



**INTERNATIONAL UNION OF GEODESY AND GEOPHYSICS**  
**UNION GEODESIQUE ET GEOPHYSIQUE INTERNATIONALE**

## **The IUGG Electronic Journal**

**Volume 13 No. 11 (1 November 2013)**

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.

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### **1. IUGG Business Meetings in Prague, Czech Republic**

The IUGG Bureau, Executive Committee (EC), Finance Committee (FC), and Science Program Committee (SPC) meetings were held in Prague, Czech Republic, from 19 to 24 September 2013. The Bureau (President, Vice President, Secretary General, Treasurer, and three members at large) met on 20-21 September, and the IUGG EC held its meeting on 21-23 September. The IUGG EC is comprised of the IUGG Bureau, the immediate Past President of IUGG, and the Presidents of eight Union Associations. The Association Secretaries-General, the Chair of the IUGG FC, and the Secretary-General of the International Lithosphere Program (ILP) were invited to attend the EC meeting.



*During the EC meeting, 21 September 2013, Corinthia Hotel, Prague (photo: H. Volkert)*

The IUGG President, the Secretary-General, and the Presidents of the Union Associations reported on the activities since the last EC meeting (Melbourne, Australia, July 2011). The IUGG Vice President reported on the activities of Union Commissions. The EC ratified its decision to establish the Union Commission on Climatic and Environmental Changes (CCEC) and the Union Working Group on History (WGH). The IUGG Executive Secretary reported on the activity of the IUGG Secretariat and new initiatives related to an IUGG Facebook page, a central electronic library, web-conferencing software, and an online voting system. The IUGG Treasurer reported on the financial situation of the Union. Other topics on the agenda included (i) the preparations for the 2015 IUGG General Assembly in Prague (Chair of the Local Organizing Committee Vladimir Cermak reported on the activity of the Committee); (ii) the development of an honor and recognition program; (iii) appointments to the Statutes / By-Laws Committee, the Resolution Committee, the Nominating Committee for the 2015 Election, and the Site Comparison Committee for the 2019 General Assembly; (iv) the International Lithosphere Program (the ILP Secretary-General Magdalena Scheck-Wenderoth reported on the activities of the scientific program), (v) Union activities in the Joint Board of ICSU GeoUnions; (vi) reports of the IUGG liaisons to the ICSU Scientific Committees and to international and intergovernmental organizations; (vii) Union activities on capacity building and education; and (viii) the relationship to IUGG National Committees. The EC established three new Awards: the Gold Medal, IUGG Fellowship, and the Early Career Scientist Award (to be announced soon).

On 20-21 September the IUGG Finance Committee (FC) met in Prague to discuss the IUGG financial report for 2011-2012, to review the IUGG accounts, to overview administrative matters, IUGG grants, allocations, and inter-association activities. The IUGG Treasurer was invited to attend the FC meeting.

On 22 September, the IUGG Executive Committee and Association Secretaries-General met the members of the Local Organizing Committee for the 2015 IUGG General Assembly and visited the venue of the future Assembly.



*IUGG officers during the visit of the Prague Congress Center (Photo: H. Volkert)*

The Science Program Committee (SPC) for the XXVI General Assembly of IUGG met on 24 September. The SPC is comprised of the Chair (Eduard Petrovsky), the IUGG Secretary-General, 8 Association Secretaries-General, and the IUGG President (ex-officio). Several Czech representatives of the SPC and the Chair of the Local Organizing Committee were invited to the SPC meeting. The tentative draft of the science program was discussed including topics of Union and inter-Association symposia. The science program should be finalized by early 2014.

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## 2. IUGG on Facebook

To learn more about IUGG and to keep individuals updated on Union's activities, the IUGG Secretariat launched an IUGG Facebook page on 11 October 2013. Everyone is welcome to join IUGG on <https://www.facebook.com/InternationalUnionGeodesyGeophysics>. The news about the XXVI IUGG General Assembly, 22 June – 2 July 2015, Prague, Czech Republic, will be posted on <https://www.facebook.com/pages/26th-IUGG-General-Assembly/656937564347023?fref=ts> by C-IN, a professional conference organizing company, responsible for organization of the IUGG event in Prague.

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## 3. IAG Scientific Assembly 2013 “150 Years of International Cooperation in Geodesy”

The International Association of Geodesy (IAG) held its Scientific Assembly, on 2-6 September 2013 in Potsdam, Germany, on the occasion of the 150<sup>th</sup> anniversary of international cooperation in geodesy. The Central European Arc Measurement (Mittleuropäische Gradmessung), which is considered the forerunner of IAG, was initiated by the Prussian General Johann Jacob Baeyer in 1862 and successfully started with the first General Assembly in Berlin in 1864. After extending to all Europe in 1867 and to the International Geodetic Association in 1887, the Section of Geodesy was officially integrated into the IUGG in 1922 and officially became today's International Association of Geodesy in 1946.



*Participants of the IAG Scientific Assembly, Potsdam, Germany, 2-6 September 2013 (photo: H. Drewes)*

532 participants from 47 countries registered at the Scientific Assembly 2013, which was organized by the GFZ German Research Centre for Geosciences, Potsdam. There were 240 oral and 220 poster presentations under the six themes: (i) Definition, implementation and scientific applications of reference frames; (ii) Gravity field determination and applications; (iii) Observing, understanding

and assessing Earth hazards; (iv) Science and applications of Earth rotation and dynamics; (v) Observation Systems and Services; and (vi) Imaging and Positioning Techniques and applications.

In the opening session there were words of greetings and congratulations of State Secretaries of the German Federal Ministry of the Interiors, the Federal Ministry of Education and Research, and the Ministry of Science, Research and Culture of the State of Brandenburg. The scientific sister associations and societies were represented by welcome speeches of the IUGG Vice-President Michael Sideris and the Joint Board of Geospatial Information Societies (JBGIS) representative Christian Heipke. The IAG Young Authors Awards for best papers published in IAG's Journal of Geodesy during the last two years were presented to Thomas Artz, Germany (for 2011) and Manuela Seitz, Germany (for 2012).

A special session on the IAG history included three lectures covering the periods from 1862 to 1916, 1917 to 1959, and 1960 to 1990 were given by Past President Wolfgang Torge, Past Secretary General Claude Boucher, and Past President Ivan Mueller, respectively. The following years up to present were presented thematically in the sessions of the specific themes. The session on history was followed by guided tours of the historical facilities at Telegrafenberg, the domicile of the former Prussian Royal Geodetic Institute, a barbecue celebration and ad hoc presentations, historical movies, photos, and amusing tales relevant to the 150<sup>th</sup> anniversary.



*From left to right: IAG Presidents I. Mueller (1987-1991), C. Rizos (2011-2015), W. Torge (1991-1995), M. Sideris (2007-2011), and G. Beutler (2003-2007)*

Interesting and novel results were presented in all the sessions on the six scientific themes. Highlights were the studies on the improvement of celestial and terrestrial (global and regional) reference frames; results of the satellite gravity field missions GRACE and GOCE; observations of sea level rise and seismic crustal deformations; theoretical studies on precise modelling of Earth rotation; the Global Geodetic Observing System (GGOS); and the precise positioning by combining the present and upcoming GNSS techniques.

In the closing session there were short résumés of the conveners of the themes, and the presentations of the best young authors' talks and posters awards endowed with a financial grant. The best talk awards were handed over to Mathis Bloßfeld (Germany), Liang Wenjing (Germany), and Sara Bruni (Italy). The best poster awards were presented to Krzysztof Sosnica (Poland),

Benedikt Soja (Germany), and Ulla Kallio (Finland). Book gifts (Torge: Geodesy) were given to eight other outstanding oral and poster presentations.

Received from Hermann Drewes, IAG Secretary General

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#### 4. Report on the Training School on Impact of Solar Variability on Climate

TOSCA (“Towards a more complete assessment of the impact of solar variability on the Earth’s climate”, <http://www.tosca-cost.eu>) is a multidisciplinary European network of scientists from more than eighteen countries whose objective is to provide a better understanding of the role of the Sun in climate change. This action aims at assessing the various contributions of solar variability to the Earth’s climate by bringing together solar physicists, space scientists, atmospheric scientists, climate modelers, paleoclimatologists, and others. TOSCA organized its first training school in Thessaloniki, Greece, from 10 to 15 March 2013. The objective of this school was to give young scientists a global understanding of the topical but also controversial role of solar variability in climate change. 28 students and early-career scientists from 17 countries attended this school. It was a very diverse group of bright students and young scientists with expertise in various research topics such as lightning and atmospheric electricity, operational space weather, ocean dynamics, geomagnetism, neutron monitors, radiative transfer modelling, regional climate simulations, solar image analysis, and some others. The participation in this school was entirely free of charge, but students were encouraged to contribute at least partly to their travel expenses. Financial support from COST (European Cooperation in Science and Technology), IUGG (IAMAS/ICMA), SCOSTEP, and COSPAR enabled participation of more students.



*Participants of the School (Photo: T. D. de Wit)*

The five-day program featured lectures, a computer class, a poster session, two movies with a debate, and a daily assessment. Lectures addressed various aspects of the Sun-climate connection, with a blend of fundamental physical issues, key questions, and practical aspects such as existing sources of data. Among the lessons learnt were the importance of being pedagogically innovative in order to get students actively involved rather than having them just listen to the lectures. Another major challenge was how to give a good understanding of a large variety of physical processes to such a diverse audience. This highlighted the importance of conveying information on the basic physical meaning of the processes rather than on specific issues and nomenclature. The debate showed how unprepared we are for bringing scientific concepts to the public, especially when

facing opposition. Clearly, more effort should be spent on helping students and lecturers to communicate controversial issues.

Received from Thierry Dudok de Wit, on behalf of TOSCA

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## 5. Obituaries

### *Volodya Keilis-Borok (1921-2013)*



Vladimir Keilis-Borok, IUGG President (1987-1991), was one of the most influential mathematical geophysicists of our time. He was engrossed by the idea of earthquake prediction and spent the last few decades of his life on understanding nonlinear processes in the Earth's lithosphere leading to earthquakes. He developed a distinguished group of experts in mathematical geophysics, who contributed together with him to the theory of lithosphere dynamics, seismic hazards and risk, and earthquake prediction. Volodya Keilis-Borok (Vladimir Isaakovich - how Russians called him, Volodya - for his friends or KB - for many of his colleagues) passed away on 19 October 2013 in Los Angeles, California, at the age of 92.

Born in Moscow (Russia) in 1921, he graduated from the Moscow State Geological Prospecting University in 1943 and received his PhD and DSc (Habilitation) degrees in mathematics and geophysics from the Russian Academy of Sciences in Moscow in 1948 and 1953, respectively. He worked at the Schmitt Institute of Physics of the Earth from 1948 to 1989 and chaired the Institute's Department of Computational Seismology. In 1989 he founded the Moscow Institute of Earthquake Prediction Theory and Mathematical Geophysics and became the Institute's first Director. After his retirement from the leadership of the Institute in mid 1990s, he moved to USA and became a distinguished professor of the University of California at Los Angeles (UCLA).

Trained as a geologist and a mathematician, the scientific credo of Volodya became 'mathematics for geophysics'. His early research was concentrated on seismic source modelling, surface wave propagation in elastic layered structures, and inverse problems in seismology. He collaborated with great mathematicians Israel Gelfand, Nobel Prize winner in economy Leonid Kantorovich, Andrei Kolmogorov, and Yakov Sinai as well as with great geophysicists Keith Aki, Leon Knopoff, Frank Press, Don Turcotte, Seiji Uyeda, and many others. In mid 1960s Keilis-Borok initiated two research programs: on seismic risk analysis (with Leonid Kantorovich and George Molchan) and recognition of the regions prone to potential large earthquakes (with Israel Gelfand and Leon Knopoff). As results, a general probabilistic approach to seismic risk assessment and pattern recognition methods to predict large earthquakes and other extreme events were developed. Keilis-Borok with his colleagues applied pattern recognition methods to predict earthquakes as well as socio-economic events with notable success. For example, together with Vladimir Kossobokov (a statistical seismologist of his Moscow group) they predicted great earthquakes around the world with a success rate of over 70%, and together with Allan Lichtman (a political historian of the American University in Washington, D.C.) they predicted the popular vote winner of presidential elections in USA from 1984 to 2012 as well as 128 out of 150 U.S. mid-term Senatorial elections since 1986.

Responding to an invitation of Abdus Salam, a Nobel Prize winner in Physics, and the founding Director of the International Centre for Theoretical Physics (ICTP) at Trieste, Italy, Volodya Keilis-Borok established in the mid 1980s a research program on structure and nonlinear dynamics (SAND group) in ICTP to promote research and education in theoretical geophysics in economically less-developed countries. Alternating biennial advanced schools on nonlinear dynamics and earthquake prediction and schools on inverse problems in seismology organized by Keilis-Borok for about two decades disseminated modern knowledge in theoretical seismology and geodynamics.

Keilis-Borok was the founding Chairman of the International Committee for Geophysical Theory and Computers (1964-1979, now the IUGG Union Commission on Mathematical Geophysics). He served IUGG as a Bureau Member (1983-1987) and the International Association of Seismology and Physics of the Earth's Interior (IASPEI) as Vice President (1983-1987), and he was also Board Member and Chair of Mathematics and Natural Sciences Section of the International Council for Science (ICSU, 1988-1991). He was a member of many expert groups and scientific committees including the Committee for International Security and Disarmament of the Russian Academy of Sciences, the Scientific Committee for the U.N. Decade for Natural Disasters Reduction, and the International Working Group on the Geological Safety of Nuclear Waste Depositories.

Keilis-Borok was an elected member of the American Academy of Arts and Sciences (1969), U.S. National Academy Sciences (1971), Russian Academy of Sciences (1988), the Royal Astronomical Society (1989), Austrian Academy of Sciences (1992), Pontifical Academy of Sciences (1994), and Academia Europaea (1999). He was awarded the first Lewis F. Richardson Medal of the European Geophysical Society for exceptional contributions to nonlinear geophysics, a Doctor Honoris Causa of the Institut du Physique du Globe de Paris, France, and the 21st Century Collaborative Activity Award for Studying Complex Systems of the McDonnell Foundation.

Volodya loved his science, he could not live without it. He loved people, and could not live without them. Volodya had an impressive knowledge of history, literature, music, and he knew several languages. He could recite Shakespearian sonnets in English and Russian (in the translation by B. Pasternak, Nobel Prize Winner in literature) and Goethe poems in German. Last time I met Vladimir Isaakovich was in his flat in Los Angeles in December 2012. He was already not well, but his eyes were shining when we spoke about advances in geophysics and especially in earthquake science.

“Why is it that some of us still decide to become scientists, despite the fact that businessmen, lawyers, and doctors enjoy a much higher income?” Volodya asked and answered. “A famous Russian writer Leo Tolstoy once wrote that a writer is not merely a person who writes; a writer is a person who cannot live without writing. The same, I believe, is true for a scientist. Science is an exciting adventure where major rewards come from the discovery itself. What you get instead of big money is freedom, camaraderie, and independence. The honors and promotions will depend on yourself more than in the other occupations. And you will have the overwhelming feeling of uncovering yet another one of nature's mysteries.”<sup>1</sup>

There are not many scientists who consider that earthquakes can be predicted, but it was not the case with Volodya. He always said that earthquake prediction is the Holy Grail of earthquake science. “Earthquakes can and should be predicted, although earthquake prediction is a challenging task”. Volodya liked to quote British Prime Minister W. Churchill when he heard concerns regarding his earthquake predictions: “This is not the beginning of the end, it's the end of the beginning”. Frank Press, the Science Adviser to President Jimmy Carter and former President of the

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<sup>1</sup> Keilis-Borok, V.I., 2004. Scientific research is a token of humankind's survival. In: *One Hundred Reasons to be a Scientist*, ed. K. Sreenivasan. Trieste, Italy: ICTP, pp. 124-126.

U.S. National Academy of Sciences, wrote on the occasion of Volodya's 90th birthday: "Volodya, your career in science has been both creative and controversial - the same characterization that can be said of Fred Hoyle, Linus Pauling, even Albert Einstein. Knowing you, I am sure that age will be no impediment and that you will continue to put forward new concepts that will stimulate much discussion, not only in geophysics but in the social sciences as well."

Life is limited, and unfortunately, Vladimir Isaakovich Keilis-Borok cannot anymore "put forward new concepts", but his students and colleagues infected by Keilis-Borok's great enthusiasm will continue scientific research "uncovering yet another one of nature's mysteries". Volodya will be remembered by his family, friends, and colleagues around the world as a great Man, Scientist, and Teacher.

Alik Ismail-Zadeh

### ***Duzheng Ye (1916-2013)***



Duzheng Ye (also spelt as Tu-Cheng Yeh), a world-renowned meteorologist, passed away on 16 October 2013 at the age of 98. Professor Ye was a member of the Chinese Communist Party, one of the two prize winners of the National Supreme Scientific and Technological Award in 2005, winner of the 48<sup>th</sup> IMO (International Meteorological Organization) Prize in 2003, a member of the Standing Committee of the 6<sup>th</sup> and 7<sup>th</sup> National People's Congress, a Senior Academician, a former Vice President and Special Consultant of the Chinese Academy of Sciences. He served as an IUGG Bureau Member from 1987 to 1995.

Duzheng Ye devoted himself to the Earth Sciences for more than 70 years and made major contributions to developments in this discipline. He was born in Tianjin, China on 21 February 1916. He received his first degree from the Department of Meteorology, Tsinghua University in 1940, and Master's degree from Zhejiang University in 1943. During 1945-1948, he studied at the University of Chicago supervised by Carl-Gustaf Rossby and obtained his PhD degree. He returned to China in 1950 and was one of the main founders of modern meteorology in China. He instigated the now well-established research efforts devoted to Tibetan Plateau meteorology; discovered the seasonal abrupt change of atmospheric general circulation over Asia; developed the theory of atmospheric long wave energy dispersion, and therefore provided the theoretical basis for modern atmospheric long wave forecasts; proposed a theory for the scales of atmospheric motion, which has since been applied to weather forecasting; and expanded global change research by building a framework of "orderly human activities" in the context of a life-supporting environment and proposing climate change adaptation theories. He actively advised and participated in the meteorological operation systems of China and made outstanding contributions to modern meteorological operations in the country.

Duzheng Ye was elected a Foreign Member of the Finish Academy of Sciences and Letters, Honorary Member of the American Meteorological Society, and Honorary Member of the Royal Meteorological Society of the United Kingdom. He served as President of the Chinese Meteorological Society and Chief Director and Honorary Director of the Institute of Atmospheric Physics, Chinese Academy of Sciences.

Duzheng Ye was also actively involved in international cooperation and coordination. He served as an executive member of many international organizations, including: the Joint Scientific Committee/World Climate Research Programme (JSC/WCRP), the International Association of



Meteorology and Atmospheric Physics (IAMAP) Executive Committee, and the International Geosphere-Biosphere Programme (SC-IGBP). In addition to his outstanding scientific achievements, Prof. Ye was also a great mentor and many of his students have, through his guidance, become renowned scientists in the international Earth Sciences community. He was, in every aspect, a true “master” of science and teaching and was widely remembered and respected.

Prof. Duzheng Ye fully dedicated his life to his profession and his country. He will be remembered for his leadership, innovation, generosity, and kindness. His passing is a great loss to the science community, and he will be sorely missed.

Source: website of the Institute of Atmospheric Physics, Chinese Academy of Sciences

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## 6. IUGG-related meetings occurring during November – December

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>). Specific information about these meetings can be found there. Individual Associations also list more meetings on their websites according to their disciplines.

### *November*

- 11-15, IAG, Fujiyoshida, Japan, 18th International Workshop on Laser Ranging. Web: <http://geo.science.hit-u.ac.jp/lw18/>
- 12-15, IRDR, Sanya, China, Scientific Committee and IRDR-China meetings.
- 16-18, GeoUnions, Antalya, Turkey, Joint Board Meeting of the ICSU GeoUnions.
- 18-20, IUGG/WMO, Geneva, Switzerland, 2<sup>nd</sup> IUGG-WMO workshop on ash dispersal forecast and civil aviation.  
Web: <http://www.unige.ch/sciences/terre/mineral/CERG/Workshop2.html>.
- 27-29, IAHS, Kathmandu, Nepal, International Conference on Climate Change, Water and Disaster in Mountainous Areas. Web: <http://www.soham.org.np/news/international-sem-2013.pdf>

### *December*

- 9-13, AGU, San Francisco, USA, Fall Meeting of the American Geophysical Union. Web: <http://fallmeeting.agu.org/2013/>

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**Note: Contributions to IUGG E-Journal are welcome from members of the IUGG family. Please send your contributions to Alik Ismail-Zadeh by e-mail (insert in Subject line: *contribution to E-Journal*). The contributions will be reviewed and may be shortened.**