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This informal newsletter is intended to keep IUGG Member National Committees informed about the activities of the IUGG Associations, and actions of the IUGG Secretariat. Past issues are posted on the IUGG website (<http://www.iugg.org/publications/ejournals/>). Please forward this message to those who will benefit from the information. Your comments are welcome.

Contents

1. Scientific meetings selected for IUGG support in 2016
2. Corrections and updates to the IUGG Yearbook
3. ICTP-IUGG Conference on Future Earth & Space Science and Education
4. Declaration on Future Earth & Space Science and Education
5. Report on the GeoUnions Steering Committee Meeting
6. News from the International Council for Science (ICSU)
7. Meeting calendar

1. Scientific meetings selected for IUGG support in 2016

IUGG co-sponsors symposia and workshops appropriate to Union disciplines of study. IUGG allocated US\$20,000 to assist meetings in 2016 and especially to support the participation of young and female scientists and scientists from developing countries. Officers of the Union, Associations and Union Commissions propose meetings to receive these awards. For 2016, IUGG will support 21 scientific meetings in 17 countries of Africa, Asia, the Caribbean, Europe, North America, and Oceania (*the IUGG Association that endorsed the meetings is indicated in brackets*):

1. 2nd Snow Science Winter School, Preda and Davos, Switzerland, 14-20 February (IACS)
2. International Summer School in Glaciology, McCarthy, Alaska, USA, 7-17 June (IACS)
3. CCEC2016 - 2nd Workshop of the IUGG Union Commission on Climatic and Environmental Change, Luxembourg, Luxembourg, 24-25 October (IAG)
4. 23rd International Workshop on Electromagnetic Induction in the Earth, Chiang Mai, Thailand, 14-20 August (IAGA)
5. IAGA-IV Symposium: "Influence of short and long term solar variability on climate", Hurgada, Egypt, 20-24 March (IAGA)
6. 7th workshop of the VLF/ELF Remote Sensing of Ionospheres and Magnetospheres (VERSIM) working group, Hermanus, South Africa, 19-23 September (IAGA)
7. The Spatial Dimensions of Water Management - Redistribution of Benefits and Risks, Bochum, Germany, 18-20 May (IAHS)
8. The International Radiation Symposium 2016, Auckland, New Zealand, 17-22 April (IAMAS)

9. The 17th International Conference on Clouds & Precipitation, Manchester, UK, 25-29 July (IAMAS)
10. International Ozone Commission Quadrennial Ozone Symposium 2016, Edinburgh, UK, 4-9 September (IAMAS)
11. The SPARC Workshop on “Strato-spheric Change and its Role for Climate prediction (SHARP)”, Berlin, Germany, 16-19 February (IAMAS)
12. 48th International Liège Colloquium on Ocean Dynamics: “Submesoscale Processes: Mechanisms, Implications and new Frontiers“, Liege, Belgium, 23-27 May (IAPSO)
13. “A Connected Ocean” - the Challenge of Observation Data Integration, Brest, France, 11-12 October (IAPSO)
14. Arctic-Subarctic Ocean Fluxes (ASOF), Lercici, Italy, 30 March-1 April (IAPSO)
15. Regional Assembly Latin American and Caribbean Seismological Commission (LACSC-2016), San Jose, Costa Rica, 20-22 June (IASPEI)
16. FIRST General Assembly of the African Seismological Commission (AfSC 2016), Luxor-Aswan, Egypt, 2-5 April (IASPEI)
17. 10th International Workshop “Physics and forecasting of rock destruction”, Apatity, Kola Peninsula, Russia, 30 May-5 June (IASPEI)
18. 9th Workshop of the IAVCEI Commission on Volcanic Lakes (CVL9), Yaoundé, Cameroon, 13-23 March (IAVCEI)
19. 3rd International Workshop on Volcano Geology, Mt. Etna, Aeolian Islands, Italy, 4-9 July (IAVCEI)
20. Advanced International School on “Early Warning Systems for Geohazards”, Rhodes, Greece, 3-9 October (IAVCEI)
21. 41st COSPAR Scientific Assembly, Istanbul, Turkey, 30 July-7 August (IAG, IAGA, IAMAS)

2. Updates to the IUGG Yearbook

Corrections and updates to the information contained in the IUGG Yearbook (<http://www.iugg.org/publications/yearbooks/yearbook2015.pdf>) are now being finalized in preparation for the Yearbook 2016. Please contact the IUGG Secretariat (secretariat@iugg.org) urgently in the case of any additions and corrections.

3. ICTP-IUGG Conference on Future Earth & Space Science and Education

The Conference on Future Earth & Space Science and Education (Future ESSE) took place at the Abdus Salam International Centre for Theoretical Physics in Trieste, Italy from 2 to 6 November 2015. The Future ESSE conference addressed the future of geosciences, science education, and determination of strategic priority areas where the creation of new knowledge would make a significant impact on society. The brainstorming conference discussed advances in geophysics, geodesy, geology, geography, and other fields of Earth and space sciences, and was dedicated to the challenging problems of disaster risks, climate variability, Earth and planetary issues, and sustainable development. Also, it considered the interactions between the geosciences community and international organizations and programs, and analyzed geoscience education, in general, and that in developing countries, particularly.

Representatives of several major international geosciences organizations and research programs lectured at the conference. They addressed major questions of the Conference:

- What are the challenging problems in your scientific discipline?
- Do we need a science team to solve challenging problems?
- Should an Earth and space scientist develop a partnership with a social scientist and/or engineer from others university departments?
- What opportunities and resources would help the Earth and space science community develop ideas and foster collaborations?
- What are the major challenges that faculty and students have when learning in your discipline?
- Should we transform the mentality that “scientific research is where you apply your intellect, and science teaching is a rote skill”?
- How to build capacity and to promote geoscience education in developing countries?



The conference participants came from 29 countries (Algeria, Belgium, Cameroon, Canada, China, Czech Republic, Egypt, Ethiopia, Gambia, Germany, France, India, Indonesia, Iran, Italy, Morocco, The Netherlands, Nigeria, Pakistan, Russia, South Africa, Spain, Switzerland, Togo, Tunisia, Turkey, UK, USA, and Vietnam) and issued a declaration that is presented below.

4. Declaration on Future Earth & Space Science and Education

The following declaration aims to highlight the importance of Earth and space science education in future scientific progress and to reinforce the link between the scientific community, national governments and the public to contribute to sustainable development of society through scientific awareness and actions related to challenging problems of society. The declaration was adopted on 6 December 2015 by the participants of the International Conference “Future Earth and Space Science and Education” co-sponsored by the Abdus Salam International Centre for Theoretical Physics (ICTP) and the International Union of Geodesy and Geophysics (IUGG) and held in ICTP, Trieste, Italy on 2-6 November 2015.

The responsibility of Earth and space scientists is to help humanity. Seismologists and volcanologists attempt to save lives by evacuating before eruptions or by mitigating the effects of

earthquakes. Geodesists quantify the shape of the Earth so that cities can be built and airplanes flown. Geologists help to restore the complicated history of our planet, and space physicists provide a window into the nearly unknown world, in which our satellites are sent and spacecraft launched. Hydrologists, oceanographers and atmospheric scientists may have the heaviest burden of all as they help guide the planet through climate change and natural hazards. In order to push knowledge forward, intellectual and financial resources should be invested in basic science and science education at a level commensurate with the applied fields. At the same time the need for a scientifically literate populace is increasingly recognized as critical in many countries, as they face the consequences of increasing population pressures, limited resources and environmental degradation (c.f., ICSU ad-hoc panel report on science education). Basic science literacy, coupled with scientific “ways of knowing” – namely drawing conclusions based on observation, experiment and analysis – provides citizens with the tools needed for rational debate and sound decision-making based on scientific knowledge. There is a consensus that in many places around the world, science education is facing serious challenges. Those seeking to improve science education face numerous, and sometimes coupled, problems. In many places, the lack of resources – both educational and financial – is linked with a dearth of adequately trained teachers and the growing popularity of non-scientific-based belief systems. It is clear that developing countries face greater challenges in science education than economically developed countries due to lack of teaching materials including books, computing and communications technologies, community-based science centers, laboratory facilities and equipment, as well as a shortage of skilled teachers. Given this global scenario, and the needs of society, there is an urgent need to improve the preparation of the scientists of tomorrow, not only through widespread access to quality instruction, facilities and research opportunities for all students, but also to improve the motivation and interest of students so that the best of them move toward scientific careers.

The participants of the ICTP-IUGG Conference “Future Earth and Space Science and Education” representing several international organizations (*in alphabetic order*)

- The Abdus Salam International Centre for Theoretical Physics, Earth System Physics Section (ICTP/ESP)
- International Astronomical Union (IAU);
- International Association for Geometrics (IAGETH);
- International Cartographic Association (ICA);
- International Council for Science, Regional Office for Africa (ICSU-ROA);
- International Geographical Union (IGU);
- International Union for Quaternary Science (INQUA);
- International Society for Photogrammetry and Remote Sensing (ISPRS);
- International Union of Geodesy and Geophysics (IUGG);
- International Union of Geological Sciences (IUGS);
- International Union of Radio Sciences (URSI)
- Integrated Research on Disaster Risks Programme (IRDR);
- World Climate Research Program (WCRP)

Acknowledging the long-standing and ongoing contributions of the International Council for Science (ICSU); the International Social Sciences Council (ISSC); the United Nations Educational, Scientific and Cultural Organization (UNESCO); other United Nations, intergovernmental, international and national organizations dealing with science education;

Recalling one of the Sustainable Development Goals is “to ensure inclusive and equitable quality education and to promote learning opportunity for all”

Considering the challenging problems of society (e.g. climate change, natural hazards and disaster risk, depletion of mineral and water resources) requires a transdisciplinary research approach and co-productive work of scientists with policymakers and end-users; and the responsibilities of scientists to help society to tackle challenging problems;

Realizing, that science education at all levels needs long-term planning, coordination and implementation;

Call for a strengthening of basic scientific research and science education especially in the developing world; namely,

1. promoting educational programs having a sound disciplinary base in the fundamentals needed for the physical sciences comprising mathematics, physics, chemistry, and biology. This is required for all mutli-disciplinary Earth and space sciences disciplines and in countries having both developed and emerging economies;
2. promoting comprehensive holistic inter- and trans-disciplinary approaches in Earth and space sciences and science education, which have to integrate knowledge from natural and social sciences, mathematics, engineering, and other relevant stakeholders;
3. cooperation between Earth and space scientists with policymakers and industry to improve science education at schools / universities and within life-learning education programs;
4. networking within education programs and between existing and new regional science educational centers, especially in Africa, Latin America and Caribbean, and Asia and Oceania;
5. promoting integrated and transdisciplinary curricula, particularly in the emerging and challenging scientific fields like disaster science and climate science, via a science team approach;
6. improving geoscience education infrastructure and increasing the number of university chairs in both multidisciplinary and transdisciplinary education;
7. promoting online geoscience education courses and hands-on science education workshops on challenging societal problems as well as science Olympiads and festivals; recognition of best science educators;
8. promoting dialogue between science educators on curricula and curriculum delivery development, and sharing of best practice;
9. citizen science education and involvement to raise awareness of the public to major societal and ethical problems.

5. Report on the GeoUnions Steering Committee Meeting

The Steering Committee of GeoUnions was hosted by the Abdus Salam International Centre for Theoretical Physics, Trieste, Italy and met on 6-7 November 2015. Representatives of eight Unions reported on the progress made since the last business meeting in Auckland, New Zealand (August 2014). They considered a relationship with the International Council for Science (ICSU), particularly discussed the information flow within ICSU and interactions with ICSU Executive Board and Secretariat. The GeoUnions urge close cooperation between the ICSU scientific programs (such as Future Earth) and the GeoUnions programs. In the light of ICSU revising its Grants Programme, GeoUnions leaders agreed to

develop a joint grant application for a long-term project on Earth and space science education. GeoUnions discussed their interaction with ICSU Regional Offices and logistical assistance of the Offices in organizing various scientific, education and outreach events. Edith Madela-Mntla, Director of the ICSU Regional Office for Africa, mentioned that GeoUnions have developed very good cooperation in the Africa region, and the Regional Office remains committed to assisting with the activities of Unions.



*Group photo of the participants of the GeoUnions meeting on 7 November 2015:
(left-to-right) Madhu Chandra (URSI representative), Allan Ashworth (INQUA President),
Harsh Gupta (IUGG Past President), Brian Chase (INQUA Secretary General),
Joos Droogleever Fortuijn (IGU Vice President), Alik Ismail-Zadeh (IUGG Secretary General),
Michael Sideris (IUGG President), Orhan Altan (ISPRS First Vice President),
Paul Cannon (URSI President), and Roland Oberhänsli (IUGS President).*

Alik Ismail-Zadeh (IUGG) reported on the efforts made by the GeoUnions to prepare a synthesis paper on disaster risk science and risk assessment for the U.N. Third World Conference on Disaster Risk Reduction held in Sendai, Japan, March 2015 (http://www.icsu.org/science-for-policy/disaster-risk/documents/DRRsynthesisPaper_2015.pdf). A summary for policymakers was distributed to the representatives of national governments attending the U.N. conference in Sendai. Orhan Altan (ISPRS) mentioned the successful disaster risk management projects of ISPRS with GeoUnions and UNOOSA (<http://www.un-spider.org/sites/default/files/VALIDPublication.pdf>).

Joos Droogleever Fortuijn (IGU) reported on the recent development related to the International Year of Global Understanding (IYGU; <http://www.global-understanding.info>). IYGU addresses global sustainability of local actions and the culturally different pathways to a sustainable world. Sustainable development is a global challenge, but solving it requires transforming the local. After the UNESCO General Assembly endorsed the International Year to become a United Nations Year, ICSU, the International Social Science Council (ISSC), and International Council for Philosophy and Human Sciences (CIPSH) jointly announced that 2016 would be the International Year of

Global Understanding (IYGU). The opening ceremony will be held in Jena, Germany, on 2 February 2016.

Roland Oberhänsli (IUGS) informed the meeting about the recent paper “Geosciences for Future Earth Research” (http://icsu-geounions.org/files/Geosci_FE.pdf) written by experts of several international organizations including GeoUnions. This paper is a commentary on the contents of the three themes, nine subthemes and 62 research priorities as distinguished in the Future Earth’s Strategic Research Agenda 2014 (<http://www.futureearth.org/media/strategic-research-agenda-2014>). The comments in this paper also point to the issues where solid Earth science expertise may help to improve the scientific quality of the potential outcomes of the research agenda, in line with the Future Earth 2025 Vision that aims to link disciplines and knowledge systems to achieve its goals.

A few administration issues were resolved: Alik Ismail-Zadeh will continue as Chair of the GeoUnions Steering Committee, and Allan Ashworth (INQUA) was elected Vice Chair for the next two years. As the ICSU Scientific Unions Meeting will be held in Paris, France, on 11-12 April 2016, the next Steering Committee meeting will be held on 10-11 April in Paris.

The GeoUnions (GUs) consortium was set up in 2004 as an informal forum of the leaders of the ICSU Scientific Unions dealing with Earth, space and planetary sciences in order to promote geosciences worldwide and to coordinate their activities. The consortium is comprised of nine international unions of ICSU: the International Astronomical Union (IAU), the International Cartographical Association (ICA), the International Geographical Union (IGU), the International Union for Quaternary Research (INQUA), the International Society for Photogrammetry and Remote Sensing (ISPRS), the International Union of Geodesy and Geophysics (IUGG), the International Union of Geological Sciences (IUGS), the International Union of Soil Sciences (IUSS), and the International Union of Radio Science (URSI). More information on GeoUnions can be found at: <http://www.icsu-geounions.org>

6. News from the International Council for Science (ICSU)

7th World Science Forum in Budapest adopts declaration

ICSU, along with the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the Hungarian Academy of Sciences, was a co-organizer of the 7th World Science Forum held from 4th to 7th November 2015 in Budapest. At the conclusion of the conference, a six-point declaration was adopted. The declaration affirmed strong support for the newly-adopted Sustainable Development Goals, calling for action towards the goals as an underlying approach to all policies. “We are committed to take and promote urgent and transformative steps to enable a shift for a new development path towards sustainable, equitable and more resilient societies and economies,” it said. The declaration endorsed the major statement of the conference “Our Common Future under Climate Change” co-organized by UNESCO, ICSU, Future Earth and major research institutions in France in July 2015. It reiterated a call contained in the Sendai Framework for Disaster Risk Reduction 2015-2030 to “enhance the scientific and technical work on disaster risk reduction,” and affirmed the importance of sound, independent scientific advice for policy-making. Finally, it called for international collaboration on capacity building and mobilization in the developing world, and an equitable participation of women, young scientists, and minority groups in the practice and application of science, also through capacity-building programs addressed to young scientists. The declaration can be viewed at: <http://www.sciforum.hu/declaration/2015-declaration-on-the-enabling-power-of-science.html>

Science International

Science International is a series of annual meetings of four top-level representatives of international science (the International Council for Science - ICSU, the InterAcademy Partnership - IAP, The World Academy of Sciences - TWAS and the International Social Science Council - ISSC) that are designed to represent the global scientific community in the international policy for science arena. At its first meeting, to be held from 7-9 December 2015 in Pretoria, South Africa, the participating institutions will discuss the topic of big data/open data. The meeting will be hosted by South Africa's Department of Science and Technology and held in parallel with the first South African Open Science Forum and the Ministerial Forum of the G77 + China. 'Big data' has emerged as a major opportunity for scientific discovery. 'Open data' will enhance the efficiency, productivity and creativity of the public research enterprise and counteract tendencies towards the privatisation of knowledge. In addition, concurrent open publication of the data underpinning scientific papers can provide the basis of scientific 'self correction'. For organisations, individuals and society to maximise the benefits of big data, however, will depend on the extent to which there is open access to publicly-funded scientific data. At the meeting, the Science International partner organizations will agree an international science 'accord' on Big Data/Open Data. The accord will be prepared by an expert working group jointly appointed by the partner organizations.

William Paton appointed Executive Director ad interim of IRDR

William Paton has been appointed Executive Director ad interim of the Integrated Research on Disaster Risk (IRDR) programme, effective December 1, 2015. Following the departure of former Executive Director Rudiger Klein in August, Paton will serve for a period of six months pending the appointment of a new Executive Director upon the completion of the review of the programme. Paton, a Canadian national, was appointed by the co-sponsors of IRDR – the International Council for Science, the International Social Science Council (ISSC) and UNISDR. Currently working as a consultant and advisor to several companies and international organizations, Paton was the former Deputy Director-General of the International Development Law Organization (IDLO) in Rome, and Special Envoy for the IDLO in Beijing. During his career he has held high-level positions at a number of UN and international organizations, including the Global Fund and the UNDP. He was UN Resident and Humanitarian Coordinator in Congo, Tajikistan and Somalia. He has also worked in academia. He holds a PhD in development studies from the Institute of Social Studies at the Hague in The Netherlands.

Source: ICSU website

7. Meeting calendar

A calendar of meetings of interest to IUGG disciplines (especially those organized by IUGG Associations) is posted on the IUGG website (<http://www.iugg.org/calendar.php>). Individual Associations also list more meetings on their websites according to their disciplines.

December

- 9-11, IAG, 9th International Symposium on Mobile Mapping Technology (MMT2015), Sydney, Australia, Web: <http://www.mmt2015.org/>
- 14-18, AGU, San Francisco, CA, USA, AGU Fall Meeting. Web: <http://fallmeeting.agu.org/2015>
- 14-18, UN OOSA, Vienna, Austria, ICG Experts Meeting: Global Navigation Satellite Systems Services. Web: <http://www.unoosa.org/oosa/en/ourwork/icg/activities.html>

January 2016

- 27-29, UNISDR, Geneva, Switzerland, Science and Technology Conference on the implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030. Web: <http://www.unisdr.org/partners/academia-research/conference/2016/>

February 2016

- 8-12, IAG, Sydney, Australia, IGS Workshop. Web: <http://kb.igs.org/hc/en-us/articles/205944657-IGS-Workshop-2016-Information>
- 14-20, IACS, IUGG, Preda/Davos, Switzerland, Snow Science Winter School. Web: http://www.slf.ch/dienstleistungen/events/snowschooll/index_DE
- 16-19, IAMAS, IUGG, Berlin, Germany, SPARC workshop on “Stratospheric Change and its Role for Climate prediction (SHARP)”. Web: <http://www.sparc-climate.org/news/news/news/2015/09/17/1st-announcement-on-sparc-workshop-on-stratospheric-change-and-its-role-in-climate-prediction-shar/>
- 21-25, AGU, Ixtapa, Guerrero, Mexico, Chapman Conference on the Slow Slip Phenomena. Web: <http://chapman.agu.org/slowslip/>
- 21-26, AGU, New Orleans, LA, USA, 2016 Ocean Sciences Meeting. Web: <http://osm.agu.org/2016/>

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