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This monthly newsletter is intended to keep IUGG Members and individual scientists informed about the activities of the Union, its Associations and interdisciplinary bodies and about the actions of the IUGG Secretariat, Bureau, and Executive Committee. Past issues are posted on the IUGG website (<http://www.iugg.org/publications/ejournals/>). E-Journals may be forwarded to those who will benefit from the information. Your comments are welcome.

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1. Algeria becomes a Regular Member of IUGG

On 5 April 2018, an application for admission of Algeria to IUGG as a Regular Member (Category 1) was received from the Centre de Recherche en Astronomie Astrophysique et Géophysique (CRAAG). Today, the institution created in 1890 as an astronomical observatory develops research in many geophysical fields and geodesy. The IUGG Executive Committee welcomed this application, and it was placed before the IUGG Adhering Bodies in Regular status for a vote by correspondence. The vote was complete by 25 May: the IUGG Secretariat received ballots from 32 Member countries (of 44 Member countries eligible to vote). The results of the vote on the admission of Algeria as a Regular Member: 31 affirmative and 1 abstained. According to paragraph 14 of the IUGG By-Laws: "Any admission accepted by a simple majority is provisional until approved by the Council." Therefore, Algeria becomes a Regular Member of IUGG (provisionally). The IUGG Council should make the final decision at the XXVII IUGG General Assembly in Montreal, Canada, in July 2019. The Adhering Body is the CRAAG. The Adhering Body established the Algerian National Committee for IUGG with Abdelkarim YELLES-CHAOUCHE as President of the National Committee and IASPEI Correspondent; Hassen ABDELLAOUI, Vice-President and IAG Correspondent; Abdesslam ABTOUT, Secretary and IAGA Correspondent; Abdenour AMBAR, IAMAS Correspondent; Mostepha BOULAHIDID, IAPSO Correspondent; and Nachida ABELLAH, IAVCEI Correspondent.

Welcome Algeria to IUGG!

2. Science education activities co-sponsored by IUGG

Since 2011, the IUGG and the Abdus Salam International Centre for Theoretical Physics (ICTP) has taken steps to enhance geophysical and geodetic science education. Founded in 1964, by the late Nobel Laureate Abdus Salam, a Pakistani-US physicist, ICTP seeks to accomplish its mandate by providing scientists from developing countries with the continuing education and skills that they need to enjoy long and productive careers. The Earth System Physics Section of ICTP studies a wide spectrum of the Earth system, from its fluid components (oceans and the atmosphere) to the planet's interior. Below are brief reports on the educational activities organized by ICTP and co-sponsored by IUGG in 2017.

Workshop on the Science of Climate Change: a focus on Central America and the Caribbean Islands

The workshop on “Science of Climate Change: a focus on Central America and the Caribbean” was organized in La Antigua, Guatemala from 14 to 16 March 2017 and so-sponsored by ICTP, IUGG, Universidad de San Carlos de Guatemala, SENACYT, and the Mesoamerican Centre for Theoretical Physics.



Group photo (courtesy: ICTP)

The workshop was attended by 40 people including lecturers and was aimed to enhance local collaborations and foster international research and educational projects on topics related to climate and climate change in this region. The general objectives of the workshop were to expose the local and regional communities to a broad and historical perspective on the science of climate and climate change. This included anthropogenic influences on climate and the state-of-the-art in global and regional climate change studies. The idea for a workshop arose from the need to foster and promote collaborations, research projects, and educational programs between experts in the field and their universities and Central American institutions and universities on climate dynamics, global and regional climate change, and adaptation and mitigation strategies for the Central American and Caribbean rim countries. The workshop also paved the way for fruitful discussions between world

experts and Central American scientists with a goal of identifying the most needed research topics to be developed in the region. The IUGG grant was used to support five scientists (including one female scientist) from Costa Rica, Cuba, El Salvador, and Honduras. More information can be found at the website: <http://indico.ictp.it/event/7949>.

Extended Workshop on Space Weather Effects on GNSS Operations

The workshop was held at ICTP, Trieste, Italy from 22 May to 2 June 2017. The Workshop was organized in partnership with the Institute for Scientific Research of the Boston College and the International Committee on GNSS of the UN Office of Outer Space Affairs (UNOOSA), and co-sponsored by IUGG and several other organizations. The workshop was attended by 20 lecturers from 10 countries and 30 participants from 20 countries. Participants were exposed to both lectures and hands-on work. In addition, Group Projects were assigned and implemented to allow participants to practice with specific case studies. Theoretical topics covered: ionosphere, ionospheric irregularities and ionospheric modeling; GNSS fundamentals; space weather, space weather effects on GNSS including satellite augmentation systems operations. Particular emphasis was given to low latitudes' ionospheric conditions. An important aspect of the workshop was the computer lab hands-on work carried out by the participants through the Group Projects where selected case studies of space weather events and their effects on the ionosphere were treated. Each Group reported in a presentation their results at the end of the workshop. It has to be noted that in two cases these results gave rise to published papers. In the opinion of lecturers and participants the aim of the Workshop to give theoretical and practical training on the physics of space weather and its main effects on the GNSS operations was fulfilled. The IUGG grant was used to support two early career scientists from India and Ukraine. More information be found at the website: <http://indico.ictp.it/event/7964>.

Fourth Workshop on Water Resources in Developing Countries: Hydroclimate Modeling and Analysis Tools

The workshop “Water Resources in Developing Countries: Hydroclimate Modeling and Analysis Tools” was held in ICTP, Trieste, Italy from 12 to 23 June 2017 and co-sponsored by IUGG. One of the Grand Challenges of the World Climate Research Programme (WCRP) is fresh water availability.



Group photo (courtesy: ICTP)

It focuses on assessing how water availability will shift in some of the major food producing regions of the world due to climate change and on the ability of the scientific community to understand and

to predict precipitation variability and change. By improving the observational system based on both in situ observations and satellite observations, model validation is becoming more and more accurate and this will allow us to improve our understanding of atmospheric and land surface processes and finally to better predict precipitation. This will in turn affect the quality of the prediction of the hydrological cycle across several scales, from catchments to regional to global. On the other side the regional climate model community and CORDEX is moving towards very high-resolution simulation ensemble efforts down to the scale of the convective permitting resolution (1-3 km). This opens new frontiers for the hydrological model community because this will bridge the spatial scale gap between regional climate models and impact models (hydrological models, ecosystem models etc.) community. This workshop focused on the state-of-the-art in precipitation measurements and tried to answer the questions: what can we use to validate precipitation coming from the model output? How can ensembles of high-resolution regional climate model outputs be used as input to a hydrological model? How can the uncertainties in global and regional climate projections be taken into account for hydro-climate simulation? IUGG funds supported participation of two female scientists and one male scientist from Argentina, Cameroon, and India. More information can be found at the website: <http://indico.ictp.it/event/7969>.

Earthquakes and Tsunami: Modeling and Observations

The international school on “Earthquakes and Tsunami: Modeling and Observations” was organized in Hanoi, Vietnam from 11 to 22 December 2017 and co-sponsored by ICTP, IUGG, and several national institutions: the Vietnam Institute for Advanced Study in Mathematics, Vietnam National Foundation for Science and Technology Development, Vietnam National University, Hanoi University of Science, and the Institute of Geophysics of the Vietnam Academy of Science and Technology. The school was attended by about 60 students and early career scientists. The two-week school began with an international conference that highlighted some of the latest developments in earthquake sciences with emphasis on the seismotectonics and hazards from earthquakes and tsunami in Vietnam and surroundings. The school brought together international experts and trained Master and PhD students and early career scientists so that each has a better understanding of the range of circumstances and knowledge related to earthquakes in Vietnam and surrounding countries. The aim was to raise national capability in the vulnerable countries, through training and establishing an international network of scientists on which those countries can call to increase their resilience. The program involved a series of lectures, seminars, discussions in earthquake and tsunami modeling. The main topics of the school covered theoretical seismology, observational and computational seismology, mechanics of earthquakes and faulting, earthquake hazard, tsunami physics and hazard. IUGG funds supported participation of two female and two male young research scientists from Indonesia, Malaysia, and Pakistan. More information be found at the website: <http://indico.ictp.it/event/8176>.

3. Report on the Second IndOOS Review Workshop

The goal of IndOOS (Indian Ocean Observation System) is to provide sustained high-quality oceanographic and marine meteorological measurements to support knowledge-based decision making through improved scientific understanding, weather and climate forecasts, and environmental assessments. The Indian Ocean Region Panel (IORP) established by CLIVAR¹ and Global Ocean Observing System (GOOS) is revising IndOOS implementation plan, with the help of a scientific team comprised of selected experts. The review seeks critical assessment of what’s working well and

¹ CLIVAR (Climate and Ocean: Variability, Predictability and Change) is a core projectsof the World Climate Research Programme (WCRP).

what's not with the present Indian Ocean observing system, and advice on fruitful future directions for IndoOS.

The 14th session of the IORP and the 2nd IndoOS Review Workshop was held in Jakarta, Indonesia from 21 to 23 March 2018. The workshop consisted of 25 review presentations based on the IndoOS review chapter, along three themes: Operational drivers; IndoOS components and new technologies; and Science drivers for future IndoOS. This was followed up by a review board session and break-out session, which brought out the key recommendations for the future IndoOS that will be considered by the review board. The main product of the review will be a list of Actionable Recommendations that will guide IndoOS into the next decade so that it can successfully provide sustained observations to (i) advance our understanding of key phenomena, (ii) track the evolving state of the ocean, (iii) support calibration and validation of satellite missions, and (iv) improve forecasting and predictions of climate variability and change. While the final report is anticipated by early 2019, some of the imperatives for implementation and resources are clear through the first draft of the review. Namely, an expansion of the tropical array (RAMA) into the Arabian Sea, biogeochemistry measurements basin-wide (BGC-Argo), with emphasis on oxygen minimum and upwelling zones, and an observing system in the subtropics to capture Indian Ocean heat and nutrient budgets, including enhanced monitoring of the Indonesian Throughflow, Agulhas, and Leeuwin Currents. IUGG and IAPSO co-sponsored the meeting.

Submitted by Roxy Koll, Lisa Beal, Jing Li, co-organizers of the meeting

4. Report on the 4th Antarctic Gravity Wave Instruments Network Workshop

The 4th Antarctic Gravity Wave Instruments Network (ANGWIN) Workshop was held at the National Institute for Space Research in São José dos Campos-SP, Brazil, from 24 to 26 April 2018. The workshop's participants (35) came from Brazil, Germany, Ireland, Japan, South Africa, South Korea, UK, and USA.



ANGWIN Workshop at INPE's Campus on 25 April 2018

The goal of this workshop was to combine new Antarctic and Arctic observations using optical and radio-wave techniques, and results with modeling studies to gain fresh knowledge and insight of their large-scale effects on the general circulation of the polar-regions lower, middle and upper atmosphere and ionosphere. Dynamical coupling process between the Antarctic Peninsula and South American

continent was another topic discussed at the workshop. The workshop provided an ideal opportunity for early career scientists/students to become involved in international collaborations and to work with some of the leading experts in this field of research. The Workshop's scientific program is available at: <http://www.inpe.br/angwin/program.php>. IUGG co-sponsored the workshop.

José Valentin Bageston, Workshop organizer

5. Report on the Second General Assembly of the African Seismological Commission

The Second General Assembly of the African Seismological Commission (AfSC) of IASPEI took place in Al Hoceima, Morocco, from 23 to 27 April 2018. Opening Ceremony presided over by the Governor of the province of Al Hoceima. At the Opening Ceremony, Taoufik Mourabit, Chair of the Local Organizing Committee, Johannes Schweitzer, IASPEI Secretary General, and Ayele Atalay, AfSC President, welcomed the participants of the assembly. Three plenary lectures were delivered by Mustapha Meghraoui (University of Strasbourg, France), Robert Reilinger (MIT, USA), and Driss Bensari (Mohamed V University, Rabat, Morocco). There were 110 oral and poster presentations; the oral sessions were organized in two adjoining rooms, and the poster sessions during coffee breaks in the hall. Three training courses were organized during the assembly, and well attended by the participants: (i) Seismotectonics, supervised by Mustapha Meghraoui, Mohamed El Gabry, Ahmed Hosni and Ahmed Ksentini; (ii) Seismic signal analysis, supervised by CTBTO experts Abdelouaheb Agrebi, Ezekiel Jonathan and Alexander Poplavskiy; and (iii) Use of radar images for monitoring of superficial movements of the lithosphere, supervised by Kharki Omar and Boulaassal Abdel Hakîm from the University of Tangier. IUGG provided a financial support to the AfSC General Assembly. With this and other co-sponsors support, registration fees were waived for all (72) students participating in the assembly, and 35 participants received full or partial support.

Taoufik Mourabit, LOC Chair

6. News from the International Science Council

The International Science Council's inaugural event in Paris

On 5 July, the International Science Council (ISC) will be launched, a new global non-governmental organization representing more than 180 scientific academies and research councils, international scientific unions and associations from around the globe. The new organization will be the only global body representing both the natural and social sciences and results from the historic merger of the International Social Science Council (ISSC) with the International Council for Science (ICSU). The founding of the International Science Council will be celebrated with a high-level inaugural event showcasing the significance of having a unified, global voice for science in today's world. Leading international scientists such as Cedric Villani, Ismail Serageldin and Esther Duflo will provide keynote addresses at the event, which will be moderated by Craig Calhoun and Nick Ishmael-Perkins. The program is expected to include addresses by the President of France, Emmanuel Macron, and the UNESCO Director General, Audrey Azoulay, as well as by the first elected President of the new Council. The inaugural event follows the founding General Assembly of the new Council, which will be held at the Maison des Oceans on 3-4 July. At the Assembly, the Council will elect its first Governing Board. The events will be hosted by the Académie des Sciences, the French national member of the new Council. IUGG will be represented at the ISC General Assembly by the IUGG President Michael Sideris and the IUGG Secretary General Alik Ismail-Zadeh.

7. Awards and honors

Giuliano F. Panza, President of the Italian National Committee for Geodesy and Geophysics, received an honorary professorship of the Beijing University of Civil Engineering and Architecture (China).

Shuanggen Jin, Chair of the IUGG Union Commission on Planetary Sciences (UCPS), was elected a Member of European Academy of Sciences in June 2018. Also he was awarded the First-class Prize of Overseas Chinese Contribution Award and appointed President of Asia Oceania Geosciences Society (AOGS) Planetary Sciences Section.

Congratulations to Giuliano and Shuanggen!

8. Cities on Volcanoes conference

The 10th Edition of the Cities on Volcanoes conference will be held in the City of Naples, Italy, on 2-7 September 2018. The IAVCEI Cities and Volcanoes Commission aims to provide a linkage between the volcanology community and emergency managers, to serve as a conduit for exchange of ideas and experience between “volcano cities”, and to promote multi-disciplinary applied research, involving the collaboration of earth scientists, social scientists and city officials. Naples had already hosted the first edition of the conference, 20 years ago. It is located among three explosive volcanoes: Vesuvius, Campi Flegrei, and Ischia. 39,000 years ago, this area also gave rise to the largest eruption ever occurred in Europe and in the Mediterranean at least in the last 200,000 years. The Naples volcanoes have always represented, in the very long history of this city, a great resource attracting people and favoring development, despite the danger posed by their eruptions. Nowadays this area, which is among the most densely populated worldwide since more than 4,000 years, is becoming a natural laboratory to develop the most advanced methodologies for the mitigation of consequences of volcanic and other natural hazard events. It is worth mentioning that modern volcanology, seismology and archaeology, they all started in this area. Field trips organized for the conference will retrace this rich history of interaction among natural hazards, culture and scientific development: the largest European volcano (Etna); the earliest volcanological Observatory on Vesuvius (Osservatorio Vesuviano); the ‘eruptive standard volcanoes’ of Eolian Islands (Stromboli). Field trips will also reach Ischia island, characterized by a peculiar seismicity, sometimes destructive like one year ago (21/08/2018); and the Campi Flegrei caldera, including the western part of the city of Naples, characterized by large up and down ground movements, with displacement rates up to 1 m a year.

Giuseppe De Natale, Italian National Committee for Geodesy and Geophysics

9. 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.

July

- 2-6, IAHS, Vienna, Austria, Summer School – Runoff Predictions in Ungauged Basins (PUB). Web: http://www.waterresources.at/fileadmin/user_uploads/News_items/PUB_2018_Flyer.pdf
- 2-6, GFZ, IAGA, IUGG, SCOSTEP, Potsdam, Germany, 7th IAGA/ICMA/CAWSES Workshop on Vertical Coupling in the Atmosphere-Ionosphere System. Web: <https://www.gfz-potsdam.de/sektion/geodaetische-weltraumverfahren/themen/vcais-2018/>
- 2-7, NC Italy, Varenna, Italy, International School of Physics "Enrico Fermi" - Mechanics of Earthquake Faulting. Web: https://www.sif.it/corsi/scuola_fermi/mmxviii#202
- 7-8, IAMAS, Vancouver, Canada, Workshop on Evaluation of Cloud Probe Processing Software (ICCP). Web: <http://www.iccp-iamas.org/news.html>
- 8-13, SEDI, Edmonton, Canada, SEDI 2018 - 16th Symposium of the Study of the Earth's Deep Interior. Web: <https://sedi2018.sciencesconf.org/>
- 9-12, IAMAS, IUGG, Boulder, CO, USA, ISARRA 2018 - International Society for Atmospheric Research using Remotely piloted Aircraft. Web: <http://isarra.colorado.edu/>
- 14-22, COSPAR, IAG, Pasadena, CA, USA, COSPAR 2018. Web: <http://cospar2018.org/>
- 15-21, IAG, Pasadena, CA, USA, IAG Commission 1 Symposium Reference Frames for Applications in Geosciences (REFAG2018). Web: <https://www.cospar-assembly.org/admin/sessioninfo.php?session=683>
- 16-18, IAMAS, Madison, WI, USA, 13th Workshop on Antarctic Meteorology and Climate (WAMC). Web: <http://amrc.ssec.wisc.edu/meetings/meeting2018/>
- 30 July - 3 August, IAPSO, IUGG, Buenos Aires, Argentina, X Jornadas Nacionales de Ciencias del Mar, Web: <http://jornadasdelmar2018.exactas.uba.ar>
- 31 July - 1 August, IACS, Dunhuang, China, International Workshop on Cryospheric Changes and their Regional & Global Impacts. Web: http://www.cryosphericciences.org/downloads/2018_newsWorkshopDunhuang-firstAnnouncement.pdf

August

- 1-3, UN-GGIM, New York City, NY, USA, Eighth Session of the United Nations Committee of Experts on Global Geospatial Information Management. Web: <http://ggim.un.org/meetings/GGIM-committee/8th-Session/>
- 6-10, IGU, CAG, Quebec, Canada, 2018 IGU Regional Conference and Annual Meeting of the CAG. Web: <http://igu2018.ulaval.ca/>
- 6-10, IAGA, Santa Maria-RS, Brazil, 7th Symposium of the Brazilian Space Geophysics and Aeronomy Society (SBGEA). Web: <http://www.sbgea.org.br/en/vii-sbgea-2/>
- 12-17, IUSS, Rio de Janeiro, Brazil, RIO18. 21st World Congress of Soil Science. Web: <http://www.21wcss.org/>
- 13-20, IAGA, IUGG, Helsingør, Denmark, 24th Electromagnetic Induction Workshop. Web: <https://emiw2018.emiw.org>
- 20-27, CCEC, IAMAS, NC China, Beijing and Lanzhou, China, 2018's IUGG Centennial Celebration Activities in China. Web: TBA
- 20-31, IAU, IAG, Vienna, Austria, 30th General Assembly of the International Astronomical Union. Web: <http://astronomy2018.univie.ac.at/>
- 26-31, IAHS, Birmingham, UK, Catchment Science Summer School 2018. Web: <https://www.usask.ca/watershed/teaching/catchment-science-summer-school.php#ClassDescription>
- 27-31, IAHS, Moscow, Russia, The Second International Young Scientists Forum on Soil and Water Conservation and ICCE symposium 2018 "Climate Change Impacts on Sediment

Dynamics: Measurement, Modelling and Management”. Web:

<http://www.eng.geogr.msu.ru/IYFSWC/home.php>

September

- 1-8, IAVCEI, IUGG, San Pedro de Atacama, Chile, State of the Arc (SOTA 7). Web: <https://www.sota7.org/>
- 2-4, IAHS, WMO, Lyon, France, 4th IAHR-WMO-IAHS Training Course on Stream Gauging. Web: <https://riverflow2018.irstea.fr/program-2/training-course-on-stream-gauging/>
- 2-7, IASPEI, IUGG, Valetta, Malta, 36th General Assembly of the European Seismological Commission. Web: <http://www.escmalta2018.eu/de-DE/page/home>
- 2-7, IAVCEI, Naples, Italy, Cities on Volcanoes 10. Web: <https://www.citiesonvolcanoes10.com/>
- 10-13, IAG, Grenoble, France, 19th General Assembly of WEGENER. On Earth deformation & the study of earthquakes using geodesy and geodynamics. Web: <https://wegener2018.sciencesconf.org/>
- 10-19, GFZ, Potsdam, Germany, Potsdam Summer School 2018 – The Skin of the Earth. The Earth Surface System. Web: <http://potsdam-summer-school.org/>
- 17-21, EMSEV, Potenza, Italy, International 2018 EMSEV Workshop. Web: <http://web.unibas.it/emsev2018/index.php/en/>
- 17-21, IAG, Copenhagen, Denmark, Gravity, Geoid and Height Systems (GGHS 2) Symposium. Web: <http://www.space.dtu.dk/english/gghs2018>
- 17-22, IAGA, L'Aquila, Italy, Course of the International School of Space Science (ISSS) on "The Polar upper Atmosphere: From science to operational issues". Web: <http://www.cifs-iss.org/futurecourses.asp>
- 21-27, IAVCEI, Toba Caldera, Sumatra, Indonesia, 7th Workshop on Collapse Calderas. Web: <https://staff.aist.go.jp/geshi-nob/CCC/>
- 24-26, IAG, Ponta Delgada, Azores, Portugal, International DORIS Service (IDS) Workshop. Web: <https://ids-doris.org/ids/reports-mails/meeting-presentations/ids-workshop-2018.html>
- 24-26, IAHS, Adelaide, Australia, STAHY 2018, Web: <https://www.stahy2018.org/>
- 25-27, AGU, Washington, DC, USA, Chapman Conference on Hydrologic Research in the Congo Basin. Web: <http://chapman.agu.org/congo-hydrologic-research/>
- 25-29, IAMAS, IUGG, Takamatsu, Japan, 2018 joint iCACGP 14th Quadrennial Symposium and IGAC 15th Science Conference (iCACGP). Web: <http://icacgp-igac2018.org/>

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