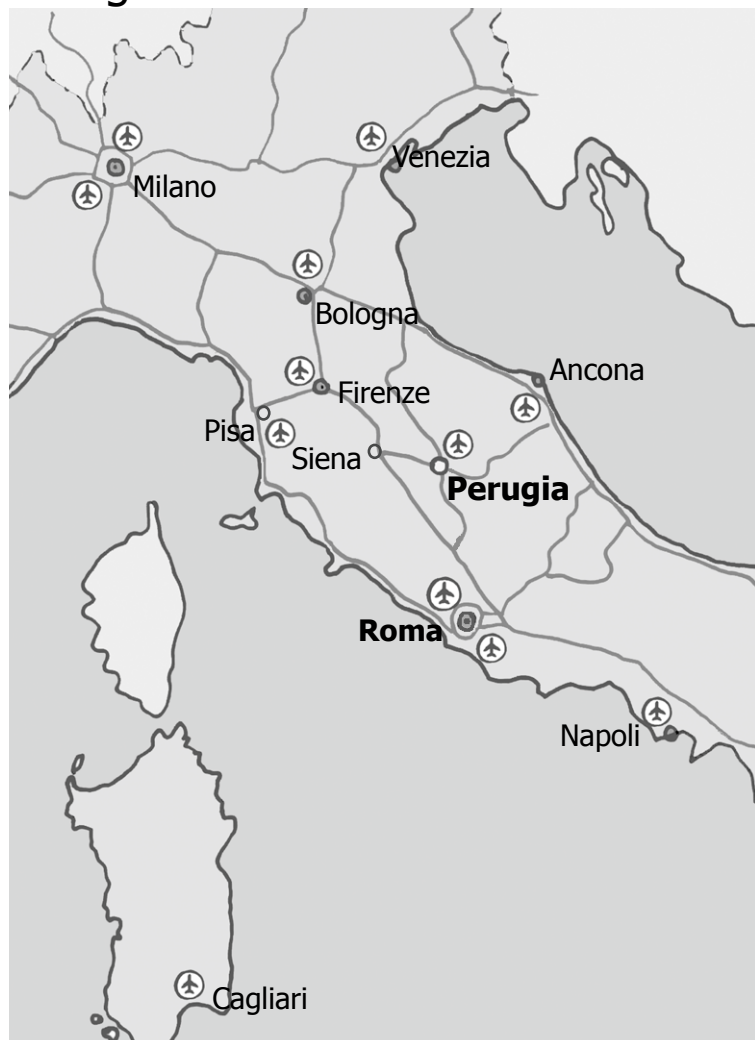
car	2h
train	3h

Bologna (250 km)

car	2h
train	3h 30m

To

Perugia



HOW TO REACH PERUGIA
travel@iugg2007perugia.it

REGISTRATION PROCEDURES

Signing in and getting your IUGG2007 UserName and Password

Registration online will be possible from Spring 2006 onwards. Upon registering online you must choose a UserName and a Password. This initial registration will enable you to surf the site, keep track of the status of your registration, visit the e-shop, just to name a few.

When accessing the site with your UserName and Password the following operations will be made available to you:

- submitting abstracts,
- applying for grants,
- signing up for field trips and excursions,
- paying the XXIV General Assembly registration fees,
- and more.

Registration fees to attend the XXIV IUGG General Assembly

Upon payment, you will be officially registered to attend the XXIV IUGG General Assembly.

Early bird and student discounts will be available. The registration fee has not yet been defined, but will not exceed € 500,00 (US \$ 550 approx.). Please note that the deadline for early bird registration is April 15 2007. Different methods of payment will be available.

The total amount owed will vary depending on the extra items you purchase (field trip, accompanying persons program, meals tickets, etc. etc.). At any time you will be able to purchase other items or submit other abstracts (within the maximum allowed number).

Detailed online instructions will guide you through the process.

By postal mail/fax

Initial registration online is highly recommended.

However, should accessing the Internet be not convenient for you, please use the IUGG2007 application form (page 112) and either mail it or fax it to the following Secretariat address. You will be assigned a IUGG2007 ID-code, a Username and a Password which you will receive by postal mail.

You will receive by mail the final registration fee form by the end of March 2007 (15 days before the deadline of early bird registration)

Send all the forms by mail to the Secretariat following address:

Secretariat of IUGG2007

c/o Research Institute for Geo-Hydrological Protection

National Research Council

Via della Madonna Alta, 126

06128 Perugia, ITALY

Fax: +39 75 5014420



REGISTRATION
registration@iugg2007perugia.it

ABSTRACTS SUBMISSION INSTRUCTIONS

Deadlines for submission of abstracts

Postal submission of abstracts: January 15, 2007

Electronic submission of abstracts: January 31, 2007

Abstracts for IAHS symposia (by postal submission): August 15, 2006

Abstracts for IAHS symposia (by electronic submission): August 31, 2006

Abstracts for IAHS joint symposia and all the workshops (by postal submission):
January 15, 2007

Abstracts for IAHS joint symposia and all the workshops (by electronic submission):
January 31, 2007

- Language: abstracts will be accepted in English or French.
- Postal abstracts will be rejected if they are:
 - not in the proper format,
 - not submitted to a specific Symposium or Workshop,
 - sent by fax.
- Submission of an abstract implies that IUGG has permission to reproduce the abstract in programs and reports related to the Assembly.
- Acceptance e-mails or letters will be sent in April 2007.
- Methods of submission:

- **Through IUGG2007 website (Highly Recommended)**

<http://www.iugg2007perugia.it>

Detailed online instructions will guide you through the process.

- **By postal mail**

Only to be used if electronic submission is unavailable; please follow the template in the next page. Send three copies, plus a file containing the abstract on two CD-ROMs or floppy disks to the following address:

IUGG2007 Abstract Submission

Secretariat of IUGG2007

c/o Research Institute for Geo-Hydrological Protection

National Research Council

Via della Madonna Alta, 126

06128 Perugia ITALY

e-mail: abstracts@iugg2007perugia.it

Website: www.iugg2007perugia.it

Note: In order to submit your abstract(s), you must sign in the web site with your personal Username and Password chosen at the moment of the initial registration.



ABSTRACTS SUBMISSION
abstracts@iugg2007perugia.it

Format for abstracts submitted by postal mail

Authors who submit abstracts by postal mail should prepare the abstract and submission information in the following format. An example is shown on page 19.

- a. Leave a margin of 20 mm at the top and bottom, and 15 mm on the right and left sides of one sheet of A4 size paper (210 mm x 297 mm).
- b. ABSTRACT TITLE IN CAPITAL LETTERS, left justified; leave a blank line after the title.
- c. Name(s) of Author(s): left justified, the first name and the last name of the AUTHOR WHO WILL PRESENT THE PAPER should be in capital letters; in case of multiple affiliations, the number that corresponds to the proper affiliation should be shown after each name; leave a blank line after the affiliation(s).
- d. Affiliation(s) of Author(s): left justified, in case of multiple affiliations, number the affiliations; leave a blank line after the affiliation(s).
- e. Text of Abstract: left justified, do not indent paragraphs, single line spacing, about 450 words in English or French.
- f. If possible, use 12 pt 'Times' or 'Times New Roman' font.

Submission Information

Below the abstract, please provide the following information. Allow for 2 carriage returns (blank lines) between the abstract and submission information. Please use the numbering given below. Please do not add any other additional information.

1. Symposium or Workshop session code
2. Symposium or Workshop title
3. Keywords (1 to 3)
4. Corresponding author's information (ID-code, UserName, title, name, affiliation, mailing address, telephone, fax and e-mail address)
5. Type of presentation preferred
Oral Presentation = O
Poster Presentation = P
Both = B
6. Equipment requested for presentation
Projector for PC = PC
Overhead Projector = OH
*If you would like to use a slide projector, a DVD or a VHS video player, please specify "slide", "DVD" or "VHS".
7. Student paper: if a student author is presenting the paper, please indicate YES.
8. Are you applying for a grant? YES or NO; list name of author(s) who is (are) applying for a grant. If applying for a grant, please read the instructions under 'Grants to Assist Attendance' carefully (Page 20).
9. Message to convener (if any)

Please save your submission file as MS DOS plain text (notepad or word-pad) or Macintosh Simple Text file.

Your Abstract Code will be sent by postal mail when your abstract has been received by the Secretariat. If you do not receive the code within 4 weeks, please contact the IUGG2007 Abstract Submission office (abstracts@iugg2007perugia.it).



ABSTRACTS SUBMISSION
abstracts@iugg2007perugia.it

Example Abstract

WEIBULL DISTRIBUTION PARAMETERS COMPUTATION IN LOW FLOW PHENOMENA

Manciola Piergiorgio 1, Pierleoni Arnaldo 2, Bellezza Michele 2, Casadei Stefano 1

1. Department of Civil and Environmental Engineering
University of Perugia, Via Duranti 94, 06100 Perugia - Italy
2. Department of Civil and Environmental Engineering
University of Perugia, Borgo XX Giugno 74, 06121 Perugia - Italy

The application of Weibull probability distribution to studies of low-flow phenomena is fairly frequent in literature [...]. Application of this distribution, and in particular the estimation of the related parameters is affected to a far from negligible extent by the estimation procedures and by the size of the historical series of data used.

This paper, therefore, suggests a calculation methodology for estimating the parameters of Weibull function, used typically to evaluate absolute minimum flow rates, starting out from the investigation of a number of intermediate parameters that are essential for reaching the final estimates.

1. U1
2. Forecasting. Prediction and Predictability
3. Weibull, estimation, low flow
4. 123XYZ, piermancio, Piergiorgio Manciola, Department of Civil and Environmental Engineering, University of Perugia, Via Duranti, 06121 Perugia - Italy,
Tel. +30 075 5014123, Fax +39 075 5141111, e-mail: piermancio@piermancio.it
5. O
6. PC
7. YES
8. Manciola Piergiorgio: NO, Pierleoni Arnaldo: NO, Bellezza Michele: YES, Casadei Stefano: NO
9. NONE

For more information or questions about abstract submission, please contact:

IUGG2007 Abstract Submission

Secretariat of IUGG2007

c/o Research Institute for Geo-Hydrological Protection

National Research Council

Via della Madonna Alta, 126

06128 Perugia ITALY

e-mail: abstracts@iugg2007perugia.it



ABSTRACTS SUBMISSION
abstracts@iugg2007perugia.it

Grants to Assist Attendance at XXIV IUGG General Assembly

The IUGG2007 Local Organizing Committee, IUGG, and the seven Associations are working together to offer a limited number of financial assistance grants to support participation at the XXIV IUGG General Assembly. An application for a grant can only be made by those who have submitted one or more abstracts to the scientific program.

Financial assistance funds are limited. Most awards will be for the registration fee only. It is unlikely that full support will be possible.

THE DEADLINE FOR GRANT APPLICATIONS IS THE SAME AS FOR THE SUBMISSION OF ABSTRACTS: JANUARY 31, 2007.

Note: IAMAS restricts its grants to applicants from developing countries [see <http://www.iamas.org>].

HOW DECISIONS ARE MADE:

All decisions regarding awards for Association Symposia will be made by the Association. The co-sponsoring Associations will have the task of deciding for inter-Association Symposium awards. The Chair of the Scientific Program Committee, with the advice of the IUGG Secretary General will assign awards for Union Symposia.

If two or more authors of one abstract request assistance, priority will be given to the presenting author. The first author listed will be considered the presenting author unless otherwise indicated.

All applications for financial assistance will be decided by March 31, 2007. All awards will be hand delivered at the Local Organizing Committee Grants Office in Perugia, Italy.

HOW TO APPLY for grants:

Access the Grant Application Form on the IUGG2007 website (www.iugg2007perugia.it) with your UserName and Password and fill in the following information.

Abstract submission is required in order to apply for a grant.

Fill in the form with:

1. First name, Last name, Nationality, Institution, and address including telephone, fax and e-mail.
2. Are you a student? If so, please name your university and your faculty advisor.
3. Are you a young scientist (i.e. have you received your academic degree within the last 5 years)? Please name your university and graduation date.
4. Are you a scientist living and working in a developing country? Please name the country.
5. For which of the following are you seeking support:
 - a) registration fee,
 - b) food and lodging expenses,
 - c) travel expenses.
6. Please inform us of any additional factors which we might consider when assessing your application. Please notify us of any subsequent changes in the above information.

Note: Should you want to apply by post, please send a letter addressed to the LOC - Grants Office with the above information included.



GRANTS APPLICATION
grants@iugg2007perugia.it

CONFERENCE PROGRAM

The XXIV IUGG General Assembly will provide an extraordinary opportunity for earth and space scientists from around the world to gather and exchange expertise, research data and results. Along with a full scientific program arranged by the IUGG Associations, there will be many symposia. Invited speakers will explore topics ranging from chaos to predictability, and geophysical measurements to geophysical risk.

Twelve Union lectures by leading research scientists will be presented as part of this special focus. These lectures and symposia will demonstrate the cutting edge and relevance of geophysical sciences, and identify the key challenges of the future.

An important feature of IUGG General Assemblies is the opportunity for inter-Association symposia. Eighty such symposia and workshops have been arranged in addition to the regular topical Association programs.

The preliminary timetable of the scientific sessions will be announced in the Third Circular and will be available first on the IUGG2007 website. However, many of the Associations have already announced a preliminary schedule on their own websites, which can be accessed from the main IUGG website (<http://www.IUGG.org>).

The IUGG2007 Scientific Program Committee members are the Secretaries-General of the seven Associations, the IUGG Secretary General, and a representative from the Local Organizing Committee. The Chair of the Scientific Program Committee is P. Malanotte Rizzoli of the Massachusetts Institute of Technology, USA.

Abbreviations

IAG International Association of Geodesy

IAGA International Association of Geomagnetism and Aeronomy

IAHS International Association of Hydrological Sciences

IAMAS International Association of Meteorology and Atmospheric Sciences

IAPSO International Association for the Physical Sciences of the Oceans

IASPEI International Association of Seismology and Physics of the Earth's Interior

IAVCEI International Association of Volcanology and Chemistry of the Earth's Interior

ClIC Climate and Cryosphere

Ev-K2-CNR Everest-K2 CNR Committee

GEWEX Global Energy and Water Experiment

HKH-FRIEND Hindu Kush-Himalayan Flow Regimes from International Experimental and Network Data

IABO International Association for Biological Oceanography

IACS International Association of Cryospheric Sciences

ICACGP International Commission on Atmospheric Chemistry and Global Pollution

ICASVR International Commission on Atmosphere-Soil-Vegetation Relations

ICCE International Commission on Continental Erosion

ICCL International Commission on Climate

ICCLAS International Commission on the Coupled Land-Atmosphere System

ICCP International Commission on Clouds and Precipitation

ICDM International Commission on Dynamic Meteorology

ICGW International Commission on Groundwater

ICIMOD International Center for Integrated Mountain Development

ICMA International Commission on the Middle Atmosphere

ICRS International Celestial Reference System
ICSIH International Commission on Snow and Ice Hydrology
ICSW International Commission on Surface Water
ICT International Commission on Trac
ICWQ International Commission on Water Quality
ICWRS International Commission on Water Resources Systems
IGAC International Global Atmospheric Chemistry
IGS International Glaciological Society
ILP International Lithosphere Program
INQUA International Union for Quaternary Research
ION International Ocean Network
IRC International Radiation Commission
PUB Prediction in Ungauged Basins
SCAR Scientific Committee on Antarctic Research
SEDI Study of the Earth's Deep Interior
SPARC Stratospheric Processes and their Role in Climate
UCCS Union Commission for the Cryospheric Sciences
UNESCO United Nation Educational, Scientific and Cultural Organization
UNITAR United Nations Institute for Training and Research
WMO World Meteorological Organization



Session code naming

The first letter of the session codes indicates whether the session is a Union, a Joint Inter-association or a single Association sponsored event, the second letter indicates the type of event: Symposium (S) or Workshop (W). For Joint events, the second letter indicates the Lead Association (with the abbreviations listed below) and the third indicates whether a session is a Symposium (S) or a Workshop (W). In some cases (namely IAGA, IAHS) Association session codes have an extra codification referring to a specific Theme or Division.

U UNION
J JOINT
G IAG
A IAGA
H IAHS
M IAMAS
P IAPSO
S IASPEI
V IAVCEI

Some examples:

US002 is a **U**nion **S**ymposium; **JGW001** is a **J**oint **IAG** **W**orkshop with IAG as the Lead Association; **MS003** is an Association (IAMAS) **S**ymposium. **AS III 020** is an Association (IAGA) **S**ymposium sponsored by its **III** Division.

CONFERENCE PROGRAM SUMMARY

Union Symposia

- US001** Our Changing Planet (Part 1)
- US002** IGY+50 and I*Y: The International Geophysical Year 1957/58 and the international years of 2007/08
- US003** Global Earth Observing Systems
- US004** Digital geophysical data exchange: remote access, virtual observatories, GEOSS, and eGY
- US005** Solar and planetary geophysics
- US006** Challenges and Advances in Nonlinear Geophysics
- US007** High-Performance Computations in Geosciences
- US008** Our Changing Planet (Part 2)
- US009** The Mediterranean as a Geophysical Laboratory
- US010** Earth System Interactions
- US011** Modelling and simulation of geophysical flows: present and future
- US012** Early Warning of Natural Hazards

Special Union Events

- USSE013** Our Understanding of Climate Change
- USSE014** The WMO/IUGG Assessment of the Effect of Pollution on Precipitation

Inter-Association Symposia and Workshops

- JGS001** Ocean Circulation and contributions from new satellite missions
- JGS002** Global sea-level change: Altimetry, GNSS and tide gauge measurements
- JGS003** Earthquake and Volcano Geodesy
- JGS004** Oceanography and geodesy in the polar regions
- JGS005** Observations of the Cryosphere from Space
- JGS006** Extraterrestrial Ice
- JGS007** Ice Cores and Climate
- JAS001** Planetary cores: physics, chemistry and dynamics
- JAS002** Large scale imaging of the continental and oceanic lithosphere
- JAS003** Distribution of water and heat in the crust: Indication from EM studies
- JAS004** Methodology in EM studies: Theory, modelling and inversion
- JAS005** The role of aerosols and dust in the middle atmosphere
- JAS006** Electrodynamical and chemical effects in the middle and upper atmosphere generated by thunderstorms
- JAS007** Response of the atmosphere/ionosphere coupling system to forcing from the Sun and the lower atmosphere
- JAS008** Long-term trends and changes in the atmosphere-ionosphere system
- JAS009** Equatorial atmosphere-ionosphere coupling processes: responses to forcing from lower atmosphere and magnetosphere
- JAS010** Magnetic field forcing of the thermosphere
- JAS011** The Sound of Physics: Advances in coronal, helio-, astero- and terrestrial seismology
- JAS012** Seismological, geological and tectonic interpretation of geomagnetic anomalies on continents and oceans
- JHS001** Debris Transport in Glaciers
- JHS002** Natural Ice Microstructures
- JHW001** Interactions between snow, vegetation and the atmosphere
- JHW002** Climate-Permafrost-Hydrology Interactions: The Impact of Changing Climate on Cold Regions Hydrology
- JMS001** Our Changing Planet



JMS002 Earth System Interactions
JMS003 Satellite Observations: Products and Applications
JMS004 Intercontinental Transport of Substances and its Consequences
JMS005 Aerosols, Biomass Burning and Precipitation
JMS006 Glacial-Interglacial Cycles: New Records, Analyses, and Modelling
JMS007 Stable Water Isotopes: from Basin to Global Scale
JMS008 Clouds and Radiation and Air-Sea-Ice Interactions
JMS009 Hydrological Cycle, Precipitation and Precipitation Systems
JMS010 Tropical Cyclones
JMS011 Monsoon Systems
JMS012 Planetary Atmospheres and Their Evolution
JMS013 Aeronomy of Planetary Atmospheres: Comparative Planetology
JMS014 Ocean-Atmosphere Coupling
JMS015 Mid-latitude Droughts in a Changing Climate
JMS016 Cryospheric Change and Sea Level
JMS017 The Holocene-Anthropocene Transition: From Natural to Human-Dominance of the Earth System
JMS018 High Latitude Modes of Climate Variability
JMS019 Toward Bridging the Gap Between Weather and Inter-Annual Climate Variability: Processes, Phenomena and Prediction
JMS020 Assessing & Exploiting Re-analysis Data Sets
JMS021 Energetic Particles and Geomagnetic Storm Influence on Chemical and Dynamical Processes in the Polar Stratosphere and Mesosphere
JMS022 Solar Impact on the Mesosphere-Stratosphere-Troposphere System
JMS023 Instabilities in the Neutral Atmosphere, Ionosphere and Magnetosphere
JMS024 Data Assimilation for the Atmosphere, Ocean and Land Surface
JMS025 3D Radiative Transfer in Complex Geophysical Media Including Clouds, Vegetation, Ice and Snow
JMS026 Ice Cores and Climate
JMS027 Glacier Fluctuations in the Asian High Mountains
JMS028 Consequences of Large Scale Circulation Variability on Snow and Ice Extent
JMS029 Snow Avalanches – Field Observations and Modelling
JMS030 Extraterrestrial Ice
JPS001 Interannual and Interdecadal Climate Variability
JPS002 Abrupt Climate Change
JPS003 Environmental Controls on Marine Biota
JPSCCS004 Arctic Glaciers and Ice Caps Mass Balance/Calving
JPSCCS005 Life in Icy Environments: Interactions Between the Biology and Chemistry of Ice
JSS001 Physics and Chemistry of Earth Materials
JSS002 Tsunami: generation and hazard
JSS003 Early-Warning Systems
JSS004 Non-instrumental “seismometry” - Quantification of past and future earthquakes: balancing the geological, historical and contemporary strain records
JSS005 Non-instrumental “seismometry” - Global and regional parameters of paleoseismology; implications for fault scaling and future earthquake hazard
JSS006 Non-instrumental “seismometry” - New Approaches to Paleoseismology and Earthquake Recurrence in the 21st Century
JSS007 Progress in electromagnetic studies on earthquakes and volcanoes - Volcanic structure and activities
JSS008 Progress in electromagnetic studies on earthquakes and volcanoes - Electromagnetic fields associated with earthquakes and active faulting
JSS009 Progress in electromagnetic studies on earthquakes and volcanoes - Crustal instabilities and earthquake precursors
JSS010 Progress in electromagnetic studies on earthquakes and volcanoes - Seismo-electroma-



gnetic studies using space technology

JSS011 Earth Structure and Geodynamics

JSS012 Earth Structure and Geodynamics - Dynamics of Stagnant Slabs

JSS013 The lithosphere

JSS014 Crustal structure and Tectonophysics - Crustal and lithospheric structure in active continental blocks and their boundaries

JSS015 Crustal structure and Tectonophysics - Large-scale multi-disciplinary programs for continental imaging

JSS016 Underwater observatories

JSS017 Lithosphere thermal state and geodynamic processes: from measurements to models

JSW001 Subduction zone related volcanism and hazard mitigation

JVS001 Large-volume eruptions, including environmental effects

JVS002 Progress in electromagnetic studies on earthquakes and volcanoes - Volcanic structure and activities

JVS003 Ice –Volcano Interactions

JVS004 Volcano seismology

JVS005 The 25 Anniversary of the El Chichón Eruption

Association Symposia and Workshops

International Association of Geodesy (IAG)

GS001 Reference Frames

GS002 Gravity Field

GS003 Earth Rotation and Geodynamics

GS004 Positioning and Applications

GS005 The Integrated Global Geodetic Observation System

International Association of Geomagnetism and Aeronomy (IAGA)

ASI001 Planetary Dynamos: theory, models, observation and experiment

ASI002 Paleomagnetism and geodynamics – neotectonics, continental reconstruction, reference frames

ASI003 Magnetic dating on all time scales

ASI004 Palaeointensity studies – progress and challenges

ASI005 Magnetic anisotropy – different scales, different parameters, different stories?

ASI006 Acquisition and stability of natural and laboratory-produced remanence

ASI007 Magnetic signature of past and present environmental changes

ASI008 Magnetism of extraterrestrial materials and bodies

ASI009 Progress in palaeo- and rock-magnetic methodologies

ASI010 Open Poster Session

ASI011 Environmental studies

ASII012 Small- and meso-scale structure in the thermosphere and ionosphere

ASII013 Response of the ionosphere-thermosphere to large geomagnetic storms: data availability and modeling

ASII014 Planetary ionospheres and thermospheres (Divisions II and III)

ASII015 Conjugate and interhemispheric polar studies (Division II and III)

ASII016 Data assimilation and space weather (Division II, III and IV)

ASII017 Sun-Earth system: science and impacts (Divisions II, III and IV)

ASIII018 Magnetopause and magnetosheath processes: reconnection, diffusion and boundary dynamics (Divisions III and IV)

ASIII019 Progressing to closure in magnetotail plasma sheet and substorm processes

ASIII020 Magnetosphere-ionosphere interactions and auroral processes (Divisions III and II)

ASIII021 Geomagnetic storms: toward a coupled system level understanding (Divisions III and



II)

ASIII022 Perspectives from global models and synoptic observations (Divisions III and II)

ASIII023 Causes and evolution of plasma pressure distributions

ASIII024 Dynamics of the Low Energy Plasma Populations (Divisions III and II)

ASIII025 Techniques and instrumentation in space plasma physics

ASIII026 Wave and particle dynamics in the ring current and radiation belts

ASIII027 Other magnetospheric worlds

ASIII028 Reporter reviews

ASIV029 The International Geophysical Year and its impact on space science (Division IV and IDCH, Divisions II, III and V)

ASIV030 New results from solar and heliospheric missions

ASIV031 From micro- to macro-scales in the heliosphere and magnetospheres (Divisions IV, II, and III)

ASIV032 IHY and universal processes (Divisions IV, II, and III)

ASIV033 Neutral-plasma interactions for planets, moons, asteroids, and comets

ASIV034 Reporter Reviews

ASV035 The role of magnetic observatories in monitoring and modeling Earth's magnetic field

ASV036 Geomagnetic measurements in remote regions (Division V and ICDC)

ASV037 International Decade of Geopotential Field Research: Current achievements and expected impact of Swarm (Divisions V, and I, II, III)

ASV038 World Digital Magnetic Anomaly Map

ASV039 Use of geomagnetic data and indices in space weather and space climatology

ASV040 Division V Reporter Reviews

ASICDC041 The investigation of low-latitude and equatorial geomagnetic variations since the International Geophysical Year 1957

ASICDC042 Advances in the investigation of equatorial aeronom processes since the International Geophysical Year 1957

ASIDCH043 The International Geophysical Year: A 50-yr Retrospective

International Association of Hydrological Sciences (IAHS)

HS1001 A New Focus on Groundwater-Seawater Interactions

HS1002 A New Focus on Integrated Analysis of Groundwater/Surface-Water Systems: Process Understanding, Conceptualisation and Modelling.

HS1003 Hydrology in Mountain Regions: Observations, Processes and Dynamics

HS2004 Quantification and Reduction of Predictive Uncertainty for Sustainable Water Resources Management

HS2005 Water Quality and Sediment Behaviour of the Future: Predictions for the 21st Century

HS3006 Changes in Water Resources Systems - Methodologies to Maintain Water Security and Ensure Integrated Management

HS3007 Remote Sensing for Environmental Monitoring and Change Detection

HW1001 Isotope Tracing of Water Balance, Hydrodynamics and Hydrological Processes

HW1002 Patterns, thresholds and non-linearities: Towards a new theory of catchment hydrology

HW2003 Analysis of Variability in Hydrological Data Series

HW2004 Towards Improved Evaluation of Hydrological Models: The Need to Understand and Characterize Uncertainties in the Modelling Process

HW2005 From Measurements and Calibration to Understanding and Predictions

HW2006 New Avenues for Contemporary Water Resources Management

HW3007 The Impact of Environmental Change on Sediment Sources and Sediment Delivery

HW3008 Changes to Hydrological Extremes and Water Quality

HW3009 Loss of Knowledge

HW3010 Hydrological Science and Water Legislation



International Association of Meteorology and Atmospheric Sciences (IAMAS)

IAMAS presents the daily lunch lecture series into the mysteries of the atmosphere: "the MONA LISA CODE"

- MS001** Overview of the Findings of the IPCC's Fourth Assessment Report
- MS002** Global Observing Systems, Past, Present and Future
- MS003** Aerosols, Radiation and Clouds
- MS004** Mineral Dust Cycle and its Impact on Clouds and Radiation
- MS005** Biological Ice Nucleators in the Atmosphere – at the Crossroads of Physics and Biology
- MS006** Ice Microphysics: Theory and Measurement
- MS007** Theoretical advances in atmospheric dynamics
- MS008** Ensembles and Probabilistic Forecasting
- MS009** Dynamics and Predictability of Severe Weather Events
- MS010** Dynamics of Convectively-Coupled Equatorial Waves and the Madden-Julian Oscillation
- MS011** The Dynamics of Eastern Tropical Oceans and Subtropical Highs
- MS012** Impacts of Biosphere-Atmosphere Interaction on Atmospheric Composition from Synoptic to Annual and Decadal Timescales
- MS013** Topographic Effects on Weather and Climate
- MS014** Interactions of Land Cover and Climate
- MS015** Extreme Weather and Climate Events: Past Occurrences and Future Likelihoods
- MS016** Downscaling to Local and Regional Scales
- MS017** Climate Sensitivity and Climate Feedbacks: Progress and Remaining Questions
- MS018** The Role of the Stratosphere in the Climate System
- MS019** Middle Atmosphere Science
- MS020** Solar Activity and its Influences on the Earth's Weather and Climate
- MW001** The Definitions of Atmospheric Ice Particles

International Association for the Physical Sciences of the Oceans (IAPSO)

- PS001** Biogeochemical Budget and Cycles in the Mediterranean Sea
- PS002** Variability of the Antarctic Circulation and Water Masses and Their Sensitivity to Climate Change
- PS003** Mediterranean Circulation and Climate: Their Variability and Sensitivity to Future Emission Scenarios
- PS004** Ocean Mixing
- PS005** Flows and Waves in Straits
- PS006** Arctic Ocean Processes
- PS007** Biogeochemical Fluxes Between the Shelf and Open Seas
- PS008** Processes in Oceanic Fronts
- PS009** Impact of CO₂ Changes on Biogeochemical Processes and Ecosystem Functioning
- PS010** New Insights into the Ocean and Its Circulation from Argo and GODAE
- PS011** Fundamental Physical and Chemical Principles Underpinning Ocean Science
- PS012** The Oceans - Their Past and Present; Considerations on their Future Behaviour (invited abstracts only)

International Association of Seismology and Physics of the Earth's Interior (IASPEI)

- SS001** Seismic Observations And Interpretation
- SS002** Earthquake Hazard, Risk, and Strong Ground Motion
- SS003** Earthquake Hazard, Risk, and Strong Ground Motion - Site effects (and their dependence on source and propagation-path)
- SS004** Earthquake Hazard, Risk, and Strong Ground Motion - Estimation of strong ground motion
- SS005** Earthquake Sources - Modelling and Prediction



SS006 Education and Outreach

SW001 Earthquake data in archaeological and historical studies

SW002 Geophysical studies of active faults

SW003 Seismogenic zones: emergence of in situ fault zone observations to the understanding of earthquake physics

SW004 Modernizing ISC procedures: model evaluation and magnitudes

SW005 Reference Events for Improved Locations

SW006 Induced seismicity

SW007 Crustal/fault drilling: an earthquake laboratory



International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI)

VS001 Sediment-laden gravity flows in volcanic settings: generation, sedimentation, prediction and hazard assessment

VS002 Submarine volcanism: eruption processes, transport mechanisms and links with hydrothermal systems

VS003 Volcanic Flows: Observation, Experiment, and Theory

VS004 Intraplate monogenetic basaltic volcanic provinces and processes

VS005 The Magma Feeding System of Persistently Active Basaltic Volcanoes: Mount Etna and Others

VS006 Calderas I - Calderas and resurgent calderas

VS007 Calderas II: Calderas and caldera forming eruptions

VS008 Volcanic hazard evaluation: methodologies and applications

VS009 Models and products of mafic explosive activity

VS010 Modeling the plumbing system of active volcanoes by integrated petrological, geophysical and fluid inclusion studies

VS011 Modeling and simulation of volcanic related phenomena for hazard mitigation

VS012 Cities on Volcanoes: looking at the links between volcanology and communities issues around volcanoes

VS013 Quantifying and expressing volcanic risk: a challenge for the Millennium

VS015 New Techniques using Remote Sensing Data for Volcano Monitoring and Analysis: Observations, Integration, Hazard Assessments and Modeling

VS016 Volcanic-plutonic provinces: a tool to understand magma genesis and geodynamics

VS017 Pedagogical and didactical methods in earth science education and geopark concepts in demonstrating volcanic processes

VS018 New advances in understanding phreatomagmatism: from experiments to volcanic facies analyses

VS019 Large Igneous Provinces

VS020 Volcanic health hazard assessment: focus on multidisciplinary collaboration and integration

VW001 Guidelines for the preparation of volcanic hazards maps

VW002 Non-localised volcanic hazards - Inter-agency and international communications

VW003 Magmatic (fluid and melt) inclusion studies in active volcanoes magmatic systems

Union sessions (invited papers only)

US001 Our Changing Planet (Part 1)

This Symposium is intended to initiate and provide an overview of the scientific program. The morning sessions will be devoted to invited papers and the afternoon session to contributed papers. This first part of the session (see US008) is devoted to the global change originating in the fluid envelopes of the Earth System involving the atmosphere (including the magnetosphere), the oceans, and the hydrosphere (including land ice). Topics will include trace gas induced global warming, the role of the oceans in climate variability and change, the stability of the cryospheric, etc.

Conveners: W.Richard Peltier, Dept of Physics, University of Toronto, 60 St. George Street, Toronto, Ontario, CANADA, M5S 1A7; Tel (416)-978-2938; Fax: (416)-978-8905; peltier@atmosp.physics.utoronto.ca

Co-Conveners: G. Beig, Indian Institute of Meteorology, Pune, India, beig@tropmet.res.in

Invited speakers / Program group: Judith Lean, Solar forcing of climate change, IAGA; Harry Bryden, The changing strength of the Atlantic meridional overturning, IAPSO Kerry Emmanuel, Hurricanes in the greenhouse, IAMAS Steve Sparks, Volcanism and Earth evolution, IAVCEI Vincent Courtillot, Earth's magnetic field and its variability, IAGA Yoshio Fukao, TBD, Seismic tomography and Earth's deep interior, IASPEI

US002 IGY+50 and I*Y: The International Geophysical Year 1957/58 and the international years of 2007/08

The International Geophysical Year has meant remarkable progress to the scientific disciplines represented in IUGG. The polar regions, the deep oceans, the earth's interior, its atmosphere and the space beyond were explored at an unprecedented rate. New technologies like satellites and computers facilitated measurements, data collection and analysis and were applied in a global effort and with an extraordinary station density.

The seven Associations and the Commission of Cryosphere Sciences of IUGG are invited to give an overview over the accomplishments in their fields during IGY and in the 50 years since. The anniversary of IGY is commemorated by four international years (I*Y): The International Polar Year, the Electronic Geophysical Year, the International Heliophysical Year and the International Year of the Planet Earth are invited to highlight their activities for 2007 and 2008. This symposium will consist of invited talks, which will be supplemented by extensive posters. It is closely related to U.03, U.04 and IDCH.01 of IAGA

Conveners: M. Kuhn, Institute of Meteorology and Geophysics, University of Innsbruck, Innrain 52, A-6020 Innsbruck, Austria; Tel: +43 512 507 5450; Fax: +43 512 507 2924; Michael.Kuhn@uibk.ac.at

Co-Conveners: B. Thompson, NASA GFSC, USA, E.W. Cliver, Air Force Research Laboratory, Hanscom Field, USA

US003 Global Earth Observing Systems

Global Earth Observation Systems and Strategies are of vital importance for virtually all associations working under the auspices of IUGG, which has adopted in the past several resolutions underlining the importance of Earth monitoring systems (IUGG Resolution No. 1, 1999, IUGG Resolution No. 3, 2003). The importance of developing global observing strategies is recognized, as well, by IGOS, the Integrated Global Observing Strategy working under the auspices of UNESCO, and GEO, the Group on Earth Observations designing its GEOSS (Global Earth Observation System of Systems), which is supported on the government level by about sixty countries. The symposium shall give an overview of all major international developments, as well as those within the IUGG associations. Follow-up symposia addressing specific issues associated with global observing systems will be organized by the IUGG Associations.



Conveners: Gerhard Beutler, Astronomical Institute, University of Bern, Sidlerstrasse 5, CH-3012 Bern, Switzerland, Tel: 0041316318591, Fax: 0041316313869, gerhard.beutler@aikb.unibe.ch; Keith Alverson, Global Ocean Observing System Head of Section, IOC/UNESCO, 1 rue Miollis, 75732 Paris Cedex 15, France, Tel: +33 (0) 1 45 68 40 42, Fax: +33 (0) 1 45 68 58 13, k.alverson@unesco.org

US004 Digital geophysical data exchange: remote access, virtual observatories, GEOSS, and eGY

There is a growing requirement for common data logging techniques, digital capture, exchange and integration of data sets across geophysical disciplines. The Electronic Geophysical Year (www.eGY.org) and the Global Earth Observation System of Systems initiatives offer modern approaches to remote data access, integration and management. This session focuses on the technology and tools, such as spatially enabled databases, Web-accessible open geographic information systems, common scientific lexicons and virtual data centers, which improve the discovery, browsing, visualization, and integration of geographically dispersed scientific data. The session will analyze trends towards the establishment of virtual observatories and networks and activities supporting the goals of the eGY and GEOSS.

Conveners: A. Thomson, Seismology and Geomagnetism, British Geological Survey, West Mains Road, Edinburgh EH9 3LA, UK, Tel: +44 131 650 0257, Fax: +44 131 668 4368, awpt@bgs.ac.uk;

Co-Conveners: V. Papitashvili, Space Physics Research Laboratory, University of Michigan, Ann Arbor, USA, S. McLean, NOAA, World Data Center, NOAA, Boulder, USA

US005 Solar and planetary geophysics

The session will highlight frontiers in the geophysics of the Sun and planets. Invited speakers will address recent discoveries and open issues for the Sun, terrestrial, giant, and extra-solar planets. The presentations are intended to be accessible to a broad audience of geophysicists. Topics will include interdisciplinary and system-level investigations.

Conveners: L.W. Esposito, LASP, University of Colorado, 392 UCB, Boulder, CO 80309-0392, USA, Tel: +01-303-492-7325, Fax: +01-303-492-1132, Larry.Esposito@lasp.colorado.edu

Co-Conveners: Tuija Pulkkinen, Finland, Finnish Meteorological Institute, tuija.pulkkinen@fmi.fi

US006 Challenges and Advances in Nonlinear Geophysics

Nonlinearities are ubiquitous in geophysics and geodesy, from Earth core to outer space and they remain the main difficulty to overcome for application sake, just like for theoretical advances. This session will provide a forum to draw perspectives on the new challenges and opportunities due to the recent advances in nonlinear methodologies (e.g. chaos, multifractals, wavelets, self-organized criticality) as applied to geophysics and geodesy.

Conveners: Daniel Schertzer (ENPC, Paris) Daniel.Schertzer@enpc.fr

Co-Conveners: J Davidsen (BAS) seismology, H. Dijkstra (Utrecht U.): oceanology, U. Frisch (Observatoire de Nice): turbulence, J. Hunt (London College): meteorology, S. Lovejoy (McGill University) hydrology, L. Zelenyi (IKI, Moscow), space physics

US007 High-Performance Computations in Geosciences

Since recent years computation has been playing an increasingly important role in the understanding of the nature of the complex Earth system, especially catastrophic extreme events emerging from the system. Developments in computational science and technology has significantly accelerated the progress in data assimilation, modeling, and forecast/prediction oriented simulations associated with various branches of Earth sciences such as atmospheric, oceanic, space, and Solid Earth sciences. This development has a strong impact to the studies of geohazards and risks such as cyclones, earthquakes, landslides, storms, tsunamis, and volcanic eruptions and shows significant potentials to be applied to serve the sustainable development of society. To reflect up-to-date developments in this direction, to identify the new frontiers and important scientific/technique problems in this developing field, and to foster new opportunities for inter-disciplinary cooperation, this session aims to



focus on (but not limited to) the following topics: 1) Computer simulation in geosciences, its physical significance, and observational constraints; 2) Web-based grid computation and parallel computation applied to geosciences; 3) Data assimilation, data analysis, and data mining in geosciences; visualization in geosciences and analysis of high-dimensional data; 4) Forecast/prediction of hazards and risks based on high performance computation and its engineering application; limitation on the predictability of hazards and risks, and related engineering countermeasures; 5) Physics of complex systems and its computational implementation; 6) Development and sharing of software for the simulation and visualization in geosciences: from traditional individual-based approach to modern networkbased approach. Invited and contributed papers will be presented in the session.

Conveners: Alik Ismail-Zadeh, Geophysical Institute, University of Karlsruhe, GERMANY, alik.ismail-zadeh@gpi.uni-karlsruhe.de; Zhongliang Wu, College of Earth Sciences, Graduate School of the Chinese Academy of Sciences, Beijing, CHINA, wuzhl@gscas.ac.cn.

Co-Conveners: Slava Gusiakov, Institute of Computational Mathematics and Mathematical Geophysics, Russian, Academy of Sciences, Novosibirsk, RUSSIA, gvk@sscc.ru, John Rundle, Center for Computational Science and Engineering and Engineering University of California, Davis, USA, jbrundle@ucdavis.edu

Invited speakers / Program group: Hans-Peter BUNGE, Munich University, Germany "High-Performance Computations in Mantle Dynamics"; Michael GHIL, Departement Terre-Atmosphere-Ocean, Ecole Normale Supérieure, Paris, France & IGPP/UCLA, USA, "Modeling of Atmospheric Processes"; Gary GLATZMAIER, University of California at Santa Cruz, USA "Three-Dimensional Simulations of Volcanic Eruptions"; Giuliano PANZA, University of Trieste, Italy "Modeling and Prediction-Oriented Simulations of Hazards Bridging to Engineering" 5. Tetsuya SATO, The Earth Simulator Center, Yokohama, Japan "Fostering the Simulation Culture"; Yaolin SHI, Graduate University of Chinese Academy of Sciences, Beijing, China "Computational Geodynamics and Its Applications"; Vasily TITOV, National Center for Tsunami Research, USA TBA; Jeroen TROMP, California Institute of Technology, USA "Adjoint Methods in Computational Seismology".

US008 Our Changing Planet (Part 2)

This Symposium is intended to initiate and provide an overview of the scientific program. The morning sessions will be devoted to invited papers and the afternoon session to contributed papers. In this second part of the session (see US001), the focus will shift to solid Earth processes and the Earth's deep interior. Topics in this area may include the physics of the earthquake source mechanism, the geodetic monitoring of tectonic deformation, the style of the mantle convection process and the physics of the Earth's core (dynamo process, mechanism(s) of field reversal, etc)

Conveners: W. Richard Peltier, Dept of Physics, University of Toronto, 60 St. George Street, Toronto, Ontario, CANADA, M5S 1A7, Tel (416)-978-2938, Fax: (416)-978-8905, peltier@atmosph.physics.utoronto.ca

Co-Conveners: G. Beig, Indian Institute of Meteorology, Pune, India, beig@tropmet.res.in

Invited speakers / Program group: Judith Lean, Solar forcing of climate change, IAGA Harry Bryden, The changing strength of the Atlantic meridional overturning, IAPSO; Kerry Emmanuel, Hurricanes in the greenhouse, IAMAS; Steve Sparks, Volcanism and Earth evolution, IAV-CEI; Vincent Courtillot, Earth's magnetic field and its variability, IAGA; Yoshio Fukao, TBD, Seismic tomography and Earth's deep interior, IASPEI

US009 The Mediterranean as a Geophysical Laboratory

The Mediterranean sea is an enclosed basin communicating with the Atlantic ocean through the Strait of Gibraltar, the "choke" point of the basin controlling in large part its general circulation. In the Mediterranean processes of global importance occur, covering a variety of aspects : from plate tectonics with the junction of the African and Eurasian plates that define a region characterized by frequent, strong earthquakes; to thermohaline circulation processes, as the Eastern and Western basins have separate, closed interior "conveyor belts"; to ecosystem dynamics, juxtaposing the eutrophic Northern Adriatic to the oligotrophic Eastern Mediterranean; to Mediterranean climate variability, as the basin has its own atmosphere/ocean coupled modes of variability and at the same time interacts with global modes such as ENSO and the Indian monsoon. Therefore the Mediterranean can be considered as a geophysical laboratory for the study of global Earth processes.

Conveners: P. Malanotte-Rizzoli, Massachusetts Institute of Technology, 54-1416, Department of



US010 Earth System Interactions

This symposium invites papers on cutting edge simulations and analyses of observations of the Earth system and the interactions among its components in the past, present, and projected to occur in the future. Situations of particular interest include the factors and processes affecting the interactions among the atmosphere, oceans, ice and land. Also welcome are contributions addressing human-induced changes that alter climate, contributed to the apparent stability of the pre-industrial climate and led to glacial cycling, and that prevailed during past climatic conditions that were warmer than at present.

Conveners: Guy Brasseur, Max-Planck-Institut für Meteorologie, Bundesstr. 53, D-20146 Hamburg, Germany; Tel: +49-40-41173-421, Fax: +49-40-41173-430, brasseur@dkrz.de

US011 Modelling and simulation of geophysical flows: present and future

Understanding the dynamics of geological systems is the ultimate goal of any geophysical science. Such a goal is particularly difficult for geophysical flows since they occur on a wide range of temporal and spatial scales and, mostly, because they are often characterized by a multiphase nature of the mean and by a multidimensional and unsteady dynamics. In recent years, a major step forward in the exploration of these natural transport systems has been possible by the development and use of physical and mathematical models able to quantitatively describe, in a deterministic or probabilistic way, their behaviours. Complex non-linear relationships between system variables, occurrence of non- or counter-intuitive effects, ability to forecast specific system behaviours, are just a few examples of results that can be obtained by using these models. Such a progress has been made possible by the huge increase of computational power as well as by the availability of laboratory experiments able to provide constitutive equations of the fluids involved. Flows of volcanic origin, debris flows, landslides, atmospheric, surface and underwater flows as well as flows associated to the transfer of fluids in the crust and inner Earth are some of the systems commonly investigated by mathematical models. In this session we invite contributions on the latest advances in the modelling and simulation of geophysical flows of any kind. Presentations of state-of-the-art models, applications aimed at model validation through comparison with real observations and lab experiments, inter-comparison between models, and papers addressing future developments and needs in this field are particularly welcome.

Conveners: Augusto Neri, Istituto Nazionale di Geofisica e Vulcanologia, Centro per la Modellistica, Fisica e Pericolosità dei Processi Vulcanici, Sezione di Sismologia e Tettonofisica, Via della Faggiola 32, I-56126 Pisa, Italia, Tel: +39-050-8311930, Fax: +39-050-8311942, neri@pi.ingv.it

Co-Conveners: Einat Aharonov, Weizmann Institute of Science, Israel; George Bergantz, University of Washington, US; Oleg Melnik (Moscow State University, Russia)

US012 Early Warning of Natural Hazards

Satellite remote sensing has proved to be a very important tool in mapping of the damages related to natural hazards in recent years. Numerous sensors onboard satellites have capability of providing information about land, ocean and atmosphere. Natural hazards (Earthquakes, Volcanoes, Tsunami, Landslides, Floods, Cyclones/hurricanes, Subsidence, Harmful algal blooms, Erosion, Cloud bursts, Snow avalanches, Oil spills, Dust storms, Coastal erosion, Droughts, Desertifications) occur on land or ocean; atmosphere provides linkage, it is now strongly believed that these natural hazards provide strong coupling between land-ocean-atmosphere-ionosphere. The session will discuss applications of Remote Sensing in mapping, monitoring and early warning of various Natural Hazards. Invited and contributed papers should be presented in the session

Conveners: Ramesh P. Singh, Department of Civil Engineering, Indian Institute of Technology, Kanpur INDIA, ramesh@iitk.ac.in

Co-Conveners: DanLing Tang, South China Sea Institute of Oceanology, Chinese Academy of Sciences, Guangzhou, CHINA (lingzistdl@126.com); Manfred Buchroithner, Institute for Cartography, University of Dresden, Dresden, GERMANY, Manfred.Buchroithner@mailbox.tu-dresden.de
Vittorio Sgrigna, Department of Physics, University of Rome Tre, Rome, ITALY, sgrigna@fis.uniroma3.it.

USSE013 Our Understanding of Climate Change, a Review of the newly available report by the Inter-governmental Panel on Climate Change, UNION (IAMAS (IPCC))

A special evening event will be held at the IUGG Assembly in Perugia to inform the audience about the findings of the Fourth Assessment Report (AR4) of the Intergovernmental Panel on Climate Change (IPCC) (published in early 2007). Representatives of the three IPCC working groups will present overviews of the scientific progress, findings, and the remaining challenges. These talks will address a) trends and projections of atmospheric composition and forcing, b) trends and projected changes in climate and sea level, c) observed and expected impacts on the environment and society, d) capabilities for adapting and building resilience to changes, and e) the status of options for limiting emissions through changes in the sources of energy and through carbon sequestration (separation and storage).

Conveners: Michael C. MacCracken, President of IAMAS, 6308 Berkshire Drive, Bethesda MD 20814 USA; Tel.: +1-301-564-4255; Fax: +1-301-564-4255; mmaccrac@comcast.net; Lucio Ubertini, IRPI-CNR, Rome-Perugia, Italy, phone 39 075 5014415; Uri Shamir, Faculty of Civil and Environmental Engineering, Stephen and Nancy Grand Water Research Institute, Technion - Israel Institute of Technology, Haifa 32000, Israel, Tel: +972-4-829-2239, Fax: +972-4-822-8898, shamir@tx.technion.ac.il; Paola Malanotte-Rizzoli, Department of Earth, Atmospheric and Planetary Sciences, Massachusetts Institute of Technology, 77 Massachusetts Avenue, 54-1416 Cambridge, MA 02139-4307, USA; Tel: +1-617-253-2451; Fax: +1-617-253-4464; rizzoli@mit.edu

USSE014 The WMO/IUGG Assessment of the Effect of Pollution on Precipitation

In 2003 Congress of the World Meteorological Organization, WMO, and the Assembly of the International Union of Geodesy and Geophysics, IUGG, set up the guidelines for an assessment of the effects of pollution and biomass burning on precipitation. Consequently an International Aerosol-Precipitation Science Assessment Group, IAPSAG, was formed under the leadership of the late Prof. Peter Hobbs. This group, now under Prof. Zev Levin, is assembling a report to address the different scientific aspects of possible interactions, and the possible confidence which can be assigned to the results. The major findings of this Report, finalized by the time of the IUGG Assembly in Perugia, will be communicated to a special evening meeting of interested scientists by the key investigators.

Conveners: Zev Levin, Department of Geophysics and Planetary Science, Tel Aviv University, Ramat Aviv, 69978, Israel; Tel: 972-3-6408274; Fax: 972-3-6409282; zev@hail.tau.ac.il; Roland List, Department of Physics, University of Toronto, Toronto, Ont. M5S 1A7, CANADA Tel. (+1) 416 978 2982, Fax (+1) 416 978 8905, list@atmosph.physics.utoronto.ca; Leonard A. Barrie, Environment Division, Atmospheric Research and Environment Programme, World Meteorological Organization, 7 bis, avenue de la Paix, BP2300, CH-1211 GENEVA 2, Switzerland; Phone: +41 22 730 82 40; Fax: +41 22 730 80 49; Lbarrie@wmo.int; George A. Isaac, Cloud Physics Research Division, Meteorological Service of Canada, 4905 Dufferin Street, Downsview, Ontario, M3H 5T4, CANADA; phone: (+1) 416-739-4605, FAX: (+1) 416-739-4211; George.Isaac@ec.gc.ca; Pierre Hubert, Ecole des Mines de Paris, 33, rue Saint-Honore, F-77305 Fontainebleau, France; phone 33 1 6 469 4702; fax: 33 1 6 469 4703; hubert@cig.ensmp.fr

Inter-Association Symposia and Workshops

JGS001 Ocean Circulation and contributions from new satellite missions

Sponsoring Association: IAG in collaboration with: IAPSO

Data from the new gravity missions (CHAMP, GRACE, and the upcoming GOCE) combined with altimetric sea surface height open up a wealth of opportunities for new observables applicable to ocean circulation, including: absolute surface geostrophic currents, time variable ocean bottom pressure, time changes in deep ocean currents, and time changes in heat content. This session will be devoted to original results using data from CHAMP and/or GRACE for ocean circulation studies, as well as estimates of what can be expected from GOCE. Results showing effects of assimilating gravity data products into general ocean circulation models are also welcome.

Conveners: D. Chambers, V. Zlotnicki



JGS002 Global sea-level change: Altimetry, GNSS and tide gauge measurements

Sponsoring Association: IAG in collaboration with: IAPSO

One of the current priorities in the scientific world is to understand changes in global sea-level and its effect on coastal populations. Recent improvements in understanding the contributions of ice sheets and glaciers, continental water storage, thermal expansion of the oceans as well as advances in the analysis of the observation of sea-level from altimetry, tide gauges and ground motion from GPS/levelling must be assimilated in order to provide the best possible estimates of present-day sea-level change. In this session we invite contributions from all disciplines associated with the measurement of changes in sea-level including satellite altimetry and gravity missions, studies of tide-gauge records, monitoring of the local ground movement of tide gauges by space geodetic techniques (e.g. GPS) as well as long-term estimates of sea-level change. Presentations related to the IGS TIGA Pilot Project are most welcome.

Conveners: R. Coleman, G. Mitchum

JGS003 Earthquake and Volcano Geodesy

Sponsoring Association: IAG in collaboration with: IASPEI, IAVCEI

Large earthquakes produce significant static and dynamic displacements that can be measured easily by modern space geodesy. The largest earthquakes, such as the 2004 Sumatra-Andaman Islands earthquake or the much older but even larger 1964 Great Alaska earthquake and 1960 Chile earthquake, may produce dynamic and static displacements detectable around the entire globe. A particular area of newly-recognized importance is the intermediate range between the seismic frequency band and the static displacements, for example the role of slow slip and early postseismic transients. High-rate GPS provides a new tool to investigate such phenomena. While volcanic eruptions and intrusions cause deformation that is more localized than for the largest earthquakes, displacements can be substantial and geodesy can provide critical information about the movement and accumulation of magma in the subsurface. Volcanoes display remarkable dynamism and variation in displacements, with a rich array of geodetically observable signals at a wide range of timescales. This session will cover topics ranging from the use of geodetic data to study earthquake and volcanic sources and related effects such as postseismic deformation, to the impact of earthquakes or volcanic unrest on geodetic observables such as gravity, displacements, and the terrestrial reference frame.

Conveners: Jeff Freymueller, Geophysical Institute, University of Alaska, Tel: 907-474-7286, Fax: 907-474-7290, PO Box 757320Fairbanks, AK 99775-7320, jeff@giseis.alaska.ed; Geoff Blewitt, University of Nevada-Reno; Eric Calais, Purdue University; Prof. David D. Jackson, Department of Earth & Space Science, University of California, Los Angeles, CA 90095-1567, Tel: 310-825-1475, Fax: 310-825-2779, djackson@ucla.edu

JGS004 Oceanography and geodesy in the polar regions

Sponsoring Association: IAG in collaboration with: IAPSO, UCCS

Recent geodetic (CHAMP, GRACE, and in the future, GOCE) and altimetric (ERS, Envisat, TOPEX/Poseidon, GFO, Jason-1 and now IceSat and CryoSat) missions are, together with the longer term satellite climatological datasets (SSM/I, AMSR-E), helping to revolutionise our knowledge of time-variability in the polar oceans. The combination of geoid and altimeter measurements allows the direct determination of absolute dynamic ocean topography for the first time. InSAR and GPS and time-varying gravity data add new insight into ice-sheet dynamics and glacial rebound, with resulting improvements in knowledge on the influence of ice mass flux and glacial isostatic adjustment on sea level. The new satellite measurements are complemented by the development of global ocean observations such as Argo, together with other new autonomous, profiling or moored sensors. This symposium seeks to highlight recent advances in understanding seasonal to interannual and secular variability in characteristics of the high latitude oceans, including its circulation and heat and freshwater balance, sea level, and the marine cryosphere, derived from the latest generation of in situ and remote observations and ocean models. Presentations that synthesise results from multiple satellite systems or satellite and in situ data are particularly encouraged.

Conveners: M. Drinkwater, S. Rintoul



JGS005 Observations of the Cryosphere from Space (IAG and UCCS Symposium hosted by IAG)

Sponsoring Association: IAG in collaboration with: IAHS, IAMAS, IAPSO, UCCS, CliC

Recent advances have been made in the development and implementation of new concepts for cryosphere-dedicated space missions, as well as the development and maturation of methods for retrieving a variety of important geophysical parameters. Both ESA and NASA have dedicated cryospheric sciences missions planned/in orbit. In addition, gravity missions such as CHAMP, GRACE and planned follow-ons and satellite altimeter missions such as ICESat, ENVISAT, JASON-1 are providing unique data on the topography and mass balance of the cryosphere. The purpose of this session is to present the latest results of observations of all aspects of the cryosphere from space. We invite presentations on the use of satellite, airborne and in-situ measurements to study sea-ice and terrestrial ice surfaces. We also invite presentations describing the accuracy and limitations of the different methods.

Conveners: Mark Drinkwater, ESA/ESTEC, Keplerlaan, Postbus 299, 2200 AG Noordwijk, The Netherlands, Tel: +31 (0)71 565 4514, Fax: +31 (0)71 565 5675, Mark.Drinkwater@esa.int; Isabella Velicogna, NASA/JPL, CIRES & Department of Physics, University of Colorado, CAMPUS BOX 390, BOULDER, CO 80309-0390, USA, Tel: 303 492 5141, Fax: 303 492 7935, isabella@colorado.edu; Konrad Steffen, University of Colorado, CIRES, Campus Box 216, Boulder, CO 80309-0216; Tel: (303) 492 4524; Fax: (303) 492 1149; Konrad.Steffen@colorado.edu

JGS006 Extraterrestrial Ice

Sponsoring Association: IAG

Rationale Ice, either as H₂O or CO₂ ice (or other possible compositions) represents a common feature in the solar system, most notably, on the surfaces of the inner planets and as major constituents of the moons in the outer solar system. Knowledge about the occurrence of ice either at the surface or inside the planetary bodies stems primarily from astronomical and satellite observations of their surfaces and from measurements of geophysical parameters that reveal information on their internal structure. However, little is known about the exact properties, the development and the present dynamics of internal or surfacial ice deposits on extraterrestrial planets. The terrestrial Cryosphere has been studied extensively, both in the field and in the laboratory. In addition, substantial insights have been gained from satellite remote sensing on the one hand and from numerical ice dynamics modelling on the other. This symposium is intended to provide an overview about our current understanding about extraterrestrial ices, their main characteristics and their development. Particular emphasis will be placed on possible analogues between terrestrial and extraterrestrial ice and possible synergies in studying the one or the other. Objective The objective of this symposium lies in providing an overview about the current understanding of internal and surfacial extraterrestrial ice deposits in our solar system. Moreover, the symposium will explore possible analogues between terrestrial and extraterrestrial ice and how our knowledge of the Cryosphere might help us in understanding extraterrestrial ice. Coverage of Symposium Contributions will be encouraged from all researchers involved in the study of extraterrestrial ice and those that may provide insight as to how their expertise of the terrestrial Cryosphere might benefit the study of extraterrestrial ice.

Conveners: Manfred Lange – Germany

Co-Conveners: Ralf Greve – Japan, Christine Schott Hvidberg, Niels Bohr Institute, University of Copenhagen, ch@gfy.ku.dk

JGS007 Ice Cores and Climate

Sponsoring Association: IAG in collaboration with: IAMAS, UCCS

Ice Cores drilled through ice on ice sheets and glaciers contain records on the past climate reaching as far back as 900,000 years on the world's biggest and coldest ice sheet covering Antarctica. Ice core analysis has developed during the last decades and the span of parameters being measured on the modern ice cores has expanded. The high resolution records from the ice cores thereby are some of the best sources we have in palaeoclimate research to manifest the full dynamics of the coupled atmosphere-ocean-ice climate system. The aim of this session is to present climate related ice core records from the ice sheets and glaciers both from the Arctic and Antarctic regions but also



from those regions where ice is rapidly disappearing and the need to obtain ice cores before the ice is gone is urgent.

Conveners: Dorthe Dahl-Jensen, Niels Bohr Institute, University of Copenhagen, Juliane Maries Vej 30, DK-2100 Copenhagen OE, Denmark, Tel: +45 35 32 05 56, Fax: +45 35 36 53 57; ddj@gfy.ku.dk

JAS001 Planetary cores: physics, chemistry and dynamics

Sponsoring Association: IAGA in collaboration with: IAG, IASPEI, IAVCEI, SEDI

This session focuses on recent advances in our understanding of the temperature, composition, structure and dynamics of the core of Earth, and of other terrestrial planets. Contributions on all related aspects are welcomed. We particularly invite contributions dealing with developments that cover the various disciplines bearing on this topic, including geodesy (e.g., rotation rate, wobble and nutation), core oscillations, seismology (e.g., structure of inner and outer core; differential rotation rate of the inner core), mineral physics (e.g., physical properties and phases at high pressure from experiments or from calculations), geochemistry (e.g. light elements, partitioning of radioactive elements), geodynamics (e.g., structural influences on dynamics and dynamo process, thermal and compositional convection, dynamic coupling of inner core, outer core and mantle) and energetic considerations (e.g. thermal history of the core, heat budget and Joule heating).

Conveners: P. Cardin, Observatoire de Grenoble, France, Tel: +33 4 76 828 044, Fax: +33 4 76 828 101, philippe.cardin@ujf-grenoble.fr; D. Loper, Geophysical Fluid Dynamics Institute, Florida State University, Tallahassee FL, USA; Tel: +1-850-644-6467, Fax: +1-850-644-8972, loper@gfdi.fsu.edu

Co-Conveners: V. Dehant, Royal Observatory of Belgium, Brussels, Belgium; R. Boehler, Max-Planck-Institut für Chemie, Mainz, Germany; S. Tanaka, Institute for Research on Earth Evolution, Japan Agency for Marine-Earth Science and Technology, Yokosuka, Japan.

JAS002 Large scale imaging of the continental and oceanic lithosphere

Sponsoring Association: IAGA in collaboration with: IASPEI

Mapping of the internal structure of the continental and oceanic lithosphere is important to understand the dynamics of the Earth. Variation of electrical conductivity reflects structural and petrophysical properties. Anomalous conductive features give clues for the existence of graphite, saline water or partial melt and throw light on the rheological properties. The objective of the session is to bring together the recent theoretical, observational and experimental studies on deep crust and mantle studies at various active and passive regions of the continents as well as oceans with a focus on the relationships with deep geological processes and tectonic interpretation. Large-scale regional studies derived from geomagnetic and magnetotelluric soundings will constrain the models that lead to new interpretation of the processes

Conveners: T. Harinarayana, NGRI, Uppal Road, Hyderabad – 500 007, India; Tel: +91-40-23434613; Fax: +91-40-23434651; tharinarayana@hotmail.com

Co-Conveners: M. Jegen, GEOMAR, Germany, J. Pous, U. Barcelona, Spain; Kerry Key, U. California, San Diego, USA

JAS003 Distribution of water and heat in the crust: Indication from EM studies

Sponsoring Association: IAGA in collaboration with: IAHS, IAPSO, IASPEI

The symposium will focus on recent studies on the crustal and upper mantle structures in active tectonic settings. We welcome studies on the regions of high heat flow, high seismicity and active deformations. In particular, studies on the volcanic and geothermal areas and active fault zones are welcome. Emphasis should be put on the relations with fluids and heat and comparison with other geophysical techniques, such as seismology, crustal deformation, and geochemistry are encouraged

Conveners: Y. Ogawa, Volcanic Fluid Research Center, Tokyo Institute of Technology, Japan; Tel: +81-3-5734-2639; Fax: +81-3-5734-2492; oga@ksvo.titech.ac.jp

Co-Conveners: A. Manzella, National Research Council - Institute of Geosciences and Earth Resources, Italy; D. Bai, Institute of Geology and Geophysics, Chinese Academy of Sciences, Beijing, China



JAS004 Methodology in EM studies: Theory, modelling and inversion

Sponsoring Association: IAGA in collaboration with: IASPEI

Electromagnetic (EM) studies of the conducting Earth has advanced significantly in the last decade, driven in particular by the progress in the methods for processing, analysis, modelling and interpretation of EM data. We seek contributions illustrating the current state and new opportunities in this field. We welcome the works that deal with various types of EM data both from controlled and natural sources, at different earth scales and levels (including sea-floor and satellite measurements). Works related to three-dimensional (3-D) modelling and inversion are particularly welcome. In addition to theoretical results, we invite examples illustrating the use of new algorithms on real data sets

Conveners: A. Kuvshinov, Danish National Space Center, Juliane Maries Vej 30, 2100 Copenhagen, Denmark; Tel: +45-3532-0507; Fax: +45-3536-2475; alexei@spacecenter.dk;

Co-Conveners: W. Siripunvaraporn, Mahidol University, Bangkok, Thailand C. Farquharson, Memorial University of Newfoundland, St. John's, Canada; S. K. Verma, National Geophysical Research Institute, Hyderabad, India

JAS005 The role of aerosols and dust in the middle atmosphere

Sponsoring Association: IAGA in collaboration with: ICMA

The middle atmosphere (MLT) is now thought to contain large quantities of charged dust and aerosols which can be responsible for many unusual phenomena such as noctilucent clouds (NLC) and polar mesospheric summer echoes (PMSE). Recently, there has been a flurry of new measurements and studies concerning this dusty plasma in the MLT. This session will concentrate on its origin, including the shape, size, and composition of the particles composing it. Both recent measurements and theoretical considerations will be highlighted. These considerations will also include such items as event dependence on background conditions, the frequency and global distribution of the induced phenomena, southern hemisphere/northern hemisphere differences, and long-term changes.

Conveners: R. A. Goldberg, NASA/Goddard Space Flight Center, Laboratory for Solar and Space Physics, Code 612.3, Greenbelt, MD 20771, USA, Tel: +1-301-286-8603, Fax: +1-301-286-1648; richard.a.goldberg@nasa.gov

Co-Conveners: F.-J. Lübken, Leibniz Institute of Atmospheric Physics, Kühlungsborn, Germany

JAS006 Electrodynamical and chemical effects in the middle and upper atmosphere generated by thunderstorms

Sponsoring Association: IAGA in collaboration with: IAMAS

Since humankind's dawn we have been intrigued by the way that solar and extra-terrestrial sources of energy affect our planet. The processes by which these energy fluxes interact with the Earth's magnetic field, impacting the outermost layer of the planet, the Magnetosphere, get transferred "downwards" to the ionosphere and consequently to the lower neutral atmospheric layers, have constituted the subject of enticing research for many decades and developed into well established research fields. In the 60's the first "upwards" transport mechanism of energy produced in the lowest atmospheric layer, the Troposphere, was discovered in the form of gravity waves. Thunderstorms, a sub-product of solar energy, constitute the most significant source of gravity wave, a "upwards" mechanical energy transport. Recently, in 1989, another process of "upwards" transfer of thunderstorm energy, this time electrical, was discovered and named sprite a few years latter. Since then, every year a new type of electrical energy transport mechanism to the upper atmosphere and space, associated with thunderstorms, have been discovered. So far, they can be summarized in two different categories: the "Transient Luminous Events", TLEs; and the high energy bursts, e.g. "Terrestrial Gamma-ray Flashes", TGF, and X-ray emissions, observed by satellite and airborne instrumentation. Satellite observations of TLEs and TGFs all over the Earth have demonstrated that they are global phenomena, having unaccounted implications in the total energy budget of the planet. The TLE component signals the continuous occurrence of complex energy exchange mechanisms in the middle and upper atmosphere, involving coupling of extensive geophysical processes like gravity waves, atmospheric chemistry, plasma physics, neutral atmosphere-ionospheric interactions and possible magnetospheric effects. The high energy bursts produced by thunderstorm related mechanisms, still highly unknown, show the Earth's capability of transforming the high extra-terrestrial energy



continuously received, into life on the surface of the planet and low energy processes relatively well understood, as well as re-emitting it to space as burst of energy comparable to supernova explosions as the 10's MeV Terrestrial Gamma-ray Flashes observed by RHESSIS satellite. This session welcome papers on all the electrodynamical effects of thunderstorms in the upper atmosphere, their interaction with the local medium, e.g. chemical effects, gravity wave interaction, ionospheric and magnetospheric possible coupling, and on the high energy bursts associated with thunderstorms, as well as any other related phenomena.

Conveners: F. T. São Sabbas, Aeronomy Division (DAE), INPE – Instituto Nacional de Pesquisas Espaciais, C.P. 515, São José dos Campos, SP, Brazil, 12245-970; Tel/Fax: +55-12-3945-7154/6990; fsaosabbas@dae.inpe.br

Co-Conveners: E. Blanc, Commissariat à l'Energie Atomique (CEA), France; C.J. Rodger, Otago University, New Zealand; D.D. Sentman, University of Alaska, USA

JAS007 Response of the atmosphere/ionosphere coupling system to forcing from the Sun and the lower atmosphere

Sponsoring Association: IAGA in collaboration with: ICMA

The variability in solar radiation and the particle flux from the Sun and the magnetosphere represent a large source of energy for the middle atmosphere, thermosphere and ionosphere. At the same time the mesosphere-lower thermosphere (MLT) and even ionosphere are driven from below by both dynamic and electrodynamic inputs from the massive lower atmosphere. The MLT region is a critical region in the coupling between the lower/middle atmosphere and the upper atmosphere/ionosphere since it is here that physical processes filter and shape the flux of waves ascending through the mesosphere into the overlying thermosphere. Most of these waves (planetary waves, atmospheric tides and acoustic-gravity waves) originating in the lower atmosphere are particularly strong and ubiquitous features in the MLT region and can influence ionosphere as well. On the other hand it is reasonable to presume that there might be a link between solar variability and the changes in the middle atmosphere and climate variables. This requires much improved knowledge and understanding of the solar effects on the coupling processes.

The symposium will cover all aspects of the worldwide activity concerning the external forcing of the middle atmosphere and meteorological effects on the ionosphere. It will address the both theoretical and empirical recent results concerning the coupling mechanisms through dynamics, composition and electrodynamics i.e., solar influence in the middle atmosphere, transfer of momentum and energy by internal atmospheric waves, the interaction between these various waves, forcing of the ionosphere from below, the dependence of coupling processes on the solar and geomagnetic activity, the downward control effects transferring from the strongly solar dependent structure to the lower atmospheric levels. The symposium will serve as a forum for the discussions of ongoing efforts including improvements and new additions to databases, interpretations, simulations and theoretical models

Conveners: D. Pancheva, Department of Electronic and Electrical Engineering, University of Bath, Bath BA2 7AY, UK, Tel: 44 (0)1225 386310, Fax: 44 (0)1225 386305, eesdvp@bath.ac.uk

Co-Conveners: E. Kazimirovsky, Institute of Solar-Terrestrial Physics, Russian Academy of Sciences, Russia; U. Langematz, Free University Berlin, Germany

JAS008 Long-term trends and changes in the atmosphere-ionosphere system

Sponsoring Association: IAGA in collaboration with: ICMA

Monitoring long-term trends mixed with short-term instabilities and periodicities in the Earth system have always been a challenge but the past two decades have enriched us with variety of observational data from space, airborne and ground-based platforms. The primary goal of this symposium is to discuss the most updated experimental and model results on long-term changes and trends in the stratosphere, mesosphere, thermosphere and ionosphere. The symposium will emphasize the emerging trend signals under global change and future predictions. To specify in more detail the relative importance of long-term natural and anthropogenic influences (greenhouse gas induces) on the observed trends is one of objectives of the symposium. Both observational and modeling/simulation papers are welcome

Conveners: G. Beig, Indian Institute of Tropical Meteorology, Dr. Bhabha Road, Pashan PUNE-411 008 India, Tel: +91-20-25893600, Fax: +91-20-25893825, beig@tropmet.res.in

Co-Conveners: J. Lastovicka, Academy of Sciences of The Czech Republic, Prague; M. Jarvis, British Antarctic Survey, Cambridge, U.K.



JAS009 Equatorial atmosphere-ionosphere coupling processes: responses to forcing from lower atmosphere and magnetosphere

Sponsoring Association: IAGA in collaboration with: IAMAS

The earth's equatorial latitudes offer unique conditions for investigating the dynamical and electro-dynamical coupling processes that govern the atmosphere-ionosphere system and its interaction with the magnetosphere and interplanetary medium. Upward transport of wave energy and momentum due to gravity, tidal and planetary waves from below and extra-tropics control the phenomenology of the equatorial atmosphere-ionosphere system and its large zonal, day-to-day and interannual variabilities while magnetospheric /interplanetary forcing through disturbance electric fields and energy deposition at high latitudes with the consequent coupling to equatorial latitudes represent another important source of variability of the system. In recent years important new results have come out from ground based as well as space borne observations and simulation studies on the different sources of variabilities of the system. This symposium will address all aspects of the dynamics and energetics governing the atmosphere- ionosphere- magnetosphere- interplanetary coupling processes of the equatorial region. Results are welcome from ground based and satellite borne experiments, and from modeling investigations, on the dynamics and electro-dynamics, and manifestations of coupling process, (such as responses to magnetic storms and upward propagating atmospheric wave disturbances etc.), in terms of small and large structures, and variabilities in winds, temperatures, waves, plasma drifts, electric fields and currents, in general, and especially, those related to the major phenomena of the region: Equatorial plasma bubbles/Spread F, Ionization Anomaly and Electrojet

Conveners: M. A. Abdu, Instituto Nacional de Pesquisas Espaciais à INPE; Ave. dos Astronautas 1758; 12201 970, SÃ£o Jose dos Campos, SP, Brazil; Tel: 55 12 345 6797, Fax: 55 12 345 6990, abdu@dae.inpe.br

Co-Conveners: T. Nakamura, Radio Science Center for Space and Atmosphere (RASC), Kyoto University, Japan; B. T. Tsurutani, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA

JAS010 Magnetic field forcing of the thermosphere

Sponsoring Association: IAGA in collaboration with: IAG, IAMAS

The study of thermospheric dynamics has become new impulses by the advent of satellite missions, such as CHAMP and GRACE, carrying sensitive accelerometers on board. From the recorded air drag it is possible to derive the details of mass density and wind distribution. The CHAMP satellite also provides in addition measurements of the ionospheric currents, the plasma density and temperature. These global and high-resolution simultaneous observations have revealed prominent new features of the thermosphere unrealized before. These include the air density bulge in the cusp region, a double-hump distribution at middle latitudes similar to the equatorial ionization anomaly, and strong winds channeled along the dip equator instead of the geographic equator. All reflects a strong magnetic control of the thermosphere. The upcoming ESA SWARM mission is a 3-satellite constellation mission. Each satellite will carry a full suit of electromagnetic instruments together with an accelerometer. These multi-point measurements provide high perspective to identify the dynamics processes leading to these features. The exciting new features challenges our classical picture about the thermospheric wind and density depicted by MSIS and HWM models, and are reshaping our view of the T-I coupling. This session will serve on one hand as a forum for discussing the most recent and prominent development of the T-I coupling in terms of magnetic forcing, on the other hand, as a meeting announcing new T-I research possibilities with the SWARM mission. Comparative modeling studies, ground and satellite observations, and theoretical studies related to wind dynamo, wave-particle interaction, atmospheric chemistry are welcome. They may help to understand the true features of the ionosphere-thermosphere coupling. Studies in preparation of the SWARM mission will also be included

Conveners: H. Lüehr, GeoForschungsZentrum Potsdam, Telegrafenberg, D-14473 Potsdam, Germany, Tel: +49 331 288-1735, Fax: +49 331 288-1732, hluehr@gfz-potsdam.de

Co-Conveners: H. Liu, Division of Earth and Planetary Science, Graduate School of Science, Hokkaido University, Japan



JAS011 The Sound of Physics: Advances in coronal, helio-, astero- and terrestrial seismology

Sponsoring Association: IAGA in collaboration with: IAMAS, IASPEI

Seismological techniques are now being applied in regimes throughout the universe to elucidate the physical properties and behavior of dynamic structures. Sound waves, magneto-hydrodynamic waves, and other propagating disturbances allow researchers to "sound out" the interior structure and dynamics of a wide range of geophysical and astrophysical objects. The development of remote sensing techniques using Doppler signatures have allowed us to determine the interior flows and structure of the Sun, providing an unprecedented view of the inner workings of our nearest star. Additionally, the field of asteroseismology is helping us to perform similar research on other stars, which in turn allows us to better understand our own Sun by providing other data points on the stellar spectrum. The new field of coronal seismology is providing the ability to deduce physical parameters that aren't accessible through direct observations, by modeling the dynamics of structures in the solar atmosphere in response to a variety of impulsive transients. As these applications of seismology continue to flourish, terrestrial seismologists have also produced new advances in data collection and interpretation. This special session welcomes presentations on scientific results, innovative techniques, and new applications in all fields of seismology, with a special emphasis on the parallels between these fields.

Conveners: T.S. Metcalfe, High Altitude Observatory, National Center for Atmospheric Research, P.O. Box 3000, Boulder, CO 80307, USA, Tel: +1 303 497 8326, Fax: +1 303 497 158, travis@hao.ucar.edu;

Co-Conveners: B.J. Thompson, NASA Goddard Space Flight Center, USA; S.J. Schwartz, Imperial College, UK.

JAS012 Seismological, geological and tectonic interpretation of geomagnetic anomalies on continents and oceans

Sponsoring Association: IAGA in collaboration with: IASPEI

Magnetic anomaly maps derived using near-surface and satellite data reveal distinctive magnetic anomalies from continents and oceans. These anomalies are routinely used to model and interpret the sources in terms of plate motion, crustal structure, geology and chemical composition of the Earth's crust, utilising seismic data as a constraint. The session solicits contributions dealing with seismic and magnetic data to reveal new geological and tectonic information of the Earth's continents and oceans

Conveners: K. Hemant, School of Earth and Environment, E.C. Stoner Building, University of Leeds, LS2 9JT Leeds, UK, Fax: +44 113 34 35259, hemant@earth.leeds.ac.uk

Co-Conveners: S. Okuma, Geological Survey Japan, AIST, Tsukuba, Ibaraki, Japan
C. P. Rajendran, Center for Earth Science Studies, Trivandrum, India

JHS001 Debris Transport in Glaciers (UCCS Symposium hosted by IAHS)

Sponsoring Association: IAHS in collaboration with: UCCS, INQUA and IGS

The aim of this session are to apply a multidisciplinary approach to (i) enhance our understanding of debris entrainment and transfer in glaciers, and subsequent deposition at contemporary ice margins, and (ii) to use this knowledge to constrain numerical models of contemporary and former ice masses. The principal themes will be: the disposition of debris within glaciers (particularly in relation to structure), contemporary glacial depositional processes, and numerical modelling of glacial depositional systems.

Conveners: Michael J. Hambrey, Center for Glaciology, Institute of Geography & Earth Sciences, University of Wales, Aberystwyth, Ceredigion, SY23 3DB, United Kingdom, Tel. +44 (0)1970 621860, Fax. +44 (0)1970 62265, mjh@aber.ac.uk,

JHS002 Natural Ice Microstructures (UCCS Symposium hosted by IAHS)

Sponsoring Association: IAHS in collaboration with: UCCS, IAMAS, IGS

Similar phenomena happen at a given physical scale in any of the various environments addressed in



the research fields of cryospheric sciences. This is specially the case of the so-called "capillary scale" (typically from micron to millimetre) that governs the behaviour of precipitation elements in clouds such as graupel, snow cover, ice fabric in ground or marine ice as well as icing patterns on mobile or immobile substrates. Applications of these studies are numerous in snow science and glaciology, particularly for snow model parameterisations and ice core measurement interpretation. All these ice microstructures are fully tri-dimensional assemblies of grains and bonds with extremely complex interface shapes. They require specific techniques of investigation that range from 3D imaging and modelling to stereology (to bridge 2D to 3D properties) and statistical approaches to reach the scalar and continuous parameterisations required by current cryosphere models. Furthermore, snow parameters relating the laboratory capillary scale to the much simpler and coarser field observation method are needed, such as described in the International Classification of Seasonal Snow on the Ground. The objective of this symposium/workshop is to develop a discussion and understanding of natural ice microstructures, with emphasis on the current state of the art in the field and promoting exchange of knowledge. Synergies are expected between the fields of glaciology, snow science, cloud meteorology, image processing and scientific instruments. Contributions on the interdisciplinary exchange with marine, aircraft or power engineering would be welcome.

Conveners: Jean-Bruno Brzoska, Météo-France, Center d'Etudes de la Neige, 1441 r. de la Piscine, 38406 St Martin d'Hères Cedex, France, Tel : +33 (0)476637925, Jean-Bruno.Brzoska@meteo.fr

Co-Conveners: Martin Schneebeli, Eidgenössisches Institut für Schnee und Lawinenforschung, Davos, Switzerland, schneebeli@slf.ch; Ed Adams, Dpt of Civil Engineering, MSU-Bozeman, USA, eda@ce.montana.edu; Pierre Etchevers, Center d'Etudes de la Neige, St Martin d'hères, France, pierre.etcchevers@meteo.fr; Charles Fierz, Eidgenössisches Institut für Schnee- und Lawinenforschung, Davos, Switzerland, fierz@slf.ch

JHW001 Interactions between snow, vegetation and the atmosphere (UCCS Symposium hosted by IAHS)

Sponsoring Association: IAHS in collaboration with: UCCS, ICSIH, IAMAS-ICPM, iLEAPS and IGS

Vegetation influences snow distribution by trapping falling and wind-blown snow, and exposed vegetation canopies alter the radiative and turbulent energy fluxes to underlying snow and the atmosphere. Snow insulates the ground and releases water and nutrients on melt, in turn influencing distributions of vegetation. Snow and vegetation distributions both respond to and feedback on changing climates. For this workshop, submissions are invited on observational and modelling studies of ecological, hydrological, meteorological and interdisciplinary aspects of interactions between snow, vegetation and the atmosphere.

Conveners: Richard Essery, Center for Glaciology, Institute of Geography and Earth Sciences, University of Wales, Aberystwyth SY23 3DB, UK, Tel : +44 (0)1970 622784, rie@aber.ac.uk

Co-Conveners: Robert Baxter, University of Durham, UK, robert.baxter@durham.ac.uk; John Pomeroy, University of Saskatchewan, Canada, pomeroy@usask.ca; Matthew Sturm, USA-CRREL-Alaska, Ft. Wainwright, USA, Matthew.Sturm@erdc.usace.army.mil; Takeshi Yamazaki, JAMSTEC, Yokosuka, Japan, yamaz@jamstec.go.jp

JHW002 Climate-Permafrost-Hydrology Interactions: The Impact of Changing Climate on Cold Regions Hydrology (UCCS Symposium hosted by IAHS)

Sponsoring Association: IAHS in collaboration with: UCCS and ICSIH

In the cold regions, the surface condition is strongly controlled by complex interactions between the climate, permafrost and hydrology. These interactions are a subject of study by the 2007 International Polar Year. Interactions include those between climate, snow cover, soil moisture, soil heat conduction, evaporation, and vegetation. In order to consider future changes in hydrology due to anthropogenic climate change it is necessary to understand these interactions. However, the nature of these interactions, and our ability to model them, are currently very limited. It is expected that both natural climate variability and anthropogenic climate change will result in significant changes to both the permafrost and local hydrological processes. However, due to the complex interactions involved, it is difficult to quantify changes in active layer depth, soil temperature and permafrost depth in areas near the current zero-degree isotherm. Factors of interest include: vegetation, snow accumulation and melt, snow free period, sub-surface flow patterns as related to active layer depth and runoff. This workshop will address these issues by bringing together experts in the field of climate change, permafrost, and cold regions hydrology in order to discuss important issues and



advances in both our understanding of the interactions between climate, permafrost and hydrology, and to consider future advances in this field. Contributions are solicited on, but not limited to, the following: 1. Interactions between climate, permafrost, and hydrology; 2. Documented past changes in climate, permafrost and hydrology; 3. Potential impacts of future climate variability and change on permafrost and hydrology; 4. The ability of existing hydrologic and land-surface models to consider the complex interactions between climate, permafrost and hydrology, and the ability of these models to consider the impact of climate change on the hydrologic system in permafrost dominated regions.

Conveners: Philip Marsh, National Water Research Institute, 11 Innovation Blvd., Saskatoon, Sask. Canada S7N 3H5, Tel +1 306-975-5752, Fax: +1 306-975-5143, philip.marsh@ec.gc.ca.

Co-Conveners: Lev Kuchment, Russia, kuchment@mail.ru; Tingjun Zhang, USA/China, tzhang@nsidc.org; Oliver Frauenfeld, USA, oliverf@kryos.colorado.edu; Tetsuo Ohata, Japan, ohata@pop.lowtem.hokudai.ac.jp

JMS001 Our Changing Planet

Sponsoring Association: IAMAS in collaboration with: IAHS, IAPSO

This is a continuation of Union Symposium U1, and contains contributed papers. First Monday afternoon is dedicated to fluids and addresses global change originating in the atmosphere (including the magnetosphere), the oceans, and the hydrosphere (including land ice). Topics will include trace gas induced global warming, the role of the oceans in climate variability and change, the stability of the cryospheric, etc. The second Monday afternoon is dedicated to solid Earth processes and the Earth's deep interior. Topics in this area may include the physics of the earthquake source mechanism, the geodetic monitoring of tectonic deformation, the style of the mantle convection process and the physics of the Earth's core, including the dynamo process and the mechanism(s) of field reversal

Conveners: W. Richard Peltier, Dept of Physics, University of Toronto, 60 St. George Street, Toronto, Ontario, CANADA, M5S 1A7, Tel (416)-978-2938, Fax: (416)-978-8905, peltier@atmosph.physics.utoronto.ca

JMS002 Earth System Interactions

Sponsoring Association: IAMAS

This symposium is a continuation of Union Symposium U10, and comprises contributed papers. Contributions are expected on cutting edge simulations and analyses of observations of the Earth system and the interactions among its components in the past, present, and projected to occur in the future. Situations of particular interest include the factors and processes affecting the interactions among the atmosphere, oceans, ice and land. Also welcome are contributions addressing human-induced changes that alter climate, contributed to the apparent stability of the pre-industrial climate and led to glacial cycling, and that prevailed during past climatic conditions that were warmer than at present.

Conveners: Guy Brasseur, Max-Planck-Institut für Meteorologie; Bundesstr. 53, D-20146 Hamburg, Germany, Tel: +49-40-41173-421, Fax: +49-40-41173-430, brasseur@dkrz.de

JMS003 Satellite Observations: Products and Applications

Sponsoring Association: IAMAS in collaboration with: IAGA, IAG, IAHS, IAPSO, UCCS

Starting with the launch of Tiros-N in 1978, satellite observations have revolutionized our view of the Earth and other planets. Observational techniques have been incorporated into many activities, often being used in unanticipated ways. Satellite observations are now a vital part of many scientific, industrial and social activities affecting many discipline areas and have had a significant impact in studies of many issues, both societal and scientific. This symposium will bring together practitioners from a number of fields to celebrate the success of this endeavor and to demonstrate new and exciting uses for these data. It will consist of both invited and contributed papers on a wide range of topics covering all aspects of space-based observations

Conveners: James R. Drummond, Department of Physics, University of Toronto, Toronto, M5S 1A7, Canada, Tel: 1 416 978 4723, Fax: 416 978 8905, james.drummond@utoronto.ca

Co-Conveners: Eric Rignot, Jet Propulsion Laboratory, eric.rignot@jpl.nasa.gov; HungLung Allen Huang, University of Wisconsin-Madison, allen.huang@ssec.wisc.edu; David Hudak, Cloud Physics



and Severe Weather Research Division, Environment Canada; David.Hudak@ec.gc.ca; Michael D. King, EOS Senior Project Scientist, Earth-Sun Exploration Division, michael.d.king@nasa.gov; Lee-Lueng Fu, Jet Propulsion Laboratory, llf@pacific.jpl.nasa.

JMS004 Intercontinental Transport of Substances and its Consequences

Sponsoring Association: IAMAS in collaboration with: IAHS, IAPSO

"What comes around goes around" is one way to express the phenomenon of long-range transport of pollution from continent to ocean to continent, often reaching far around the world. Examples of intercontinental transport of non-welcome substances include dust, soot, sulfate aerosols, ozone, CO, and a number of reactive trace gases having lifetimes in the atmosphere of days to weeks. Sources can include megacities and extended urbanized regions as well as eroding and unvegetated land. Pollutant plumes can leave one continent and cross an ocean or even return to the same continent after extended travel over the oceans. This symposium invites papers on issues regarding the long-distance transport of pollution of all sorts, including studies carried out based on observations, field experiments, and models.

Conveners: Anne Thomson, Dept of Meteorology, 510 Walker Building, University Park, PA 16802 USA, Tel: (814) 865-0479, anne@met.psu.edu

Co-Conveners: Robbie W. Macdonald, Department of Fisheries and Oceans, Institute of Ocean Sciences, macdonaldrob@pac.dfo-mpo.gc.ca

JMS005 Aerosols, Biomass Burning and Precipitation

Sponsoring Association: IAMAS in collaboration with: IAHS, IGAC

This session will explore recent progress in our understanding of the interactions between atmospheric aerosols and biomass burning, and precipitation and their implications for the Earth's climate. We encourage contributions of the role of aerosols on the formation and evolution of water and ice clouds, on the impact of aerosols on cloud microphysical properties, and especially on the processes that lead to the formation of precipitation. The session encourages presentations on the implications of aerosol-cloud-precipitation interactions for climate and atmospheric chemistry. The presentations will include reports on field campaigns and laboratory studies, theoretical investigations, and modeling studies at all scales

Conveners: Ulrike Lohmann, Institute of Atmospheric and Climate Science, ETH Zurich, Universitätsstr. 16, 8092 Zurich, Switzerland, Tel: +41 44 633 0514, Fax: +41 44 633 1058, ulrike.lohmann@env.ethz.ch

JMS006 Glacial-Interglacial Cycles: New Records, Analyses, and Modelling

Sponsoring Association: IAMAS in collaboration with: IAHS, IAPSO, UCCS

Water stable isotopes in snow and ice are precious tools to reconstruct past climatic changes; they can be also implemented into atmospheric, oceanic and ice sheet models. We encourage contributions showing new isotopic records from both precipitation and ice in polar and high altitude regions, as well as contributions showing new modeling results and interpretations of precipitation isotopic composition

Conveners: Valerie Masson-Delmotte, IPSL CEA CNRS UMR 1572, Bat 701 L'Orme des Merisiers CEA Saclay, 91 191 Gif sur Yvette Cedex, France, Tel: (33) (0) 1 69 08 77 15, Fax: (33) (0) 1 69 08 77 16, valerie.masson@cea.fr; Kumiko Goto-Azuma, National Institute of Polar Research, 1-19 Kaga, Itabashi-ku, Tokyo 173-8515, Japan, Tel: +81-3-3962-3275, Fax: +81-3-3962-5719, kumiko@pmg.nipr.ac.jp

Co-Conveners: Barbara Stenni, University of Trieste, Department of Geological, Environmental and Marine Sciences, stenni@univ.trieste.it; Andrew Weaver, School of Earth and Ocean Sciences, University of Victoria, weaver@uvic.ca

JMS007 Stable Water Isotopes: from Basin to Global Scale

Sponsoring Association: IAMAS in collaboration with: IAHS

Stable water isotopes are a novel means of tracing and evaluating simulations of hydrological processes. Recent measurement campaigns (e.g. IAEA's Global Network of Isotopes in Rivers (GNIR)



and "Moisture Isotopes in the Biosphere and Atmosphere" (MIBA)) are being combined with new international model intercomparisons (e.g. the World Climate Research Program and the Integrated Land Ecosystem – Atmosphere Processes Studies (iLEAPS) iPILPS). This session provides an opportunity to present new work on stable water isotope techniques and tools from the basin scale to the global scale, including techniques for field and laboratory measurement, parameterisation of vegetation and soil effects together with basin to global scale integration of processes

Conveners: Kendal McGuffie, Department of Applied Physics, University of Technology, Sydney, PO Box 123, Broadway NSW 2007, AUSTRALIA, Tel: +61 2 9514 2072, Fax: +61 2 9514 2219, kendal.mcguffie@uts.edu.au

Co-Conveners: Ann Henderson-Sellers, Institute for Nuclear Geophysics, Australian Nuclear Science and Technology Organisation, ahssec@ansto.gov.au; John Gibson, (Temporary Address Until 9/2006): Institute for Nuclear Geophysics, Australian Nuclear Science and Technology Organisation (ANSTO), john.gibson@ansto.gov.au; (Permanent address): National Water Research Institute at W-CIRC, University of Victoria, john.gibson@ec.gc.ca

JMS008 Clouds and Radiation and Air-Sea-Ice Interactions

Sponsoring Association: IAMAS in collaboration with: IAPSO, SCAR

The transfer of energy from the ocean to the atmosphere at high latitude is controlled by many factors including clouds and flux transfer in the boundary layer over sea ice. This energy transfer plays a major role in driving the global ocean circulation and hence in controlling global climate. Contributions on new insights are welcome.

Conveners: Tom Lachlan-Cope, British Antarctic Survey, High Cross, Madingley Road, Cambridge CB3 0ET, UK, Tel: 01223 221484, t.lachlan-cope@bas.ac.uk

Co-Conveners: Svetlana V. Krakovskaia, Department of Atmospheric Physics, Ukrainian Hydrometeorological Research Institute, KraSvet@ozsol.kiev.ua; Sergey Gulev, P.P. Shirshov Institute of Oceanology, gul@sail.msk.ru

JMS009 Hydrological Cycle, Precipitation and Precipitation Systems

Sponsoring Association: IAMAS in collaboration with: IAG, IAHS, IAPSO, UCCS

The hydrological cycle is a fundamental aspect of the Earth's climate system and it must be well understood if we are to better predict our varying and changing climate. This Symposium focuses on assessing our present capabilities to determine, understand and predict the hydrological cycle on global to regional scales including its variations and extremes as well as on examining how it may change in the future. Because precipitation is such an important aspect of the hydrological cycle and also has major direct impacts, special attention will be paid to it. This will include an examination of the precipitation cloud systems that produce this precipitation and play a major role on the hydrological cycle. Studies based on observations, theory, and modeling are all welcome

Conveners: Ronald Stewart, Department of Atmospheric and Oceanic Sciences, Burnside Hall, Room 945, 805 Sherbrooke Street West, Montreal, Quebec H3A 2K6, Canada, Tel: 514-398-3764, Fax: 514-398-6115; ronald.stewart@mcgill.ca

Co-Conveners: Jianli Chen, Center for Space Research, University of Texas at Austin, 3925 W. Braker Lane, Suite 200, Austin, TX, 78759-5321; Tel: 512-232-6218; Fax: 512-471-3570; chen@csr.utexas.edu

JMS010 Tropical Cyclones

Sponsoring Association: IAMAS in collaboration with: IAHS, IAPSO

Tropical cyclones constitute the most powerful and destructive weather phenomena on the planet. As the recent example of Cyclone Katrina demonstrates, we do not yet fully understand the processes that determine the development and movement of tropical cyclones to the extent that their properties can be forecasted with precision over a time scale of several days. The magnitude of these events also calls for more detailed study of their impacts on coastal environments. Papers on the genesis, movement, dynamics and consequences of tropical cyclones are solicited. These may address observations and forecasting, the interaction with the ocean, and their impact on land, particularly with regard to inundation and rainfall.



Conveners: Roger K. Smith, Meteorological Institute, University of Munich, Theresienstr. 37, 80333 Munich Germany, Tel: +49 89 2180 4383, Fax: +49 89 2180 4182, roger@meteo.physik.uni-muenchen.de

Co-Conveners: Peter Baines, Dept. of Civil and Environmental Engineering, University of Melbourne, p.baines@unimelb.edu.au; Gustavo Jorge Goni, U.S. Dept. of Commerce, NOAA/AOML/PHOD, Miami, FL, USA; Gustavo.Goni@noaa.gov



JMS011 Monsoon Systems

Sponsoring Association: IAMAS in collaboration with: IAHS, IAPSO, THORPEX

Monsoons are among the most complex of atmospheric weather phenomena, involving processes on a wide range of space and time scales. They contain much of the rainfall of the tropics, and their variability on even the largest scales is notoriously difficult to predict. The energy released in these systems also has impact on weather in mid-latitudes. In recent years, observations from a variety of field studies and satellite data have provided much more information on monsoons, and progress is being made. This symposium invites presentations on all aspects of monsoon dynamics, including observations, modeling and forecasting studies. Studies involving interactions with the ocean, and the effect of processes on a variety of scales on rainfall, are particularly sought

Conveners: Guoxiong Wu, State Key Lab of Atmospheric Sciences and Geophysical Fluid Dynamics (LASG), Institute of Atmospheric Physics, Chinese Academy of Sciences, P.O. Box 9804, Beijing, 100029 China, Tel: 0086-10-62043356, Fax: 0086-10-62043526, gxwu@lasg.iap.ac.cn

Co-Conveners: Bin Wang, Meteorology/IPRC, University of Hawaii, wangbin@hawaii.edu; Harry Hendon, Bureau of Meteorology Research Center, h.hendon@bom.gov.au; Peter Webster, School of Earth and Atmospheric Sciences, Georgia Institute of Technology, Environmental Science and Technology Building, pjw@eas.gatech.edu

JMS012 Planetary Atmospheres and Their Evolution

Sponsoring Association: IAMAS in collaboration with: (ICPAE), IAGA

Papers are invited which report important progress on all aspects of our current understanding of the evolution of atmospheres of all planets, moons and comets. The emphasis will be on insights gained from recent space missions, including Cassini and other satellites. Contributions describing the atmosphere-related objectives of the relevant missions, analysis of observations, and the results of model simulations of atmospheric evolution are also welcome

Conveners: Athena Coustenis, LESIA (Bât 18), Observatoire de Meudon, 92195, Meudon Cedex, France, Tel: 331 45 07 77 20, Fax: 331 45 07 74 69; Athena.Coustenis@obspm.fr

JMS013 Aeronomy of Planetary Atmospheres: Comparative Planetology

Sponsoring Association: IAMAS in collaboration with: (ICPAE, ICMA), IAGA

Papers are invited on the physics and chemistry of the lower, middle and upper atmosphere and ionosphere of the inner and outer planets and their satellites. Studies of comparative atmospheres, including the atmospheres of Venus, Earth, and Mars, are also invited, with emphasis on the differences and similarities in their climates. Results from recent missions to Mars and the outer planets are of particular interest. Reports on improvement in general circulation models of the thermosphere and lower atmospheres of the planets and descriptions of future planetary missions are also invited

Conveners: Athena Coustenis, LESIA (Bât 18), Observatoire de Meudon, 92195, Meudon Cedex, France, Tel: 331 45 07 77 20, Fax: 331 45 07 74 69, Athena.Coustenis@obspm.fr

JMS014 Ocean-Atmosphere Coupling

Sponsoring Association: IAMAS in collaboration with: IAPSO

The ocean and atmosphere are coupled through air-sea fluxes of heat, mass, momentum, and biogeochemical species. This symposium examines the mechanisms and feedbacks that couple the atmosphere and ocean, in particular, the dynamics, thermodynamics, and biogeochemical cycling of the coupled atmosphere-ocean system at latitudes from the equator to the poles

Conveners: David Battisti, Dept. of Atmospheric Sciences, University of Washington, 718 Atmo-

spheric Sciences Building, Box 351640, Seattle WA 98195-1640, USA, Tel: (206) 543-2019, Fax: (206) 543-0308, david@atmos.washington.edu.

Co-Conveners: David Kevin Woolf, Ocean Observing & Climate Group, National Oceanography Center, dkw@noc.soton.ac.uk

JMS015 Mid-latitude Droughts in a Changing Climate

Sponsoring Association: IAMAS in collaboration with: IAHS

The aim of this session is to bring together scientists that investigate mid-latitude droughts from various perspectives using observational, diagnostic or modeling approaches. The symposium invites papers from a wide range of themes: case studies of recent droughts (e.g. the European heat wave of 2003, the Iberian drought of 2005), mechanisms and dynamics of droughts (including the role of atmospheric drivers and land-surface processes), variability and trends of droughts (using observations and/or proxy data), and modeling studies addressing the role of climate change and climate variability for the occurrence of droughts

Conveners: Christoph Schär, Institute for Atmospheric & Climate Science, ETH, Universitätsstrasse 16, CHN M12.1, CH-8092 Zurich, Switzerland, Tel: +41 44 632 8199, Fax: +41 44 632 1311, schaar@env.ethz.ch

JMS016 Cryospheric Change and Sea Level

Sponsoring Association: IAMAS in collaboration with: IAHS, UCCS (plus SCAR and CliC)

Major changes have occurred in the cryosphere in recent decades, with Arctic sea ice extent reaching record low values, glaciers retreating in all parts of the world, permafrost disappearing in many parts of the Arctic and snow cover extent reducing. There are also indications that the Greenland ice sheet is decreasing in size with implications for sea level. This symposium invites papers on all aspects of monitoring and modeling the cryosphere, and determining the possible impact on sea level. We welcome papers of sea ice, the ice sheets, snow cover, glaciers, ice shelves and permafrost.

Conveners: Steve Harangozo, Physical Sciences Division, British Antarctic Survey, High Cross, Madingley Rd, Cambridge CB3 0ET, U.K., Tel: +44 1223 221437, Fax: +44 1223 221279, sah@bas.ac.uk

Co-Conveners : Konrad Steffen, University of Colorado, CIRES, Konrad.Steffen@colorado.edu; David Michael Holland, Courant Institute of Math. Sci., New York University, holland@cims.nyu.edu; Robert Thomas, EG&G Services, NASA Wallops Flight Facility, Wallops Island, VA, USA, robert_thomas@hotmail.com

JMS017 The Holocene-Anthropocene Transition: From Natural to Human-Dominance of the Earth System

Sponsoring Association: IAMAS in collaboration with: IAPSO

Until recently, the Holocene climate of the last 10,000 years has been relatively stable, at least on a global basis. This period, also characterized by regional to global fluctuations of varying degrees, provides the context for human-induced change. Since about 1750, human activities have become a major factor in the climate, altering atmospheric composition and the land surface. With projections for the rates of change to continue, we are transitioning to a human-dominated climate—the Anthropocene has been coined to describe this emerging period. This symposium invites papers describing the Holocene climate (observational/ proxy or modeling); the forcings that humans are adding to the factors that have affected the climate in the past; documentation, detection, and attribution of the resulting changes; and projections of how these changes will develop in the future

Conveners: Phil Jones, Climatic Research Unit, School of Environmental Sciences, University of East Anglia, Norwich, NR4 7TJ, UK, Tel. +44 (0) 1603 592090, Fax: +44 (0) 1603 507784, p.jones@uea.ac.uk; Michael E. Mann, Earth System Science Center (ESSC), Department of Meteorology, 503 Walker Building, The Pennsylvania State University, University Park, PA 16802-5013 USA; Tel: +1 (814) 863-4075; Fax: +1 (814) 865-3663; mann@psu.edu



JMS018 High Latitude Modes of Climate Variability

Sponsoring Association: IAMAS in collaboration with: (ICPM, ICDM), SCAR, IAHS, IAPSO, UCCS

The climates of the Arctic and Antarctic are governed by the large scale modes of atmospheric variability such as the Northern and Southern Annular Modes (NAM/SAM), and the El Niño-Southern Oscillation that is manifested in high latitudes by the Pacific-North American and Pacific-South American (PNA/PSA) patterns. The impacts of the Pacific Decadal Oscillation and the Atlantic Multidecadal Oscillation will also be explored. The symposium will be concerned how these patterns are changing and affecting high latitude climate, how the different modes interact and the mechanisms by which this occurs, the roles of high latitude versus tropical forcing, the roles of the ocean and sea ice cover in initiating and/or amplifying change, stratospheric versus tropospheric causes of variability, and the issue of natural versus anthropogenic forcing. Contributions are solicited from all approaches that bear on these topics, such as observational analyses from reanalyses and ice-core records, theoretical studies, and all types of numerical modeling

Conveners: David H. Bromwich, Byrd Polar Research Center, The Ohio State University, 1090 Carmack Road, Columbus, Ohio 43210-1002, USA, Tel 001 614 292 1094, bromwich.1@osu.edu

Co-Conveners: Andrey Proshutinsky, Woods Hole Oceanographic Institution, Physical Oceanography Department, aproshutinsky@whoi.edu

JMS019 Toward Bridging the Gap Between Weather and Inter-Annual Climate Variability: Processes, Phenomena and Prediction

Sponsoring Association: IAMAS in collaboration with: IAHS, IAPSO

Improvement on the one hand in our understanding of persistent weather patterns and the continuing progress in deterministic and ensemble weather prediction has been paralleled on the other hand by the identification of key patterns of intra-seasonal and inter-annual climate variability and the development of operational suites for seasonal prediction. These advances have also pinpointed the role and significance of the oceans and land-surface processes to the understanding and forecasting of the phenomena and patterns. This Inter-Association Symposium will focus on the efforts being made to bridge the "Weather - Climate Variability" divide reflected in our understanding of the inter-play of the ocean, land and atmosphere, of the dynamics of the major phenomena, and in development of "seamless" prediction suites.

Conveners: Huw C. Davies, Institute for Atmospheric & Climate Science, ETH, Universitätsstrasse 16, ETH Zentrum CHN M12.1, CH-8092 Zurich, Switzerland, Tel. +41-44-633 3506, Fax: +41-44-633 1058, huw.davies@env.ethz.ch

JMS020 Assessing & Exploiting Re-analysis Data Sets

Sponsoring Association: IAMAS in collaboration with: IAHS, IAPSO

The compilation of spatially and temporally consistent global data sets for atmosphere variables along with associated variables at the underlying surface (- such as SST, surface, wind stress, land surface state and soil moisture) has presented the environmental community with unprecedented opportunities. It has become possible to derive global budget estimates for a range of variables, to compile climatologies of a myriad of phenomena, and to undertake detailed diagnostic analyses of environmental processes. This Inter-Association symposium will aim at assessing the strengths and weaknesses of the data sets, highlight the progress made in diagnostic studies, and preview future developments.

Conveners: Phillip Arkin, Earth System Science Interdisciplinary Center (ESSIC), 2207 Computer and Space Science Building, University of Maryland, College Park, MD 20742-2465, USA, Tel: (301) 405-2147, Fax: (301) 405-8468, parkin@essic.umd.edu

Co-Conveners: Adrian Simmons, European Center for Medium-Range Weather Forecasts, adrian.simmons@ecmwf.int; Annarita Mariotti, ENEA National Agency, (annarita.mariotti@casaccia.enea.it), also at Earth System Science Interdisciplinary Center, University of Maryland, amariotti@essic.umd.edu; Tsengdar Lee, Research Division, NASA Office of Earth Science, NASA HQ, tlee@hq.nasa.gov; David H. Bromwich, Byrd Polar Research Center, The Ohio State University, bromwich.1@osu.edu



JMS021 Energetic Particles and Geomagnetic Storm Influence on Chemical and Dynamical Processes in the Polar Stratosphere and Mesosphere

Sponsoring Association: IAMAS in collaboration with: ICMA, IAGA Div. II

This symposium covers satellite and ground based observations, numerical simulations and theoretical studies of the polar stratosphere and mesosphere response to solar protons and precipitating electrons penetrating into the polar atmosphere during solar proton events, and periods of geomagnetic storms. Studies devoted to perturbations in the D-region after external forcing from above, and comparison with changes in neutral composition, are also welcome

Conveners: Alexei Krivolutsky, Central Aerological Observatory, Pervomayskaya str. 3, Dolgoprudny 141700, Moscow Region, Russia, tel: +7-495-408-77-06, Fax: +7-495-576-33-27, alk riv@lenta.ru

Co-Conveners: Cora Randall, Laboratory for Atmospheric and Space Physics and Department of Atmospheric and Ocean Sciences, University of Colorado, cora.randall@lasp.colorado.edu; Yvan Orsolini, Norwegian Institute for Air Research, orsolini@nilu.no

JMS022 Solar Impact on the Mesosphere-Stratosphere-Troposphere System

Sponsoring Association: IAMAS in collaboration with: ICMA, IAGA

The session will address the identification of the solar signal based on observational datasets ranging from the upper atmosphere (thermosphere, mesosphere) to the troposphere, the Earth's surface and the oceans. It will further focus on the physical and chemical processes leading to the observed solar signal, including those due to variations in electromagnetic radiation and energetic particle precipitation. Simulations with mechanistic, general circulation and chemistry climate models are especially encouraged. Studies on the variations on different time scales ranging from the 27-day rotation period over the 11-year solar cycle to centennial variations including the Maunder Minimum are welcome.

Conveners: Ulrike Langematz, Institut für Meteorologie, Freie Universität Berlin, Carl-Heinrich-Becker-Weg 6-10, 12165 Berlin, Germany, tel: 49-30-83871165, Fax: 49-30-83871128, Ulrike.Langematz@met.fu-berlin.de

Co-Conveners: Lon L. Hood, Lunar and Planetary Laboratory, University of Arizona, lon@lpl.arizona.edu; J. Lastovicka, Institute of Atmospheric Physics, Prague, Czech Republic, jla@ufa.cas.cz

JMS023 Instabilities in the Neutral Atmosphere, Ionosphere and Magnetosphere

Sponsoring Association: IAMAS in collaboration with: ICMA, IAGA Div. II

Instabilities occur throughout the Earth's neutral atmosphere, ionosphere, and magnetosphere and their occurrence triggers numerous interesting phenomena that continue to be studied. These include Kelvin-Helmholtz instabilities near the mesopause and the magnetopause, and Rayleigh-Taylor instabilities in the ionosphere. This session will feature reviews, emphasizing the similar physics involved, of observations and modeling of instabilities that occur in these three regions. Contributions directly related to instabilities throughout the neutral atmosphere/ionosphere/magnetosphere are also welcome. Of particular interest are papers discussing instabilities in one regime which are either produced or are caused by phenomena in another

Conveners: James H. Hecht, The Aerospace Corporation, P.O. Box 92957, Los Angeles, California 90009, USA, tel: 1-310-336-7017, Fax: 1-310-336-1636, james.h.hecht@aero.org

Co-Conveners: Kazue Takahashi, The Johns Hopkins University Applied Physics Laboratory, kazue.takahashi@jhuapl.edu

JMS024 Data Assimilation for the Atmosphere, Ocean and Land Surface

Sponsoring Association: IAMAS in collaboration with: IAHS, IAPSO

Data Assimilation is a key technique in Earth Science, allowing the exploitation of the vast quantity of measurements of the atmosphere, ocean and land surface. We are living a golden age in which a wide range of data from research satellites, such as EOS-Aura, COSMIC and CloudSat, complements the increasing amount of data from operational weather satellites. Data assimilation can organise



the wealth of data from both satellite and in situ platforms to analyse the current state of the Earth System and form the basis of improved forecasts from the meso to the global scale. The session will bring together scientists working across a broad range of subject areas; particular areas will include: - novel assimilation methods, - weather and climate prediction, - mesoscale and cloud-scale processes, - atmospheric chemistry, - oceanography, - land surface and hydrology

Conveners: Richard Swinbank, Met Office, FitzRoy Road, Exeter, EX1 3PB, UK, Tel: +44 1392 886619, Fax: +44 1392 885681, richard.swinbank@metoffice.gov.uk

Co-Conveners: William Lahoz, Data Assimilation Research Center, Department of Meteorology, University of Reading, swslahoz@reading.ac.uk; Paola Malanotte-Rizzoli, Department of Earth, Atmospheric and Planetary Sciences, Massachusetts Institute of Technology, Cambridge, MA, USA, rizzoli@mit.edu

JMS025 3D Radiative Transfer in Complex Geophysical Media Including Clouds, Vegetation, Ice and Snow

Sponsoring Association: IAMAS in collaboration with: IAHS, UCCS

Papers are invited on modeling and observations involving three-dimensional (3D) radiative transfer (RT) applications to the Earth's atmosphere and surface (vegetation, land and sea ice). We are interested in aspects of solar ultraviolet (UV) radiation (e.g. actinic flux; irradiance on horizontal and tilted receivers including biological ones); visible and near-infrared radiation with applications to solar radiative transfer and remote sensing; and 3D effects due to variations in thermal absorption and emissivity. We expect methods for identifying errors and limits of various RT methods, and highlighting 3D effects characteristic of UV, Vis-NIR, and thermal RT. We strongly encourage papers on new approaches explicitly considering 3D radiative effects

Conveners: Robert F. Cahalan, Climate and Radiation Branch, NASA GSFC, NASA/GSFC/613.2, Greenbelt, MD USA 20771, Tel: +1-301-614-5390, Fax: +1-301-614-5493; Robert.F.Cahalan@nasa.gov.

Co-Conveners: Bernhard Mayer, DRL, Deutsches Zentrum fuer Luft- und Raumfahrt, Institut fuer Physik der Atmosphaere, bernhard.mayer@dlr.de

JMS026 Ice Cores and Climate (UCCS Symposium hosted by IAMAS)

Sponsoring Association: IAMAS in collaboration with: UCCS, IGS

Ice Cores drilled through ice on ice sheets and glaciers contain records on the past climate reaching as far back as up to 900,000 years. Ice core analyses have developed during the last decades and the span of parameters measured on the modern ice cores has expanded. The high resolution records from the ice cores thereby are some of the best sources we have in palaeo-climate research to manifest the full dynamics of the coupled atmosphere-ocean-ice climate system. The aim is to present climate related ice core records from the ice sheets and glaciers both from the Arctic and Antarctic regions but also from those regions where ice is rapidly disappearing and the need to obtain ice cores before the ice is gone is urgent

Conveners: Dorthe Dahl-Jensen, Niels Bohr Institute, University of Copenhagen, Juliane Maries Vej 30, DK-2100 Copenhagen OE, Denmark, Tel: +45 35 32 05 56, Fax: +45 35 36 53 57, ddj@gfy.ku.dk

JMS027 Glacier Fluctuations in the Asian High Mountains (UCCS Symposium hosted by IAMAS)

Sponsoring Association: IAMAS in collaboration with: UCCS, IAHS, CGI, Ev-K2-CNR, ICIMOD, HKH-FRIEND, IG

On the Asian high mountains effects of climate variations on glaciers and, thus, on mountain landscape and water availability are subject of increasing concern. 20th century mass loss of these glaciers is considered to contribute markedly to sea level rise. A high variety of different climate settings from the monsoon regions to westerlies to very dry Inner Asian circumstances give reason to complex patterns of the glaciers' sensitivity. Effects of changing climate include mass balance variability, debris cover pattern, glacier surges, glacier terminus fluctuations, and glacier related risks. Current and future glacier fluctuations and impacts are addressed.



Conveners: Claudio Smiraglia, Dipartimento di Scienze della Terra, Università degli Studi di Milano, Via Mangiagalli 34 - 20133 Milano, tel +39-02-50315516, Fax: +39-02-50315494, claudio.smiraglia@unimi.it

Co-Conveners: Olga Solomina, Inst. Geography, Russian Academy of Sciences, Staromonetny 29, 109017 Moscow, Russia, olgasolomina@yandex.ru; Jiawen Ren, Key Lab of Cryosphere and Environment, Cold and Arid Regions Environmental and Engineering Research Institute, Chinese Academy of Sciences, Lanzhou, Gansu 730000, China, jwren@lzb.ac.cn; Mandira Shrestha, MNR Division ICI-MOD, Kathmandu, Nepal, mshrestha@icimode.org.np; Christoph Mayer, Glaziologische Kommission, Bayerische Akademie der Wissenschaften; Alfons Goppel Strasse 11, 80539 München, Germany, christoph.mayer@LRZ.badw-muenchen.de



JMS028 Consequences of Large Scale Circulation Variability on Snow and Ice Extent (UCCS Symposia hosted by IAMAS)

Sponsoring Association: IAMAS in collaboration with: UCCS, IAHS-ICSIH, GEWEX, IGS

Atmospheric circulation patterns significantly influence the seasonal, inter-annual, and long term variations of snow cover extent and glacier mass balance. In turn, snow and ice also influence these larger scale circulation patterns. The linkage between the large scale air and moisture movement with solid phase water stores provides multi-directional feedback that further influences variability in both the circulation, and snow and ice accumulation, persistence and ablation. The objective of this symposium is to develop a discussion and understanding of the complex interaction between snow and ice, and circulation patterns at the large scale, and to synthesize the knowledge from various regions around the world.

Conveners: Steven Fassnacht, Snow Hydrology, Watershed Science Program, Natural Resources Building Room 335, Colorado State University, Fort Collins, Colorado 80523-1472, USA, Tel: +1.970.491.5454, Fax: +1.970.491.6754, srf@cnr.colostate.edu

Co-Conveners: Gwyn Rees, Center for Ecology & Hydrology Wallingford, Maclean Building, Crowmarsh Gifford, hgrees@ceh.ac.uk; Peter Jansson, Department of Physical Geography and Quaternary Geology, Glaciology, Stockholm University, peter.jansson@natgeo.su.se; Thomas Painter, National Snow and Ice Data Center, Cooperative Institute for Research in Environmental Sciences, tpainter@nsidc.org; Pratap Singh, Mountain Hydrology Division, National Institute of Hydrology, pratap@nih.ernet.in

JMS029 Snow Avalanches – Field Observations and Modelling (UCCS Symposium hosted by IAMAS)

Sponsoring Association: IAMAS in collaboration with: UCCS, IGS

Most of the currently used avalanche simulation models are either statistical run-out models that are restricted to avalanche tracks that fit into different categories, or one-dimensional center of mass models. Additionally, the avalanche path has to be prescribed by the user. Field evidence for verification is difficult to obtain and therefore rare. The approaches simplify very much and cannot describe the deformation of the avalanche body. Two- and three-dimensional models based on fundamental fluid mechanics are able to predict the avalanche track as well as lateral spreading and run out distances, and request for additional verification criteria. The session is to define the state of the art of determining the snow pack distribution in a high temporal and spatial resolution

Conveners: Karl Kleemayr, Institut fuer Naturgefahren und Wald-grenzregionen, BFW, Department for Natural Hazards and Timberline, BFW, Hofburg-Rennweg 1, 6020 Innsbruck, Austria, Tel: +43(0)512 573933 5102, Karl.Kleemayr@uibk.ac.at

Co-Conveners: Andi Schaffhauser, Department for Natural Hazards and Timberline, andreas.schaffhauser@uibk.ac.at; Betty Sovilla, Swiss Federal Institute for Snow and Avalanche Research, sovilla@slf.ch; Guido Luzi, Department of Electronic and Telecommunications, University of Florence, guido.luzi@unifi.it; Margarita Eglit, Department of Hydromechanics, Faculty of Mechanics and Mathematics, M.V. Lomonosov Moscow State University, eglit@mech.math.msu.su

JMS030 Extraterrestrial Ice (UCCS Symposium hosted by IAMAS)

Sponsoring Association: IAMAS in collaboration with: UCCS, IAG, IGS

Ice, either as H₂O or CO₂ ice (or other compositions) represents a common feature in the solar system, most notably, on the surfaces of the inner planets and as major constituents of the moons in the outer solar system. Knowledge about the occurrence of ice either at the surface or inside the planetary bodies stems primarily from astronomical and satellite observations of their surfaces and from measurements of geophysical parameters that reveal information on their internal structure. Little is known about the exact properties, the development and the present dynamics of ice deposits on extraterrestrial planets. This symposium is intended to provide an overview about our current understanding about extraterrestrial ices, their main characteristics and their development

Conveners: Manfred Lange, Institute for Geophysics and Center for Environmental Research (ZUFO), University of Muenster, Corrensstrasse 24, 48149 Muenster, Germany, Tel: +49-251-833-3591, Fax: +49-251-833-6100, langema@uni-muenster.de

Co-Conveners: Ralf Greve, Institute of Low Temperature Science (ILTS), Hokkaido University, greve@lowtem.hokudai.ac.jp

JPS001 Interannual and Interdecadal Climate Variability

Sponsoring Association: IAPSO in collaboration with: IAMAS, UCCS

This symposium will address the causes and consequences of climate variability on interannual to interdecadal time scales from theoretical, numerical, and observational perspectives. Phenomena of interest include ENSO, NAO, Northern and Southern Annular Modes, Pacific Decadal Oscillation and the related Interdecadal Pacific Oscillation, the Indian Ocean Dipole, Atlantic and Benguela Niños, the Atlantic Interhemispheric Gradient Mode, and other dominant modes of variability. Papers dealing with climate dynamics, environmental and societal impacts, paleoclimate reconstructions, and the relationship between dominant modes of natural climate variability and anthropogenic climate change are encouraged.

Conveners: Michael J. McPhaden, NOAA/Pacific Marine Environmental Laboratory, 7600 Sand Point Way NE, Seattle, WA 98115, USA, Tel: 1-206-526-6783, FAX: 1-206-526-6744, michael.j.mcphaden@noaa.gov

Co-Conveners: Neil Holbrook, Macquarie University, AUSTRALIA; James Hurrell, NCAR, USA

JPS002 Abrupt Climate Change

Sponsoring Association: IAPSO in collaboration with: IAMAS, UCCS

Anthropogenic greenhouse gas emissions may cause future abrupt climate changes. Potential examples include: (1) collapse of the North Atlantic thermohaline circulation; (2) disintegration of the West Antarctic ice sheet; (3) dissociation of methane hydrates; and (4) changes in ENSO properties. Accordingly, this symposium will focus on: (1) the mechanisms of abrupt climate change; (2) simulation of past abrupt climate changes and comparison with corresponding paleoclimate observations; (3) detection of early warning signs of future abrupt climate changes; and (4) impacts of such future abrupt climate changes.

Conveners: Hans Renssen, Department of Paleoecology and Paleoclimatology, Faculty of Earth and Life Sciences, Vrije Universiteit, Amsterdam, NETHERLANDS, Tel, 31-20-5987376, FAX: 31-20-5989940, hans.rensen@geo.falw.vu.nl

Co-Conveners: Michael Schlesinger, Department of Atmospheric Sciences, University of Illinois at Urbana-Champaign, USA

JPS003 Environmental Controls on Marine Biota

Sponsoring Association: IAPSO in collaboration with: IAPSO, IABO

This symposium encourages the development of further interdisciplinary collaborative studies concerning the processes that influence marine biota. It will focus on physical (e.g., temperature, light, mixing, turbulence and currents), chemical (e.g., element concentration, distribution, and bioavailability), and biological (e.g., grazing and predation) processes which control organisms at the lower end of the food web. Understanding how biogeochemical cycles and fluxes integrate with food web



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dynamics is a major challenge in marine science today. We encourage papers on all aspects of this wide ranging topic including nutrient availability and limitation; molecular processes; impact of physical processes on biological populations; the impacts of biogeochemical cycles on marine food webs, etc.

Conveners: Denise Smythe-Wright, National Oceanography Center, Southampton, European Way, Southampton, SO14 3ZH, UNITED KINGDOM, Tel: 44-238-059-6439, FAX: 44-238-059-6204, dsw@noc.soton.ac.uk

Co-Conveners: Annelies Pierrot-Bults, Amsterdam Zoological Museum, University of Amsterdam, NETHERLANDS



JPSCCS004 Arctic Glaciers and Ice Caps Mass Balance/Calving (UCCS Symposium hosted by IAPSO)

Sponsoring Association: IAPSO in collaboration with: UCCS, IAMAS, CLIC, IASC, IGS

The Mass Balance of Glaciers and Ice Caps are sensitive to climate changes and these glaciers will in the next hundred years, according to IPCC, probably contribute more to sea level changes than the large ice sheets of Greenland and Antarctica. About 50 percent of the world's glaciers and ice caps are located in the Arctic/sub-Arctic areas. It is therefore important to know the current and future volume changes of these glaciers. The calving flux from these glaciers contributes an important part, 10-50 percent of the total mass loss. In spite of the large volume, the calving loss is not well known. It varies across the Arctic. There is observational evidence from the Antarctic Peninsula and from outlet ice streams from the Greenland Ice Sheet that the calving flux may change as a response to a warmer climate. It is important both to understand how the calving flux will change in a future possibly warmer climate, and how this dynamic response can be incorporated in mass balance calculations and mass balance modelling of future response. The objective of this symposium is to discuss the current status and future of the mass balance of glaciers in the Arctic with a special focus on how to include the calving in mass balance assessments.

Conveners: Jon Ove Hagen, Department of Geosciences, Faculty of Mathematics and Natural Sciences, University of Oslo, P.O. Box 1047, Blindern, N-0316 Oslo, NORWAY, Tel: 47-22854038, FAX: 47-22854215, joh@geo.uio.no

Co-Conveners: Johannes Oerlemans, Institute of Marine and Atmospheric Research, University of Utrecht, NETHERLANDS; Julian Dowdeswell, Scott Polar Research Institute, University of Cambridge, UK; Jacek Jania, Faculty of Earth Sciences, University of Silesia, POLAND; Andrey Glazovski, Institute of Geography, Russian Academy of Sciences, Moscow, RUSSIA

JPSCCS005 Life in Icy Environments: Interactions Between the Biology and Chemistry of Ice (UCCS Symposium hosted by IAPSO)

Sponsoring Association: IAPSO in collaboration with: UCCS, IABO, IGS

This symposium invites interdisciplinary biologists, microbiologists, biogeochemists and glaciologists to focus on the following themes: (1) Interactions between the biology and chemistry of snow pack including: biological interactions with N and P; controls on primary and secondary production, and sensitivity to climatic perturbations; and export of organic matter to other cryospheric environments. (2) Interactions between biology and chemistry of sea ice including: controls on primary and secondary production, and sensitivity to climatic perturbation; and impacts on nutrient budgets in the surface ocean. (3) Interactions between the biology and chemistry of glacier and ice sheet surfaces including: biogeochemical reactions to cryoconite holes; and biological impacts on nutrient export from glaciers, and sensitivity to climatic perturbations. (4) Interactions between the biology and chemistry of subglacial environments including: biological controls on subglacial chemical weathering; remote sensing of subglacial and microbial population -biological signals in runoff chemistry; and potential for biological activity in subglacial lakes. (5) Potential for viable icy ecosystems on other planetary bodies including physical and chemical characteristics of icy habitats on other terrestrial bodies that have analogues on Earth.

Conveners: Martyn Tranter, Bristol Glaciology Center, School of Geographical Sciences, University of Bristol, Bristol BS8 1SS, UK tel: 44-117-928-8307, FAX: 44-117-928-7878, m.tranter@bristol.ac.uk

Co-Conveners: John Priscu, Department of Land Resources and Environmental Sciences, Montana State University, USA

JSS001 Physics and Chemistry of Earth Materials

Sponsoring Association: IASPEI in collaboration with: IAGA, IAVCEI, SED

Insight into the physical and chemical behaviour of Earth materials is essential for the interpretation of seismological, geochemical, geodynamic, and geomagnetic observations. Experimental techniques now provide direct access to the conditions of high pressure and temperature of subducting lithospheric slabs, the transition zone, lower mantle and core. Complementary theoretical studies predict behaviour of materials under extreme conditions difficult to realise in laboratory experiments. The structure and behaviour of mineral surfaces and crystal defects, as well as the bulk properties of crystalline and molten materials, are increasingly amenable to investigation. These developments in materials science promise a better understanding of the Earth's interior - from crust to core. Papers are invited on all aspects of contemporary research into the physics and chemistry of Earth materials.

Conveners: Ian Jackson, Australian National University, Canberra, ACT, Australia, Ian.Jackson@anu.edu.au

Co-Conveners: Sharon Webb, Georg-August-Universität, Göttingen, Germany, webb@gwdg.de

Invited speakers / Program group: Harry Green, University of California, Riverside, California, USA, harry.green@ucr.edu; Tetsuo Irifune, Ehime University, Matsuyama, Japan, irifune@dpc.ehime-u.ac.jp; David Dobson, University College, London, d.dobson@ucl.ac.uk; Patrick Cordier, University of Lille, France, patrick.cordier@univ-lille1.fr; Artem Oganov, ETH, Zuerich, a.oganov@mat.ethz.ch

JSS002 Tsunami: generation and hazard

Sponsoring Association: IASPEI in collaboration with: IAPSO, IAVCEI

The 2004 Indian Ocean tsunami, the worst tsunami disaster in history, had a significant impact on tsunami research, warning and hazard mitigation systems. To fully document the 2004 tsunami, IUGG Tsunami Commission formed working groups to collect and compile field survey data, instrumental sea level data and satellite data. Regional tsunami watch systems are being set up in basins and oceans in the world with a guidance of UNESCO's IOC. Tsunami hazard maps are implemented in many coastal communities world-wide using the state-of-the-art numerical modeling techniques. Probabilistic tsunami hazard assessments have been introduced in many coastal areas in the world. This joint session offers forums for information exchange and discussion on such developments of tsunami research, particularly after the 2004 Indian Ocean tsunami, as well as case studies of recent tsunamis.

Conveners: Kenji Satake, Geological Survey of Japan, National Institute of Advanced Industrial Science and Technology, kenji.satake@aist.go.jp, ph: +81-29-861-3640, Fax: +81-29-852-3461.

Co-Conveners: Gerassimos A. Papadopoulos (Institute of Geodynamic, National Observatory of Athens, g.papad@gein.noa.gr; Frank Gonzalez (Tsunami Research Program, NOAA/PMEL), Frank.I.Gonzalez@noaa.gov; Fumihiko Imamura (Tohoku University), imamura@tsunami2.civil.tohoku.ac.jp

JSS003 Early-Warning Systems

Sponsoring Association: IASPEI in collaboration with: IAGA, IAMAS, IAPSO, IAVCEI, UCCS

Early warning systems can reduce the negative impacts across the globe of extreme events such as earthquakes, tsunamis, volcano eruptions, landslides, tropical storms, floods, extreme space weather and others. They provide timely information that allows individuals exposed to a hazard, to take action to avoid or reduce their risk and prepare for effective response. Dependent on the type of hazard the warning time available may range between only a few seconds in case of earthquakes to months and years in case of creeping disasters such as droughts. Although rapid information- and early warning technologies are now available to a great extent, their potential in the field of disaster mitigation is not used to any appreciable extent, showing that the user needs are not yet addressed sufficiently. Integrated earth observation, the development of real-time analysis, modelling and simulation methods, their integration with appropriate facilities for data processing, visualization and rapid information systems and their application to early warning in conjunction with disaster management, therefore, remains one of the major challenges of applied earth system sciences.

The session will discuss the latest scientific/technological developments, projects, programs and



best practices in the field of early warning. This will be done for various disaster types, from global to local scale and with special regard to the user needs. Contributions are particularly welcome if they address the aspect of multi-hazard early warning.

Conveners: Jochen Zschau, GeoForschungsZentrum Potsdam, D-14473 Potsdam, Germany, Tel: 49 331 28 81 200, zschau@gfz-potsdam.de

Co-Conveners: Harsh Gupta, National Geophysical Research Institute, Hyderabad, India, harshgupta@nic.in



JSS004 Non-instrumental "seismometry" - Quantification of past and future earthquakes: balancing the geological, historical and contemporary strain records

Sponsoring Association: IASPEI in collaboration with: IAGA, ILP

General scopes related to Symposia on Non-instrumental "seismometry".

During the past 20 years, the seismic hazard assessment practice has increasingly relied on the quantification of past and future seismicity based on non-instrumental disciplines such as active tectonics, paleoseismology, historical seismology. Over the years, these disciplines have been turned from merely descriptive to progressively more quantitative. Quantification involves not only significant parameters of the earthquake source for recent and more distant earthquakes (e.g. fault location, fault length, coseismic slip, rupture complexity), but also the rate of earthquake production and recurrence properties of a fault, the development of segmentation models, the description of the geometric conditions leading to dynamic triggering. The symposium intends to acknowledge the enormous progress achieved in this area of seismology in recent years and particularly since the mid-1990s, emphasize their mutual relationships and show how they integrate with conventional instrumental methods. Due to its long-standing tradition in the analysis of the historical earthquake record and to its contribution to the development of methodologies in earthquake geology, Italy qualifies as an especially appropriate country to take a leading role in this symposium. This is the first of four related symposia: JSS004, JSS005, JSS006, JSS007. Below the scopes of JSS004. One of the outstanding issues in modern seismic hazard assessment practice is the comparison of the earthquake record with the geologic and geodetic evidence for ongoing tectonic strain. The correct estimation of past earthquakes on the one hand and of geologic and tectonic parameters on the other hand forms the basis for assessing the maximum credible earthquake, the size of impending earthquakes, and the expected rate of earthquake production in any given region. Significant over- or under-estimations of the earthquake potential may derive from such diverse conditions as source complexity during historical earthquakes, poor assessment of fault size, dynamic fault interaction, failed identification of active fault trends, and aseismic creep. This session intends to draw on scientists from different lines of expertise who are willing to cross conventional disciplinary boundaries and compare their approaches, results and residual uncertainties. We especially welcome contributions from these areas, or contributions that combine them into unconventional schemes:

- quantification of the historical earthquake record;
- quantification of the geologic record, including field studies of cumulative tectonic strain and the development of fault segmentation schemes;
- partitioning of geodetically-derived strain onto individually identified or areal active tectonic structures. Papers are expected to emphasize the impact of the proposed results or approaches in the improvement of i) the understanding of the seismic cycle of major faults, and of ii) mid- to long-term seismic hazard estimates.

Conveners: Gianluca Valensise, INGV - Sezione Sismologia e Tettonofisica, Italy, valensise@ingv.it

Co-Conveners: Kenji Satake (Active Fault Research Center, GSJ/AIST, Japan), kenji.satake@aist.go.jp; Steven Ward (UC Santa Cruz, USA), ward@uplift.ucsc.edu; Thierry Winter (BRGM, France), t.winter@brgm.fr

JSS005 Non-instrumental "seismometry" - Global and regional parameters of paleoseismology; implications for fault scaling and future earthquake hazard

Sponsoring Association: IASPEI in collaboration with: IAGA, ILP

For the general scopes see introduction to symposium JSS004. This session deals mainly with the integration of earthquake and fault rupture parameters across the seismological/geological/geophysical boundaries exploring the difference in scaling between large and small earthquakes. Another

interesting aspect we would like to discuss concerns the evidence for linear or nonlinear relationship between average displacement and fault length for large dip-slip and strike-slip earthquakes. These have been the topic of considerable debate in the last years and we hope that the contributions to the session will advance our knowledge at both global and regional scales. The session includes, but is not restricted to, the following topics: - relationships between paleoseismological parameters (surface rupture length and average surface displacement) and earthquake magnitude estimates; - comparison of paleoseismological parameters obtained from the pre-instrumental epoch as against modern earthquakes studies; - comparison of source parameters obtained by different methodologies (geodesy, geology, seismology and geophysics). We particularly welcome contributions based on results from fieldwork, high-resolution geophysical measurements, remote sensing studies and analogue models. We also encourage presentations dealing with problems of under- or over-estimation of earthquake magnitude resulting from spatial variability of slip and scarp degradation processes at the surface.

Conveners: Kelvin Berryman, IGNS, New Zealand, k.berryman@gns.cri.nz

Co-Conveners: Paolo M. De Martini, INGV- Sezione Sismologia e Tettonofisica, Italy, demartini@ingv.it

JSS006 Non-instrumental "seismometry" - New Approaches to Paleoseismology and Earthquake Recurrence in the 21st Century

Sponsoring Association: IASPEI in collaboration with: IAGA, ILP

For the general scopes see introduction to symposium JS004. Paleoseismology is now a well-established discipline whose major goal is the identification and dating of past earthquakes in the geological record. It provides the fundamental data for developing an understanding of the behavior of seismogenic faults in time and space and the primary recurrence information for seismic hazard assessment. Paleoseismology has evolved during the past 30 years and is now practiced worldwide. As the field moves into the 21st century there is recognition of the need to: develop longer earthquake chronologies, reduce uncertainties in recurrence times, and develop better knowledge of earthquake recurrence on sources that do not easily lend themselves to traditional paleoseismic analysis (trenching). We invite contributions on topics that include NEW:

- statistical analyses of paleoseismic recurrence data, particularly for correlating the occurrence of past events along faults;
- approaches to identify paleoearthquakes on blind or remote (ie, subduction zone) earthquake sources and in logistically difficult settings such as urban environments;
- technologies that increase the length of the paleoseismic record and paleoearthquake chronologies at investigation sites on major faults;
- dating techniques of paleoearthquakes;
- approaches to quantify slip in paleoearthquakes for better estimates of paleo-earthquake magnitudes.

Conveners: David P. Schwartz, USGS, 345 Middlefield Rd MS977, 94025 Menlo Park, USA; dschwartz@usgs.gov

Co-Conveners: Daniela Pantosti, Istituto Nazionale di Geofisica e Vulcanologia, Sismologia e Tettonofisica, pantosti@ingv.it

JSS007 Progress in electromagnetic studies on earthquakes and volcanoes - Volcanic structure and activities

Sponsoring Association: IASPEI in collaboration with: IAGA, IAVCEI

Magnetic, electric and electromagnetic methods are intensively applied to imaging volcanic structures and monitoring volcanic activity. The knowledge of volcanoes' interior is crucially important for understanding the dynamics of the feeder as well as for proper interpretation of EM signals. Both aspects lead to a more complete description of the time varying EM phenomena related to on-going volcanic processes. The contributions along the following lines are encouraged: 1) EM methods to study the volcanic structures, the associated geothermal fields and hydrothermal systems; 2) Joint interpretation of EM, seismic, gravimetric and other geophysical/geological data; 3) Land-based and satellite EM monitoring of active volcanoes, geothermal fields and hydrothermal systems; 4) Space and time changes of EM signals related to volcanic activity; 5) Modeling of EM manifestations of volcanic processes.

Conveners: Viacheslav V. Spichak, Geoelectromagnetic Res. Inst., GEMRC IPE RAS, P.O.Box 30, 142190 Troitsk Moscow region, Russia, v.spichak@g23.relcom.ru



Co-Conveners: Jacques Zlotnicki, jacques.zlotnicki@wanadoo.fr; Yoichi Sasai, yosasai@zag.att.ne.jp; Domenico Patella, domenico.patella@na.infn.it; Ciro Del Negro, delnegro@ct.ingv.it.

JSS008 Progress in electromagnetic studies on earthquakes and volcanoes - Electromagnetic fields associated with earthquakes and active faulting

Sponsoring Association: IASPEI in collaboration with: IAGA, IAVCEI

Electromagnetic fields are both expected and observed during seismic and aseismic fault rupture. Furthermore, as a consequence of this rupture, secondary fields are generated by coupling of ground motion into the atmosphere and ionosphere. These phenomena relate directly and indirectly to source processes driving these tectonic events and may reflect the roles of fluids in active faulting. Unfortunately, not all aspects of these measurements, or theories proposed to explain them, are well understood. This session will focus on the following areas of investigation: 1) Measurements of electric and magnetic fields near and during active faulting; 2) Heterogeneity in electromagnetic structure around seismic and aseismic rupture region including lower crust; 3) Controlled laboratory observations and observations from natural laboratories such as dam loading/filling, and crustal loading/failure; 4) Theoretical considerations regarding source generation mechanisms; 5) Measurement resolution, data quality, identification, separation and removal of spurious signal sources; 6) Multi-parameter measurements (strain, tilt, pore pressure, displacement, etc) together with EM measurements that can place better constraints on the physics of source processes before, during and after earthquakes.

Conveners: Malcolm Johnston, U.S. Geol. Survey, 345 Middlefield Rd., MS977, Menlo Park, CA 94025, USA, mal@usgs.gov

Co-Conveners: Naoto Oshiman, osman@eqh.dpri.kyoto-u.ac.jp, Antonio Meloni, meloni@ingv.it

JSS009 Progress in electromagnetic studies on earthquakes and volcanoes - Crustal instabilities and earthquake precursors

Sponsoring Association: IASPEI in collaboration with: IAGA, IAVCEI

Tectonic activity produces permanent and/or temporal alterations of geophysical, geodetic, geochemical and hydrological state of the earth crust. These alterations, earthquakes being the most typical, reflect the crustal instabilities at critical state. It has been reported that often even the atmosphere/ionosphere is affected by such instabilities - the phenomenon now called the lithosphere-atmosphere-ionosphere (LAI) coupling. Different methods of geosciences are in operation to monitor the crustal instabilities. The earthquake precursors, in particular the electromagnetic precursory phenomena, constitute one of the important targets of crustal instability research. The crucial point here is that all these phenomena are inter-related and to understand them, we have to treat the earth's crust as a system. The scope of this session includes: 1) All kinds of evidence of crustal instabilities, involving seismicity, magmatism, strain anomalies, active faulting, fault creep and underground fluid perturbations, in addition to EM anomalies, and their inter-relationships; 2) All empirical and statistical variations of crustal phenomena, preceding or coming with earthquakes and their inter-connections. Instrumentation, measurement techniques and methods of data analysis for pre-co-post crustal instabilities; 3) Theoretical models to explain the physical mechanisms behind instabilities and their precursors.

Conveners: Pier Francesco Biagi, University of Bari, Italy, biagi@fisica.uniba.it

Co-Conveners: Masashi Hayakawa, hayakawa@whistler.ee.uec.ac.jp; Jann-Yenq Liu, jyliu@jupiter.ss.ncu.edu.tw; Toshiyasu Nagao, nagao@scc.u-tokai.ac.jp.

JSS010 Progress in electromagnetic studies on earthquakes and volcanoes - Seismo-electromagnetic studies using space technology

Sponsoring Association: IASPEI in collaboration with: IAGA, IAVCEI

During the last decade, the possibilities have been shown that large events in the solid earth and oceans, such as earthquakes, volcanic activity and tsunamis, may affect the atmosphere and ionosphere through yet unresolved process - the lithosphere-atmosphere-lithosphere (LAI) coupling. LAI coupling was postulated from ground-based observations associated with earthquakes. The recent



investigations using multi satellite sensors have been actively pursued. Significant changes in total electron concentration (TEC) in the ionosphere, ground surface temperature anomaly by thermal infrared (TIR) emission and/or cloud cover associated with several large earthquakes have been observed over the epicentral region. Latest observations from the DEMETER satellite seem to provide evidence of Very Low Frequency (VLF) electrical and magnetic signals prior to some earthquakes. However, convincing results are still insufficient and the physical understanding of the link between the solid earth processes and surface/atmospheric/ionospheric precursory events is largely unclear. Topics to be discussed in this session include: 1) Case studies of satellite observation related to seismo-electromagnetic observations comparison with ground-based observations; 2) Theory on the physical mechanism of the connection between the process in the earth crust and atmospheric-ionospheric phenomena prior to main earthquakes; 3) Thermal infrared (TIR) emission phenomena, cloud cover and TEC anomalies, possibly related to major earthquakes, and volcanic/geothermal activities and their comparisons with ground-based relevant data, such as meteorological, radon emission and ionosonde data; 4) Possible usefulness of space technology in tsunami early warning.

Conveners: Ramesh Singh, Department of Civil Engineering, Indian Institute of Technology, Kanpur - 208 016, India, ramesh@iitk.ac.in

Co-Conveners: Sergey Pulnits, pulse@geofisica.unam.mx, Michael Parrot, mparrot@cnrs-orleans.fr, Dimitar Ouzounov, ouzounov@core2.gsfc.nasa.gov; Valerio Tramutoli, tramutoli@unibas.it.

JSS011 Earth Structure and Geodynamics

Sponsoring Association: IASPEI in collaboration with: IAG, IAGA, IAVCEI, ILP, SEDI

Integrated theoretical, observational and experimental studies involving seismology, geodynamics and geomagnetism are essential for advances in understanding of the dynamics of our planet. Fundamental problems such as the driving mechanisms for plate tectonics, the fate of subducted slabs, the role of water in the transition zone, the existence and nature of any mantle plumes, the isolation of geochemical reservoirs in the mantle, the structure and processes in the lowermost mantle boundary layer, and the chemical and physical interactions between the core and mantle all require multidisciplinary approaches. These topics will all be addressed in this symposium. Seismology provides constraints on the structure and amplitudes of heterogeneity in elastic properties and density and on elastic anisotropy using many imaging and modeling approaches. Geodynamics provides insights on the thermo-chemical nature of mantle convection, boundary layer behavior, interaction of flow with phase transitions, time evolution, and deformation processes using numerical modeling and laboratory experiments. These two fields interact closely, combined with constraints from mineral physics, geochemistry and geomagnetism to develop quantitative understanding of how the planet works. Both disciplinary and multidisciplinary papers drawing from these fields are invited for this symposium. This symposium will be subdivided into 5 multidisciplinary sessions: 1) lithosphere and asthenosphere structure and processes (L) 2) subduction zones and deep slabs (S), 3) mantle upwellings and plumes (P), 4) transition zone structure (T), 5) D" and mantle-core interactions (MC)

Conveners: Thorne Lay, Earth Sciences Department, Univ. of California, Santa Cruz, Earth and Marine Sciences Building, Santa Cruz, CA 95064, USA, Tel: +1-831-459-3164, Fax: +1-831-3074, thorne@pmc.ucsc.edu; Gregory A. Houseman, School of Earth and Environment, University of Leeds, Leeds LS2 9JT, UK, Tel: +44-113-343-5206, Fax: +44-113-343-5259, greg@earth.leeds.ac.uk

Invited speakers/Program group: Thorne Lay, thorne@pmc.ucsc.edu; Gregory A. Houseman, greg@earth.leeds.ac.uk.

JSS012 Earth Structure and Geodynamics - Dynamics of Stagnant Slabs

Sponsoring Association: IASPEI in collaboration with: IAGA, IAVCEI, ILP, SEDI

Seismic tomography has revealed the presence of fast seismic velocity anomalies, which are likely to be associated with the subducted oceanic lithospheres, in and around the mantle transition zone of the current and past subduction zones. Although the existence of such "stagnant slabs" is now well established, their cause, fate and impact on the tectonics, dynamics and evolution of the earth system are not well understood. We solicit contributions from a wide variety disciplines of earth science to eventually answer questions like "Why do slabs stagnate, and why/where do they disappear?", "What occurs when they fall into the deep mantle?". Contributions may include: detailed geophysical



mapping of subducted slab (including oceanic crust) signatures in the deep mantle, dynamic modeling and high-pressure experiments to delineate the fate of subducted slabs, possible connection between stagnant slabs and surface tectonics and volcanisms, etc...

Conveners: KAWAKATSU, Hitoshi, Earthquake Research Institute, University of Tokyo, 1-1-1 Yayoi, Bunkyo-ku, Tokyo 113-0032 JAPAN, Tel: +81-3-5841-5817, Fax: +81-3-3812-9417, hitosi@eri.u-tokyo.ac.jp

Co-Conveners: Tetsuo Irifune, irifune@dpc.ehime-u.ac.jp; S. Yoshioka, yoshioka@geo.kyushu-u.ac.jp; Andrea Morelli, morelli@ingv.it.

Invited speakers / Program group: Thorne Lay, thorne@pmc.ucsc.edu; Gregory A. Houseman, greg@earth.leeds.ac.uk



JSS013 The lithosphere

Sponsoring Association: IASPEI in collaboration with: IAGA, IAVCEI, ILP

This session will include multi-disciplinary discussions of the continental lithosphere from geophysical, geochemical, and geologic data. The focus will be on probing the structure and composition of the lithosphere, including its physical properties, by both indirect and direct methods. Studies of the processes that have formed and modified the continental lithosphere since the Archean to the present are welcome. Some of the topics to be addressed include: (1) integrated thermal, gravity, electrical, and seismic models of lithospheric structure; (2) global and regional geophysical models of lithospheric structure; (3) studies of mantle xenoliths in the context of complementary geophysical results; (4) lithospheric stability; (5) models of lithospheric deformation from mantle xenoliths, seismic anisotropy, electrical properties, and other data. (6) discussions of the multitude of definitions of the lithosphere according to method, e.g. seismology, structural studies, electromagnetism, geothermology, and petrology.

Conveners: S. Cloetingh, Faculteit der Aardwetenschappen, Vrije Universiteit, De Boelelaan 1085, 1081 HV Amsterdam, THE NETHERLANDS, President, ILP, Tel: 31 20 5 484741, Fax: 31 20 6 462457, cloetingh@geo.vu.nl

Co-Conveners: B.L.N. Kennett, Research School of Earth Sciences, The Australian National University Canberra, ACT 0200, AUSTRALIA, Tel: 61 2 6249 4621 (Sec/5502), Fax: 61 2 6257 2737, brian@rses.anu.edu.au; Hans Thybo, Geological Institute, University of Copenhagen, Øster Voldgade 10, DK-1350 Copenhagen K, Denmark, Tel: +45 3532 2452 or 2455, Fax +45 3314 83 22, thybo@geol.ku.dk

JSS014 Crustal structure and Tectonophysics - Crustal and lithospheric structure in active continental blocks and their boundaries

Sponsoring Association: IASPEI in collaboration with: IAGA

Although the concept of localized plate boundaries has been a foundation of modern plate tectonics, it is clear that deformation associated with the interaction of crustal and lithospheric blocks (or plates) is oftentimes distributed over a substantially broader region. This session will focus on studies aimed at defining the structure of plate boundaries, the regional extent of deformation associated with block interaction, the depth extent/distribution of plate boundaries, and innovative tools or approaches for defining the nature of plate (or crustal block) boundaries. We encourage contributions from the broad range of geophysical and geodetic studies, including modeling, that provide insight into the structure, deformational style, and the resulting diffuse or localized plate boundary structure.

Conveners: Kevin Furlong, Department of Geosciences, Pennsylvania State University, 503 Deike Building, University Park, PA 16802, USA, Tel: 1 814 863 0567, Fax: 1 814 863 7823, kevin@geodyn.psu.edu

Co-Conveners: Tim Stern, Victoria University, New Zealand, tim.stern@vuw.ac.nz; Rob Govers, Utrecht University, Netherlands, govers@geo.uu.nl

JSS015 Crustal structure and Tectonophysics - Large-scale multi-disciplinary programs for continental imaging

Sponsoring Association: IASPEI in collaboration with: IAGA

Imaging experiments that incorporate multiple geophysical tools (e.g. active and passive seismology,

MT, GPS, heat flow, etc.) provide significantly improved images of the structure and composition of the continents. In this session we will highlight those multi-disciplinary experiments that are aimed at improving our understanding of the continental lithosphere. Contributions describing both existing and planned experiments along with contributions focusing on the benefits of including specific techniques are encouraged for this session.

Conveners: Hans Thybo, University of Copenhagen, Denmark, thybo@geol.ku.dk;

Co-Conveners: Oliver Ritter, GFZ, Potsdam, Germany, oritter@gfz-potsdam.de; Jaume Pous, University of Barcelona, Spain, jaume@geo.ub.es



JSS016 Underwater observatories

Sponsoring Association: IASPEI in collaboration with: IAGA, IAPSO, IAVCEI, ION

The international earth and ocean sciences community recognizes the need for long-term observatories in the oceans in order to provide optimally sampled observations of global scale processes, in real-time when appropriate, and for the long-term monitoring of time dependent processes on the regional and local scales. International Ocean Network (ION) was formed to foster synergies among different disciplines, and to facilitate cooperation in the development of critical elements of the observing systems, harmonization of those elements of the system. In order to achieve these goals, technical developments are required that should provide the prolongation of the study of investigated parameters from the land to the ocean bottom. The session interests will be concentrated on the discussion of scientific tasks which need joining of international efforts for their realization as well as on technological problems solution to create new generation of inexpensive ocean/sea bottom long-term observatories but with sufficiently high level of parameters, development of sensors that can operate stably over long times and take advantage of observatory infrastructure. Harmonization of interfaces to facilitate the interchangeability of instruments and the sharing of maintenance tasks is also between session's interests.

Conveners: Barbara Romanowicz, Department of Geology and Geophysics, University of California, Berkeley, 215 McCone Hall #4760, Berkeley, CA 94720-4767, USA, Tel: 1 510 643 5690, Fax: 1 510 643 5811, barbara@seismo.berkeley.edu

Co-Conveners: Adam Schultz (USA) adam@coas.oregonstate.edu; Domenico Giardini (Switzerland) giardini@seismo.ifg.ethz.ch; Valery Korepanov (Ukraine) vakor@isr.lviv.ua

JSS017 Lithosphere thermal state and geodynamic processes: from measurements to models

Sponsoring Association: IASPEI in collaboration with: IAGA

The lithosphere is identified as the outer layer of the Earth that is sufficiently cool and therefore rigid to act as a coherent tectonic unit. This symposium seeks papers from the many branches of geology and geophysics that relate to the thermal state of the lithosphere (heat flow, seismology, electromagnetism, petrology, etc) either from the perspective of measurements and data sets, or from creating models constrained by these data. Papers addressing geodynamic processes such as rifting, plate convergence, mid plate volcanism, delamination, underplating, etc. and their consequence for lithosphere evolution are especially welcome.

Conveners: David Chapman, Department of Geology and Geophysics, University of Utah, Salt Lake City, Utah 84112, USA, Tel: +1 801-581-7642, Fax: +1 801 585-6749, chapman@earth.utah.edu

Co-Conveners: Vladimir Cermak, Geophysical Institute, Czech Acad.Sci., 141-31 Praha 4, Czech Republic, Tel: +420-2-67103385, Fax: +420-2-72762546, cermak@ig.cas.cz

JSW001 Subduction zone related volcanism and hazard mitigation

Sponsoring Association: IASPEI in collaboration with: IAVCEI

Many densely populated countries are situated along major subduction zones whose seismic and volcanic hazards may have severe consequences on the socio-economic conditions of these countries. The 2004 Sumatran great earthquake with its attendant devastating tsunami highlighted the need to study such areas in order to understand the nature of subduction processes and provide a coherent picture to understand its possible effects. Several eruptions occurred in the 20th century in developing countries located along subduction zones. Some of them have caused a large number

of casualties and great damage to infrastructure. The symposium on "subduction zone related volcanism and hazard mitigation" is to bring together people working on volcanological studies along subduction zones and especially in volcanic hazard mitigation. Research on topics like: i) Volcano hazard mapping, ii) Mitigation strategies for subduction zone related hazards, iii) Development of integrated emergency plans to reduce risk in subduction zones, iv) General volcanological studies focused in improving volcanic hazard knowledge, and v) Integrated geophysical, geological and geochemical studies to improve volcanic hazard mitigation would be most welcome.

Conveners: Sri Widiyantoro, Department of Geophysics and Meteorology, Bandung Institute of Technology, Jalan Ganesha 10, Bandung 40132, INDONESIA, Tel: 62 22 250 0494 (253 4142), Fax: 62 22 253 4139, sriwid@geoph.itb.ac.id



JVS001 Large-volume eruptions, including environmental effects

Sponsoring Association: IAVCEI in collaboration with: IAMAS

There has recently been a publicity focus on large-volume eruptions in Earth's history, particularly explosive "Supervolcanoes". We invite contributions that deal with -Factors that contribute to the accumulation of magma within arc and intraplate settings to form large magma chambers. (tectonics) -volcanology of large volume eruptions (effusive and explosive) -evolution and magma chamber dynamics -scaling problem of known small eruptions to super eruptions -climatic and environmental impacts -potential sites and eruption prediction

Conveners: Steve Self, Open University, UK, Tel: 01908-659773, Fax: 01908-655151, stephen.self@open.ac.uk

Co-Conveners: Roberto Isaia

JVS002 Progress in electromagnetic studies on earthquakes and volcanoes - Volcanic structure and activities

Sponsoring Association: IAVCEI in collaboration with: IAGA, IASPEI

Magnetic, electric and electromagnetic methods are intensively applied to imaging volcanic structures and monitoring volcanic activity. The knowledge of volcanoes' interior is crucially important for understanding the dynamics of the feeder as well as for proper interpretation of EM signals. Both aspects lead to a more complete description of the time varying EM phenomena related to on-going volcanic processes. The contributions along the following lines are encouraged: 1) EM methods to study the volcanic structures, the associated geothermal fields and hydrothermal systems; 2) Joint interpretation of EM, seismic, gravimetric and other geophysical/geological data; 3) Land-based and satellite EM monitoring of active volcanoes, geothermal fields and hydrothermal systems; 4) Space and time changes of EM signals related to volcanic activity; 5) Modeling of EM manifestations of volcanic processes.

Conveners: Viacheslav V. Spichak, Geoelectromagnetic Res. Inst., GEMRC IPE RAS, P.O.Box 30, 142190 Troitsk Moscow region, Russia, v.spichak@g23.relcom.ru

Co-Conveners: Jacques Zlotnicki, jacques.zlotnicki@wanadoo.fr; Yoichi Sasai; Domenico Patella, domenico.patella@na.infn.it, Ciro Del Negro

JVS003 Ice –Volcano Interactions

Sponsoring Association: IAVCEI in collaboration with: IAHS, UCCS, IGS

There are many important interactions between volcanism and glaciation, operating at different levels and over a wide range of timescales. In several regions of the world volcanoes generate the elevation necessary for glaciers and snow covers to form, while the deposition of pyroclastic material and eruptive and geothermal activity impact directly on glacier mass balance. On the other hand, expansion and contraction of glaciers over millennia and the release of meltwater during deglaciation can influence eruptive activity through the overburden pressure release and infiltration of water into the volcanic system. Catastrophic floods may be generated by subglacial eruptions and geothermal activity in the form of lahars and jökulhlaups, while landform evidence from moraines and flood and tephra deposits can provide important information on past glacier extent and the interactions between glacier fluctuations and eruptive activity. This session welcomes contributions on any aspect of ice-volcano interactions on Earth or on other bodies in the solar system, including results from

field, remote sensing and modelling studies. The aim is to provide a forum for exchange of knowledge and ideas, particularly between scientists from different disciplines, and to encourage future collaborative research into these complex and challenging systems.

Conveners: Ben Brock, Department of Geography, University of Dundee, Dundee, UK, Tel: + (44) (0)1382 345443, b.w.brock@dundee.ac.uk

Co-Conveners: Andrés Rivera, Glaciology and Climate Change Laboratory, Center for Scientific Studies, Valdivia, Chile, arivera@cecs.cl

JVS004 Volcano seismology

Sponsoring Association: IAVCEI in collaboration with: IASPEI

Seismic monitoring of active and dormant volcanoes remains the key element of any monitoring program undertaken by volcano observatories or research institutions. Major advances in volcano seismology have been made in the last years allowing us to identify several categories of volcanic seismic events, and interpret them in terms of different magmatic or tectonic processes encountered on a volcano. Attempts based on multi-disciplinary methodologies turned out to be particularly successful. This session is dedicated to latest developments in volcano seismological monitoring techniques, interpretation and modelling methodology in a wider volcanological context. We invite contributions for both oral and poster presentations that deal with any seismological aspects relevant to volcano monitoring, new methodologies as well as case studies from a wide variety of volcanic settings. This includes advances in seismic instrumentation, as well as theoretical approaches. Particularly welcome are studies that combine seismology with other monitoring or modelling techniques, such as ground deformation, gas monitoring, petrology and fluid dynamics of magmatic systems.

Conveners: Jurgen Neuberg, School of Earth and Environment, The University of Leeds, Leeds LS2 9JT, UK, Tel: +44 113 343 6769, Fax: +44 113 343 5259, Locko@earth.leeds.ac.uk; Maurizio Ripepe, Dipartimento Scienze della Terra, Università di Firenze, Via LaPira, 4, 50121 – Firenze, Italy, Tel: +39 055 2757479, Fax: +39 055 218628, Maurizio.ripepe@unifi.it; Stephen R. McNutt, Geophysical Institute, University of Alaska, Fairbanks, 903 Koyukuk Drive, Fairbanks, AK 99775-7320, USA, Tel: 907-474-7131, Fax: 907-474-5618, steve@giseis.alaska.edu

JVS005 The 25 Anniversary of the El Chichón Eruption

Sponsoring Association: IAVCEI in collaboration with: IAMAS

A dome-destroying explosion of a small dormant volcano named El Chichón occurred on March 1982 in Mexico. More than 1.5 km³ of the pyroclastics has covered a large area of jungle with many small settlements in the northern Chiapas State. More than 2000 people were killed. A 1-km wide, 250 m deep crater was formed, almost immediately filled with an acid hot lake. A special volume of JVGR has been issued in 1984, where papers were published on different topics related to the eruption, its impact and products. During a quarter of century after the eruption, volcanology has done a remarkable step forward, armed with new lab and field powerful tools. New techniques and computer codes have been developed for modeling volcanic plumes and pyroclastic columns and flows, magma generation and differentiation, volcano-hydrothermal systems, volcanic explosions and magma dynamics. Many new experimental works have been done on physical and chemical properties of magmatic rock and volatiles. A spectacular set of the high-resolution seismic tomography images obtained in the last couple of decades is available for demonstration of deep structures of convergent and divergent plate boundaries. The most of the mentioned new techniques were applied during the last 25 years for studying El Chichon volcano, its historical eruptions and other similar events occurred after 1982 like the 1991 eruption of Mt. Pinatubo and a decade of the eruptive activity of Montserrat. The theme of this session are new studies on the past, present and future of El Chichon volcano. We invite also works on volcanic hazard and impact, explosive volcanism, volcano-atmosphere interaction, volcano-hydrothermal systems, volcanic lakes, volcano tectonics, volcanic seismology and geophysics within environments close to that of El Chichon volcano. Contributions on the petrology and geochemistry of the alkaline subduction-type magmas are particularly welcome.

Conveners: Yuri Taran (taran@geofisica.unam.mx) and Jose Luis Macias, macias@geofisica.unam.mx, Institute of Geophysics, UNAM, 04510, Mexico, Tel: +52 55 56224145, Fax: +52 55 55502486 Dmitri Rouwet (dmitrirouwet@gmail.com) - now in Institute of Geophysics, UNAM, Mexico



Association Symposia and Workshops

GS001 Reference Frames

Sponsoring Association: IAG

The symposium will deal with the subjects covered by IAG Commission 1 and the related services. Establishment, maintenance, improvement of the geodetic reference frames. Advanced terrestrial and space observation technique development. International collaboration for the definition and deployment of networks of terrestrially-based space geodetic observatories. Theory and coordination of astrometric observation for reference frame purposes. All aspects of theory are also included. (See also Symposium GA5.)

Conveners: Prof. H.Drewes, Deutsches Geodätisches Forschungsinstitut; Alfons-Goppel-Str. 11, D-80539 Muenchen, Tel.: +4989 23031 1106, Fax: +4989 23031 1240, drewes@dgfi.badw.de

GS002 Gravity Field

Sponsoring Association: IAG

The symposium will deal with the subjects covered by IAG Commission 2 and the related services: Terrestrial, marine, and airborne gravimetry. Satellite gravity field observations. Gravity field modeling. Time-variable gravity field. Geoid determination. Satellite orbit modeling and determination. All aspects of theory are also included. (See also Symposium JGA1.)

Conveners: Prof. C.Jekeli Division of Geodetic Science, Department of Geological Sciences, Ohio State University, 275 Mendenhall Laboratory, 125 South Oval Mall Columbus, OH 43210-1398. Tel: +16142927117, Fax: +16142923780, jekeli.1@osu.edu

GS003 Earth Rotation and Geodynamics

Sponsoring Association: IAG

The symposium will deal with the subjects covered by IAG Commission 3 and the related services. Earth Orientation (Earth rotation, polar motion, nutation and precession). Earth tides. Tectonics and Crustal Deformation. Sea surface topography and sea level changes. Planetary and lunar dynamics. Effects of the Earth's fluid layers (e.g., post glacial rebound, loading). All aspects of theory are also included. (See also Symposium JGA3).

Conveners: V. Dehant, Royal Observatory of Belgium, 3 avenue Circulaire B 1180 Brussels, Tel: +32 2 373 0266, Fax: +32 2 374 98 22, v.dehant@oma.be

GS004 Positioning and Applications

Sponsoring Association: IAG

The symposium will deal with the subjects covered by IAG Commission 4 and the related services. Terrestrial and satellite-based positioning systems development, including sensor and information fusion. Navigation and guidance of platforms. Interferometric laser and radar applications (e.g., Synthetic Aperture Radar). Applications of geodetic positioning using three dimensional geodetic networks (passive and active networks), including monitoring of deformations. Applications of geodesy to engineering. Atmospheric investigations using space geodetic techniques. All aspects of theory are also included.

Conveners: C. Rizos, School of Surveying & Spatial Information Systems, The University of New South Wales, Sydney NSW 2052, AUSTRALIA, Tel: +61-2-93854205 (Int.), Fax: +61-2-93137493 (Int.), c.rizos@unsw.edu.au

GS005 The Integrated Global Geodetic Observation System (GGOS)

Sponsoring Association: IAG

The central theme of GGOS is Global deformation and mass exchange in the System Earth. The plans for and progress in creating the System will be presented.

Conveners: Markus Rothacher, GeoForschungsZentrum Potsdam (GFZ), Department 1: Geodesy &



ASI001 Planetary Dynamos: theory, models, observation and experiment

Sponsoring Association: IAGA

The field of planetary magnetism is presently in a state of flux due to a broad array of new scientific inputs. Ongoing satellite observations by Ørsted, CHAMP, and SAC-C are making measurements of Earth's magnetic field with previously unknown precision. In the past decade, new models of the historic geomagnetic field have been improved to accurately extend back nearly 10,000 years in time, requiring explanations of core dynamics on longer timescales. Missions to other planets, such as the Galileo, Cassini and the MGS missions, have discovered a broad array of magnetic field morphologies and magnetic histories within our solar system. Numerical dynamo models and advanced laboratory experiments are both accessing increasingly realistic nearly-planetary parameter regimes and are offering new ways to explain the observations. These diverse ongoing efforts offer a formidable chance to advance our understanding of how planets' generate large-scale magnetic fields. In this session, we invite contributions relating to this joint effort.

Conveners: J. Wicht, Max-Planck-Institut für Sonnensystemforschung, Max-Planck-Straße 2, D-37191 Katlenburg-Lindau, Germany, Tel: +49-5556-979437, Fax: +49-5556-979240, wicht@linmpi.mpg.de

Co-Conveners: A. Chulliat, IPG, Paris, France, D. Ivers, University of Sydney, Sydney, Australia; J. Aurnou, UCLA, Los Angeles, USA

ASI002 Paleomagnetism and geodynamics – neotectonics, continental reconstruction, reference frames

Sponsoring Association: IAGA

The symposium addresses paleomagnetic reconstructions on different scales and within different geological periods. New data from magnetic remanences, magnetic anomalies and hotspots are welcome in order to improve the reference frames of major plates and smaller terranes. A major topic of the session concerns intracontinental deformation in fold belts and fault zones including neotectonic processes. It is of particular interest to interpret the paleomagnetic results in the framework of geological constraints, geophysical models of the lithosphere structure, seismological data and GPS movements. Presentation of new methodologies to deal with primary and secondary remanences in deformed rocks is also invited

Conveners: E. Appel, Institute for Geosciences, Tuebingen University, Sigwartstr. 10, 72076 Tuebingen, Germany, Tel: +49-(0)7071-2974132, Fax: +49-(0)7071-295842, erwin.appel@uni-tuebingen.de

Co-Conveners: S. Geuna, Departamento de Ciencias Geológicas, Buenos Aires, Argentina; Y. Otofuji, Department of Earth and Planetary Sciences, Kobe, Japan

ASI003 Magnetic dating on all time scales

Sponsoring Association: IAGA

This session will address a broad range of magnetic dating problems. Characteristic time variations of the Earth's magnetic field provide dating tools applicable to geological and archaeological structures, and these have been widely exploited. Apparent polar wander paths, the geomagnetic polarity time scale, geomagnetic excursions, and secular variations including paleointensity demonstrate changes on time scales from millions of years to centuries and less. Rock magnetic properties of sediments can also provide useful regional age constraints, and cyclic correlations to the astronomical time scale. The basic requirement for a dating tool is a variation curve or reference model that can be used to match the temporal evolution of the feature or parameter from undated material. Contributions are invited on the use of any aspect of the geomagnetic field for dating on any timescale, including the development of new databases and reference curves. Presentations on new methods for curve and model construction, and techniques for evaluating the reliability of both reference models and the dates attributed by correlation to existing records are particularly welcome.

Conveners: C. Batt, Department of Archaeological Sciences, University of Bradford, Bradford BD7

1DP, U.K., Tel: +44 (0) 1274 233533, Fax: +44 (0) 1274 235190, c.m.batt@bradford.ac.uk

Co-Conveners: E. Schnepf, Paleomagnetic Laboratory Gams, Leoben, Austria; C. Constable, IGPP, Scripps Institution of Oceanography, La Jolla, USA



ASI004 Palaeointensity studies – progress and challenges

Sponsoring Association: IAGA

Paleointensity determination has broad applications from geochronology to discussions regarding regimes of convection in the outer core, the growth of inner core, and possibly the evolution of core-mantle boundary. In contrast to our knowledge of the directional behavior of the Earth's magnetic field during geological and historical times, data constraining the past intensity of the field remain relatively scarce. The scarcity originates from the difficulty in finding suitable material and rather narrow range of rock magnetic parameters required for reliable paleointensity work. We are welcoming contributions covering both absolute and relative paleointensity determination in the following broad areas of interest: advances in paleointensity methodology (development of new/optimum techniques), novel high-fidelity paleointensity recorders, discussions on a possible link between paleointensity and reversal frequency, results from extraterrestrial samples, and general contribution to the wealth of data on all timescales

Conveners: Y. Yu, Scripps Institution of Oceanography, Geosciences Research Division, 9500 Gilman Drive Dept 0220, La Jolla, CA 92093-0220, USA, Tel: +1-858-822-1288, Fax: +1-858-534-0784, yjyu@ucsd.edu

Co-Conveners: D. Krasa, School of GeoSciences, University of Edinburgh, Edinburgh, UK; Y. Yamamoto, Geological Survey of Japan, AIST, Tsukuba, Japan.

ASI005 Magnetic anisotropy – different scales, different parameters, different stories?

Sponsoring Association: IAGA

In the past 50 years the anisotropy of magnetic susceptibility (AMS) has established itself as a rapid and sensitive petrofabric tool that can be used, among other things, to infer flow/emplacement directions in sedimentary and igneous rocks, principal orientations of incremental strains, or to study complex fabric superpositions in many types of rocks. In recent years, AMS studies have expanded their scope either by developments in the theory linking the acquisition of mineral fabrics, by the increase in the sophistication of already existing measurement techniques or by the inclusion of a new family of measurements that include anisotropies of remanence and of high fields. This session aims to bring together recent studies of magnetic anisotropy made from all different scale perspectives, from mineral fabrics to bulk anisotropy, with special emphasis in investigations made with new types of measurements (AARM, AIRM, HF-AMS, etc.) or temperatures. Correlations between magnetic fabric and mineral fabrics with texture goniometry, neutron diffraction, image analysis or BSED are also of interest, and specially those methods that can be used to separate the contributions from mineral subfabrics present in a single rock.

Conveners: F. Martin Hernandez, Paleomagnetic Laboratory "Fort Hoofddijk", Faculty of Geosciences, Utrecht University, Budapestlaan 17, 3584 CD Utrecht, The Netherlands, Tel: 31 30 253 13 61, Fax: 31 30 243 16 67, fatima@geo.uu.nl

Co-Conveners: M. Mattei, Università Roma Tre, Rome, Italy; S. Bijaksana, Institute of Technology, Bandung, Indonesia; E. Canon, Centro de Investigación Científica y de Educación Superior de Ensenada, Ensenada, Mexico

ASI006 Acquisition and stability of natural and laboratory-produced remanence

Sponsoring Association: IAGA

This symposium will address a variety of issues related to the stability of both natural and laboratory remanences. We encourage any contributions on how rocks acquire natural remanent magnetization, including studies of primary remanences such as detrital remanent magnetizations. Remagnetization is tangible evidence of an important chemical, thermal, or tectonic event in the history of the rock and we welcome contributions on any aspect of remagnetization, including the origin of

syntectonic remanences, remagnetization related to bolide impacts, and rock magnetic characterization of chemical remanences. Studies of laboratory remanences, including isothermal remanence acquisition, backfield measurements, and anhysteretic remanence are also encouraged as fundamental analytical tools in paleomagnetic and rock magnetic investigations

Conveners: R.D. Elmore, School of Geology and Geophysics, University of Oklahoma, 100 E. Boyd St., Norman, Oklahoma 73019, USA, Tel: +1-405-325-3253, Fax: +1-405-325-3140, delmore@ou.edu

Co-Conveners: D. Heslop, University of Bremen, Bremen, Germany; L. Sagnotti, Istituto Nazionale di Geofisica e Vulcanologia, Rome, Italy

ASI007 Magnetic signature of past and present environmental changes

Sponsoring Association: IAGA

Iron is one of the most common elements in soils and sediments and the concentration and mineralogy of magnetic iron minerals may constitute a sensitive indicator of local environmental conditions. Iron is also an important element in biological processes that are environmentally sensitive. Magnetic methods have been used as a proxy for environmental change over the last 20 years so that the applicability of magnetic methods can be now evaluated. Examples of large data collections include loess and lake sediments in which various magnetic parameters have been linked to change in climate; or the magnetic signature in soils or leaves, which has been used to quantify atmospheric pollution. In light of the improvement of instrumentation and methodology that gives new perspectives for deeper knowledge about the relations between different magnetic properties of the environmental materials. In some cases these magnetic parameters provide unique informations which are not available with other methods. This symposium will address the following topics: 1) evaluation of techniques that are used to obtain the magnetic signature of environmental change in various natural materials such as soils, sediments or vegetation; 2) the importance of biomagnetic processes in environmental magnetism; and 3) case studies and palaeoenvironmental reconstructions where magnetic studies contribute information that would be otherwise unavailable.

Conveners: A.M. Hirt, Institute of Geophysics, ETH-Hoenggerberg, Schafmattstrasse 30, CH-8093 Zurich, Switzerland, Tel: +41 (0)44 633 2705, Fax: +41 (0)44 633 1065, hirt@mag.ig.erdw.ethz.ch, L. Lanci, Facoltà di Scienze Ambientali, Università di Urbino, Campus scientifico SOGESTA, I-61029 Urbino, Italy, Tel/Fax: +39 0722 304295, llanci@uniurb.it

Co-Conveners: M.-J. Orgeira, University of Buenos Aires, Argentina, M. Hanesch, University of Leoben, Austria

ASI008 Magnetism of extraterrestrial materials and bodies

Sponsoring Association: IAGA

The session is focused on the magnetic signature and properties of extraterrestrial materials and bodies ranging in size from meteorites and asteroids to moons and planets. The aim is to present and discuss new approaches and results in the research of rock magnetic properties of extraterrestrial matter, impact cratering process and its magnetic signature, the implications to ancient magnetic dynamos and paleofields. the session is open to all laboratory, theoretical and remote sensing studies.

Conveners: G. Kletetschka, CUA-GSFC/GLI ASCR, Code 691, Greenbelt/Prague, USA/CZ, Tel: +1 301-286-3804, Fax: +1 301 286 0212, gunther.kletetschka@gsfc.nasa.gov

Co-Conveners: J. Gattacceca, University of Aix-Marseille, Aix en Provence, France
T. Kohout, Division of Geophysics, University of Helsinki, Helsinki, Finland

ASI009 Progress in palaeo- and rock-magnetic methodologies

Sponsoring Association: IAGA

The symposium will address recently developed methods and underlying theories related to paleomagnetism, rock- and environmental magnetism. Key progress in paleomagnetism include microwave demagnetization and paleointensity determination techniques, as well as measurements of single crystals. In the field of rock magnetism, focus is given to various techniques for the characterization of magnetic particle assemblages, such as FORC diagram and other hysteresis properties, low-tem-



perature transitions, various determinations of grain size distributions, and quantitative unmixing methods. Contributions to the theoretical backgrounds of the abovementioned methodologies are welcomed, especially if linked to direct applications. Included are models of magnetic mineral properties that can be used for identification and quantification purposes in rocks and sediments, as well as reports on the statistical properties of populations of magnetic particles

Conveners: R. Egli, Institute for Rock Magnetism, University of Minnesota – 291 Shepherd Laboratories, 100 Union St. SE, Minneapolis, MN 55455, USA, Tel: +1-612-625-9985, Fax: 612-625-7502, eglix007@umn.edu.

Co-Conveners: E. Petrovsky, Geophysical Institute, Academy of Sciences, Prague, Czech Republic
H. Böhnelt, Univ. Nacional Autónoma de México; Juriquilla, Querétaro, Mexico; C. Carvallo, IPG, Paris, France

ASI010 Open Poster Session

Sponsoring Association: IAGA

This open session is being organized solely as a poster session. In addition to presentations that do not fit directly into the scope of the specific 'magnetic' sessions, we would like to attract contributions which deal with new and innovative aspects and interpretations of magnetic studies. Please feel free to present provocative ideas, interpretations and theories that will be attractive for (heavy) discussions at your poster board.

Conveners: H. DeWall, Institut für Geologie, Pleicherwall 1, 97070 Würzburg, Germany, Tel: +49-931-312592, Fax: +49-931-312378, DeWall@geologie.uni-wuerzburg.de

Co-Conveners: T. Werner, Warsaw, Poland; V. Pavlov, Institute of Physics of the Earth, Russian Academy of Science, Moscow, Russia

ASI011 Environmental studies

Sponsoring Association: IAGA

Advances in digital technology and concurrent developments in instrumentation and multi-dimensional inverse numerical modelling have led to improved data acquisition and interpretation techniques as well as brought geophysical (and in particular electrical and electromagnetic) methods within range of their theoretical resolving capability in near-surface investigations. This session focuses on novel applications of electrical and electromagnetic methods or their combination with other methods to address challenging environmental problems. We invite contributions that deal with, but not limited to, the following: (i) 3D investigations of derelict or contaminated land and groundwater resources; (ii) New non-invasive procedures for tracking or monitoring the progress of soil degradation (e.g. by chemical loading from agricultural activities) and bioremediation; (iii) Remote prediction of petrophysical and hydrochemical attributes of near-surface targets; (iv) Development of robust surface-process models and correspondence principles for geophysical anomalies; (v) Improved integration of field and lab techniques (multi-scale approaches) and time-lapse characterisations; and (vi) Sophisticated integrative mathematical models and controlled field experimental studies.

Conveners: M.A. Meju, Department of Environmental Science, Lancaster University, Lancaster LA1 4YQ, UK, Fax: +44-1524 593985, m.meju@lancaster.ac.uk

Co-Conveners: C. Sainato, University of Buenos Aires, Argentina; G. El-Qady, National Research Institute of Astronomy and Geophysics, Cairo, Egypt

ASII012 Small- and meso-scale structure in the thermosphere and ionosphere: observations and modeling

Sponsoring Association: IAGA

Remarkable advances over recent years in CCD sensitivity and radar techniques are allowing thermosphere and ionosphere observations to resolve structures at ever-smaller spatial and temporal resolutions. Many techniques now achieve meso-scale resolutions of several 10's kilometers spatially and a few minutes temporally, with resolutions of kilometers and seconds being possible in some cases. Numerical models are also beginning to explore these same resolutions, using techniques such as nested-grids. Meso-scale structure is most likely established by the highly dynamic interactions of the solar wind with the magnetosphere, ionosphere and thermosphere. For example, it is now thought that small scale variability may account for the discrepancy in the high-latitude energy



budget by a factor of up to 2 between models and observations. Also, it is now possible to examine in detail the role of high-latitude electrodynamics in forcing phenomena such as waves, divergence, shear and vertical motion.

Conveners: A.Aruliah, Atmospheric Physics Lab, University College London, 67-73 Riding House St., London W1W 7EJ, England, Tel: +44-(0) 20-7679-9017, group tel: +44-(0)20-7679-9023, Fax: +44-(0)20-7679-9024, a.aruliah@ucl.ac.uk

Co-Conveners: D. Hysell, Department of Earth and Atmospheric Science, Cornell University, Ithaca, NY, USA; M. Conde, Geophysical Institute, University of Alaska, Fairbanks, AK, USA



ASII013 Response of the ionosphere-thermosphere to large geomagnetic storms: data availability and modeling

Sponsoring Association: IAGA

Global Circulation Models (GCMs) of the terrestrial thermosphere predict fairly accurately the diurnal, seasonal and solar cycle variability of the thermospheric temperature and winds. However, in dynamic situations, though the individual elements of behaviour seen can generally be explained, the balance between them, their timing and their relative magnitudes are still difficult to predict. During extreme storms, the sort that occur only a handful of times a year, the behaviour is particularly complex, and understanding and predicting the flow of events for such circumstances will be the ultimate test of our understanding of the physics. This is solar-terrestrial coupling - Space Weather - at its limit. New space missions and improved ground-based facilities are providing new data for studying these events, and the resolution and complexity of GCMs is being continually improved to keep up with the volume and resolution of the data. How far we have come in measuring, understanding and simulating the more extreme events is the topic of this session. Some of the work presented is expected to form an argument for more directed ground-based experiments and space missions.

Conveners: A.D. Aylward, Atmospheric Physics Laboratory, Department of Physics and Astronomy, University College London, 67-73 Riding House Street, London, W1W 7EJ, UK, Tel: +44 (0)20 7679 9021, Fax: +44 (0)20 7679 9024, a.aylward@ucl.ac.uk

Co-Conveners: G.H. Millward, Atmospheric Physics Laboratory, Department of Physics and Astronomy, University College London, UK; L. Zhu, Utah State University, Logan, UT, USA

ASII014 Planetary ionospheres and thermospheres (Divisions II and III)

Sponsoring Association: IAGA

Many planets and some moons in our solar system are surrounded by permanent atmospheres. These are affected by the incident solar radiation and interact with the solar wind, in some cases via a magnetosphere. Over the past decades we have not only explored the upper atmosphere (thermosphere, ionosphere) and magnetosphere around our own planet, but also around most other planets and many moons in our solar system. Comparing these to one another rather than studying each in isolation has considerably enhanced our understanding of their differences and similarities, and thereby of the fundamental physical and chemical processes that drive these complex regimes. Relevant datasets are provided by recent missions, such as Cassini/Huygens, Mars Express and Venus Express. We invite papers discussing observations, model calculations and theoretical studies investigating the thermospheres and ionospheres of planets and moons in our solar system, their forcing from below and their coupling to magnetospheres, where present. In addition, papers on laboratory measurements relevant to planetary upper atmospheres are welcome. We strongly encourage presentations which apply a comparative approach.

Conveners: E. Bunce, Department of Physics and Astronomy, University of Leicester, University Road, Leicester, LE1 7RH, UK, Tel: +44-116-2523541, Fax: +44-116-2522464, emma.bunce@ion.le.ac.uk

Co-Conveners: M. Galand, Imperial College London, UK; I. Mueller-Wodarg, Imperial College London, UK

ASII015 Conjugate and interhemispheric polar studies (Division II and III)

Sponsoring Association: IAGA

The Earth's magnetosphere is an electrodynamic system that couples the northern and southern

polar ionospheres, each with different geophysical and electrodynamic properties. The unique physical characteristics of the northern and southern polar regions must be considered in models of the fully coupled, global, dynamic geospace system. For example, the separation of geomagnetic and rotation poles, magnetic field strength, and conductivity structures are different in the two polar regions. Further, the solar wind electrodynamic coupling to the northern and southern hemispheres can be very different depending upon the orientation of the interplanetary magnetic field (IMF). Research that quantifies these differences and their consequences is a focus of the International Polar Year and the associated ICESTAR program. In addition, considerable new data should be available from various sources such as ground/satellite conjunctions (e.g. Double Star, Cluster) and the coordinated Themis experiment. These programs along with other national and international efforts are producing new instrument arrays and methods for combining and synthesizing global data sets to investigate the fully coupled solar wind – magnetosphere – ionosphere system including interhemispheric coupling. This symposium solicits the results from research that contrasts and/or considers the coupled, interhemispheric global system including the consideration of times when the two polar ionospheres may not be coupled. The symposium also solicits papers that discuss the tools that can be used to investigate very high latitude phenomena where traditional CGM coordinates are ineffective. Also appropriate are papers that consider the factors that determine conjugacy/asymmetry of polar cap phenomena. Results from observation, theory, and computer simulations are solicited for presentation and discussion in this symposium.

Conveners: C.R. Clauer, University of Michigan, Center for Space Environment Modeling, 2455 Hayward, Ann Arbor, MI 48109-2143, USA, Tel: +1-734-476-624, Fax: +1-734-763-0437, rclauer@umich.edu

Co-Conveners: M. Freeman, British Antarctic Survey, Cambridge, U. K.; K. Kauristie, Finnish Meteorological Institute, Helsinki, Finland; V. Pilipenko, Institute of the Physics of the Earth, Moscow, Russia

ASII016 Data assimilation and space weather (Division II, III and IV)

Sponsoring Association: IAGA

Data assimilation techniques are a dominant tool for specifications and forecasts in meteorology and oceanography. More recently, data assimilation models have also been developed for space weather applications, largely due to the rapid increase in the number of data that will become available over the next decade. This data, which will come from a variety of sources, will be available in real-time for assimilation into physics-based specification and forecast models. In order to adapt modern data assimilation techniques developed in meteorology and oceanography to the near-Earth space regimes, a rigorous examination of the available data, the data assimilation techniques, and the statistical properties of the system is necessary. Papers dealing with data sources, data quality issues, and data assimilation models and techniques are welcome.

Conveners: L. Scherliess, Utah State University, Center for Atmospheric and Space Sciences, Logan, UT 84322, USA, Tel: +01 435 797 7189, Fax: +01 435 797 2992, ludger@gaim.cass.usu.edu

Co-Conveners: T. Matsuo, NCAR, Boulder, CO, USA

ASII017 Sun-Earth system: science and impacts (Divisions II, III and IV)

Sponsoring Association: IAGA

Space weather can affect the performance and reliability of space-borne and ground-based technological systems and endanger human life or health. Adverse conditions in the space environment can cause disruption of satellite operations, communications, navigation, electric power distribution grids and impacts the science in all IAGA Divisions. Also, the speed and density of the solar wind and the interplanetary magnetic field (IMF) are thought to affect indirectly the climate system. The pathways that link solar variability to climate and the influences of upward propagating disturbances from the lower atmosphere on space weather involve the sciences in the IAMAS Division. This symposium, which spans IAGA and IAMAS discipline areas, will focus upon descriptions of new impacts and science findings that improve our understanding of the Sun-Earth interaction as an interconnected non-linear system and will lead to increased reliability in the prediction of space weather and the Earth's climate system. Thus, the session will cover the two main thrusts of the international CAWSES program. The science may range from understanding of specific phenomena through to end-to-end modelling of the closely-coupled system. Contributions that address adaption and mitigation strategies and techniques that will minimise the effects of space weather, as well as improvements in the description of coupling mechanisms within the atmosphere that will lead to a clearer understanding



of climate variability, are strongly encouraged.

Conveners: J. Kozyra, Department of Atmospheric, Oceanic and Space Sciences, Space Research Building, University of Michigan, 2455 Hayward St., Ann Arbor, MI 48109-2143, USA, Tel: 01-734-647-3550, Fax: 01-734-647-3083, jukozyra@umich.edu

Co-Conveners: A. Rodger, British Antarctic Survey, Cambridge, UK

ASIII018 Magnetopause and magnetosheath processes: reconnection, diffusion and boundary dynamics (Divisions III and IV)

Sponsoring Association: IAGA

The magnetopause and its boundary layers are the prime sites of mass, momentum and energy transfer from the solar wind into the magnetosphere. The physics of these processes are therefore of central importance to magnetospheric physics. Observations of these regions continue to be returned from spacecraft missions. These observations are further supported by observations from ground based observatories. New progress in simulations, MHD, hybrid and kinetic, and theoretical advances allow the physics of reconnection and boundary layer processes to be elucidated as never before. This symposium invites contributions on a wide range of magnetopause related topics, including observations of the structure of the magnetopause current layer, its boundary layers and their transient variations, the signatures of the various forms of plasma interactions, such as magnetic reconnection, at the magnetopause and their relevance to solar wind magnetosphere coupling, and the interaction of solar wind disturbances with the magnetosphere. The basic physics of reconnection, plasma diffusion and boundary layer formation at the magnetopause and magnetosheath processes influence magnetopause dynamics are also highly relevant. Multi-spacecraft and/or ground based observations which relate the magnetopause signatures to phenomena observed inside the magnetosphere or in the ionosphere are particularly welcome, as are modelling and simulation studies which complement the observations.

Conveners: C. Owen, Mullard space Science Laboratory, University College London, Holmbury St. Mary,, Dorking, Surrey, RH5 6NT, UK, cjo@mssl.ucl.ac.uk

Co-Conveners: T. Phan, Space Science Laboratory, University of California, Berkeley, USA; S. Schwartz, The Blackett Laboratory, Imperial College, London, UK; E. Lucek, The Blackett Laboratory, Imperial College, London, UK

ASIII019 Progressing to closure in magnetotail plasma sheet and substorm processes

Sponsoring Association: IAGA

Much progress has been made recently on the dynamics of the thin current sheets developing in the central region of the geomagnetic tail. The magnetotail current sheet has proven to be the seat of more complex structure and dynamics than expected involving multiple current sheets, coupling of micro- and meso-scale dynamics and turbulent structures and flows. Notably, multi-satellite missions provide new observational capabilities enabling critical tests of competing mechanisms of energy release and tail reconfiguration. The symposium provides a forum for discussion of the relevant scales for current sheet dynamics, evaluating evidence for and against proposed instability processes, and comparison with theory, simulation and modeling to identify the key processes relevant to magnetotail and substorm processes and their manifestation in global scale substorm development. Contributions are welcome that address the dynamics of current sheets and their relation to substorms. Priority will be given to near Earth and mid-tail regions.

Conveners: V.E. Angelopolous, Space Science Laboratory, University of California Berkeley, Berkeley, CA 94720-7450, USA;

Co-Conveners: K. Shiokawa, STELAB, Nagoya University, Toyokawa, Japan; W. Baumjohann, Space Research Institute, Graz, Austria

ASIII020 Magnetosphere-ionosphere interactions and auroral processes (Divisions III and II)

Sponsoring Association: IAGA

The dynamical evolution of magnetosphere-ionosphere systems is closely related to processes that mediate the exchange of mass, momentum, and energy between the ionosphere and mag-neto-



sphere. Energetic particle fluxes, currents, and Poynting flux associated with magneto-spheric flows, plasma populations, and waves carry energy from the magnetosphere into the ionosphere. These dynamical processes can modify ionospheric conductivity and ionospheric current systems; excite plasma instabilities; and dissipate energy through collisional and wave-induced heating processes. Moreover, ionospheric modifications feed back on the magneto-sphere through alteration of the current system, radiation/reflection of waves, plasma outflow, and development of parallel electric fields to maintain quasineutrality. This symposium invites contributions on a range of areas relevant to coupling dynamics including: How do magnetospheric flows and current systems evolve when coupled to the ionosphere? What is the temporal evolution of the global ionospheric current system in the context of M-I coupling? What are the processes involved in plasma inflow/outflow, under what conditions do they occur, and how do they couple the magnetosphere and ionosphere? What role do waves and plasma instabilities play in M-I coupling? Papers presenting observations, theory, simulation and modeling are all welcome.

Conveners: W. Lotko, Dartmouth College, Thayer School of Engineering, Hanover, NH 03755, USA; lotko@dartmouth.edu

Co-Conveners: J. Moen, Institute of Physics, University of Oslo, Oslo, Norway; R Fujii, Solar-Terrestrial Environment Laboratory, Nagoya University, Nagoya, Japan

ASIII021 Geomagnetic storms: toward a coupled system level understanding

(Divisions III and II)

Sponsoring Association: IAGA

Storms and other geomagnetic disturbances are manifestations of enhanced solar wind – magneto-sphere coupling, whose effects can be detected as configurational changes and high temporal variability. Solar wind disturbances and southward-oriented interplanetary magnetic field enhance the ring current and radiation belts, distort and disturb the electromagnetic fields, and strongly increase the ionosphere – magnetosphere interaction. During these events the system displays dynamics intrinsic to its coupled interactions that are not evident during ‘normal’ moderately disturbed conditions. This session concentrates on understanding the system storm-time dynamics incorporating the coupled interactions between the solar wind, magnetopause, polar regions, magnetotail and plasma sheet and inner magnetosphere. Papers addressing these questions using ground-based and space-borne observations, modeling and simulation techniques, or theoretical analysis are all welcome.

Conveners: G. Reeves, Space and Atmospheric Sciences, Los Alamos National Laboratory, Los Alamos, New Mexico, USA, reeves@lanl.gov

Co-Conveners: J.U. Kozyra, Space Physics Res Laboratory, University of Michigan, Ann Arbor, Michigan, USA; Delcourt, T. J. Pulkkinen, Finnish Meteorological Institute, Helsinki, Finland

ASIII022 Perspectives from global models and synoptic observations (Divisions III and II)

Sponsoring Association: IAGA

The dramatic and ongoing improvements in both ground-based and space based observational capabilities allow more complete and stringent comparisons with global models and simulations to test our understanding of fundamental physical processes. Technological advancements in data storage, retrieval, and communications, new space-based imaging techniques, and ever more cost effective and efficient sensors make collecting more data from more platforms, and the integration of that data into the framework of worldwide virtual arrays an increasingly easy task. In addition, the international modeling community is constantly improving the capacity to integrate data from disparate types of instruments and the assimilation of the resulting product into physical and empirical models. This symposium will highlight research using global scale ground-based and space based observations to study the global and meso-scale system dynamics and also their comparison with global models. In particular, we will focus on synoptic observations provided by remote sensing instruments and arrays of instruments and the integration of these data to provide as complete as possible a specification of the spatio-temporal evolution of the magnetosphere-ionosphere system.

Conveners: Eriksson (Lasp),

Co-Conveners: J. Gjerloev, Applied Physics Laboratory, Johns Hopkins University, Laurel, MD, USA M. Lester; K. Yumoto, Department of Earth and Planetary Sciences, Kyushu University, Fukuoka, Japan



ASIII023 Causes and evolution of plasma pressure distributions

Sponsoring Association: IAGA

This session will be devoted to recent findings in magnetospheric plasma pressure distributions, the mechanisms by which they develop and dissipate and their resulting dynamics. Plasma pressure distributions are one of the key physical elements determining magnetospheric structure, currents, and instabilities. They control the large and medium scale electric currents including the Birkeland currents, they are the source of the Dst disturbance and they are a major contributor to storm-time auroral energy deposition. The ionosphere and the solar wind are considered as sources of equal importance. Either one is capable of supplying the observed magnetospheric plasma over a broad-band of energy spectrum. The results of particle measurements from the latest satellite missions, including observations from remote sensing of energetic neutral atoms give new and extremely important information on the structure, stability and dynamics of plasma pressures during storms and substorms. Papers are solicited that discuss magnetospheric plasma sources, sinks, energization, and transport using experiment, theory and simulation/modeling.

Conveners: L.R. Lyons, University of California, Dept. Of Atmospheric Sciences, 405 Hilgard Avenue, Los Angeles, CA90095-1567, USA, larry@atmos.ucla.edu

Co-Conveners: S. G. Zaharia, E. Antonova, Institute of Nuclear Physics, Lomonosov Moscow State University, Moscow, Russia

ASIII024 Dynamics of the Low Energy Plasma Populations (Divisions III and II)

Sponsoring Association: IAGA

The dynamics of low energy plasmas have proven to yield unique insight into convection dynamics and plasma transport. Techniques using remote sensing and ground based arrays are giving new views of the system dynamics. This session focuses on observations and theoretical/modeling of low energy ion and electron dynamics, including heavy ions, during quiet and disturbed periods. Particular interest concerns the formation and evolution of density structures in the inner magnetosphere and their relationship to processes of importance to radiation belt and ionospheric disturbances. Observational studies, theory/modeling of the system dynamics are all welcome.

Conveners: Henri Reme,

Co-Conveners: M. Moldwin, Department of Earth and Space Sciences, University of California, Los Angeles, USA; Menk, M. Clilverd, T. Ono

ASIII025 Techniques and instrumentation in space plasma physics

Sponsoring Association: IAGA

Space and ground based instrumentation has shown significant advances in technology in recent years. These developments enable a new generation both of measurements and of data acquisition and logistical support for ground based instrumentation. Not only have advances been made to improve performance of individual instruments, for example, space based imagers and sensors but also in systems used for ground based systems to enable improved reliability and autonomy enabling large networks of sensors. With these technical developments new techniques in operation and analysis of data have been developed to take full advantage of the broad range of measurements provided. This session invites papers describing instrument technologies and developments applied to space physics including both space and ground based as well as papers describing new techniques of measurement and data analysis.

Conveners: A. Hilgers, ESTEC, Noordwijk, The Netherlands; Alain.Hilgers@esa.int

Co-Conveners: E. Donovan, Department of Physics and Astronomy, University of Calgary, Calgary, Canada; H. Lühr, GeoForschungsZentrum, Potsdam, Germany

ASIII026 Wave and particle dynamics in the ring current and radiation belts

Sponsoring Association: IAGA

Recent studies have shown that wave-particle interactions with ULF and VLF waves have a major influence on the energization, transport and loss of ring current and radiation belt particles. Further progress requires a more complete understanding of the wave particle interactions and their effects on the energetic particles. This session will cover the wave-particle physics and the effect of these processes on the development, energization and transport of ring current and radiation belt par-



ticles. Papers addressing these topics using observations and/or theory and modeling are welcome.

Conveners: Chan,

Co-Conveners: I. Mann, Department of Physics, University of Alberta, Edmonton, Canada
Meredith,

ASIII027 Other magnetospheric worlds

Sponsoring Association: IAGA

While the terrestrial magnetosphere shares many common features with planetary magnetospheres, they display enormous variation from the terrestrial system providing a broad range of systems to inform our understanding of the fundamental physics underlying the interactions of magnetized bodies with space plasma environments. Given that planetary magnetospheres can have satellites, rings, dust, and high densities of neutral gas imbedded deep within them, there is much to be gained in asking how processes of transport, auroral generation, and others are maintained in these different environments and which processes are unique only to Earth or to some planets. Our focus will be on lessons learned from remote and in situ investigations of other magnetospheric systems, including in particular Saturn, although results from studies of the Jovian and other systems are most welcome. Papers that draw on the wealth of knowledge of other systems to identify broader themes relevant to astrophysical systems are also welcome as are papers which discuss current knowledge in the context of upcoming missions including the MESSENGER and BepiColombo missions to Mercury, the Pluto/Kuiper Belt Missions among others.

Conveners: P. Brandt, The Johns Hopkins University, Applied Physics Laboratory, Johns Hopkins Road, Laurel, MD 20723, USA

Co-Conveners: A. Coates, B.E. Bunce, H. Hayakawa,

ASIII028 Reporter reviews

Sponsoring Association: IAGA

Invited reporter reviews by eminent scientists selected by their peers are presented on the following topics: 1. Large-scale fields, flows and plasma morphology; 2. Magnetospheres of solar system bodies other than Earth; 3. Boundary layer structures and processes; 4. ULF waves; 5. Dynamics of the magnetotail; 6. Multi-scale physics in the auroral acceleration region; 7. Ring current, radiation belts and inner magnetospheric plasmas; 8. Wave-particle interactions.

Conveners: M. Fujimoto, University of Nagoya, Physics Department, Chikusa-ko, Nagoya, Japan,
Tel: +81 52 789 2452, Fax: +81 52 789 2919, fujimoto@phys.nagoya-u.ac.jp

ASIV029 The International Geophysical Year and its impact on space science

(Division IV and IDCH, Divisions II, III and V)

Sponsoring Association: IAGA

The International Geophysical Year (IGY) in 1957-8 ranks among the most significant events in space science history. The IGY witnessed the launch of the first artificial satellites and space probes, 10 in all, beginning famously with Sputnik 1 on 4 October 1957. This session will focus on the role of the IGY in establishing the field of space science, discoveries made during the IGY (most notably the Van Allen belts), and the enduring impact of the IGY on the organization and conduct of space science and exploration. Accounts of IGY space activities, including national organization and planning of IGY space efforts, are solicited.

Conveners: B.J. Thompson, NASA Goddard Space Flight Center, Mail Code 612.1, Greenbelt, MD, 20771, USA, Tel: +1 301 286 3405, Fax: +1 301 286 1617, barbara.j.thompson@nasa.gov; N. Meyer-Vernet; Laboratoire d'Etudes Spatiales et Instrumentation en Astrophysique, Observatoire de Paris, 92195 Meudon Cedex, France, Tel: +33 1 45 07 76 90, Fax: +33 1 45 07 28 06, nicole.meyer@obspm.fr

Co-Conveners: W. Gonzalez, National Institute for Space Research (INPE), Brazil



ASIV030 New results from solar and heliospheric missions

Sponsoring Association: IAGA

Continuous observations of the Sun obtained by ground- and space-based instrumentation have provided detailed information on the solar interior, atmosphere, extended corona and solar wind. These observations offer a unique capability to investigate the physical processes responsible for the dynamic nature of the Sun and the Solar Wind. The symposium invites contributions covering new results from observations from existing missions (e.g., SOHO, TRACE, RHESSI, Ulysses, ACE, Wind, Genesis, Cassini) and new missions (e.g., Solar B, STEREO); theory, and modeling of the different aspects of the Sun, including its interior, atmosphere and wind. This symposium is aimed at stimulating exchange and promoting discussion on the recent developments derived from the observations and the latest research in the field.

Conveners: Mari Paz Miralles, Harvard-Smithsonian Center for Astrophysics, 60 Garden St., MS-50, Cambridge, MA 02138, USA, Tel: +1 617 496-7925, Fax: +1 617 495-7455, mmiralles@cfa.harvard.edu

Co-Conveners: M.L. Kaiser, NASA Goddard Space Flight Center, Greenbelt, USA; T. Kosugi, Institute of Space and Astronautical Science of the Japan Aerospace Exploration Agency (ISAS/JAXA), Japan; J. Sanchez Almeida, Instituto de Astrofísica de Canarias, Spain,

ASIV031 From micro- to macro-scales in the heliosphere and magnetospheres

(Divisions IV, II, and III)

Sponsoring Association: IAGA

Both the interplanetary medium and planetary magnetospheres are characterized by a multiplicity of scales, ranging from short-scale, high-frequency fluctuations to low-frequency MHD scales to solar rotation and solar cycle scales. The interaction of these scales is often highly non-linear and the separation of scales and physical effects is frequently not obvious. Obvious examples include the scattering and transport of energetic particles by low-frequency turbulence, the interaction of the solar wind with the local interstellar medium, the acceleration and transport of solar energetic particles, the evolution and dynamics of turbulence in the interplanetary medium, emission processes at shocks, the response of shocks to turbulence, the characteristics of collisionless shock waves and foreshocks, turbulence in the magnetotail, etc. This session solicits contributions that explore the coupling of multiple scales and physical processes in the context of the interplanetary medium and planetary magnetospheres.

Conveners: G. P. Zank, Institute of Geophysics and Planetary Physics, University of California, Riverside, CA 92521, USA, Tel: +1 951 827 4508, Fax: +1 951 827 4324 or 4509, zank@ucr.ac1.ucr.edu

Co-Conveners: T. Hada, Kyushu University, Japan; I. Veselovsky, Institute of Nuclear Physics, Moscow State University, Russia

ASIV032 IHY and universal processes (Divisions IV, II, and III)

Sponsoring Association: IAGA

On October 4, 1957, only 53 years after Kitty Hawk, the launch of Sputnik marked the beginning of the space age. Discovery of the radiation belts, the solar wind, and the structure of Earth's magnetosphere prepared the way for human exploration to follow. Today a similar story is unfolding, as the spacecraft Voyager is leaving the heliosphere, and for the first time, humans will begin to explore the local interstellar medium. It is inevitable that, during the next 50 years, exploration of Mars and the Outer Planets will be the focus of the space program, and a better understanding of the global heliophysical processes will be required. Like the IGY before it, The International Heliophysical Year (IHY) will focus on the cross-disciplinary physics governing all of heliophysics through the study of Universal Processes in the solar system. Basic science themes are (1) Evolution and Generation of Magnetic Structures and Transients, (2) Energy Transfer and Coupling Processes, (3) Flows and Circulations, (4) Boundaries and Interfaces: Sheaths, Shocks, and Layered Interfaces, and (5) Synoptic Studies of the 3D Heliosphere. Contributions on plasma processes, particle acceleration/propagation, solar phenomena, magnetospheric/heliospheric processes, the coupling of planetary atmospheres to



the space environment, etc. are sought.

Conveners: J.M. Davila, Code, 612.1, NASA Goddard Space Flight Center, Greenbelt, MD 20771 USA, tel: +1 301 286 8366, Fax: +1 301, Davila@ihy.gsfc.nasa.gov

Co-Conveners: A.Chiliangarian, Alikhanian Physics Institute, Armenia; W. Liu, Canadian Space Agency, Canada; G. Poletto, Arcetri Osservatorio Astrofi., Italy.

ASIV033 Neutral-plasma interactions for planets, moons, asteroids, and comets

Sponsoring Association: IAGA

This session will be a forum for presenting recent progress in the space plasma physics of solar system bodies without measurable dynamo magnetic field. The interaction of Mars with the solar wind is mainly of the atmospheric type like Venus but with strong modifications of the local ionospheric structure by the crustal fields. Their exosphere makes these planets also share common physical processes with comets. The interaction of Titan with the fast co-rotating plasma inside the magnetosphere of Saturn is another example of such interaction in a different parameter range. The session will be in particular devoted to new results from Mars Global Surveyor and Mars Express at Mars (e.g., Martian aurorae), from Cassini around Saturn's moons including Titan, Enceladus, Rhea and others, and expected results from Venus Express. Paper relating to Rosetta's Mars flyby are also encouraged. Numerous open issues include upstream waves, plasma boundaries and their dynamics, atmospheric and ionospheric escape, influence of Martian crustal fields, etc. Recent results in data analysis and theoretical results, including numerical simulations are encouraged. Papers related to forthcoming space missions (including Rosetta and New Horizons) or future projects are also welcome.

Conveners: C. Mazelle, Center d'Étude Spatiale des Rayonnements, CNRS / University of Toulouse / Observatoire Midi-Pyrénées, 9, Avenue du Colonel Roche, BP 4346, 31029 Toulouse Cedex 4, France, tel: +33 5-6155-7775, Fax: +33 5-6155-6701, christian.mazelle@cesr.fr

Co-Conveners: A.J. Coates, Mullard Space Science Laboratory, University College London, UK; W. Ip, Institute of Astronomy, National Central University, Taiwan (TBC).

ASIV034 Reporter Reviews

Sponsoring Association: IAGA

This session contains reviews of recent advances, both theoretical and observational, on the Sun, solar wind, and heliosphere. Given by active researchers, these reviews will cover a comprehensive range of topics in a manner that is accessible to researchers from other IAGA Divisions, while offering synthesis and context to Division IV scientists. All talks in this session are by invitation only.

Conveners: Iver H. Cairns, School of Physics, University of Sydney, NSW 2006, Australia, tel: +61 2 9351-3961, Fax: +61 2 9351-7726, cairns@physics.usyd.edu.au

ASV035 The role of magnetic observatories in monitoring and modeling Earth's magnetic field

Sponsoring Association: IAGA

Magnetic observatories specialize in measuring the long-period changes in the field while at the same time providing one-minute or sub-minute sample data for studies of rapid variations. Over the years, the types of users of magnetic observatory data and the uses to which they put the data have changed. In addition, a large amount of data now comes from satellite surveys. How have these changes affected the role of magnetic observatories? What impact will the changing requirements of the user community and the availability of data from satellites or other sources have on ground magnetic observatories? We welcome contributions that examine these questions from all points of view, such as the type of data required by the user, the coordination of observatories and other ground magnetometers with satellite and other campaigns, and the types of instruments required to produce the data.

Conveners: J.-J. Schott, Service des Observatoires Magnétiques, 5, rue Descartes, 67084 Strasbourg Cedex, France, Tel: 33 (0)3 90 24 00 60, Fax: 33 (0)3 90 24 01 25, JeanJacques.Schott@eost.u-strasbg.fr



Co-Conveners: L. Newitt, Geomagnetic Laboratory, Geological Survey of Canada, Natural Resources Canada; P.B. Kotze, Geomagnetism Group, Hermanus Magnetic Observatory, Hermanus, South Africa

ASV036 Geomagnetic measurements in remote regions (Division V and ICDC)

Sponsoring Association: IAGA

Lack of measurement and collection of geomagnetic data from many regions of the earth due to environmental, logistic and communication difficulties prevent complete description and, thus, inhibit the search for the physical mechanisms of a number of transient phenomena, e.g., space-time variability of auroral and equatorial electrojets, high altitude and low altitude coupling, influence main field and oceans on transient variations etc. This session focuses on data based and numerically based research suggesting essential configuration of geomagnetic stations, both on land and on ocean floor, to quantify such phenomena, particularly highlighting the strategic gaps in the existing observatory network; for example, Antarctica and the equatorial region. Papers defining strategic locations where measurements of geomagnetic field could improve upon existing geomagnetic indices and models will be of special interest, as well as discussions on the uniqueness of a region and the scientific justification for the placement of the station. Papers describing novel design of equipment, modes of data collection and decimation from the remote regions where there are limited or no power / electronic communication means are particularly welcome.

Conveners: B.R. Arora, Wadia Institute of Himalayan Geology, Dehradun, India, Tel: +91 135 2627942, Fax: 91 135 2625212, arorabr@wihg.res.in

Co-Conveners: H. McCreadie, Defence Science and Technology Organisation (DSTO), Edinburgh, Australia; A. De Santis, Istituto Nazionale di Geofisica e Vulcanologia, Roma, Italy

ASV037 International Decade of Geopotential Field Research: Current achievements and expected impact of Swarm (Divisions V, and I, II, III)

Sponsoring Association: IAGA

The Decade of Geopotential Research, inaugurated with the launch of Ørsted and Sunsat in February of 1999 is now in its 9th year. The combination of high quality data sets from several near-Earth satellites and ground based measurements has opened numerous opportunities to study not only core processes, mantle conductivity, lithospheric composition and ocean flow but also the dynamics of ionospheric and magnetospheric currents. Contributions on all these topics are solicited for this session. In addition, we welcome papers dealing with the difficult separation of the various sources of the field and the implications for the forthcoming multi-satellite SWARM mission.

Conveners: E. Friis-Christensen, Danish National Space Center, Juliane Maries Vej 30, DK 2100 Copenhagen, Denmark, Tel: +45 3532 5707, Fax: +45 3536 2475; Eigil.Friis@spacecenter.dk

Co-Conveners: S. Maus, CIRES, University of Colorado, Boulder, CO, USA V. Lesur, GeoForschungsZentrum, Potsdam, Germany

ASV038 World Digital Magnetic Anomaly Map

Sponsoring Association: IAGA

This session will focus on magnetic data, methods, and maps contributing to the World Digital Magnetic Anomaly Map (WDMAM) being prepared at the 1:50 million scale. The WDMAM will represent the total field magnetic anomalies of the Earth's lithosphere at the grid interval of about 5 km (specifically, 3 minutes of latitude/longitude) and altitude of 5 km above the geoid and up to spherical harmonic degree 15 (about 2600 km wavelength). This session solicits contributions that describe the data, methods, merging procedures, and processes taken to arrive at candidate segments for future editions of the WDMAM. Deadline for receiving the new data sets by the WDMAM task force for the first edition is end of June 2006 and the submission of candidate maps/models to the WDMAM committee will take place before the end of September 2006. The contributors may freely choose the methods of merging short as well as long wavelength parts of the field, provided that they are transparent, scientific, and reproducible and are proven robust during the review process. An adequate description of the methods and merging procedures of specific large segments of maps



must be included with the candidate models.

Conveners: D. Ravat, Southern Illinois Univ, Dept Geology, MS 4324, Carbondale, IL 62901-4324, USA, Tel: +01(618)453-7352, ravat@geo.siu.edu

Co-Conveners: E. Thebault, GeoForschungsZentrum, Potsdam, Germany; J. Korhonen, Geological Survey Finland, Espoo, Finland

ASV039 Use of geomagnetic data and indices in space weather and space climatology

Sponsoring Association: IAGA

Magnetometers are routinely used on the ground, throughout the magnetosphere and in the solar wind to gather information on rapidly changing space environment conditions. Ground based magnetic observatories also provide an important long time series of data for monitoring conditions over many solar cycles. Such a global database and time span allows us to explore both short term space weather and long term space climatology. In this session we solicit papers that address issues in geomagnetic data and index analysis such as: space weather event detection; methods of classifying geomagnetic activity (e.g. storm severity); derivation of geomagnetic indices (both traditional and new); applications of data and indices for academic and commercial purposes; geomagnetic data mining, analysis, assimilation and visualisation; the short and long term variability of the space environment and of space weather; and climatological models of magnetospheric and ionospheric current systems and fields.

Conveners: J.J. Curto Subirats, Observatori de l'Ebre, c/Horta alta, 38, 43520 Roquetes, Spain, Tel: +34 977 500511, Fax: +34 977 504660, jjcurto@obsebre.es

Co-Conveners: R. Lukianova, Arctic and Antarctic Research Institute, St.Petersburg, Russia; K. Mursula, University of Oulu, Oulu, Finland

ASV040 Division V Reporter Reviews

Sponsoring Association: IAGA

This session is composed of invited papers which review important progress or discovery in observation, modeling and interpretation of geomagnetic field. All Division-V research topics are covered, from geomagnetic data acquisition systems, magnetic observation (ground/satellite measurements and survey programs), field modeling, geomagnetic indices, data dissemination, and analyses, in the context of a new understanding of the geomagnetic field.

Conveners: T. Iyemori, World Data Center for Geomagnetism, Kyoto Graduate School of Science, Kyoto University, Kyoto 606-8502, Japan, Tel: +81-75-753-3949, Fax: +81-75-722-7884, iyemori@kugi.kyoto-u.ac.jp

Co-Conveners: M. Mandea, GeoForschungsZentrum Potsdam, Potsdam, Germany

ASICDC041 The investigation of low-latitude and equatorial geomagnetic variations since the International Geophysical Year 1957

Sponsoring Association: IAGA

The symposium will provide an open forum to present all aspects of geomagnetic variations at the equatorial and low latitude regions since the International Geophysical Year 1957. Papers describing the variability of equatorial electrojet on a global-scale, using ground and/or satellite data are especially welcome. Distinctive signatures of the equatorial magnetic field that signify solar and geophysical forcing and have applications in space weather predictions would be of particular interest. The analyses of EEJ data since 1957 up to the present time are of particular interest.

Conveners: Nguyen Thi Kim Thoa, Institute of Geophysics, 18 Hoang Quoc Viet, Cau Giay, Hanoi, Vietnam, Tel: +84 48 363238, Fax: +84 48 364696, nkthoa@fpt.vn

Co-Conveners: B.R. Arora, Wadia Institute of Himalayan Geology, India; H. McCreadie, KyotoUniv., Japan



ASICDC042 Advances in the investigation of equatorial aeronomic processes since the International Geophysical Year 1957

Sponsoring Association: IAGA

Contributions related to advances in theoretical and experimental investigations on (i) Equatorial Electrojet (ii) Dynamical Processes and Coupling of the E and F-region and (iii) Plasma Irregularities, with special emphasis on the equatorial and low latitude regions are welcome. We invite contributions on the existing data base on the equatorial and low latitude upper atmosphere and ionosphere since the International Geophysical Year 1957. The main emphasis of the session will be on working out specific future plans of coordinated observations especially in the developing countries in order to resolve problems in the area.

Conveners: P. Muralikrishna, Instituto Nacional de Pesquisas Espaciais, C.P.515, 12.201-970 São Jose dos Campos-SP, Brazil, Tel: +55 12 39457148, Fax: +55 12 39456990, murali@dae.inpe.br

Co-Conveners: C. Amory-Mazaudier, CETP, Paris, France; V.Doumouya, Université de Cocody, Cote d'Ivoire

ASIDCH043 The International Geophysical Year: A 50-yr Retrospective

Sponsoring Association: IAGA

The International Geophysical Year (July 1957 - December 1958) was a watershed event in the geosciences. Described at the time as "the most ambitious and successful co-operative effort in the history of science", the IGY has had a profound impact on the organization and conduct of the geosciences during the past half century. Conceived at a dinner party at the home of James Van Allen on 5 April 1950, the IGY was sponsored, nurtured, and carried out by the IUGG and the other cooperating international scientific unions of the ICSU through the Comité Spécial de l'Année Géophysique Internationale. All domains of the geosciences from the Sun to the Earth were covered. In this symposium, which is coordinated with U.02, we consider the long-term impact of the IGY on the development of the geosciences. The symposium will consist primarily of invited talks but contributions are solicited on topics including, but not limited to, organizational and institutional aspects of the IGY, personal accounts of IGY activities/discoveries, and retrospectives of the significance of the IGY for the various geophysical disciplines. Contributed presentations that cannot be accommodated in the oral session will be given as posters.

Conveners: E.W. Cliver, Air Force Research Laboratory (VSBXS), 29 Randolph Rd., Hanscom AFB, MA 01731-3010, USA, Tel: 011 781 377 3975, Fax: 011 781 377 3975, edward.cliver@hanscom.af.mil; G.S. Lakhina, Indian Institute of Geomagnetism, Kalamboli Highway, New Panvel (W), Navi Mumbai- 410 218, India. Tel: 91-22-2748 4127, Fax: 91-22-2748 0762, lakhina@iigs.iigm.res.in,

Co-Conveners: M. Kuhn, University of Innsbruck, Austria; G. Good, University of West Virginia, USA

HS1001 A New Focus on Groundwater-Seawater Interactions (Sponsors ICGW and IAPSO)

Sponsoring Association: IAHS

In the past, groundwater studies in coastal environments were driven by the need to protect freshwater resources from saltwater intrusion. Recently, a new research focus has evolved to better understand the fluid exchange across the sea floor. This new focus is motivated by the possibility that nutrients or other groundwater pollutants may be contributing substantial chemical inputs to coastal water bodies. The purpose of this symposium is to bring together scientists from the terrestrial and marine sides to establish a dialog and a common understanding of processes that occur at the subterranean boundary between freshwater and seawater. Examples of appropriate topics for this symposium include methods for measuring and modelling saltwater intrusion, submarine groundwater discharge and geochemical reactions within the transition zone.

Conveners: Ward Sanford, U.S. Geological Survey, Reston, VA, USA, Tel: +1703-648-5882, wsanford@usgs.gov

Co-Conveners: Christian Langevin, U.S. Geological Survey, Miami, FL, USA, langevin@usgs.gov; Maurizio Polimio, National Research Council, Italy, m.polemio@ba.irpi.cnr.it, Pavel Povinec, Comenius University, Bratislava, Slovakia, povinec@fmph.uniba.sk



**CONFERENCE PROGRAM details
ASSOCIATION IAGA/IAHS**

HS1002 A New Focus on Integrated Analysis of Groundwater/Surface-Water Systems: Process Understanding, Conceptualisation and Modelling. (Sponsors

ICGW, ICSW and ICCLAS)

Sponsoring Association: IAHS



A comprehensive understanding of the transport of water and chemicals between surface water and groundwater and the affects this has on biological processes is essential to improve management of surface and groundwater resources and to protect the functionality of the associated ecosystems. Here, surface-water is defined broadly to include rivers, lakes, and water fluxes related to precipitation, snow and ice that affect ground-water recharge and discharge. Factors of importance include climate and weather, geologic setting, fluvial geomorphology, terrestrial vegetation, glaciation, flow and transport through the unsaturated and saturated subsurface and human impacts. Historically, policy makers, scientific investigators and water resources managers have considered surface-water and groundwater as separate, essentially unconnected components of the watershed. However, today we appreciate the fact that hydrologic exchange is critical for the maintenance of biodiversity and the ecological functions of both rivers and groundwater. Data, computer capabilities, computer programs, and expertise have finally advanced far enough that the artificial barriers are being removed and integrated approaches are being used to better understand entire hydrologic systems. This advance is badly needed as these systems have already been severely altered and increasingly face over-exploitation and contamination. Moreover, in many areas of the world large sums are being devoted to stream restoration while the ecological consequences and potential benefits of these measures are hardly considered in the light of surface/groundwater exchange and hence not designed to improve the ecological connectivity of these systems. This symposium will bring together scientists to advance integrated analysis of groundwater/surface-water systems. Physical, chemical, biological, and ecological contributions focused on ground-water/surface-water interactions are welcome, including innovative field investigations, new methods of data collection and use, new process conceptualisations, and new methods of simulating integrated systems. We also welcome contributions on water resource management strategies for mitigating exploitation impacts.

Conveners: Corinna Abesser, British Geological Survey, UK, cabe@bgs.ac.uk (IAHS-ICGW)

Co-Conveners: Thorsten Wagener, Pennsylvania State University, USA, thorsten@engr.psu.edu
Janine Gibert, Université Claude Bernard Lyon1, FRANCE, Janine.Gibert@univ-lyon1.fr; Louise Heathwaite, Lancaster University, UK, louise.heathwaite@lancs.ac.uk; Gunnar Nuetzmann, Leibniz-Institute of Freshwater Ecology and Inland Fisheries, Germany, nuetzmann@igb-berlin.de; Enrique Vivioni, New Mexico Institute of Mining and Technology, USA, vivoni@nmt.edu

HS1003 Hydrology in Mountain Regions: Observations, Processes and Dynamics (Sponsor ICSIH with co-sponsorship of UCCS, ICRS, ICSW, ICCLAS, ICGW, PUB)

Sponsoring Association: IAHS

The storage and modulated release of water from seasonal snowpacks and perennial ice are major components of hydrological systems in many mountainous regions of the world. In these regions, snow cover and ice are critical component of the annual water cycle, controlling soil moisture, streamflow and the development and stability of terrestrial and aquatic ecosystems. Heavy rainfall is another input to many mountain systems, resulting in water excess and mountains operating as the Water Towers of the world. This water is crucial to downstream areas, many of which are arid or semi-arid and subject to drought. Detailed understanding of snowpack dynamics coupled with the ability to adequately model intra-basin hydrologic processes is necessary to test hypotheses concerning runoff, biogeochemistry and climatic interactions. The relative contribution of glacial ice versus seasonal snow to mountain runoff also remains relatively unknown in many regions. Monsoons are important to other regions and require better understanding. Prediction in ungauged mountain basins will require improved understanding of such runoff generation processes and their dynamics at appropriate scales. The objective of this symposium is to promote the advancement in understanding of the dynamics of a broad range of physical and chemical hydrological processes, measurements and models in mountainous regions. It will address a broad range of topics that are important to understanding hydrology in mountains. Of interest are oral and poster presentations on all aspects of hydrology in mountains, with an emphasis on the following specific topics: * Novel measurement and monitoring techniques and instruments; * Investigations into physical properties

of snowmelt, rainfall delivery, infiltration and runoff generation: linking microscale properties to macroscale processes; * Modelling in vegetated and complex terrain; * Remote sensing of mountain states and fluxes; * Prediction of runoff with minimal calibration in mountain headwaters catchments.

Conveners: Daniel Marks, USDA Agricultural Research Service, Northwest Watershed Research Center, 800 Park Blvd, Suite 105 Boise, Idaho 83712-7716 USA, Tel : +1-208-422-0721, Fax: +1-208-334-1502, danny@nwrc.ars.usda.gov

Co-Conveners: Regine Hock, , Stockholm University, Sweden, regine@natgeo.su.se; Michael Lehning, Institut für Schnee und Lawinenforschung (SLF/ENA), Davos Dorf, Switzerland, lehning@slf.ch; Robert Gurney, University of Reading, UK, rjg@mail.nerc-essc.ac.uk; Masaki Hayashi, University of Calgary, Canada hayashi@ucalgary.ca

HS2004 Quantification and Reduction of Predictive Uncertainty for Sustainable Water Resources Management (Sponsors ICCLAS, IAHS/WMO Working Group on GEWEX , ICWRS, ICRS, IAMAS-ICCL and PUB)

Sponsoring Association: IAHS

The symposium aims at a multidisciplinary view of the uncertainties in the end-to-end prediction of hydrological variables, beginning with the atmospheric driving and ending with the hydrological calculations for scientifically sound decisions in sustainable water management. The symposium focuses on uncertainty quantification and reduction for (1) improving the hydrologic predictability of hydrometeorological forcing variables by better representation of land surface processes; and (2) minimizing risks in water management decisions by accounting for the coupled land-atmosphere system. Particular emphasis is put on studies dealing with areas of weak infrastructure such as the less developed countries in climate sensitive regions. The symposium will cover associated programs such as GEWEX, MOPEX, CLIVAR, THORPEX, TIGGE, THEPS and HEPEX which integrate across the above areas. The symposium will be composed of two sub-sessions. The first sub-session will consider the quantification and reduction of predictive uncertainty in hydrometeorological forcing and land surface processes. It will offer a forum where both meteorologists/climatologists and hydrologists can share their expertise in downscaling meteorological fields for applications in large basin surface/subsurface hydrology. It will examine the predictive capability of meteorological models when applied both to short-term and long-term hydrological simulation, including 1) impact studies of land surface parameterisations on the quality of weather predictions, 2) data assimilation for prediction, 3) ensemble predictions for climate and hydrology uncertainty assessment, 4) model parameterization, validation and intercomparison studies, and 5) the transferability of methodologies between different geographical regions. The second sub-session will consider the minimization of risks in water management decisions by improving the understanding of the coupled land-atmosphere system. Its purpose will be to incorporate data and understanding of the coupled land-atmosphere system to minimize risk in model based hydrological predictions for sustainable water management. Topics addressed will include 1) the understanding of the coupled land-atmosphere system to quantify and reduce uncertainties in hydrological predictions; 2) the use of spatial data (ie. remote sensing, GIS data) to quantify and evaluate impacts of land use and land surface patterns on hydrological predictions; and 3) the application of land-atmosphere representation in hydrological models to assess and mitigate responses to extreme events, i.e. droughts and floods. Scientists, water managers and policy makers are encouraged to contribute to the sub-session.

Conveners: Eva Boegh, Roskilde University, Department of Geography, Hus 02, P.O. Box 260, 4000 Roskilde, Denmark, Tel: +45 4674 3942 ; Fax: +45 4674 3031, eboegh@ruc.dk

Co-Conveners: Harald Kunstmann, IMK-IFU, Garmisch-Partenkirchen, Germany, Harald.kunstmann@imk.fzk.de, Alan Hall, Australia, hallalan@acr.net.au; Hoshin Gupta, University of Arizona, Tucson, USA, hoshin@hwr.arizona.edu; Thorsten Wagener, Pennsylvania State University, USA, thorsten@engr.psu.edu; Stewart Franks, University of Newcastle, Australia, ceswf@civeng.newcastle.edu.au; Charles Vörösmarty, University of New Hampshire, USA, charles.vorosmarty@unh.edu Dan Rosbjerg, Technical University of Denmark, Lyngby, Denmark, dr@er.dtu.dk; John Schaake, NOAA, USA, john.schaake@noaa.gov; Lawrence Martz, University of Saskatchewan, Canada, lawrence.martz@usask.ca; Luis Bastidas, Utah State Universty, Logan, USA, luis.bastidas@usu.edu



HS2005 Water Quality and Sediment Behaviour of the Future: Predictions for the 21st Century (Sponsors ICWQ, ICCE, ICGW, PUB and ICT)

Sponsoring Association: IAHS

From the local to the global scale, surface- and ground-water quality is becoming as important and as critical as water quantity. Over the 21st century, changes in climate, land use and population, among other factors, will affect many different aspects of freshwater quality, often to the detriment of aquatic ecosystems and human use of water. The objective of this symposium is to bring together experts to provide a state of the art review of our current understanding of the potential water quality changes resulting from climate and land use change during the 21st Century. It will interpret water quality broadly to include not only chemistry but also sediment and sediment-associated substances, as well as other quality aspects such as temperature for both surface waters and groundwater. Water quality has been identified in the PUB Science Plan as an integral part, and this Symposium would contribute to PUB activities. The focus of the proposed Symposium would be on the following major themes: - How will the water quality of the surface and subsurface, and the interactions between these environments, and the behaviour of sediment change in response to changes in climate, land-use, population and other driving factors during the 21st Century? - How will point and diffuse sources of pollution change over the next 100 years and how will they impact on water quality? - What will be the impacts and implications of changes in water quality and river sediments during the 21st Century for human use of water and for freshwater ecosystems? - How well is the science of water quality and sediment behaviour for these environments equipped to understand and model future changes in water quality and the challenges they will pose? - How can we improve and develop our ability to predict surface- and ground-water quality, including our ability to cope with the uncertainties inherent in these predictions? - How much will ungauged basins be used and how do methods of analysis need to be adapted to these circumstances?

Conveners: Bruce Webb, School of Geography, Archaeology and Earth Resources, Department of Geography, University of Exeter, Amory Building, Rennes Drive, Exeter EX4 4RJ, UK, Tel : +44 (0)1392 263334, Fax: +44 (0)1392 263342, B.W.Webb@exeter.ac.uk

Co-Conveners: Dirk de Boer, University of Saskatchewan, Canada, deboer@duke.usask.ca

HS3006 Changes in Water Resources Systems - Methodologies to Maintain Water Security and Ensure Integrated Management (Sponsor ICWRS)

Sponsoring Association: IAHS

The issues of water shortage and related eco-environmental degradation are of great importance and urgency, particularly in developing countries. Accordingly, this symposium will address changes affecting water resource systems and their different functions: changes related to climatic conditions as well as those resulting from human activities. Many examples can be given of where these have had a devastating impact and threaten the long-term sustainability of local socio-economic systems. A key challenge therefore is to forecast over a wide range of time scales the changing quantity and quality of the freshwater resource. Key themes will include the water cycle processes impacted by climate change and high intensity human activity; changes in water use as a result of new economic factors; the evaluation of eco-water demands; and integrated management and rational water allocation. The symposium will have a particular focus on developing countries and will seek to evaluate different methodologies designed to maintain the multiple functions of water resource systems under change. An important aspect is how the different system components can adapt to new conditions. Since water resource systems are complex, a successful approach to dealing with change must be multi-disciplinary. Hence, in considering methodologies, account must be taken of social, economic and environmental factors, as well as the technical dimensions of the measures contemplated. In view of the large uncertainty in both future water resources availability and our potential to deal with the problems, focus will be on the flexibility and robustness of approaches and solutions.

Conveners: Nick van de Giesen, Water Management, Civil Engineering & Geosciences, TU Delft, Stevinweg 1, 2628 CN Delft, PO Box 5048, 2600 GA Delft, Netherlands, Tel : +31 (0)15 2787180, N.C.vandeGiesen@CitG.TUdelft.NL

Co-Conveners: Xia Jun, Chinese Academy of Sciences, Beijing, China, xiaj@igsrr.ac.cn; Dan Rosbjerg, Technical University of Denmark, Lyngby, Denmark, dr@er.dtu.dk; Yoshihiro Fukushima, RIHN, Kyoto, Japan, yoshi@chikyu.ac.jp



CONFERENCE PROGRAM details
ASSOCIATION IAHS

HS3007 Remote Sensing for Environmental Monitoring and Change Detection

(Sponsor ICRS)

Sponsoring Association: IAHS

Remote sensing technology continues to play a significant role in the understanding of our changing environment. It has evolved into an integral research tool for the natural sciences. Disciplines such as climatology, hydrology, and studies of the terrestrial biosphere have all developed a strong remote sensing component. Moreover, remote sensing has facilitated our understanding of the environment and its many processes over a broad range of spatial and temporal scales. This is a highly important aspect of hydrological research, especially in the detection of environmental change, water resources management, irrigation water management and environmental monitoring and prediction in remote locations. This symposium seeks papers describing recent research results in the application of remote sensing as relating to the hydrological sciences. Papers are especially sought on applications that emphasize monitoring and change detection in environmentally sensitive regions, remote locations or otherwise data-poor locations. Contributions using visible, near and thermal infrared, microwave as well as other wavebands, are solicited. The symposium is especially interested in papers which emphasize the use of satellite data, the synergistic application of multiple wavebands and sensors, and other new and innovative remote sensing applications.

Conveners: Manfred Owe, Code 614.3, NASA Goddard Space Flight Center, Greenbelt, MD 0771, USA, Tel : +1 301-614-5783, Manfred.Owe@nasa.gov

Co-Conveners: Christopher Neale, Utah State University, Logan, USA, cneale@cc.usu.edu; Guy Serbin, University of Rhode Island, Kingston, guy@serbin.org; Guido D'Urso, University of Naples "Federico II", Portici, Italy, durso@unina.it

HW1001 Isotope Tracing of Water Balance, Hydrodynamics and Hydrological Processes (Sponsor ICT)

Sponsoring Association: IAHS

Isotopic and geochemical tracers are increasingly being applied at the watershed to basin scale to study water cycling processes including evaluation of runoff generation mechanisms, flowpaths, water residence times, water yields and partitioning of water sources and sinks. This workshop explores the application of tracers as an integrated approach for improving the understanding of hydrology in ungauged or under-monitored areas, and as a fundamental contribution to the challenge of "Prediction in Ungauged Basins (PUB)". Discussion will include application of isotope tracers for the evaluation of hydrological and hydro-climatic models and the organization of regional, national and global networks that serve to build scientific capacity for tracer-based research.

Conveners: John Gibson, National Water Research Institute W-CIRC, University of Victoria PO Box 1700 STN CSC, Victoria, BC V8W 2Y2, Canada Tel: +1 250 472 5137, Fax: +1 250 472 5167, john.gibson@ec.gc.ca

Co-Conveners: Piotr Maloszewski, GSF-Institute of Hydrology, Munich, Germany maloszewski@gsf.de

HW1002 Patterns, thresholds and non-linearities: Towards a new theory of catchment hydrology (Sponsor PUB)

Sponsoring Association: IAHS

Catchment hydrology is presently operating under an essentially reductionist paradigm, dominated by small-scale process theories. Yet, hydrology is full of examples of highly complex behavior, including strong nonlinearities and thresholds, and paradoxes that defy causal explanation through these small-scale process theories. There are strong interactions and feedbacks between processes, leading to apparent simplicities in the overall catchment response, yet the laws governing these feedbacks are not well understood. Routine measurements and specialized field experiments have been valuable for observing catchment responses and understanding the underlying process controls, but there has been little progress in extrapolating the local knowledge and understanding gained from these well studied (or gauged) catchments to ungauged catchments. Efforts at generalization are hampered by the lack of an appropriate quantitative framework, for example, a classification



system, to help identify interesting and useful patterns in the observations. There are many theories governing different elements of catchment hydrology, but not a unified theory that connects these seemingly disparate elements. This session solicits contributions that address how multi-scale heterogeneities, nonlinear dynamics and feedback mechanisms affect the predictability of hydrological dynamics at multiple scales in different biomes and explore new ideas of multi-scaling, nonlinear systems, self-organisation, pattern dynamics, etc. for developing a radically new theory of catchment hydrology.

Conveners: Peter A. Troch, Department of Hydrology and Water Resources, The University of Arizona 1133 E. North Campus Drive, Harsbarger Bldg. P.O. Box 210011, Tucson, AZ 85721, USA, Tel : +1 520 626 1277, Fax: +1 520 621 1422, patroch@hwr.arizona.edu

Co-Conveners: James Kirchner, UC Berkeley, USA, kirchner@geomorph.berkeley.edu Louise Heathwaite, Lancaster University, UK, louise.heathwaite@lancaster.ac.uk

HW2003 Analysis of Variability in Hydrological Data Series

Sponsoring Association: IAHS

Statistical and other mathematical methods have been widely used in hydrology. In the last twenty years many different approaches have been developed for extreme values analysis, rainfall simulation in time and space, and runoff forecasting and management. In addition to classical linear parametrical models and univariate inference statistical procedures, a variety of procedures have been developed. This session collects presentations describing theory, procedures and applications related to following approaches: - Linear and non-linear time series modeling; - Neural network methods; - Space-time simulation procedures; - Multivariate distribution analysis; - Analysis of extremes; - Stochastic processes; - Analysis of long time series; - Long range dependence; - Trend and multiple scale fluctuation analyses; - Hypothesis testing. Presentations on theoretical innovative approaches and advanced statistical and mathematical methods, and poster contributions with applications of such procedures are encouraged. One of the expected results of the session is an assessment and comparison of different methods applied to all hydrological data types (rainfall, runoff, temperature, wind, waves, soil moisture, etc.), in univariate and multivariate settings, as well as in a multiple time scale setting (e.g. disaggregation/downscaling). Particular emphasis will be given to contributions on the analysis of reconstructed records of the past using isotopes, pollen analysis, tree rings, manuscripts, journals and newspapers and other proxy methods that can provide knowledge of previous hydrological conditions with the aim of assessing whether these methods can help to better understand hydroclimatic changes and predict future conditions.

Conveners: Salvatore Grimaldi, GEMINI Department, University of Tuscia, Via San Camillo De Lellis, 01100 Viterbo, Italy, Tel: +39 0761 357326, Fax: +39 0761 357356, salvatore.grimaldi@unitus.it

Co-Conveners: John Rodda, Center for Ecology and Hydrology, Wallingford, UK, jandarodda@waitrose.com, Demetris Koutsoyiannis, Technical University of Athens, Greece, dk@itia.ntua.gr; Domenico Piccolo, University of Napoli, Italy, dopiccol@unina.it; Lucio Ubertini, University of Roma "La Sapienza", Italy, lucio.ubertini@uniroma1.it

HW2004 Towards Improved Evaluation of Hydrological Models: The Need to Understand and Characterize Uncertainties in the Modelling Process (Sponsor ICCLAS)

Sponsoring Association: IAHS

To increase our knowledge about hydrological systems and to develop better models we have to be able to effectively evaluate models and predictions against observations of watershed responses. In doing so we have to be pragmatic about the limitations of our knowledge, our data collection techniques and our ability to characterize all sources of uncertainty in the modelling process, including the assumptions within our uncertainty analysis methodologies. Contributions are invited that explore novel ways in which we directly incorporate data (e.g., site parameterization) uncertainties (both temporal and spatial) in the evaluation and analysis of hydrological models. Papers are invited that characterise uncertainties in data at all spatial scales, from the 'effective model grid' scale for localised processes, to small headwater catchments and flood inundation experiments, through to the regionalisation of catchment characteristics at large scales. In addition, contributions are also invited on research that identifies new uncertainty analysis procedures for model evaluation and the quantification of prediction uncertainties. Issues to be explored include, but are not limited to: (a)



the propagation of uncertainties in input data through hydrologic models to output prediction uncertainties; (b) techniques for assessing the data uncertainties in comparison with model simulated output; (c) novel ways to define data uncertainties so as to characterise directly the error properties, where such error structures may have non-stationary properties; (d) uncertainty analysis methods that try to understand more explicitly model structure errors and the identification of competing process descriptions; (e) techniques for incorporating extreme events, which typically have large measurement uncertainties; and (g) novel field experiments designed to understand better the dominant processes as well as the uncertainties in observations at a range of scales that are useful for modelling applications. Both oral and poster contributions addressing one or more of the above mentioned issues are solicited.

Conveners: Jim Freer, Environmental Science Department, Lancaster University, Lancaster, Lancs, LA1 4YQ, UK, Tel +44 (0)1524 593563, Fax: +44 (0)1524 593985, j.freer@lancaster.ac.uk

Co-Conveners: Thorsten Wagener, Pennsylvania State University, USA, thorsten@engr.psu.edu, Erwin Zehe, University of Potsdam, Germany, ezehe@rz.uni-potsdam.de

HW2005 From Measurements and Calibration to Understanding and Predictions (Sponsor PUB with the support of ICWRS and ICGW)

Sponsoring Association: IAHS

Because of equi-finality, calibrated hydrological models often suffer from poor predictability. One important reason for this problem is that models are often merely calibrated on the output signal at the downstream end of a catchment. The availability of additional "orthogonal" information on internal state variables could constrain the solution space considerably, leading to reduced predictive uncertainty of the model. Hence there is a clear need for more information. Partly this information can be provided by a denser network of discharge and groundwater observations within a catchment, but in poorly gauged catchments such information is not available. New observation techniques can provide crucial additional information on ungauged catchments to further constrain the modelling space. Such techniques may include: gravity observations from space to derive time series for water storage in a catchment; estimates of rainfall patterns from space at different temporal and spatial resolutions; radar altimetry to derive water levels in rivers and lakes; techniques to derive estimates of actual evaporation from remote sensing and ground observations; techniques to derive soil moisture estimates from remote sensing; isotope diagnostics; the combination of atmospheric and hydrological modelling. Effective predictions of water flow and quality in surface- and groundwater systems also require that system dynamics and reactions be well understood and modeled, and that uncertainty be properly assessed. A fundamental problem in the analysis of complex hydrologic systems is the interplay of data and modeling when testing fundamental theories, calibrating and testing models, and assessing prediction uncertainty. Improving how data and models are used has proven to be exceedingly difficult. One of the most difficult problems is that hydrologic model calibration methods frequently lack any rigorous method of relating models to the calibration data and the predictions of interest, and numerical problems and limitations of forward models make the problems more difficult. This session invites contributions on new measurement approaches and on calibration techniques to reduce predictive uncertainty of hydrological models, with a focus on poorly gauged catchments (PUB). Applications for and in developing countries are particularly welcome.

Conveners: Hubert Savenije, UNESCO-IHE P.O. Box 3015, 2601 DA, Delft, The Netherlands, Tel: +31-15-2151829; Fax: +31-15-2122921 H.H.G.Savenije@citg.tudelft.nl

Co-Conveners: Witold Krajewski, The University of Iowa, USA, witold-krajewski@uiowa.edu
John Gibson, University of Victoria, Canada, john.gibson@ec.gc.ca
Mary C. Hill, USGS, Boulder, USA, mchill@usgs.gov

HW2006 New Avenues for Contemporary Water Resources Management (Sponsor ICWRS)

Sponsoring Association: IAHS

Floods, droughts, water scarcity and water contamination are already prominent problems in many parts of the world, but will become even more so in the future. In the past, many different tools have been used for simulation and optimization of complex water resources systems in order to provide an improved basis for decision making. The continuing evolution of information technology (hardware



and software) creates a good environment for the transition to new tools. Application of the systems approach to water resources planning, management and operations has been established as one of the most important advances made in the field of water resources engineering. Based on the lessons learned, this workshop provides an overview of the tools to be used in the future. Two paradigm shifts are shaping the future: the first focuses on the complexity of the water resources domain and the complexity of the modelling tools in an environment characterized by continuous rapid technological development; the second deals with water-related data availability and natural variability of domain variables in time and space affecting the uncertainty of water resources decision making. Water management tools incorporating understanding of the coupled land-atmosphere system are needed to accurately represent and understand the impact of climate dynamics and land surface patterns on the development of water resources. The construction of such tools is particularly important to enable an appropriate representation of the current and future environmental setting, which is characterized by climate change and intensified human activities. Hence this session will also look into tools to incorporate data and understanding of the coupled land-atmosphere system to improve hydrological predictions used for water management. Topics to be addressed include: 1) the use of coupled land-atmosphere understanding to quantify and reduce uncertainties in hydrological predictions; 2) the use of spatial data to quantify and evaluate impacts of land use and land surface patterns on hydrological predictions; and 3) the application of land-atmosphere representation in hydrological models to assess and mitigate responses to extreme events, i.e. droughts and floods. The workshop will address the role of new tools for the effective management of water resources. Contributions are invited on a wide spectrum of techniques from object oriented dynamic simulation to spatial optimization under uncertainty, including application case studies. In addition, there will be a focus on the utility of (a) system dynamics simulation tools; (b) evolutionary optimization tools; (c) integration of fuzzy analyses with simulation and optimization tools; and (d) spatial extension of simulation and optimization tools.

Conveners: Toshiharu Kojir, Water Resources Research Center, DPRI, Kyoto University, Gokasho, Uji, Kyoto, Japan, 611-0011 Tel: +81-774-38-4269, Fax: +81-774-32-3093 tkojiri@wrcc.dpri.kyoto-u.ac.jp

Co-Conveners: Slobodan Simonovic, University of Western Ontario, London, Canada, simonovic@uwo.ca; Eva Boegh, Roskilde University, Denmark, eboegh@ruc.dk

HW3007 The Impact of Environmental Change on Sediment Sources and Sediment Delivery (Sponsor ICCE)

Sponsoring Association: IAHS

There is increasing concern for the potential impact of environmental change, including both climate change and land use change, on sediment fluxes in catchments and river basins. Increased sediment loads and concentrations can result in significant environmental problems associated with sedimentation in river channels, reservoirs, canals and related hydraulic structures, increased water treatment costs and degradation of water quality and aquatic habitats. Such impacts relate to both the physical presence of the sediment and its biogeochemical impact. Any attempt to develop an improved understanding of the potential impact of climate and land use change on sediment fluxes must consider their interaction with both sediment sources and sediment delivery mechanisms. Sediment source exerts a key influence on the sensitivity of mobilisation and delivery processes to environmental change and on the biogeochemical properties of sediment (e.g. nutrient and contaminant content). Similarly, small changes in catchment hydrology could generate important changes in sediment delivery dynamics, which increase slope-channel connectivity and greatly increase the proportion of the sediment mobilised from the catchment surface that reaches the channel network. The workshop will review the existing understanding of sediment sources and sediment delivery in catchments and river basins and their likely sensitivity to the impacts of environmental change.

Conveners: Des Walling, University of Exeter, School of Geography and Archaeology, Amory Building, Rennes Drive, Exeter EX4 4RJ, UK, el: +44 1392 263345, Fax: +44 1392 263342 d.e.walling@exeter.ac.uk

Co-Conveners: Jim Bogen, Norwegian Water Resources and Energy Directorate, Oslo, Norway, jbo@nve.no; Paolo Porto, Università Mediterranea di Reggio Calabria, Italy, paolo.porto@unirc.it



HW3008 Changes to Hydrological Extremes and Water Quality (Sponsors ICWQ and ICSW)

Sponsoring Association: IAHS

In many countries around the world a rapid alternation of floods and droughts is observed. A common question which has been posed is whether the change in frequency of hydrological extremes is a result of global warming or lies within the natural variability of climate. For water resources management water quantity aspects were important. But a key concern is the environmental impact of floods and droughts as a result of rapid change due to different flow conditions. The main purpose of the workshop is to bring together scientists from various fields of research (hydrologists, chemists, etc.) who have experience of interdisciplinary programs on hydrology and water quality. Scientists who are not currently participating in large programs but who have an experience in that scientific domain are also welcome. The workshop topics will cover several aspects: (1) point sources which will influence water quality (industry, waste water treatment plants, landfills); (2) diffuse sources (agricultural areas, groundwater and sediments); (3) fate and behaviour of pollutants under extreme hydrological conditions and their impact on water quality; (4) mobilisation models for different flow conditions (risk management); (5) indicator substances (which flow conditions trigger which substances); (6) techniques for estimating hydrological regimes at gauged and ungauged locations; (7) methods for detecting change in the frequency of hydrological extremes; and (8) evidence for global warming causing a change in the frequency of extremes. The workshop will provide an opportunity to establish a closer link between the water quantity and quality communities, especially with respect to hydrological extremes.

Conveners: Peter Heininger, Division G "Qualitative Hydrology", Federal Institute of Hydrology (BfG); Am Mainzer Tor 1, D-56068 Koblenz, Germany Tel: +49261-13065307, Fax: +49261-13065363 heininger@bafg.de

Co-Conveners: Siegfried Demuth, BfG, Koblenz, Germany, demuth@bafg.de; Hege Hisdal, NVE, Oslo, Norway, hhi@nve.no; Alan Gustard, CEH, Wallingford, UK, agu@ceh.ac.uk; Mikhail Bolgov, Water Problems Institute, Moscow, Russia, caspian-sea@mtu-net.ru; Thomas Ternes, BfG, Koblenz, Germany, ternes@bafg.de

HW3009 Loss of Knowledge (with support of WMO and UNITAR)

Sponsoring Association: IAHS

Over many decades concern has been expressed throughout Africa at the deterioration of hydrological records, the inadequate support for hydrological research and the loss of trained hydrologists to other careers, particularly in private business. This same phenomena is now becoming apparent in many of the former Soviet republics and, if one looks with care, there is a similar tendency, though less dramatic, throughout the world. If we are to reverse this trend and save the practice of hydrological science in many regions, we need to learn from those close to the problem how and why it has arisen and seek together for possible solutions. New technologies certainly hold promise, but they need the very expertise that is lacking if they are to be applied effectively. Papers are invited from those with experience of these problems to join an open debate on the current situation and means of resolving the difficulties faced.

Conveners: Arthur Askew, 4A Avenue de la Foretaille, 1292 Chambésy, Geneva, Switzerland, Tel: +41 22 758 14 45, arthuraskew@greenmail.ch

HW3010 Hydrological Science and Water Legislation (with support of UNESCO, WMO, UNITAR and University of Dundee)

Sponsoring Association: IAHS

In many countries, past legislation was based on an out-dated and often quite erroneous understanding of hydrological processes. As a result, the laws were unjust or even unenforceable. Recent years have seen the adoption of new laws which are based on good science, but many countries still lack such laws and the hydrological sciences, and hence hydrologists, have a responsibility to advise those drafting and enforcing water legislation of facts concerning hydrological processes. This alone is not enough, however, and hydrologists also need to sit down with colleagues from the legal profession and learn about legal processes and contribute to the difficult process of drafting laws and



regulations that make both legal and hydrological sense. This workshop will bring together experts in this specialized field to present their experiences and join discussions with the broader geophysical community on ways of improving the situation. Participation is open to all, but presentation of papers will be by invitation only.

Conveners: Arthur Askew, 4A Avenue de la Foretaille, 1292 Chambésy, Geneva, Switzerland, Tel: +41 22 758 14 45, arthuraskew@greenmail.ch



MS001 Overview of the Findings of the IPCC's Fourth Assessment Report

Sponsoring Association: IAMAS

The Fourth Assessment Report (AR4) of the Intergovernmental Panel on Climate Change (IPCC) will be published in early 2007. This special half-day symposium will include invited overviews describing the findings of the three IPCC working groups. Among the topics that will be covered are trends and projections of atmospheric composition and forcing, trends and projected changes in climate and sea level, observed and expected impacts on the environment and society, capabilities for adapting and building resilience to changes, and the status of options for limiting emissions through changes in the sources of energy and through carbon sequestration. Contributed papers on the findings of particular IPCC chapters should be submitted to the symposium closest to their scientific subject

Conveners: Michael C. MacCracken, President of IAMAS, 6308 Berkshire Drive, Bethesda MD 20814 USA, Tel.: +1-301-564-4255, Fax: +1-301-564-4255, mmaccrac@comcast.net; Paola Malanotte-Rizzoli, Department of Earth, Atmospheric and Planetary Sciences, Massachusetts Institute of Technology, 77 Massachusetts Avenue, 54-1416 Cambridge, MA 02139-4307, USA, Tel: +1-617-253-2451, Fax: +1-617-253-4464, rizzoli@mit.edu

MS002 Global Observing Systems, Past, Present and Future (ICCL)

Sponsoring Association: IAMAS

This symposium is for submitted contributions addressing the topic of the Union Symposium "U03 on Global Observing Systems, Past, Present and Future". It will concentrate on the societal benefits of Earth observations in the context of the many global programs contributing to the Global Earth Observing System of Systems (GEOSS), including the Global Climate, Terrestrial and Ocean Observing systems (GCOS, GTOS, GOOS) and the Integrated Global Observing Strategy (IGOS) Partnership. Presentations on any aspects of Earth System Observations, but particularly those clearly resulting in societal benefits, are welcome

Conveners: Keith Alverson, Global Ocean Observing System, Section, IOC/UNESCO, 1 rue Miollis, 75732 Paris Cedex 15, France, Tel: +33 (0) 1 45 68 40 42, Fax: +33 (0) 1 45 68 58 13, k.alverson@unesco.org

Co-Conveners: John Latham, Global Terrestrial Observing System, SDRN, Food and Agriculture Organization of the UN, john.latham@fao.org; David Goodrich, Global Climate Observing System, gcosjpo@wmo.int

MS003 Aerosols, Radiation and Clouds (IRC, ICCP, ICACGP)

Sponsoring Association: IAMAS

The general uncertainties related to aerosols, radiation and clouds remain among the largest problems in understanding global climate and estimating global change. This symposium invites papers reporting on recent advances in scientific understanding achieved through improved measurements (e.g satellite remote sensing), field studies, parameterizations and numerical modeling, and climate simulations. Key topics are expected to include: 1) aerosol physics and chemistry, 2) radiation effects and interactions, and 3) clouds and cloud physics."

Conveners: Teruyuki (Terry) Nakajima, Center for Climate System Research, University of Tokyo, 5-1-5 Kashiwanoha, Kashiwa, Chiba 277-8568, Japan, Tel: +81-4-7136-4370, Fax: +81-4-7136-4375; teruyuki@ccsr.u-tokyo.ac.jp; George A. Isaac, Cloud Physics and Severe Weather Section, Environment Canada, 4905 Dufferin Street, Toronto, Ontario, M3H5T4, Canada, Tel: 1 416 739-4605, Fax: 1 416 739-4211, george.isaac@ec.gc.ca; Guangyu Shi, Institute of Atmospheric Physics (IAP), Chinese Academy of Sciences, Beijing 100029, China, Tel: +86-10-6204-0674, Fax: +86-10-6204-3526, shigy@mail.iap.ac.cn; Frank Raes, Institute for Environment and Sustainability, Joint Research

MS004 Mineral Dust Cycle and its Impact on Clouds and Radiation (ICCP)

Sponsoring Association: IAMAS

This symposium solicits updates and new results in areas of mineral dust research, air quality, cloud and climate implications: 1) Dust sources and processes leading to dust suspension and removal; 2) In-situ measurements of dust physical and chemical properties (size, shape, concentration, vertical distribution, chemical composition, mineralogy); 3) Optical properties of dust particles and their effects on radiation; 4) Remote sensing of dust particles (passive and active remote sensing); 5) Mineral dust effects on aerosols, clouds, and precipitation; 6) Modeling of the dust cycle at meso and global scales; 7) Impacts of dust on air quality, human health, ecosystems and climate; 9) Dust trends from seasonal to paleoclimatic scales.

Conveners: George Kallos, University of Athens, School of Physics, Atmospheric Modeling and Weather Forecasting Group, University Campus, Bldg PHYS-V, 15784 Athens, Greece, Tel. +30-210-7276923, 7276835, +30-6944-544325, Fax. +30-210-8994739, 7276765, kallos@mg.uoa.gr, gkallos@tellas.gr

Co-Conveners: Andrea Flossman, Université Blaise Pascal Laboratoire de Météorologie Physique, flossman@opgc.univ-bpclermont.fr; Charlie Zender, Department of Earth System Science, zender@uci.edu; Alcide Giorgio di Sarra, ENEA, CLIM-OSS, S. Maria di Galeria, Italy, disarra@casaccia.enea.it

MS005 Biological Ice Nucleators in the Atmosphere – at the Crossroads of Physics and Biology (IAMAS/ICCP)

Sponsoring Association: IAMAS

Biogenic ice nuclei are among the most active of the known ice nucleators, yet their contribution to atmospheric processes has not been clarified. However, techniques of detection improve, understanding of biological sources is growing, and observations and modelling of clouds identify the role of early ice nucleation in the formation of precipitation and in determining other cloud characteristics. Experts from the atmospheric and biological sciences will review knowledge and assess evidence about the nature, distribution and role of biogenic ice nuclei in the atmosphere, and discuss the future research directions

Conveners: Gabor Vali, Dept. Atmospheric Science, University of Wyoming, 1000 E. Ivins, Laramie, WY 82070, USA, Tel: +307-766-3225, Fax: +307-766-2635, vali@uwyo.edu

Co-Conveners: Cindy E. Morris, INRA, Plant Pathology Research Unit, morris@avignon.inra.fr

MS006 Ice Microphysics: Theory and Measurement (ICCP)

Sponsoring Association: IAMAS

Results of experimental and theoretical studies of ice initiation and its following transformation in clouds are expected on topics including: observation of first ice formation and secondary ice production, concentration of small ice particles, metamorphosis of ice particle shapes in clouds, mechanisms of growth of ice particles by deposition, aggregation and riming, laboratory and theoretical studies of ice growth, effect of dynamics and radiation on ice formation, ice nuclei measurements, of homogeneous and heterogeneous ice nucleation, parameterization of ice concentration in numerical models, explanation of ice particle size distribution, instrumentation for in-situ measurements, remote sensing of cloud ice particles, validation and accuracy of ice measurements

Conveners: Alexei Korolev, Environment Canada, Toronto, ON, M3H 5T4, Canada, tel (+1)-416-739-5716, (+1)-416-739-4211; Alexei.Korolev@ec.gc.ca

Co-Conveners: Paul Field, National Center for Atmospheric Research, prfield@ucar.edu

MS007 Theoretical advances in atmospheric dynamics (ICDM)

Sponsoring Association: IAMAS

This session will focus on the application of geophysical fluid dynamics theory to the understanding



of the atmospheric circulation, with an emphasis on synoptic to large scale atmospheric circulations, both in the troposphere and stratosphere. Contributions are encouraged on a range of topics including wave and cyclone growth and evolution, eddy-mean flow interactions and possible dynamical regimes arising from it, the dynamics of storm tracks and jet streams, the dynamics of the stratospheric polar vortex, and its interaction with the troposphere

Conveners: Eyal Heifetz, Department of Geophysics and Planetary Science, Tel Aviv University, Israel. Tel: 972-3-6407048, Fax: 972-3-6409282, eyalh@cyclone.tau.ac.il

Co-Conveners: Nili Harnik, Department of Geophysics and Planetary Science, harnik@post.tau.ac.il; John Nielsen-Gammon, Dept. of Atmospheric Sciences, Texas A&M University, n-g@tamu.edu



MS008 Ensembles and Probabilistic Forecasting (ICDM)

Sponsoring Association: IAMAS

This symposium invites contributions on all aspects of ensemble and probabilistic forecasting at all lead times and will include the following 5 topics: A) Probabilistic data-assimilation; B) Probabilistic short-range forecasting systems; C) Probabilistic medium-range forecasting systems; D) Probabilistic monthly, seasonal and climate prediction systems; E) Applications of probabilistic forecasts

Conveners: Craig Bishop, 7 Grace Hopper Ave, Monterey, CA 93943-5502, USA. Tel: (831) 656 5715, Fax: (831) 656-4769; Craig.Bishop@nrlmry.navy.mil

Co-Conveners: Myles Allen, Atmospheric, Oceanic and Planetary Physics, University of Oxford, Clarendon Laboratory, myles.allen@physics.ox.ac.uk

MS009 Dynamics and Predictability of Severe Weather Events (ICDM)

Sponsoring Association: IAMAS

This symposium invites papers on all aspects of severe weather events on synoptic scales and smaller, and their predictability. All studies that relate to the global program THORPEX will be appropriate for this session. This includes dynamical processes and their predictability, observing systems, data assimilation and observing strategies, and societal and economic implications. This session will cover factors affecting the predictability of weather events on one-day to sub-seasonal time scales."

Conveners: Istvan Szunyogh, Department of Atmospheric and Oceanic Science, University of Maryland, College Park Maryland, USA, Tel.: (1)-301-405-4841, Fax: (1)-301-314-9363, szunyogh@ipst.umd.edu

Co-Conveners: Richard Swinbank, Met Office, richard.swinbank@metoffice.gov.uk

MS010 Dynamics of Convectively-Coupled Equatorial Waves and the Madden-Julian Oscillation (ICDM)

Sponsoring Association: IAMAS

This symposium invites contributions based on diagnostic, theoretical and modeling studies of convectively-coupled tropical disturbances on synoptic and intraseasonal time scales. The aim of the Symposium is to bring together scientists to exchange their knowledge and experience so as to improve understanding and promote interdisciplinary studies of the dynamics and predictability of equatorial waves. Topics of relevance include: Dynamics of Equatorial Waves, Organized Tropical Convection, Observations of Intraseasonal Variability, Coupled Ocean-Atmosphere Dynamics, Numerical Simulations of Equatorial Waves, Scale Interactions, The Role of the MJO in ENSO Variability, and Tropical-Extratropical Interactions.

Conveners: George Kiladis, Physical Sciences Division, NOAA/OAR Earth System Research Laboratory, 325 Broadway, R/PSD5 Boulder, CO 80305 USA, Tel: (303) 497-3892, Fax: (303) 497-5373, george.kiladis@noaa.gov

Co-Conveners: Adam Scaife, Hadley Center, Met Office, adam.scaife@metoffice.gov.uk

MS011 The Dynamics of Eastern Tropical Oceans and Subtropical Highs (ICDM)

Sponsoring Association: IAMAS

There is considerable current interest in the dynamics of the eastern tropical oceans, particularly with regard to the processes that maintain sea surface temperature, and with dynamics of the sub-

tropical highs, which are often related. The topic is interpreted broadly, and studies that relate to marine stratocumulus clouds, aerosol-stratocumulus interactions, coastal upwelling and ocean eddies, systematic GCM errors in the region, and the interaction between the tropics and mid-latitude will be relevant to this symposium

Conveners: Roberto Mechoso, Department of Atmospheric Sciences, University of California, Los Angeles(UCLA), 405 Hilgard Avenue, Los Angeles, CA 90095-1565 USA, Tel: (310) 825-3057, Fax: (310) 206-5219, mechoso@atmos.ucla.edu

Co-Conveners: Richard Grotjahn, Dept. of L.A.W.R., Univ. of California, grotjahn@ucdavis.edu; Chris Fairall, NOAA Environmental Technology Laboratory, chris.fairall@noaa.gov



MS012 Impacts of Biosphere-Atmosphere Interaction on Atmospheric Composition from Synoptic to Annual and Decadal Timescales

Sponsoring Association: IAMAS

Changes in biosphere-atmosphere fluxes of climatically important trace gases can impact atmospheric composition and climate on micro-meteorological to global scales. Successful prediction of changing atmospheric composition and its impact on chemistry and climate will require an improved representation of the processes governing biosphere-atmosphere interaction in regional and global models, and an identification of the critical temporal and spatial process scales. This symposium will focus on processes responsible for biosphere-atmosphere exchange of climatically significant species (e.g., greenhouse gases and biogenic VOCs). We invite papers from experimentalists and modelers on atmospheric interaction with both land and ocean biospheres, focusing on a range of timescales up to multi-annual, and on regional to global spatial scales

Conveners: Dylan Jones, Department of Physics, University of Toronto, 60 St. George Street, Toronto, Ontario, Canada M5S 1A7, Tel: 416-978-4992, Fax: 416-978-8905, dbj@atmosp.physics.utoronto.ca

Co-Conveners: Parvatha Suntharalingam, Department of Earth and Planetary Science, Harvard University, pns@io.harvard.edu

MS013 Topographic Effects on Weather and Climate (ICDM)

Sponsoring Association: IAMAS

This Symposium invites contributions based on observational, (including diagnostic), theoretical and numerical studies of the effects of the Earth's topography on atmospheric circulation, weather, and climate. Topics of relevance include: boundary layer flow over hills, generation of waves and turbulence by flow over complex terrain, variability of dynamical fields over complex terrain, spatial and temporal distribution of mountain induced rainfall, mesoscale orographic impacts revealed by observations, vortex and cyclogenesis associated with orography and their weather impacts, mechanical and thermal forcing of large-scale orography and their regional and global climate effects

Conveners: Kenneth S. Gage, Tropical Dynamics and Climate Group, Physical Sciences Division, NOAA/OAR Earth System Research Laboratory, 325 Broadway, R/PSD5 Boulder, CO 80305 USA, Tel: 303-497-3964, Fax: 303-497-5373, Kenneth.S.Gage@noaa.gov

Co-Conveners: Ronald B. Smith, Dept. of Geology and Geophysics, Yale University, ronald.smith@yale.edu; Zhe-Min Tan, Department of Atmospheric Sciences Nanjing University, zmtan@netra.nju.edu.cn

MS014 Interactions of Land Cover and Climate (ICCL)

Sponsoring Association: IAMAS

Land cover both responds to the climate and affects the climate, and these interactions are a major focus of the IGBP core project Integrated Land Ecosystem Atmospheric Processes Study (iLEAPS). Changes in land cover are now recognized as a factor that has contributed to changes in climate on all scales from local to regional and even global. This symposium invites papers on the full range of topics relating to the interactions of changes in land cover and condition and in climate, including changes relating to deforestation, agriculture, and other development; feedbacks relating to albedo, roughness, carbon storage and fertilization, trace gas fluxes, and other biogeochemical cycles; and impacts relating to ecosystem shifts, melting of permafrost, and water resources and soil moisture

Conveners: Meinrat O. Andreae, Max Planck Institute for Chemistry, P.O. Box 3060, D-55020 Mainz, GERMANY, Tel: +49-6131-305-420, Fax: +49-6131-305-487, andreae@mpch-mainz.mpg.de

Co-Conveners: Pavel Kabat, ALTERRA Green World Research, Wageningen University and Research Center, Pavel.Kabat@wur.nl

MS015 Extreme Weather and Climate Events: Past Occurrences and Future Likelihoods (ICCL)

Sponsoring Association: IAMAS

The vulnerability of society to climate variability and change is likely to depend more on changes in the intensity and frequency of extreme weather and climate events than on changes in the mean climate. This is the case because extremes usually have strong impacts on society and a small change in the mean condition can cause a large change in the likelihood of an extreme. This symposium invites papers that document past occurrences and future projections of extreme weather and climate events, especially as a result of changes in the climate and other factors. Papers reporting on observed changes, comparisons with model-simulated changes, projections of future extremes, physical processes leading to extremes, and quantification of uncertainties are invited

Conveners: Amanda Lynch, School of Geography and Environmental Science, PO Box 11A (for courier, replace with "Building 11"), Monash University, Clayton, Vic 3800, Australia, Tel: +61 3 9905 8291, Fax: +61 3 9905 2948 Amanda.Lynch@arts.monash.edu.au

Co-Conveners: Lisa Alexander, Bureau of Meteorology Research Center, l.alexander@bom.gov.au
Xuebin Zhang, Meteorological Service of Canada, Xuebin.Zhang@ec.gc.ca

MS016 Downscaling to Local and Regional Scales (ICCL)

Sponsoring Association: IAMAS

This symposium invites papers on studies directed towards deriving fine-scale estimates of atmospheric and hydrologic conditions. Approaches based on both statistical and deterministic techniques, including especially fine-scale regional models, are invited. Topics to be covered will include techniques for downscaling and modeling, intercomparison projects, application of the approaches to particular regions and localities, and evaluation of the techniques and their transferability and uncertainties. Papers are also welcomed on the linking of regional atmospheric and climate models to models of other processes, including hydrologic and ecosystem models

Conveners: Filippo Giorgi, Physics of Weather and Climate Section, The Abdus Salam International Center for Theoretical Physics, P.O. BOX 586, (Strada Costiera 11 for courier mail), 34100 Trieste, Italy, Tel: + 39 040 2240 425, Fax: + 39 040 2240 449 (or + 39 040 224 163, giorgi@ictp.it

Co-Conveners: Bruce Hewitson, Climate System Analysis Group, Department of Environmental & Geographical Science, University of Cape Town, hewitson@egs.uct.ac.za

MS017 Climate Sensitivity and Climate Feedbacks: Progress and Remaining Questions (ICCL)

Sponsoring Association: IAMAS

Human economic activity is an important driving force for evolution of the climate system. Understanding and predicting changes in the climate system is a scientific goal for avoiding unwanted and abrupt changes. So far, in spite of uncertainties of its estimation, the climate sensitivity, defined as a change in the global near-surface temperature due to doubling carbon dioxide, still serves as an informative measure of climate change. It is widely used for climate model intercomparison and for evaluation of the climate system feedbacks. This symposium will be devoted to papers that further advance our knowledge of climate feedbacks, address uncertainties in climate sensitivity and use it to predict future climates.

Conveners: Natalia Andronova, Research Scientist, University of Michigan, UIUC Associate Adjunct Professor, 1541D Space Research Building, 2455 Hayward Street, Ann Arbor, MI 48109-2143, USA, Tel: +1-734-763-5833, Fax: +1-734-936-0503, natand@umich.edu



MS018 The Role of the Stratosphere in the Climate System (ICMA, IRC, ICCL)

Sponsoring Association: IAMAS

Stratospheric processes play a significant role in the Earth's climate. The absorption of solar radiation in the stratosphere by ozone modulates the solar forcing of climate. The concentrations of some stratospheric gases, principally ozone, carbon dioxide and water vapor, determine significant radiative forcing terms, and there is two-way interaction between stratospheric and tropospheric dynamics. This session will discuss observations, theories and models of the role of the stratosphere in the climate changes that have been observed over the past several decades and those anticipated in the next century.

Conveners: Marvin Geller, Marine Sciences Research Center, Stony Brook University, Stony Brook, New York, USA, tel: 1-631-632-8686, marvin.geller@sunysb.edu

Co-Conveners: Lorenzo Polvani, Department of Applied Physics and Applied Mathematics, Columbia University, Imp@columbia.edu

MS019 Middle Atmosphere Science (ICMA)

Sponsoring Association: IAMAS

Papers related to any aspect of the dynamics, chemistry, or physics of the atmosphere from near the tropopause to the lower thermosphere are appropriate for this session. Observational, modeling and theoretical papers are all solicited. Particularly welcome are contributions relating to a number of recent satellite missions that have the potential to greatly increase our knowledge of the middle atmosphere, including TIMED, ENVISAT, EOS-AURA and COSMIC.

Conveners: Kevin Hamilton, International Pacific Research Center, University of Hawaii, Honolulu, Hawaii 96826, USA, tel: 1-808-956-8327, Fax: 1-808-956-9425, kph@hawaii.edu

Co-Conveners: Elisa Manzini, Istituto Nazionale di Geofisica e Vulcanologia, manzini@bo.ingv.it; Didier Hauglustaine, Institut Pierre Simon Laplace (IPSL), Laboratoire des Sciences du Climat et de l'Environnement (LSCE), Unit Mixte de Recherche CEA-CNRS UMR 1572, didier.hauglustaine@cea.fr; Daniel Marsh, Atmospheric Chemistry Division, National Center for Atmospheric Research, marsh@ucar.edu

MS020 Solar Activity and its Influences on the Earth's Weather and Climate (IRC)

Sponsoring Association: IAMAS

There is increasingly strong evidence that there is a link between variations in solar activity and the terrestrial climate. Changes in the solar output are present in total solar irradiance but also in spectral irradiance (particularly in the UV), solar wind, and high energy particles, and these can influence the state of the terrestrial atmosphere by both direct and indirect means, potentially having an influence on weather and climate. This symposium invites papers on topics relating to the nature and consequences of changes in solar activity on tropospheric meteorological processes and climate variability with the goal of a better understanding of the linear and nonlinear processes through which these influences may occur.

Conveners: Werner Schmutz, Director PMOD / WRC, Dorfstrasse 33, Davos Dorf, CH-7260, Switzerland, Tel: +41 (081) 417 5145, Fax: +41 (081) 417 5100, werner.schmutz@pmodwrc.ch

Co-Conveners: Joanna D. Haigh, Space and Atmospheric Physics, Blackett Laboratory, Imperial College London, j.haigh@imperial.ac.uk

MW001 The Definitions of Atmospheric Ice Particles

Sponsoring Association: IAMAS

The meteorological observer is presently given an unsatisfactory coding procedure leading to data records which have been of no use in physical and climatological understanding of ice particles falling from the atmosphere. This calls for an attempt to formulate better definitions of atmospheric ice particles which may include relevant physical properties such as size range, shape, density, fall behavior, surface properties, growth history, etc. Contributors to this Workshop are encouraged to provide not only measurement-based definitions but also pictures and suggestions for the character-



ization of meteorological conditions which led to their growth. For further details authors are advised to consult the Perugia file on <http://www.iamas.org>

Conveners: George A. Isaac, Cloud Physics and Severe Weather Section, Environment Canada, 4905 Dufferin Street, Toronto, Ontario, M3H5T4, Canada, Tel: (416) 739-4605, Fax: (416) 739-4211, george.isaac@ec.gc.ca; Roland List, Department of Physics, University of Toronto, Toronto, M5S 1A7, Canada, Tel: 416 9282982, Fax: 416 978 8905, list@atmosp.physics.utoronto.ca; John Hallett, Atmospheric Physics, Desert Research Institute, 2215 RAGGIO Parkway, Reno, NV 89512, USA, Tel: +1-775-674-7013, hallett@dri.edu



PS001 Biogeochemical Budget and Cycles in the Mediterranean Sea

Sponsoring Association: IAPSO

The Mediterranean is a unique ecosystem with unusual biogeochemical characteristics. It is ultra-oligotrophic with very low nutrient concentrations in most of the domain, anomalously high N:P ratios leading to P limitation, and evidence of temporal trends in nutrient pools. Paleo-records show large fluctuations in the trophic regime of the basin, probably due to drastic changes in water column dynamics and in nutrient fluxes from the boundaries. At present, there is widespread anthropogenic pressure which acts as an additional and changing forcing of this almost land-locked marginal sea. All of the above makes the basin both a fragile ecosystem under stress and a suitable natural laboratory to understand the role and controls on globally important biogeochemical processes such as nitrogen fixation, impact of atmospheric inputs (both natural and anthropogenically modified), nutrient co-limitation, etc. The symposium will particularly welcome contributions focused on: better constraining on fluxes from the boundaries of the basin and their time variability; assessment of nitrogen fixation at basin and regional scale; understanding the nature and importance of atmospheric inputs to the system; analytical studies connecting structure and functioning of the plankton food web to biogeochemical fluxes and anomalies; analysis of paleo-records, e.g., sapropels, to shed light on future trends in the Mediterranean trophic regimes; model simulations of biogeochemical processes either hindcasting observed processes or forecasting changes on the decadal-centennial time scale due to climate and/or anthropogenic changes; and/or multidisciplinary analyses connecting socio-cultural trends, past and future, of the Mediterranean region and their impact on basin dynamics.

Conveners: Maurizio Ribera d'Alcala', Laboratory of Biological Oceanography, Stazione Zoologica "A.Dohrn", 80121 Napoli, ITALY, Tel. 39-081-5833245, FAX 39-081-7641355, maurizio@szn.it

Co-Conveners: Giuseppe Civitarese, Institute of Marine Science, ISMAR-CNR, ITALY; Michael D. Krom, Earth and Biosphere Institute, Leeds University, UK

PS002 Variability of the Antarctic Circulation and Water Masses and Their Sensitivity to Climate Change

Sponsoring Association: IAPSO

This symposium will address the Antarctic Circumpolar Current and its role in global scale thermohaline circulation, its variability and sensitivity to inter-ocean transport of heat and freshwater anomalies, and its impact on global climate. Presentations are invited on the following topics: (1) water transport processes of Antarctic intermediate water, subantarctic mode water, and deep and bottom water; (2) deep and bottom ventilation variability including shelf-slope dynamics, circumpolar deep water - shelf water interactions, and modified circumpolar deep water transformation processes; (3) Reconstruction of the circulation based on instrumental data, natural and documentary proxies, and model simulations focused on regional domains as well as the entire Southern Ocean.

Particularly welcome are presentations analyzing the atmosphere-cryosphere-hydrosphere couple systems and the interactions between atmosphere and ocean variability, as well as Southern Ocean characteristic processes including sea ice, polynyas area and glacial shelf ice interactions. Also welcome are presentations on variability, trends, and Antarctic-ENSO teleconnection at decadal scale related with the Southern Annular Mode.

Conveners: Andrea Bergamasco, CNR-ISMAR, S.Polo 1364, 30125 Venice, ITALY, Tel: 39-041-5216-836, FAX: 39-041-260-2340, andrea.bergamasco@ismar.cnr.it

Co-Conveners: Stephen R. Rintoul, CSIRO Marine Laboratories, AUSTRALIA, David H. Bromwich, Byrd Polar Research Center, Ohio State University, USA

PS003 Mediterranean Circulation and Climate: Their Variability and Sensitivity to Future Emission Scenarios

Sponsoring Association: IAPSO

This symposium concerns the Mediterranean climate, focusing on the ocean circulation component, its variability, trends, and sensitivity to future emission scenarios. Particularly welcome are presentations analyzing the coupled atmosphere-ocean system and the interactions between atmosphere and oceanic variability. Themes included in this symposium are: the reconstruction of the past Mediterranean circulation based on instrumental data, natural and documentary proxies; model simulations focused on the Mediterranean region; connections between the variability of the Mediterranean Sea circulation and both the Tropics (ENSO, Monsoons, etc.) and the Mid-Latitudes (NAO, East Atlantic Pattern); variability and trends of temperature, salinity, and sea level at regional scales; the role of air-sea interaction at regional scale and the structure and relative intensity of the circulation cells of the Mediterranean Sea. It will be important to compare present trends and the results of future climate simulations.

Conveners: Piero Lionello, Dipartimento di Scienza dei Materiali, University of Lecce, via per Arnesano, 73100 Lecce, ITALY piero.lionello@unile.it

Co-Conveners: Serge Planton, Météo-France, Center National de Recherches Météorologiques, FRANCE; Alexander Theocharis, Hellenic Center for Marine Research/Institute of Oceanography, GREECE

PS004 Ocean Mixing

Sponsoring Association: IAPSO

Themes covered by this symposium include: (1) abyssal mixing and potential sources for mixing adequate to resupply the abyssal ocean with potential energy that is lost to the meridional overturning circulation and to eddy formation processes; (2) issues related to parameterization of mixing in numerical models and, in particular, to inclusion of physics that will enable the model codes to include the effects of processes down to the smallest scales; and (3) new technologies and the means to collect information on ocean mixing over a far broader geographical area than has been possible to date. Results related to these themes and obtained using theoretical, model-derived and field methods are appropriate. Reports on work involving collaboration among modelers and mixing process specialists are especially welcome.

Conveners: Robin D. Muench, Earth & Space Research, 1910 Fairview Ave. E., Suite 210, Seattle, WA 98102, USA, Tel: 1-206-726-0522, ext 17, FAX: 1-206-726-0524, rmuench@esr.org

Co-Conveners: Hans Burchard, Baltic Sea Research Institute, Warnemuende, GERMANY; Anne Marie Treguier, LPO, CNRS, IFREMER, FRANCE

PS005 Flows and Waves in Straits

Sponsoring Association: IAPSO

Straits and passages connecting different basins play an important role in controlling the circulation by means of mass transport exchanges. Quantifying the transport through the straits and its variability are important for the circulation in the basins connected by straits. Modeling the motion in the straits and various approximations of the flow as well as topographic and boundary effects in the flows through straits will be among the main issues of this symposium.

Very often, strong internal waves are generated in the straits due to the interaction of tidal currents with bottom topography. This is a characteristic feature of the Strait of Gibraltar and many other straits. The density distribution in the deep ocean, overflows across deep sills in the straits, and strong internal waves may induce intense mixing in the straits. The study of flows and waves in straits is especially important in Europe since the continent is surrounded by many seas and islands with a large number of straits between them.

Conveners: Eugene Morozov, Shirshov Institute of Oceanography, Russian Academy of Sciences, Nakhimovsky prospekt 36, 117997 Moscow, RUSSIA, emorozov@mtu-net.ru

Co-Conveners: Gregorio Patrilla-Barrera, Instituto Español de Oceanografía, SPAIN



CONFERENCE PROGRAM details
ASSOCIATION IAPSO

PS006 Arctic Ocean Processes

Sponsoring Association: IAPSO

Remarkable changes in the Arctic Ocean have happened in recent years including changes in sea ice extent and thickness; water mass characteristics; ocean circulation; biogeochemical cycling, and the Arctic ecosystem as a whole. However, the impact and consequences of global and amplified polar warming remain poorly understood. Some evidence shows that there are positive and negative feedbacks to the atmosphere from the Arctic Ocean. Many studies have been focused on the Arctic changes in order to find the correlations among different phenomena. By data analysis, theoretical studies, and numerical modeling, many linkages among marine processes in the Arctic Ocean have been revealed. In this symposium, physical and biogeochemical processes related to the Arctic changes will be reported, and their driving factors and dynamic mechanisms will be discussed. The 2007/2008 International Polar Year (IPY) will provide ample opportunities to obtain more data for a better understanding of the Arctic changes. Therefore, this symposium will be a good occasion for polar oceanographers.

Conveners: Jinping Zhao, Ocean University of China, 5 Yushan Road, Qingdao, CHINA, jpzhao@ouc.edu.cn

Co-Conveners: Robie W. Macdonald, Institute of Ocean Sciences, CANADA; Laodong Guo, University of Southern Mississippi, Stennis Space Center, USA.

PS007 Biogeochemical Fluxes Between the Shelf and Open Seas

Sponsoring Association: IAPSO

Shelf sea and oceanic regimes meet and must mutually adjust over the steep topography of the shelf edge. The processes involved in this adjustment control the exchange of water and many important properties between the continental shelf and the deep ocean. Topographic steering of the geostrophic flow along the slope tends to restrict this exchange but this constraint may be circumvented by a number of processes including cross slope transfer in the boundary layers and tidal motions. This symposium will focus on studies, both observational and modelling, of shelf edge transfer processes and the biogeochemical fluxes which they induce. We anticipate particular emphasis on (1) the fluxes of organic carbon to the deep ocean and (2) nutrient transfer from deep water into the shelf system, the understanding of which are critical in efforts to determine the role of shelf seas in relation to the global carbon budget and climate change.

Conveners: John H. Simpson, University of Wales, Bangor, School of Ocean Sciences, Menai Bridge, Anglesey LL595RH, UK, j.h.simpson@bangor.ac.uk

Co-Conveners: Sharples, Proudman Oceanographic Laboratory, University of Liverpool, UK

PS008 Processes in Oceanic Fronts

Sponsoring Association: IAPSO

Oceanic fronts are regions of enhanced dynamic physical and biological activity characterized by large exchange of momentum and water mass properties. They are areas of enhanced biological activity, forming distinct biogeographic provinces. Processes that control the dynamics of oceanic fronts range from the microscale (double-diffusion, density compensation, etc.) to global scales (air-sea interaction, climate zones, etc.). Oceanic fronts can be permanent or transient features exhibiting either a pronounced horizontal gradient extending to over 1000 m in depth or occurring seasonally. Fronts are further characterized as regions of high mesoscale variability. This symposium will cover all aspects of oceanic fronts, from fronts on the continental shelf to fronts of global dimensions. It will review the existing observation base and focus on processes of frontogenesis, frontal stability, and frontal decay. The role of fronts as water mass boundaries and their influence on marine life is expected to be an important aspect of the session. Presentations are sought on fronts in European seas, particularly tidal mixing fronts; salinity fronts of regions of freshwater influence (ROFI); fronts of the Mediterranean, Black, Baltic, North, Barents, and Nordic Seas; and on biological aspects of fronts including NABs at fronts.

Conveners: Igor Belkin, Graduate School of Oceanography, University of Rhode Island, Narragansett, RI 02882-1197 USA, ibelkin@gso.uri.edu

Co-Conveners: Isabelle Ansorge, University of Cape Town, SOUTH AFRICA



PS009 Impact of CO₂ Changes on Biogeochemical Processes and Ecosystem Functioning

Sponsoring Association: IAPSO

This symposium will bring together a multidisciplinary approach to consider the impact of a high CO₂ world on the biological and biochemical processes within the ocean. There is now clear scientific consensus that the increasing atmospheric levels of CO₂, resulting mainly from human activities, are causing environmental change. While we understand the chemical processes involved when CO₂ from the atmosphere dissolves in seawater, we know little about the impact.

A range of coupled climate models has been developed to investigate the response of the physical ocean-atmosphere system to increased greenhouse gases and aerosols. These simulations predict increases in ocean temperatures, more salty water in the subtropics and fresher water at high latitudes, increased oceanic stratification and a reduction in the mixed layer depth, and changes in cloud cover and sea ice. In turn, these changes are highly likely to cause significant alteration in nutrient and light availability and the length of the growing season and, taken together, will severely alter biological community structure. For example, warmer more oligotrophic conditions could result in increases in cyanobacteria, while increases in dust will induce more nitrogen-fixers.

In addition, there is now increasing concern about ocean acidity. The surface ocean pH is already 0.1 unit lower than pre-industrial levels and, by the end of the century, it will become another 0.3 - 0.4 units lower under the IS92a "business as usual" scenario. Experimental evidence suggests that if trends in ocean acidity continue, key marine organisms such as corals and coccolithophores will have difficulty in maintaining their calcium carbonate skeletons. Contributions that address all the above issues are welcomed.

Conveners: Denise Smythe-Wright, National Oceanography Center, Southampton, European Way, Southampton, SO14 3ZH, UK, Tel: 44-238-059-6439, FAX: 44-238-059-6204, dsw@noc.soton.ac.uk

Co-Conveners: James Orr, Laboratoire des Sciences du Climat et de l'Environnement, CEA-CNRS, FRANCE; Jorge L. Sarmiento, AOS Program, Princeton University, USA

PS010 New Insights into the Ocean and Its Circulation from Argo and GODAE

Sponsoring Association: IAPSO

The Global Ocean Data Assimilation Experiment (GODAE) has been a driving force in developments in ocean state estimation. The powerful combination of satellite altimetry with the rapidly increasing abundance of data from the Argo array of profiling floats has made possible a wide range of research and operational data assimilation efforts.

This symposium provides a platform to explore the wide range of regional and global results and new data assimilation techniques that have been made possible by the link between Argo and GODAE.

Conveners: W. John Gould, National Oceanography Center, University of Southampton, Waterfront Campus, Southampton, SO14 3ZH, UK, wjg@noc.soton.ac.uk

Co-Conveners: Pierre-Yves le Traon, IFREMER, Center de Brest, FRANCE

PS011 Fundamental Physical and Chemical Principles Underpinning Ocean Science

Sponsoring Association: IAPSO

The oceans are a unique environment, as challenging as outer space. Within the oceans are a range of extremes - high pressure; complex chemistry; turbulent boundary layers; a crucial interface with the atmosphere for the transfer of gases, particulates, heat, and momentum. Our understanding of the oceans on a global scale and our ability to probe their interior depends on the details of a wide range of physical and chemical processes and phenomena that include - gas transfer; the equation of state; the physics of bubbles; turbulent mixing in the ocean interior and at its boundaries; the propagation of sound and ocean optics. This session will invite papers that describe our understanding of these physical and chemical processes, and the potential for their exploitation.

Conveners: Trevor MacDougall, CSIRO Marine and Atmospheric Research, Castray Esplanade, Hobart, TAS 7001, AUSTRALIA, trevor.mcdougall@csiro.au

Co-Conveners: Peter Brewer, Monterey Bay Aquarium Research Institute (MBARI), USA



CONFERENCE PROGRAM details
ASSOCIATION IAPSO

PS012 The Oceans - Their Past and Present; Considerations on their Future Behaviour (invited abstracts only)

Sponsoring Association: IAPSO

This symposium will feature three distinguished invited speakers who will each present their perspectives on the ocean circulation and biogeochemical processes during different time slices of ocean history. In the past, the land-ocean basin configuration, the position of gateways between basins, the extent of the cryosphere and air-sea exchanges of carbon dioxide have played important roles in determining the nature of upwelling, ocean gyres and overturning circulations. In the future, it is anticipated that due to human activities, the large-scale ocean circulations will change, and this could impact on marine productivity. Thus it is natural to ask where the present ocean circulation patterns and biogeochemistry fit into the spectrum of past and possible future behaviour

Conveners: Lawrence A. Mysak

SS001 Seismic Observations And Interpretation

Sponsoring Association: IASPEI

The essence of seismology lies in the observation and interpretation of earthquakes and earthquake-generated ground motions, together with effective data distribution and analysis. There is a continuing need to improve mechanisms for the archiving, dissemination and analysis of these data.

The real Earth structure varies in three-dimensions, can show variation with time and is anisotropic and anelastic in part. Thus methods for seismogram interpretation need to take account of the complexities, which are revealed in the currently available high quality data. Papers are invited for the topics: 1. Developments in seismic instrumentation, networks and data centers, early warning systems, large-scale portable networks, international data exchange and management of massive data sets. 2. Comprehensive seismogram analysis at single stations, seismic networks and arrays - requirements, potentials and future developments. 3. Rapid and routine determination of earthquake parameters, particularly in the context of natural disasters as well as the verification and detection associated with the Comprehensive Nuclear-Test-Ban Treaty (CTBT). 4. The role of international data centers in improving and modernizing the global catalogs of earthquakes. 5. Advances in wave propagation in heterogeneous media, including synthetic seismograms and waveform modeling in realistic Earth structures, theory and observations of scattering, attenuation and anisotropy. 6. Developments in seismological interpretation, including development of inversion techniques, seismic tomography and whole-Earth analysis methods. 7. Earthquake location and relocation. 8. Preserving and cataloging the seismological records of past earthquakes. 9. Re-interpretation and calibration of early 20th century earthquakes from seismological archive data.

Conveners: Dmitry Storchak, International Seismological Center, Pipers lane, Thatcham, Berkshire, U.K. Tel: +44 1635 861022, Fax: +44 1635 872351, dmitry@isc.ac.uk

Co-Conveners: Remy Bossu, EMSC, France, remy.bossu@cea.fr; Jim Dewey, U.S. Geological Survey, dewey@usgs.gov; Winfried Hanka, GeoForschungsZentrum Potsdam, Germany, hanka@gfz-potsdam.de; Roger Musson, British Geological Survey, UK, r.musson@bgs.ac.uk; Paul Richards, Columbia University, USA, richards@ldeo.columbia.edu; Haruo Sato, Tohoku University, Japan, sato@zisin.geophys.tohoku.ac.jp

SS002 Earthquake Hazard, Risk, and Strong Ground Motion

Sponsoring Association: IASPEI

Since recent years, the rapid development of theoretical and numerical tools has led to new understandings of source complexity, seismic wave field, effect of site geology, and seismic destructions. Interaction between seismologists and earthquake engineers has obtained fruitful results. New scientific problems have been emerging from the needs of the development of large/critical engineering works and big cities. Many earthquakes have occurred since recently, with plenty of strong motion data recorded by densely deployed high-quality strong motion networks. The analysis of such a huge database is to much extent behind schedule. Even handling the data itself becomes one of the difficult issues under discussion. In comparison, in most of the developing countries/regions with high seismic activity and intense earthquake disasters, there is still lack of enough strong mo-



tion recordings. Observation and study of earthquake hazard in these countries/regions are urgently needed for the safety of society with the threatening of earthquake disasters. Meeting these dual challenges is one of the tasks of seismological and engineering communities within the next four years. To reflect the up-to-date advancements in earthquake hazard assessment, risk management, and strong ground motion seismology, and to foster inter-disciplinary international exchange and cooperation in these fields, this session will be focusing on, but not limited to, the following topics: 1) Strong motion seismology: observation, interpretation, and modeling; 2) Earthquake hazard assessment: probabilistic and deterministic approaches; 3) Long-term and intermediate-term medium-range earthquake forecasting, and analysis of the complexity of seismicity: statistical and physical approaches; 4) Interaction among seismological community, engineering community, policy makers, and the public in the perspective of the preparedness and management of earthquake disasters.

Conveners: Wu Zhongliang, Institute of Geophysics, China Earthquake Administration, 100081, no.5, Minzudaxue Nanlu, Beijing, China. Tel: +86 10 8825 6477, Fax: +86-10-6841-5372, wuzhl@gscas.ac.cn

Invited speakers / Program group: Z. L. Wu, China, wuzhl@gucas.ac.cn; F. Romanelli, Italy, romanell@dst.units.it; G. F. Panza, Italy, panza@dst.units.it; H. Kawase, Japan, kawase@arch.kyushu-u.ac.jp; Y-T. Chen, China, chenyt@cdsn.org.cn.

SS003 Earthquake Hazard, Risk, and Strong Ground Motion - Site effects (and their dependence on source and propagation-path)

Sponsoring Association: IASPEI

The importance of site response and site effects in the resulting damage has been demonstrated in numerous examples of both recent and past earthquakes. These topics have therefore attracted considerable attention over the past decades; though, a number of issues are still unsatisfactorily solved, and, as usual, latest data, often raise new questions. This session will welcome all papers bringing improvements in the scientific understanding of site effects and their sensitivity to the incoming wavefield, and their quantitative prediction for future events. All approaches (instrumental, numerical, empirical, theoretical), and all viewpoints (from scientific understanding to engineering applications in earthquake regulations) are welcome. Contributions on several specific topics are especially encouraged : • Coupling between source, crustal propagation and site effects

• Advances in numerical modeling. • Evidence of site effects within seismological networks that might bias estimates on source parameters (long period effects, weathered rock, ...). • Surface topography effects. • non-linear response of soils : observations, characterization (lab and in-situ tests), modeling. • site characterization techniques and results. • advanced processing techniques for different kinds of instrumental data (surface, borehole, dense arrays). • Dealing with uncertainties: estimating their level and accounting for them for hazard estimates and design levels.

Conveners: Pierre-Yves Bard, Chargé de mission Risque Sismique au LCPC (Division MSRG), LGIT - BP 53, F38041 - GRENOBLE Cedex, France. Tel: (+33) (0)476 82 80 61, Fax: (+33) (0)476 82 81 01; Pierre-Yves.Bard@obs.ujf-grenoble.fr

Co-Conveners: Donat Fäh, Switzerland faeh@seismo.ifg.ethz.ch; Takashi Furumura, Japan furumura@eri.u-tokyo.ac.jp

Invited speakers / Program group: Z. L. Wu, wuzhl@gucas.ac.cn

SS004 Earthquake Hazard, Risk, and Strong Ground Motion - Estimation of strong ground motion

Sponsoring Association: IASPEI

The accurate estimation of the characteristics of the shaking that occurs during damaging earthquakes is vital for efficient risk mitigation in terms of land-use planning and the engineering design of structures to adequately withstand these motions. At present there are numerous methods for estimating these characteristics ranging from empirically-based methods using data recorded during previous earthquakes (commonly referred to as attenuation relations), through kinematic simulation methods of various complexity to fully dynamic models. In addition, there are a number of hybrid methods that seek to combine benefits of different approaches. These methods all have their own advantages and limitations that are not often discussed by their proponents. Contributions to this session are sought that discuss these different methods of ground-motion prediction, in particular,



with respect to their associated uncertainties and also the advantages and disadvantages of different methods. What is the most appropriate method to use for varying quality and quantity of input data and for different seismotectonic environments? How can the best use be made of the available data? How can the uncertainties associated with a given method be properly accounted for? Ground-motion estimation in regions of the world where strong-motion recording history is short (most regions of the world outside California and Japan) and/or seismic activity moderate poses particular problems since there is limited observational data to allow robust empirical prediction or to constrain free parameters in simulations. Reliable ground-motion estimates are, however, required for these parts of the world in order to correctly estimate the earthquake risk and often, for high importance facilities such as nuclear power stations, for long return periods. Contributions that address the issue of how to provide reliable ground-motion estimates in regions with limited observational data are invited. The associated uncertainties within ground-motion prediction remain high despite many decades of research and many sophisticated techniques. The unchanging level of aleatoric uncertainties within empirical ground-motion estimation equations over the past thirty years are an obvious example of this. However, estimates from simulation methods are similarly affected by large (and often unknown) uncertainties. These large uncertainties oblige earthquake engineers to design structures with large factors of safety that may not be required. Papers that suggest methods to reduce the uncertainties associated with ground-motion estimates by, for example, better characterising the earthquake source, travel path or recording site are requested. In addition, contributions on other aspects of strong ground motion estimation are welcome.

Conveners: John Douglas, ARN/RIS, BRGM, 3 avenue C. Guillemin, BP 6009, 45060 ORLEANS Cedex 2, France. Tel: +33 (0)2.38.64.36.48, Fax: +33 (0)2.38.64.33.61, j.douglas@brgm.fr

Co-Conveners: David Wald, USA, wald@usgs.gov; Peter Suhadolc, Italy, suhadolc@dst.units.it

Invited speakers / Program group: Z. L. Wu, wuzhl@gucas.ac.cn

SS005 Earthquake Sources - Modelling and Prediction

Sponsoring Association: IASPEI

In the last decade there has been great progress in the physics of earthquake generation; that is, the introduction of laboratory-based fault constitutive laws as a basic equation governing earthquake rupture, quantitative description of tectonic loading driven by global plate motion, and a microscopic approach to study fault zone processes. Our vision in the next decade is to develop physics-based realistic simulation models for the entire process of earthquake generation cycles. The assimilation of seismological and geodetical observations into such models will provide a new approach for studying earthquake precursory phenomena and have direct application to earthquake prediction and earthquake hazard quantification. Recent advances in high performance computer technology and numerical simulation methodology are bringing this vision within reach. We address this central subject in earthquake physics from a multidisciplinary point of view. Contributions are invited for the following topics: 1) Fault zone processes and constitutive properties. 2) Modelling and simulation of earthquake generation processes; 3) Fault system complexity and dynamics; 4) Generation and propagation of strong ground motion; 5) Tectonic loading, stress-state evolution, and seismicity change; 6) Monitoring and modelling of earthquake processes for prediction; 7) Earthquake forecasting and evaluation; 8) Seismicity as manifestation of critical behavior of the crust

Conveners: Mitsuhiro Matsu'ura, Department of Earth & Planetary Science, Graduate School of Science, University of Tokyo, JP-Bunkyo-Ku, Tokyo, 113-003 Japan, Tel: +81 3 5841 4318, Fax: +81 3 5841 87911, matsuura@eps.s.u-tokyo.ac.jp

Co-Conveners: Massimo Cocco, Italy, cocco@ingv.it, Alexey Zavyalov, Russia, zavyalov@ifz.ru, Takashi Furumura, Japan, furumura@eri.u-tokyo.ac.jp

SS006 Education and Outreach

Sponsoring Association: IASPEI

The 2004 Sumatra-Andaman Islands earthquake and tsunami demonstrated both the level of potential public interest in earthquakes and more importantly, the need for increased education. This need exists at all levels, from educating more school children about the causes and effects of earthquakes to training new seismic network operators in the management and analysis of seismic data. This symposium will focus on effective strategies for education and outreach for this wide range of



audiences. Presentations are encouraged on the following topics: (1) Innovative professional education of geophysicists and seismic network operators, including manuals of standard practice and informed use of standard data bases. (2) Formal and informal education of teachers, the public, press, officials, etc., especially using new technologies. (3) Examples of the successful use of school seismographs and seismic networks to engage students and teachers in recording and analyzing seismic data as part of their science curriculum. (3) Interdisciplinary professional outreach, including projects in assessing seismic hazard, seismic risk, and sustainable development. (4) Capacity building in developing countries and underrepresented groups.

Conveners: John Taber, IRIS, New York Ave. NW, Suite 800, Washington, DC 20005, USA, taber@iris.edu

Co-Conveners: Kiyoshi Suyehiro, Ocean Research Institute, University of Tokyo, 1-15-1 Minamidai, Nakano-ku, Tokyo 164, JAPAN, suyehiro@jamstec.go.jp

SW001 Earthquake data in archaeological and historical studies

Sponsoring Association: IASPEI

When a destructive earthquake occurs - as in the most recent cases at Bam (Iran, 2003), Indonesia (2004), Kashmir (2005) etc. - one of the first questions raised by seismologists, media and by the common people concerns the seismic history of the affected places. The importance of the contribution of historical earthquake data to seismological studies, in particular to seismic hazard assessment and related topics, is increasingly acknowledged by the international scientific community.

Historical earthquake data stems from the written records of seismic effects of the past, as provided by the historical sources; as such, they supply the most important - if not the unique - evidence of earthquake activity before the early instrumental period (beginning of 20th century), and a very necessary one also in the period up to modern instrumental period (up to 1964). Since about 20 years, thanks to pioneer works, historical seismology has established itself as a discipline with internationally recognized, rigorous procedures, for both retrieving historical data and interpreting them in seismological terms. Investigations are frequently performed by multidisciplinary teams that today release a reliable, semi-quantitative, scientific historical earthquake data set. Around the world, historical earthquake data, and more recently also archaeological evidence related to earthquakes, are collected by many organizations with varying criteria and degrees of commitment; most of them are concerned with national or local data only. A few countries only have a consistent, accessible set of historical earthquake data, interpreted in terms of macroseismic intensity data points; in many countries scattered data are available on paper only. Single investigators, from both the seismological and the historical side, contribute very useful studies, which often feed the grey literature and miss international dissemination. In all, a huge amount of useful literature and data still wait to be made available to the scientific community. The goals of the recently established IASPEI Working Group "Historical Seismology" (2005) can be summarized as follows: i) to inventory the published and unpublished material supplying historical earthquake data, supplemented by an annotated bibliographical list; ii) to collect and preserve as many inventoried items as possible, both on hard copy and in digital format; iii) to disseminate the material through a dedicated web-site. To discuss the achievements in these fields and to foster the international cooperation and scientific exchange, contributions focusing on these topics are warmly encouraged, both with respect to Archaeoseismology and Historical Seismology studies.

Conveners: Paola Albini, Istituto Nazionale di Geofisica e Vulcanologia, Sezione di Milano, Via E. Bassini 15, 20133 Milano, Italy, Tel: +39-02-23699264, Fax: +39-02-23699458, albin@mi.ingv.it

Co-Conveners: Katsuhiko ISHIBASHI, Dept. of Earth and Planetary Sciences, Faculty of Science, Kobe University, Kobe, 657-8501 Japan, Tel/Fax: 81-78-803-5731, ishi@kobe-u.ac.jp

SW002 Geophysical studies of active faults

Sponsoring Association: IASPEI

Identifying and characterizing seismogenic sources is an important task for seismic hazard mapping using either characteristic or probabilistic approaches. Geological and geophysical data are used to identify the location, dimensions (length, dip and depth) and kinematics of active geological structures that can be reasonably associated with one or more historical or recent earthquakes.

Different types of geophysical surveys are used to provide images of active faults and growth folding at scales ranging from that of the outcrop (or the paleoseismological trench) to that of the entire crust. Seismic reflection, refraction and tomography data are now available in many seismically active regions of the Earth, particularly along active thrust belts, in extensional areas, and in subduc-



tion-zone settings. These data can provide information about the fault geometry and dimensions, completely independent of that provided by instrumental seismology.

The depth of imaging of seismic profiles acquired primarily for oil exploration purposes usually comparable with the focal depth of upper crustal earthquakes (< 10 km). At greater depths, deep crustal seismic profiles (BIRPS, COCORP, etc.) and regional tomography studies can help to relate geologic structures with deep earthquakes. At shallower depths, high-resolution seismic reflection and refraction profiles, high-resolution tomography, and electromagnetic surveys (e.g. ground penetrating radar, resistivity, etc.) can be used to image active faults and folds in Quaternary sediments, where age dates can be obtained from soils. Historical seismicity can be used first to locate the seismically active regions, and then reliably associate geological structures with significant earthquakes to evaluate the probability of future occurrence. This session aims to provide an overview of geophysical methods currently used to image seismogenic structures, and provide a selection of case studies of geophysical surveys in seismogenic regions. Studies of active faults and folds from diverse tectonic environments are welcome from seismic interpreters, geophysicists, and modelers, especially when a combined geological/geophysical approach is used.

Conveners: Massimiliano R. Barchi, Dipartimento di Scienze della Terra, Università di Perugia, P.za Università 06100 Perugia Italy, Tel: +39 075 5852629, Fax: +39 075 5852603, mbarchi@unipg.it

Co-Conveners: Thomas L. Pratt, University of Washington, School of Oceanography, Box 357940 University of Washington, Seattle, WA 98195, Tel: 206-543-7358, Fax: 206-543-6073, tpratt@usgs.gov

SW003 Seismogenic zones: emergence of in situ fault zone observations to the understanding of earthquake physics

Sponsoring Association: IASPEI

Recent and future experiments penetrating the seismic fault zone provide direct and first hand information critical to the understanding of earthquake physics. Deep drillings, which sample and quantify the fault zone materials and allow in situ monitoring of the fault zone, are expected to reveal important physical properties as temperature and deformation parameters in relation to the understanding of earthquake cycle. However, the challenge is how these observations relate to the deformation and rupture of the whole fault zone or to the stress field that causes earthquakes. This session will look at the present status and future plans of such experiments and try to identify ways to connect these observations in different scales.

Conveners: Kiyoshi Suyehiro, Ocean Research Institute, University of Tokyo, 1-15-1 Minamidai, Nakano-ku, Tokyo 164, JAPAN. Tel: 81 3 5351 6439, Fax: 81 3 5351 6438, suyehiro@jamstec.go.jp.

Co-Conveners: Kuo-Fong Ma (Taiwan), fong@earth.ncu.edu.tw.

SW004 Modernizing ISC procedures: model evaluation and magnitudes

Sponsoring Association: IASPEI

The International Seismological Center (ISC) has developed and put into operation a new Data Management System. As a result, it is now possible to review and subsequently introduce more up-to-date methods of locating seismic events into the ISC operations. A first workshop on modernizing ISC procedures was held during the 2005 Santiago IASPEI General Assembly. Using a list of 156 well-located test events (GT0/GT5) selected from the IASPEI collection of Ground-Truth events, a number of prominent seismologists studied the effects of different location algorithms on location accuracies. The first workshop participants recommended that the ISC consider changing from the Jeffreys-Bullen velocity model, currently used in operations to locate seismic events, to a modern spherical Earth model with consistent travel-time tables for all major seismic phases. In particular the AK135 velocity model was recommended as the best candidate for this purpose. To make sure that introducing new travel times into the ISC operation does not cause unwanted or unforeseen biases, the ISC was asked to produce its bulletin for two or three data months using the AK135 tables as well as JB. These two bulletin versions will be made available to the seismological community from the ISC and NORSAR web pages. For the present workshop, we encourage seismologists to use their local knowledge of different geographic and tectonic regions to conduct critical comparisons of the ISC JB bulletin and the experimental ISC AK135 bulletin. Also at the Santiago General Assembly, the IASPEI Commission on Seismological Observations and Interpretation provisionally accepted proposed standard procedures for computing the widely used magnitude types ML, MS, mb, mB, and mb(Lg). For ML and mb(Lg), the standard procedures explicitly allow for regionalization, to account for geographical variations in seismic wave attenuation. For MS, standard procedures are proposed



for MS measured from waves with periods near 20s [MS(20)] and MS measured from waves in a much broader period-range [MS(BB)]. Papers are invited on implications of implementing the procedures. Papers are especially welcome on regionalization of ML and mb(Lg), on the value of mB and MS(BB) for characterizing the seismic source, and on comparison of magnitudes computed with the recommended standard procedures with magnitudes computed by network-specific procedures. The IASPEI-recommended standard procedures are posted at the IASPEI web site at www.iaspei.org. Also planned is a program to announce test-events, for which station operators will be encouraged to report amplitude measurements to the ISC, which will in turn make the measurements available for analysis by workshop participants. Interested participants are invited to contact the Workshop conveners for updated information on the test-event program.

Conveners: Johannes Schweitzer, NORSAR, P.O. Box 51, Granaveien 33, N-2027 Kjeller, Norway. Tel: 47 638 05940, Fax: 47 638 18719, johannes@norsar.no

Co-Conveners: Dmitry Storchak, International Seismological Center, UK, dmitry@isc.ac.uk; Jim Dewey, U.S. Geological Survey, dewey@usgs.gov

SW005 Reference Events for Improved Locations

Sponsoring Association: IASPEI

Good locations for seismic sources are needed as the starting point for quantitative studies of Earth structure, tectonics, and earthquake physics, as well as for emergency management following a damaging earthquake, for studies of earthquake hazard and risk, and in the context of monitoring compliance with test ban treaties. Considerable progress has been made in recent years in improving the precision with which seismic events are located --- that is, in obtaining good relative locations between a set of events in the same general region. But there are continuing needs to improve the accuracy of event locations --- that is, improving estimates of the absolute location of seismic events. To this end, a Working Group on Reference Events for Improved Locations (REIL) under the IASPEI Commission on Seismological Observation and Interpretation has been established to develop a set of earthquakes or other seismic sources for which hypocenter information (origin time, depth, latitude, longitude) is accurately known, and whose seismic signals are large enough to be detected at distances out to 1000 km and perhaps teleseismically. Such earthquakes (or other seismic sources) are called "reference events." By building up a large enough set of reference events, it is anticipated that empirical information on travel times as a function of distance, phase, and azimuth (and eventually as a function of depth) can be obtained for individual stations detecting the events. From stations calibrated in this way, we anticipate that it will be possible to improve the accuracy of earthquake locations over broad regions for which reference events are available. The data derived from these reference events can also be used to test and improve 3-D Earth models. The development of an ever larger set of reference events is potentially an international effort that will have significant impact on improving the quality of regional and global seismicity bulletins. This Workshop invites contributions on: (1) Effective seismological and non-seismological methods for obtaining reference events in different regions; (2) Methods for implementing the use of travel-times that differ for each station (as determined in part from reference events), in the work of event location; (3) Evaluation of the accuracy of bulletin locations, as currently published using traditional methods, and as they might be published using improved methods, and (4) Use of reference events in testing 3-D Earth models and in other applications. The Workshop will include opportunities for discussion of effective methods to acquire and disseminate information on reference events.

Conveners: E. Robert Engdahl, Department of Physics, University of Colorado Campus Box 390 UCB, Boulder, CO 80309-0390, USA, Tel: 1-303-735-4853, Fax: 1-303-492-7935, engdahl@iaspei.org

Co-Conveners: Paul G. Richards, Lamont-Doherty Earth Observatory, 61 Route 9W, Palisades, New York 10964, USA, Tel: 1-845-365-8389, Fax: 1-845-365-8150, richards@ldeo.columbia.edu; Avi Shapira, International Seismological Center, Pipers Lane, Thatcham, Berkshire, RG19 4NS, UK, Tel: 44 1635 861022, Fax: 44 1635 872351, avi@isc.ac.uk

SW006 Induced seismicity

Sponsoring Association: IASPEI

The increased need for energy and minerals requires a variety of complex industrial processes to be performed under more and more difficult environmental conditions. Among these, the unstable fracturing of rocks, resulting from stress field alterations induced by human activity threatens various technical processes. Consequently, microseismic monitoring is called upon by the industry to



assist the extraction of minerals and hydrocarbons, the injection of fluids into the ground related to the use of geothermal energy and waste disposal, as well as in geotechnical projects such as underground nuclear waste repositories, hydrocarbon storage caverns, tunnels, underground water purification plants, and water dams. The hazards associated with triggered earthquakes are, however, still frequently unpredictable and uncontrollable. In order to achieve the desired level of control, the mechanism of these kind phenomena must be fully understood. The goal of this session is to summarize a present state of knowledge about the induced and triggered seismicity processes and to discuss future trends in the field. Its purpose is also to provide an overview of the capabilities and limitations of current monitoring techniques and interpretation methods as applied to triggered earthquakes to assess and mitigate the seismic hazard.

Conveners: Stanislaw Lasocki, Department of Geophysics, Faculty of Geology, Geophysics and Environmental Protection, AGH University of Science and Technology, al. Mickiewicza 30, 30-059 Krakow, Poland, tel: +48-12-6173811, Fax: +48-12-6332936, lasocki@agh.edu.pl

Co-Conveners: Rajender Kumar Chadha, India chadha@ngri.res.in; Aderson do Nascimento, Brasil, aderson@dfe.ufrn.br; Hans-Joachim Kuempel, Germany, kuempel@gga-hannover.de

SW007 Crustal/fault drilling: an earthquake laboratory (ILP Workshop hosted by IASPEI)

Sponsoring Association: IASPEI

Preliminary Outline for the Fault Drilling Session to be held at the IUGG meeting in Perugia 2007. Drilling active faults provides a unique approach for better understanding of the processes that govern earthquakes and fault behaviour. This approach allows acquiring in-situ observations and seismic activity of the active faults at depth. The scientific rationale for most ongoing fault-zone drilling projects was developed in the 1990s. The recent advances in fault-zone physics open excellent perspectives for new applications to existing and planned fault-zone drilling projects. This session will serve as an open forum for detailed exchange of knowledge, ideas, learned lessons, and fundamental science concepts following the joint IODP-ICDP workshop on fault-zone drilling held in Japan in May 2006. We invite participants from all active fault zone drilling projects. It is anticipated that they will focus on the following items: - long-term monitoring of active faults; - stress tensor variations in the vicinity of the fault-zone - role of fluids in fault mechanics; - physical properties and deformation mechanisms; - geochemical interactions between fluids and fault material; - seismic structure in and around fault zone environments; - temperature profiles and heat transfer - downhole measurements; - pre-drilling surveys and site characterization.

Conveners: Georg Dresen, GeoForschungsZentrum Potsdam, dre@gfz-potsdam.de;

Co-Conveners: Francois Cornet, France, cornet@ipgg.fr; Marco Bohnhoff.

VS001 Sediment-laden gravity flows in volcanic settings: generation, sedimentation, prediction and hazard assessment

Sponsoring Association: IAVCEI

This session will focus on state of the art and new views and concepts concerning the triggering, transport and sedimentation mechanisms that characterize sediment-laden gravity flows in volcanic settings. Methods for prediction and hazard assessment. Sediment-laden gravity flows are common occurrences in volcanic settings, where they present widespread and continuing risk to human settlements and life. Sediment-laden gravity flows are initiated by various mechanisms, among which the most common are intense and/or prolonged precipitation, breakouts of crater lakes, melting of snow or glacial ice during an eruption, or seismic triggering of landslides that evolve to debris flows. Volcaniclastic mass flows can be generated both during or shortly after an eruption or some years to centuries later. A common source area is the terrain mantled by tephra deposits downwind from a volcano. Geological history, morphological constraints and modeling can yield important constraints for hazard assessment. It is very important to understand the mechanisms promoting the generation of sediment-laden flows in volcanic terrains, with particular attention to erosion processes in loose volcaniclastic material. Because rainfall is the most common triggering factor in slope stability, analysis of rainfall intensity and frequency is the most frequently adopted approach to forecasting the debris flows initiated in this way. Rainfall thresholds are also commonly adopted for civil protection purposes and to establish alarm networks in endangered areas. Therefore, improvements in our



knowledge of hydrologic behavior, including modeling, in volcanoclastic terrains are key elements of hazard assessment. Once flows are triggered, other processes can greatly influence the transport and sedimentation of sediment-laden flows, and thus affect the size of areas potentially subject to inundation. Those factors include the processes of bulking and debulking--the addition and loss of sediment and water to the original flow volume, respectively, and the effects of longitudinal change in slope profile.

Conveners: Pareschi, Maria Teresa, Istituto Nazionale di geofisica e Vulcanologia (INGV), via della Fagiola 32, I-56100 Pisa, Tel: +39-050-8311946, Fax: +39-050-8311942, pareschi@pi.ingv.it; Scott, Kevin M., U.S.G.S. Geological Survey, Cascades Volcano Observatory, 1300 Cardinal Ct., Bldg. 10, Ste. 100, Vancouver, Washington, 98683 USA, Tel: +1-360-993-8941, Fax: +1-360-993-8980, kscott@usgs.gov; Zanchetta, Giovanni, University of Pisa, Dipartimento di Scienze della Terra, via Santa Maria 53, I-56100 Pisa, Tel: +39-050-2215795, zanchetta@dst.unipi.it

VS002 Submarine volcanism: eruption processes, transport mechanisms and links with hydrothermal systems

Sponsoring Association: IAVCEI

Recent detailed volcanological, geophysical, hydrological and geochemical studies of modern volcanoes on the seafloor have provided us with new insights into the mechanisms and products of submarine eruptions. It is also clear that there are close links between seafloor volcanoes and ore-forming hydrothermal activity. Complementary studies on ancient, submarine successions provide a 3-dimensional analysis of the facies architecture and transport and depositional processes involved during sedimentation. We invite contributions that focus on: (1) observations of the volcanology and sedimentology of modern seafloor volcanoes; (2) models for both explosive and effusive seafloor eruptions; (3) transport and depositional mechanisms of the products of submarine eruptions; (3) character, setting, and temporal and spatial variability in seafloor and sub-seafloor hydrothermal systems; and (4) links between magma reservoirs, magma migration, eruptive processes, and hydrothermal activity.

Conveners: Sharon Allen, Center for Ore Deposit Research, University of Tasmania, Private Bag 79, Hobart, Tasmania 7001, Australia; Jocelyn McPhie, Center for Ore Deposit Research, University of Tasmania, Private Bag 79, Hobart, Tasmania 7001, Australia

Co-Conveners: Fabiano Gamberi

VS003 Volcanic Flows: Observation, Experiment, and Theory

Sponsoring Association: IAVCEI

This session will focus on the dynamics of volcanic flows, such as pyroclastic density currents, debris avalanches, lava flows, and lahars. Contributions concerning field observations of such flows, the characteristics of their deposits, laboratory experimentation using real or analog materials, and theoretical modeling are relevant to this session. Research linking models with quantitative field measurements of flows and flow deposits are particularly welcome.

Conveners: Shinji Takarada, Geological Survey of Japan, AIST, AIST Tsukuba Central 7, 1-1, Higashi 1-Chome, Tsukuba, Ibaraki 305-8567, JAPAN, Tel: 81-29-861-3985, Fax: 81-29-861-3579, s-takarada@aist.go.jp; Tim Druitt, Laboratoire Magmas et Volcans, Université Blaise Pascal – CNRS, 5, rue Kessler, 63038 Clermont-Ferrand, France, Tel: +33-4-7334-6718, Fax: +33-4-7334-6744, T.Druitt@opgc.univ-bpclermont.fr

VS004 Intraplate monogenetic basaltic volcanic provinces and processes

Sponsoring Association: IAVCEI

The session will focus on the effects of the interplay between regional stress, other regional factors and the magmatic source on the development of monogenetic intraplate basaltic volcanism. The session is aimed at giving the opportunity to researchers to illustrate the variety of eruptive styles and volcanic features that characterise plains basalt provinces. Effusive, strombolian, violent strombolian and phreatomagmatic styles are generally all displayed in plains basalt provinces, with a regional distribution that reflects the interaction of the rising magma with the structural fabric of the crust, the orientation and intensity of the regional stress field and the presence of ground or surface water.



Studies on both modern and ancient systems are welcome, as well as those on exhumed intrusive plumbing systems of such volcanic provinces. Hazard-related studies are also welcome.

Conveners: Guido Giordano, Università Roma TRE, Dipartimento di Scienze Geologiche, L.go S. Leonardo Murialdo 1, 00146 Roma Italy, Tel:+39-06-54888089, Fax: +39-06-54888201, giordano@uniroma3.it; Raymond Cas, Monash University, Earth Science, Monash Campus, 3800 Victoria AUSTRALIA, Tel:+61 3 9905 4897, Fax: +61 3 9905 4903, Ray.Cas@sci.monash.edu.au

VS005 The Magma Feeding System of Persistently Active Basaltic Volcanoes: Mount Etna and Others

Sponsoring Association: IAVCEI

The eruptive behavior of persistently active basaltic volcanoes is closely dependent on the geometry and the dynamics of their magma feeding system. Therefore, quantitative imaging and modeling of magma feeding systems is essential to improve our eruption forecasting capabilities. This can be obtained from multidisciplinary investigations of the volcanic activity, of its solid and gaseous products, of geophysical and geochemical signals, as well as of the regional and local structural framework. Since its inclusion among the IAVCEI Decade volcanoes, Mount Etna - the largest active volcano in Europe - has been the target of growing studies and monitoring, which have allowed substantial progress on these aspects. Nevertheless, there still remain a number of questions, for instance about the respective triggering effects of magma replenishment and regional tectonic forces, that could only be resolved through closer combination of different methodologies. The same is true for other basaltic volcanoes elsewhere. This session is thus aimed at making a standpoint of our current knowledge of the magma feeding system and eruptive dynamics of Mt. Etna and other persistently active basaltic volcanoes. We welcome either single or multidisciplinary contributions dealing with geophysical, geochemical, petrological, structural and remote sensing approaches. Inter-comparison between different basaltic volcanoes is encouraged. One final objective should be to identify a number of priorities in future investigations of magma dynamics and feeding systems on basaltic volcanoes.

Conveners: Renato Cristofolini, rcristof@unict.it, Patrick Allard, Patrick.Allard@cea.fr; allard@ct.ingv.it; Giuseppe Puglisi, puglisi-g@ct.ingv.it

VS006 Calderas I - Calderas and resurgent calderas

Sponsoring Association: IAVCEI

Caldera collapse and resurgence are common features in volcanic systems and have been classically interpreted in light of inflation and deflation processes of magma reservoirs. Their size can vary significantly as well as their dynamics. Such a variability can depend upon both the characteristics of the volcano, including its magmatic feeding system, and/or of the crust, and regional stress regime. Pre-existing regional structures may influence stress propagation or may be reactivated during collapse and resurgence. The regional stress field may directly influence the formation of new structures, and the shape of calderas and resurgent blocks. This Session is devoted to the presentation, discussion and comparison of caldera collapse and resurgence case histories. Contributions based on geological, sedimentological, structural, petrological, geophysical investigations, as well as on variable types of modelling, are solicited. Contributions on active calderas and resurgent calderas, with obvious implications on volcanic hazards assessment, are also welcome. Participants are encouraged to register for Field Trip F7 on the Neapolitan volcanoes, during which the active Campi Flegrei and Ischia resurgent calderas will be illustrated.

Conveners: Giovanni Orsi, Istituto Nazionale di Geofisica e Vulcanologia - Osservatorio Vesuviano, Naples, Italy, orsi@ov.ingv.it; Grant Heiken, 331 Windantide Pl., Freeland, WA, USA, heiken@whidbey.com; Sandro de Vita, Istituto Nazionale di Geofisica e Vulcanologia - Osservatorio Vesuviano, Naples, Italy

VS007 Calderas II: Calderas and caldera forming eruptions

Sponsoring Association: IAVCEI

Calderas involve the rapid eruption of magma from crustal reservoirs that vary in size and shape in different tectonic environments. Some caldera-forming eruptions have been far larger than any



in the historical record and may have had large impacts on earth climate. In contrast, other large volcanoes have been active for hundred thousands of years without caldera-forming eruptions. Much recent volcanological research is aimed at understanding the conditions favoring the occurrence of large caldera-forming eruptions, how the magma reservoir develops in time, and how the resulting caldera is related to the style of the causative eruption. Lacking direct observation of unrest that preceded large caldera-forming events, we are dependent on the geologic record of precursory eruptive activity. Will we be able such data to forecast large caldera-forming eruptions in the future? This session focuses on the diverse methods, including field observations, petrologic and geochronologic studies, geophysical monitoring, and physical and numerical modeling, that can help understand the conditions leading to a caldera-forming eruption, its temporal evolution, and the form and shape of the resulting caldera and associated subvolcanic magma reservoir.

Conveners: Gianfilippo De Astis, INGV, Napoli, Italy; Peter Lipman, USGS, Menlo Park, Ca, USA, plipman@usgs.gov; Roberto Scandone, Dip. Fisica "E. Amaldi", Università Roma TRE, Via Vasca Navale 84, 00146, Roma, Italia, Tel. 06-55177250 uff. 06-5579303, scandone@fis.uniroma3.it; Guido Ventura, INGV, Roma, Italy

VS008 Volcanic hazard evaluation: methodologies and applications

Sponsoring Association: IAVCEI

The aim of this session is to discuss quantitative tools to evaluate volcanic hazard, both from the theoretical point of view and from the point of view of the application to specific case studies. We welcome contributions that allow to characterize the entire processing line going from the monitoring data to the probability of a given eruptive scenario. In particular, the theory and application of methodologies that can be used to integrate different strands of evidence and that can handle new monitoring data as it comes in to evaluate updated probabilities are particularly welcome. These include for instance bayesian belief networks and event trees but also methodologies that can feed these tools with simpler input data, such as artificial neural networks, classification tools, data reduction tools, multivariate time series statistics, markovian models, logical models, expert elicitation techniques, etc.

Conveners: Roberto Carniel, Dipartimento di Georisorse e Territorio, Università di Udine, Italy; Susanna Falsaperla, Istituto Nazionale Geofisica e Vulcanologia, Catania, Italy

VS009 Models and products of mafic explosive activity

Sponsoring Association: IAVCEI

This session will focus on the dynamics of explosively erupting mafic magmas from product analysis, multiparametric observations, and analytical, numerical, and experimental simulations. Mafic magmas can erupt explosively after a broad range of physical processes that, among those already identified, include: surface bursting of buoyant gas bubble slugs, multifarious interaction of magma with external water, overpressurization of cooled magma plugs, annular gas flow, and fast foaming of volatile-saturated melt. However different these processes may appear, they all reflect the fundamental properties specific of mafic magmas, mainly low viscosity and fast internal kinetics. A current challenge to volcanologists is to relate, possibly in a predictive manner, the above physical processes to the highly-variable eruptive styles observed and the products and hazards they emanate. The aim of this session is to bring together scientists with different approaches to the processes that underlie mafic explosive activity. In particular, three fields of research seems to increasingly converge on this topic: a renewed effort on the study of mafic pyroclasts and pyroclastic deposits; multiparametric geophysical, geochemical, and volcanological observation of ongoing activity; and analytical, numerical, and experimental simulation of eruptive processes. All the above (and other) specific aspects of mafic explosive activity will be welcome to this interdisciplinary session, and we specially encourage the submission of presentations showing integration of different approaches.

Conveners: Jacopo Taddeucci, Istituto Nazionale di Geofisica e Vulcanologia, Seismology and Tectonophysics, Via di Vigna Murata 605, 00143, Rome, Italy, Tel: +39-06-51-860-502, Fax: +39-06-51-860-507, taddeucci@ingv.it; Greg Valentine, Los Alamos National Laboratory, Earth and Environmental Sciences, Mail Stop D462, Los Alamos National Laboratory, 87545/Los Alamos, NM/USA, Tel: +1 505 665 0259, FAX: +1 505 665 3285, gav@lanl.gov



VS010 Modeling the plumbing system of active volcanoes by integrated petrological, geophysical and fluid inclusion studies

Sponsoring Association: IAVCEI

An understanding of the internal structure of active volcanoes is a major though often overlooked objective of volcanology. The composition of the primary melts, the depths and conditions at which magmas are stored, the way they differentiate, and the residence time of melts at different crustal levels have important effects on the style and magnitude of volcanic eruptions. These issues are crucial to understand the behavior of active volcanoes and to establish more reliable basis for monitoring strategies and for forecasting volcanic eruptions. To date, geophysical studies have been mainly used to investigate the internal structure of volcanoes. However, the complexity of volcanic systems cannot be adequately investigated by employing a single technique, but requires a multidisciplinary approach. Investigation of major, trace element and isotopic data of volcanic rocks and their constituent phases can furnish significant information on the nature and effects of magma evolution processes, allowing inferences on chemicophysical conditions of magma storage and differentiation. Petrological and geochemical studies can provide basic information on how volcanoes have been working in the past and, presumably, in the future. Seismic and gravimetric data have been widely used to have information on the structure of the basement beneath the active volcanoes, on the depth and size of magma chambers and on melt migration within the volcano plumbing systems. Finally, composition and density of fluid inclusion in phenocrysts and xenoliths are able to give quantitative constraints on depth (i.e. pressure) of fluid inclusion entrapment, i.e. on depth of magma storage systems. It goes without saying that the maximum of information on single active volcanoes can rise from studies that integrate the results of these different disciplines. Integrated, multidisciplinary investigation has the potential to furnish the most reliable models for volcanoes plumbing systems. This symposium has the aim of collecting scientists with different expertise (Petrology, Geochemistry, Fluid Inclusion Petrology, Seismology, etc.) to discuss the potentiality of integrated research in the modeling of volcanic plumbing systems and how this can help in establishing better strategies of volcano monitoring and in obtaining more reliable forecasting of volcanic eruptions. The symposium could be of interest to IAVCEI, IASPEI and possibly other IUGG associations.

Conveners: Angelo Peccerillo, Department of Earth Sciences, University of Perugia, Italy, pecceang@unipg.it; Robert J Bodnar, Virginia Polytechnic Institute, Blacksburg, Va, USA; Maria Luce Frezzotti, Department of Earth Sciences, University of Siena, Italy

VS011 Modeling and simulation of volcanic related phenomena for hazard mitigation

Sponsoring Association: IAVCEI

Volcanic activities give rise directly or indirectly to many dangerous phenomena: lava flows, pyroclastic flows, lahars, pyroclastic surges, release of volcanic gases and tephra into the atmosphere, debris avalanches, landslides and tsunamis. They represent a not exhaustive list of induced volcanic hazards, which pose serious risk conditions for the human environment in many parts of the world. In typical risk analyses, after defining the type and severity of a given dangerous phenomenon, a fundamental task is to determine the area influenced by the hazardous phenomenon, together with its evolution in space and time, once it has become activated. Eventually, the presumed effects on the elements at risk can be estimated. Modelling and computer simulation of such complex phenomena becomes a fundamental task. Computational methods are crucial: new approximated numerical techniques are greatly extending the class of problems which can be solved in terms of differential equation systems, while alternative approaches emerge from innovative computational paradigms such as cellular automata, neuronal nets, genetic algorithms, etc. The session deals with computer hazard analysis by applying new methods of modelling and simulating volcanic related phenomena. We invite the submission of contributions on such types of approaches of simulation, as well as on case studies.

Conveners: Gino M. Crisci, University of Calabria, Department of earth Sciences and center of high performance computing, Arcavacata, 87036, Rende, Italy, Tel: +39+0984+493901, Fax: +39+0984+493577, crisci@fis.unical.it; Salvatore Di Gregorio, University of Calabria, Department of Mathematics and Center of high performance computing, Arcavacata, 87036, Rende, ITALY, Tel: +39+0984+496432, Fax: +39+0984+496410, dig@unical.it



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VS012 Cities on Volcanoes: looking at the links between volcanology and communities issues around volcanoes

Sponsoring Association: IAVCEI

Urban vulnerability to natural hazards is one of the most underestimated issues in urban development. By 2050, the world population is expected to grow by three billion people. Almost all this growth will take place in developing countries, and particularly within their cities and towns. By more than doubling the urban population, large numbers of people will be concentrated in megacities and their increasingly fragile landscape, with huge impacts on the natural resources surrounding them. There are currently almost 450 cities worldwide with a population of more than one million inhabitants. The stresses and strains of rapid urbanization are nowhere more apparent than in the local areas in developing countries. From today to 2025 about 80% of the urban population will be in the developing countries. Resulting population densities place many more people at risk to any hazards, and in particularly volcanic hazards. The Cities and Volcanoes session will explore the links between the volcanology community, emergency managers and city officials. It will focus on the role of multi-disciplinary applied research and need for collaboration between physical and social scientists in reducing volcanic risk and improving community resilience to volcanic hazards.

Conveners: David Johnston, Institute of Geological & Nuclear Sciences, PO Box 30 368, Lower Hutt, New Zealand, Tel: + 64 4 570 1444, Fax: + 64 4 570 4679, david.johnston@gns.cri.nz; Giovanni Orsi, Istituto Nazionale di Geofisica e Vulcanologia – Osservatorio Vesuviano, Naples, Italy, orsi@ov.ingv.it

VS013 Quantifying and expressing volcanic risk: a challenge for the Millennium

Sponsoring Association: IAVCEI

The Millennium Development Goals of United Nations include halving extreme poverty and hunger by 2015, and natural disasters are recognised as potent inhibitors of development. As well as being the causes of huge economic losses. Volcanic risk is a growing problem for cities near volcanoes, especially where urbanisation is unplanned, and for many small island developing states. Eruptions can have regional and global climatic impacts which affect environmental sustainability, economic activity, travel and communications and, in this regard, risk reduction strategies are as important as early warning systems. Recent progress has been made in developing structured multi-disciplinary methods for quantifying the consequences of eruptions on human settlements and human activities. The theme of this session is methodological advances for quantifying and expressing volcanic risk for decision-making, and new approaches for reducing vulnerability. Contributions on the integration of hazard, vulnerability and exposure studies into formalised risk assessment, on ways of interfacing with civil authorities within a risk-informed approach as well as presentations of real cases are particularly welcome.

Conveners: Peter Baxter, Institute of Public Health, University of Cambridge, Robinson Way, Cambridge CB2 2SR, UK, Tel: +44-1223-336590, Fax: +44-1223-336584, pjb21@medschl.cam.ac.uk; Willy Aspinall, Aspinall and Associates, UK; Augusto Neri, Istituto Nazionale di Geofisica e Vulcanologia, Italy, neri@pi.ingv.it; Giulio Zuccaro, University of Naples, Italy

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of hazard, vulnerability and exposure studies into formalised risk assessment, on ways of interfacing with civil authorities within a risk-informed approach as well as presentations of real cases are particularly welcome.

Conveners: Peter Baxter, Institute of Public Health, University of Cambridge, Robinson Way, Cambridge CB2 2SR, UK, Tel: +44-1223-336590, Fax: +44-1223-336584, e-mail: pjb21@medschl.cam.ac.uk; Willy Aspinall, Aspinall and Associates, UK; Augusto Neri, Istituto Nazionale di Geofisica e Vulcanologia, Italy, e-mail: neri@pi.ingv.it; Giulio Zuccaro, University of Naples, Italy



VS015 New Techniques using Remote Sensing Data for Volcano Monitoring and Analysis: Observations, Integration, Hazard Assessments and Modeling

Sponsoring Association: IAVCEI

The use of remote sensing data and modeling to monitor and analyze volcanoes, and to assess hazards, has significantly improved over the past few years. These data provide a better understanding of eruption processes, distribution of eruption deposits and hazard assessments. New sensors have been launched that provide various facets of resolution not previously available. The number of satellites with hourly to daily coverage has increased, and some of these have pixels as small as 250 m pixels and as many as 36 spectral bands. Moderate spatial resolution sensors provide multi-spectral bands in visible and IR wavelengths with pointing capabilities that can provide coverage every few days. Data with spatial resolution up to 60 cm are also available. Due to these improvements, subtle increases in activity and volcanic processes can now be detected, measured and analyzed, such as increases in thermal flux and details in the structure and composition of volcanic clouds and deposits. Modeling has also become an important tool for prediction of activity using DEMs to analyze topographic change and wind-fields to predict the movement of volcanic clouds. New field-instruments, such as TIR cameras, radiometers, and webcams detect volcanic processes not seen from satellites and provide calibration and validation of satellite data. Parallel to sensor developments, improvements in connectivity, infrastructure and web browsers have resulted in better and more timely analysis capabilities and data distribution. Satellite data are now received by local stations to provide real-time images to monitor and assess volcanoes in Italy, Central America, Alaska, Hawaii, Kamchatka and other regions. Contributions on the use of these new remote sensing systems and techniques to analyze or model volcanoes, eruptions and hazard assessments are encouraged for this session. Also, with the aging of moderate resolution sensors (e.g. ASTER and Landsat), we encourage presentations on replacement or development of new sensors to fill this void.

Conveners: Ken Dean, Geophysical Institute, University of Alaska Fairbanks, 903 Koyukuk Drive, Fairbanks, AK 99775-7320, USA, Tel: 907-474-7364, Fax: 907-474-5618, kdean@gi.alaska.edu; David Rothery, Open University, UK, D.A., Rothery@open.ac.uk; Valerio Lombardo

VS016 Volcanic-plutonic provinces: a tool to understand magma genesis and geodynamics

Sponsoring Association: IAVCEI

Volcanic-plutonic provinces are of great importance in understanding genesis and evolution of magmas in the context of crustal accretion and structuring. They can be found in all geodynamic environments with magmas spanning a large range of compositions and geochemical affinities. However, despite recent advances in trace element geochemistry, isotope systematics and chronology, and experimental petrology, the link between tectonic setting and petrogenetic processes in volcanic-plutonic provinces is not yet fully understood. This session is aimed at discussion of the physical and chemical mechanisms responsible for the genesis and evolution of volcanic and plutonic magmatism, and how these mechanisms are reflected in the mineralogy, and the chemical and isotopic composition of rocks. The idea is to bring together specialists in the fields of geodynamics, volcanic and plutonic geology, petrology, and geochemistry with experience in volcanic-plutonic provinces in different geodynamic settings, from Archean to recent, in order to gain a more comprehensive knowledge on the genesis, evolution, and interrelationships between volcanism and plutonism.

Conveners: Giampieri Poli, Department of Earth Sciences, University of Perugia, Italy; Bernard Bonin, Université de Paris-Sud, Orsay Cedex, France, bbonin@geol.u-psud.fr

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VS017 Pedagogical and didactical methods in earth science education and geopark concepts in demonstrating volcanic processes

Sponsoring Association: IAVCEI

Methods in education to demonstrate the complex interrelationships between animal, plant and non-living environments should be a tool to learn living with and in our environment. In this point of view there is a good connection between the Geopark concept developed under the UNESCO and earth science education. Through the creation of a world network of natural parks with significant geological features, labelled UNESCO Geopark, UNESCO promotes the twin goals of conserving a healthy environment and enhancing sustainable economic development. Geoparks are designed to become a tool for a better understanding of the geological heritage and wise use of the Earth's crust, by increasing public awareness for a balanced relationship between humankind and the earth. Especially multi level programs, e.g. to demonstrate the variation of volcanic features are necessary to transfer the feeling of responsibility for our environment already in the childhood. Methods are necessary to transfer scientific information about volcanic processes including volcanic hazards to the general population. Contributors are encouraged to consider these key topics and contributions are invited on all aspects of the complexity of pedagogical and didactical methods to transfer knowledge about understanding volcanoes and their hazards.

Conveners: Ulrike Martin, Institut für Geologie, Universitaet Wuerzburg, Pleicherwall 1, D-97070 Wuerzburg / Germany, Tel: +49-931-31-6019, Fax: +49-931-31-2378, ceboruco@web.de; Karoly Nemeth, nemeth_karoly@hotmail.com

VS018 New advances in understanding phreatomagmatism: from experiments to volcanic facies analyses

Sponsoring Association: IAVCEI

The record of the eruption is complicated by complex interactions between magmatic and phreatomagmatic processes in the conduit, transport processes in the vertical and lateral currents, and depositional processes. Many new and old techniques are being applied to understanding these processes. This session invites papers presenting new information on phreatomagmatism. Phreatomagmatic explosions and eruptions represent the key mechanism for the formation of maar-diatreme volcanoes, irrespective of magma composition or host rock type. However, there are environmental conditions (including magma and host-rock characteristics) that apparently cause quite a variability in size and shape of maars and the characteristics of their deposits. Furthermore, phreatomagmatism in maar volcanoes can occur with eruptive stages of purely magmatic explosivity, mixed magmatic/phreatomagmatic eruptions, or even final stages of lava lake effusion. The aim of this session is the discussion of physical processes of phreatomagmatism, how such processes lead to eruption variability, and the environmental factors that influence them.

Conveners: Irike Martin, Institut für Geologie, Universitaet Wuerzburg, Pleicherwall 1, D-97070 Wuerzburg / Germany, Tel: +49-931-31-6019, Fax: +49-931-31-2378, ceboruco@web.de; Karoly Nemeth, nemeth_karoly@hotmail.com

VS019 Large Igneous Provinces

Sponsoring Association: IAVCEI

Large igneous provinces (LIPs) represent large volume, generally short duration mafic-ultramafic events not associated with 'normal' plate boundary processes. They consist of continental flood basalts, volcanic rifted margins, oceanic plateaus, ocean basin flood basalts, submarine ridges and seamount chains. In the pre-Mesozoic record their plumbing system of dyke swarms, sill provinces and layered intrusions is typically exposed by erosion. Archean analogues may be represented by greenstone belts of the tholeiite-komatiite association. Many LIPs are linked to regional-scale uplift, continental rifting and breakup, and climatic crises. They can be useful as precisely dated time markers in the stratigraphic record, and are key targets for Ni-Cu-PGE exploration. LIPs have also become a focus in the debate on the existence and nature of mantle plumes. Contributions on any of these themes are welcome.

Conveners: Richard Ernst, Ernst Geosciences, 43 Margrave Ave., Ottawa, CANADA K1T 3Y2
Tel: 1-613-295-7955 mobile, Richard.Ernst@ErnstGeosciences.com; Ian H. Campbell, Research



VS020 Volcanic health hazard assessment: focus on multidisciplinary collaboration and integration

Sponsoring Association: IAVCEI

The assessment of the health hazard of volcanic emissions is becoming standard procedure at the onset of eruptions. Since the eruption of Mt. St. Helens in 1980, several volcanoes (e.g. Sakurajima, Japan and the Soufriere Hills, Montserrat) have had detailed studies carried out on the potential health hazard posed by inhaling volcanic ash and gas. Although it is now accepted that volcanic emissions can cause acute health problems such as asthma and bronchitis, we are still unsure as to whether chronic diseases, such as silicosis, can be triggered following long durations of exposure. The development of techniques for the rapid assessment of volcanic emissions for health-related parameters, such as grain size and composition analysis, is also a current priority. Much of what we know about the health hazard of volcanic emissions is drawn from comparison with other disciplines or adaptation of techniques used to assess the health hazard of other airborne pollutants such as anthropogenic aerosols and natural dusts. As well as mineralogical and geochemical analyses, health hazard assessment primarily relies on collaboration with the medical, toxicological and epidemiological communities. We invite contributions on health hazard assessment of volcanic emissions, with particular interest in presentations which incorporate novel techniques or information drawn from parallel disciplines interested in the assessment of health hazard of airborne particulate, gases and aerosols.

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VW001 Guidelines for the preparation of volcanic hazards maps

Sponsoring Association: IAVCEI

The IAVCEI Commission on Mitigation of Volcanic Disasters (Giovanni Orsi, Claus Siebe, and Jan Lindsay, leaders) is currently focussing efforts on volcanic hazard maps as these are probably the single most important tool and first step in volcanic hazard mitigation. The rationale behind this effort is not only to promote the preparation of volcanic hazards maps among members of our community, but also to seek consensus on the criteria and format used in the preparation of such maps. The workshop will provide the opportunity to compare different methodological approaches at various types of volcanoes in different socio-economical environments. The exchange of experiences in different parts of the world will foster the development of new future strategies. This workshop follows a similar initiative held at the 2004 IAVCEI General Assembly in Pucon, Chile. Participants to the workshop are encouraged to contribute to session V13 "Volcanic hazards evaluation: methodologies and applications". They are further solicited to register for Field Trip F7 on the Neapolitan volcanoes. During the field trip the current criteria used for preparing the hazard maps of these volcanoes will be also discussed.

Conveners: Giovanni Orsi (Istituto Nazionale di Geofisica e Vulcanologia – Osservatorio Vesuviano, Naples, Italy; Claus Siebe, Instituto de Geofisica, UNAM, Ciudad Universitaria, C.P. 04510 Coyoacan Mexico, D.F., MEXICO, Tel. (525) 622-4146, FAX: (525) 550-2486, csiebe@tonatiuh.igeofcu.unam.mx; Jan Lindsay j.lindsay@auckland.ac.nz

VW002 Non-localised volcanic hazards - Inter-agency and international communications

Sponsoring Association: IAVCEI

The World Organisation of Volcano Observatories, a commission of IAVCEI, will convene this workshop. Natural hazard mitigation has increasingly globalised over the past few years. The workshop will consider the role and status of volcanic observatories as the 'official' warning source for non-localised, international volcanic hazards, such as drifting volcanic ash clouds and volcanic tsunamis. The

role of the World Meteorological Organisation (WMO) and International Civil Aviation Organisation (ICAO) in the International Airways Volcano Watch (IAVW) will be discussed in detail, along with the potential opportunities afforded by pooling the remote sensing, communications and funding capacities of IAVW members. Our discussion will center on strategies to use these opportunities to enhance volcanic monitoring, and to co-ordinate the flow of official information from observatories to international organisations and to the media. Speakers from volcanic observatories will be encouraged to share their own positive and negative experiences with these issues, and their ideas for the future. United Nations agencies such as WMO and ICAO will share their perspectives on international co-operation and data exchange. Duration: 1/2 day (may be extended depending on level of interest).

Conveners: Andrew Tupper, Supervising Meteorologist, Bureau of Meteorology, Darwin, Australia, Tel: +61 8 8920 3872, Fax: +61 8 8920 3829, andrewt@bom.gov.au; Warner Marzocchi, Istituto Nazionale di Geofisica e Vulcanologia, Via Donato Creti 12, 40128 Bologna, ITALY, Tel.: (+39)051-4151420, Fax: (+39)051-4151498/(+39)051-4151499, marzocchi@bo.ingv.it, warner@ov.ingv.it; Glen Mattioli, Department of Geosciences, 113 Ozark Hall, University of Arkansas, Fayetteville, AR 72701, Tel:(479) 575-7295, Fax:(479) 575-3469, mattioli@uark.edu

VW003 Magmatic (fluid and melt) inclusion studies in active volcanoes magmatic systems

Sponsoring Association: IAVCEI

This workshop will focus on investigations of fluid and melt inclusions in determining the abundance and in understanding the role played by volatile constituents (H₂O, CO₂, S species, Cl,...) in the generation, evolution and eruption of magmas.

The fundamental issue for explosive volcanoes is to understand the link between pre-eruptive magmatic evolution and subsequent eruptive style. The main goal of the Workshop is to provide critical key to answer the following questions: 1) How do melt compositions, especially volatile contents, evolve prior to eruption of different type? 2) How are fractional crystallization and pre-eruptive volatile evolution linked? 3) To what extent, where, and how do volatiles accumulate in the magmas prior to eruption? 4) At what depths and over what time scale do the above processes operate? 5) How are eruption style, magnitude and frequency controlled by the magmatic system? 6) How accurate constraints on the solubilities of volatiles in the magma make us to understand magmatic degassing? 7) How and to which extent new microanalytical tools (e.g., new techniques of in situ analyses) improve the determination of volatile abundance in volcanic magmas through investigations on fluid and melt inclusions?

Conveners: De Vivo, Benedetto, University of Napoli Federico II, Dipartimento di Geofisica e Vulcanologia, Via Mezzocannone 8, 80134 Napoli, Tel: +39-081-2535065, Fax: +39-081-2535070, bdevivo@unina.it; Webster, James D., American Museum Natural History, Earth & Planetary Sciences, 79th Central Park West, New York, 10024-5192, Tel: +1-212-7695401, Fax: +1-212-7695233, jdweb@amnh.edu





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IUGG2007 Registration Form

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