



# News



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**IAGA, the International Association of  
Geomagnetism and Aeronomy,**

is the premier international scientific association promoting the study of terrestrial and planetary magnetism and space physics

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## Foreword



This issue of IAGA News contains information about the IAGA 2013 Scientific Assembly, held August 26-30, 2013 in Mérida, Mexico, under the motto "Living on a magnetic planet". What a great conference this was!! The science

presented was truly at the cutting edge, the organization was fantastic and the social and networking opportunities were great and a lot of fun. Just a triple AAA!

Some major decisions taken during the Assembly by the IAGA Conference of Delegates and the Executive Committee are also reported here.

This issue also contains reports on IAGA activities of different kinds and provides information about deceased IAGA scientists. In its present form, IAGA News contains brief summaries of different activities and topics; the reader is referred to the IAGA website ([www.iugg.org/IAGA](http://www.iugg.org/IAGA)) for more details.

IAGA News is distributed – in its electronic form – to the National Correspondents in the Member Countries, to all IAGA officers and to IAGA scientists who have attended recent IAGA assemblies. Please feel free to distribute IAGA news around, especially to national policy makers and leaders, whose decisions can affect the activities of IAGA scientists.

Keep on supporting all IAGA activities!

Mioara Mandea  
(Secretary-General)

## IAGA on the Web

Information on IAGA is regularly updated at the IAGA site:

<http://www.iugg.org/IAGA/>

## 1 Message from the President



The highlights of my year have to be the excellent Scientific Assembly in Mérida, Mexico, and the successful launch of ESA's Swarm constellation magnetometry mission in late November.

In Mérida, it was my pleasure to recognise the achievements of

IAGA scientists at all stages of their careers at the awards ceremony. We were then treated to fine cultural displays, accompanied by local food specialities. The facilities for the Scientific Assembly were very good. Participants appreciated not having to move far between sessions, as has happened at some previous Assemblies. As noted in the fuller report on the meeting below, financial problems meant that fewer North Americans and southern Europeans were able to attend than anticipated. Visa delays and problems affected others intending to attend, including some who were denied transit visas on arrival in the USA, an issue that prompted the Conference of Delegates to pass a resolution (see Resolution 4 below). We are taking up the matter with ICSU. Despite the smaller number of participants, we had few cancellations in the oral programme, and lively discussions accompanied most sessions. There were a few too many empty poster boards, but the drinks accompanying the late afternoon poster session ensured a good turn out! The Local Organising Committee received sponsorship for organising an outreach session for local school teachers, which was very well received. We had excellent, well attended presentations from our two Association Lecturers and two evening speakers on Mayan scientific knowledge.

We enjoyed more local culture at the conference dinner, held at a hacienda on the outskirts of the city. Mérida was at the centre of the sisal trade in the nineteenth and early twentieth centuries, and most surviving haciendas retain some of that heritage. It is still well-known for its sisal hammocks, and the accompanying persons programme in-

cluded a visit to a small-scale, quality producer, part of what several people commented on was one of the most interesting and varied accompanying persons programmes they had ever participated in. Many delegates also found time to enjoy cultural and recreational activities in the area, including visiting Mayan ruins, seeing flamingos on a nature reserve, and swimming or diving in fresh water sinkholes and caves, known locally as cenotes.

I'm delighted that our first Summer School was so successful, as judged by both the students and their lecturers - as one of the lecturers commented to me, 'we should have started doing this years ago!'. I hope it stimulates, encourages and enables attendees to continue their scientific careers, helping to maintain the strength of the IAGA community. They worked hard and played hard, making the most of the opportunity to engage with leaders in the field, learn new skills and techniques, and interact and socialise together. We got informal feedback from the participants at the time, and conducted a survey afterwards, to see if there were changes to the format that would make it an even more valuable experience in the future.

I would like to pass on my personal thanks to the Local Organising Committee, especially its Chair, Harald Böhnel, for a job very well done. In addition, Harald's wife is to be congratulated for running an excellent accompanying persons programme. I'm very grateful to those who gave up their time for the school teachers' workshop, and to our Association and evening lecturers. A big thank you also to the Secretary General, the Division and Working Group chairs, and session convenors and chairs, for putting together and managing a stimulating programme. Also, thanks to all the scientists who contributed to the meeting, even if they did not attend in person. The Summer School's success depended on Eduard Petrovsky personally taking charge of the organisation and spending a lot of time and sustained effort to ensure it went ahead. We all owe him a debt of gratitude for establishing this new initiative.

I am pleased that the Conference of Delegates approved the proposal to hold a joint Assembly with IAMAS and IAPSO in Cape Town in 2017, the other two Associations having already taken the decision to meet there. The organisation will be

complex and challenging, but the potential benefits to our science are enormous. It will be the first time IAGA has held an Assembly in Africa.

The Secretary General and I were at IUGG meetings in Prague in September, which included a tour of the conference centre in which the 2015 IUGG General Assembly will be held. Planning is now well under way for the meeting, and urge all of you asked to convene and co-convene symposia to respond positively.

Many in the IAGA community are excited now that ESA's Swarm mission has finally launched successfully. Next year's Swarm International Science Meeting will be in my diary.

The year ahead promises many interesting topical meetings and workshops that IAGA is sponsoring. I wish everyone involved smooth journeys and productive interactions.

Finally, I hope all readers will join me in thanking our Secretary General, Mioara Mandea, for her tireless efforts on behalf of the Association, without which it just would not function! She carries an enormous workload and a great deal of responsibility, largely unseen. She has the unenviable task of trying to keep me, and the rest of the Executive Committee, in order and on track.

Kathryn Whaler  
(President)

## 2 The XII<sup>th</sup> IAGA Scientific Assembly, Mérida, Mexico

### 2.1 Participation



The IAGA 2013 Scientific Assembly took place August 26-30, 2013 in Mérida, Mexico, under

the motto "Living on a magnetic planet". The meeting was attended by 459 participants from 43 countries, a smaller number than expected and probably caused by the recent economic restrictions in the USA and southern Europe. 871 papers (609 oral and 262 posters) were presented in 51 sessions organized by the five IAGA Divisions and the two Interdivision Commissions.



An Opening Ceremony was held the evening of August 24, followed by the first IAGA Award Ceremony. The new Shen Kuo Medal for Interdisciplinary Achievements was awarded for the first time to Jean-Louis Le Mouël (France), the IAGA Long Service Medal honored Evgeny Kharin (Russia) and Michel Menville (France), and the IAGA Young Scientist Award was given to Henrique Aveiro (USA), Laura Holt (USA), Cristina Garcia-Lasanta (Spain) and Ilya Kuzichev (Russia).

Two remarkable Association Lectures were delivered by Cathy Constable, "A survey of geomagnetic field variations over the past 10 thousand years: evolutionary trends from the dipole to the South Atlantic Magnetic Anomaly", and by Eigil Friis-Christensen, "The three-satellite geomagnetic field mission, Swarm".



The week before the meeting, the 1st IAGA Sum-

mer School was held, with 20 students and 8 renowned teachers. The Summer School students stuck together for the rest of the meeting, so it must have been very successful!

During the meeting, a high school teachers workshop was organized, with 40 teachers from the Yucatan peninsula participating. They received an introduction to different geomagnetism themes and later constructed simple instruments which may be easily constructed and used at their schools.

Two different evening lectures about archeo-astronomy of the ancient Maya calendar and the surprising astronomical knowledge of the Mayans were presented by Mexican scientists, José Franco-López and Jesús Galindo-Trejo. Pre- and post-meeting excursions were organized to some of the spectacular Mayan archeological sites nearby, including Uxmal, Chichen Itza, and Dzibichaltun, as well as to natural sink hole (cenotes) sacred sites, and to the ecological reserve Celestun.

The meeting provided many occasions for scientists to discuss all these topics, over breaks, poster sessions, and the IAGA conference dinner!

Participants enjoyed the very comfortable, safe and therefore relaxed environment of Mérida city and the charm and kindness of the local people. The IAGA EC members and the National Delegates warmly thanked the LOC and particularly its chair, Harald Böhnel, for the meeting organization.



Altogether 6 topics across all the disciplines of IAGA were covered by lectures given by top experts in their respective fields: Ionosphere and Thermosphere (Andrew Yau, Calgary, Canada); Geomagnetic Observations, Field Models and Geodynamo (Mioara Mandea, Paris, France; Monika Korte, Potsdam, Germany; Alexandre Fournier, Paris, France); Wavelet Analyses (Matthias Holschneider, Potsdam, Germany); Paleomagnetism (Lisa Tauxe, San Diego, USA); Magnetic Anisotropy (Martin Chadima, Brno, Czech Republic) and Electromagnetic Induction (Alan Jones, Dublin, Ireland). Lectures were followed by practical exercises.



## 2.2 The First IAGA Summer School

The first IAGA Summer School took place in Mérida, Mexico, from 19-27 August 2013 (the week before the IAGA Scientific Assembly). The event was attended by 20 pre- and post-graduate students from 11 countries worldwide (including China, Russia, Mexico, Brazil, Peru, USA, France, and Austria). These attendees included students nominated for the IAGA Young Researcher Award, and nominated by the IAGA Division and Working Group leaders. The event was also open to any other interested person able to fund themself.

The whole event took place in a very informal and friendly – though hard-working! – atmosphere. Not only the students, but also the lecturers enjoyed the event very much. This was evident from the bonding that developed among the students right from the beginning. The fact that they all stayed in the same hotel and enjoyed the vibrant city center every evening contributed to this atmosphere significantly. All the students became highly visible during the IAGA Assembly. Their attitude and mutual support was evident also during scientific sessions, when very often a group of students attended talks and posters given by their colleagues, with lively discussion ensuing.

Last but not least, a trip to a cenote, with swimming inside a cave, made the event even more pleasant. The main aims, increasing the visibility and attractiveness of IAGA to young researchers, providing young promising researchers with an overview of the activities carried out within IAGA across all fields of research related to the Earth's magnetic field and aeronomy, and to facilitate establishing new personal contacts, were fully accomplished. The IAGA Executive Committee is firmly committed to organizing similar events in the future.

We are very grateful to the European Geosciences Union (EGU), who provided significant sponsorship, and to AGICO (Brno, Czech Republic), who provided an instrument for measuring magnetic anisotropy and fully covered the costs of their lecturer. Finally, the event would have been impossible without the great hospitality and help of local Mexican organizers and without the enthusiasm and time offered by Eduard Petrovsky.

### 2.3 The First IAGA Shen Kuo award



Jean-Louis Le Mouël was awarded the first Shen Kuo medal for outstanding contributions to geomagnetism over his long and distinguished career. Through his combination of observational and theoretical work at Chambon-la-Forêt magnetic observatory and at Institut de Physique du Globe de Paris, we have a much wider and more readily accessible suite of geomagnetic measurements, and a better understanding of the dynamical processes operating in the Earth's core responsible for the geodynamo, and of the electrical characteristics of the Earth's mantle.

Jean-Louis was instrumental in establishing the extensive French geomagnetic observatory network and in encouraging regional magnetic surveying (including aeromagnetic surveys), data sources which have been crucial to the international community, both research and exploration, over so many years. He was a key figure in establishing the worldwide INTERMAGNET geomagnetic observatory network, and associated data standards. He encouraged electromagnetic in-

vestigation of tectonically and volcanically active regions in areas of French influence world-wide. He has played a prominent role in the space age, through initiating a collaboration that led to the construction of the absolute magnetometers on board the Ørsted and CHAMP satellites; the success of these missions set the stage for the satellite constellation Swarm.

Amongst his major scientific achievements, the discovery of geomagnetic 'jerks' or impulses is probably the best known. Their origin remains enigmatic, but they have implications for core dynamics, core-mantle coupling, and the electrical conductivity of the mantle, all areas in which Jean-Louis and colleagues have made significant contributions. He introduced a dynamic constraint – tangential geostrophy – on the outer core fluid at the core-mantle boundary, which has been a crucial component of using the geomagnetic secular variation as a tracer of the flow. The flows deduced predict the decadal timescale changes in length-of-day, an independent data set, through angular momentum exchange between the core and mantle.

Besides his contributions to geomagnetism through fundamental developments in observations and theory, as evidenced by more than 230 publications cited almost 5000 times, Jean-Louis has served the geomagnetism (and wider geoscientific) community, nationally and internationally, with exceptional dedication. Besides his leadership of IPGP, he was instrumental in the establishment of the IUGG Studies of the Earth's Deep Interior commission, and served a term as its Chair. He has also supervised and mentored a large number of young scientists, many of whom are now senior members of the geomagnetism community.

### 2.4 IAGA Long Service Award



**Dr. Evgeny Kharin** was awarded an International Association of Geomagnetism and Aeronomy long service medal for his significant contributions to accumulation, retention and dissemination of data on the Earth's magnetic field required for fundamental scientific research. He was Director of the

World Data Center for Solar-Terrestrial Physics for 42 years based at the Geophysical Center of the Russian Academy of Sciences. Through his extensive experience of working with geophysical data, he developed international systems of collecting and storing data on the Earth's magnetic field, the ionospheric phenomena of solar activity, and cosmic rays. Of particular note is his contribution to the long series of observations of geomagnetic variations and geomagnetic indices, which are included in the international Space Physics Interactive Data Resource (SPIDR). Under his leadership and with his direct involvement, international projects were undertaken to save historic magnetograms, and to prepare for and collect data and information from the International Polar Year 2007-2008 (for which he was awarded Diplomas by the Russian Academy of Sciences and the Organizing Committee). Latterly, he took an active role in developing the national node for Russian INTERMAGNET data collection.

Sadly, he passed away soon after the awards ceremony at the Mérida Scientific Assembly.

**Prof. Menvielle** of the French magnetic observatory was awarded an International Association of Geomagnetism and Aeronomy long service medal for his extensive and sustained contributions to IAGA and geomagnetism.

Prof. Menvielle was the French national delegate to IAGA for a number of years, and served on IAGA's Executive Committee from 1995 to 2003, during which time he translated the statutes and by-laws into French. He has also served on its Resolutions Committee several times, again taking responsibility for the French translation. He was a valuable Local Organising Committee member for the 2005 Scientific Assembly in Toulouse.

The International Service of Geomagnetic Indices (ISGI), of which Prof Menvielle has been Director since 1988, keeps definitive digital and digitised records of IAGA-endorsed indices and geomagnetic events, many of which now have very long homogenous series. Some indices were introduced by Prof Menvielle, and the K-index is now produced automatically based on his analysis of methods recommended by IAGA. Ready access to these long time series, which he facilitated, is important, for example, to select data

for IGRF candidate modelling. Another service provided by ISGI is near real time indication of magnetic activity. Its importance is recognised by membership of the ICSU World Data System. Prof Menvielle's other scientific interest is electromagnetic induction, where his contributions include algorithms applicable to planetary induction studies from orbiting and lander magnetometers, and research into the coast effect and the utility of ocean bottom magnetotelluric measurements. He has led several working groups and ad hoc committees, and convened or co-convened many scientific sessions and workshops, on both electromagnetic induction (including joint inversion of electromagnetic, geodetic and seismic data) and geomagnetic indices. He has been a proponent of satellite missions to the Earth and other terrestrial planets to measure and characterize their magnetic field environments, as well as for induction studies. Related to this he has recently been studying the thermosphere response to geomagnetic activity forcing, in order to develop a new thermospheric model that allows an accurate estimate of aerodynamic braking.

## 2.5 Report of the Meetings of the IAGA Conference of Delegates

Two meetings of the Conference of Delegates of the IAGA were held in Mérida, the first (CoD-1) on Tuesday August 27, 2013, 1600-1810, and the second (CoD-2) on Friday August 30, 0830-1005. Both meetings were attended by 25 of the Chief Delegates from the 35 voting member countries that had sent accreditation letters. The following provides a very brief summary of the topics discussed and decisions and recommendations made.

### Summary of CoD-1 minutes

The National Delegates stood for a minute of silence in remembrance of the 8 deceased IAGA members in 2011-2013.

The following items were discussed:

- President's report (IAGA activities on IUGG and ICSU Committees and other activities);
- Secretary General's report (EC membership, EC activities in 2011-2013, 2012-13 Budget, Young Scientists Award and new

IAGA awards, liaison with other organizations, support of topical meetings, and SG-specific activities);

- Finance Committee report (account balance, income, and expenses in 2011 and 2012; suggestions to maintain current, low administrative expense and to explore possible publication contracts);
- IAGA 2013 Summer School report (20 student attendees, IAGA, EGU and AGICO sponsorships);
- Reports on Divisional activities (from Div. I, II, IV, and V, and ICDC);
- 2015 IUGG GA in Prague; and 2017 IAGA-IAMAS-IAPSO SA in Cape Town.

## Conclusions, Recommendations and Decisions

- (1) The summer school was very successful, owing in part to the camaraderie that developed between the small number of participants.
- (2) The National Delegates agreed to the proposed
  - (i) task force to review the existing statutes and to recommend appropriate changes before the next IUGG GA;
  - (ii) election of M. Kono, D.J. Kerridge, C. Barton and B. Hultqvist as Honorary Members;
  - (iii) appointment of members of the Resolution Committee.
- (3) The National Delegates deferred the vote on the 2017 SA bid to the second CoD.
- (4) The National Delegates thanked the Secretary General for her great work and E. Petrovsky for his hard work and dedication to the Summer School.
- (5) The Secretary General thanked the Division Chairs for their efforts.

### Summary of CoD-2 minutes

The following items were discussed:

- Venue for the 2017 SA;
- Secretary General Report (2013 SA had 702 registered participants);

- Inputs for 2015 Scientific Program; and Resolutions from the Divisions.

## Conclusions, Recommendations and Decisions

- (1) The National Delegates voted to direct EC to request in writing a reduction in the 2017 SA registration fee.
- (2) The National Delegates accepted the resolutions from Div. I, III, and V (on MAGIC database, ULTIMA magnetometer array, and Polar Cap index, respectively), a resolution on Transit visas, and a resolution to thank the LOC.
- (3) The National Delegates accepted the plan of the EC to proceed with a proposal to establish an Interdivisional Commission on Space Weather, and to investigate other ways of voting such as electronic voting.

## 2.6 Resolutions

Draft resolutions from were presented by the Chair of the Resolutions Committee, Eduard Petrovsky, on behalf of the Resolution Committee (Iver Cairns and Erwan Thébault). After some small modifications they were accepted as follows:

### IAGA Resolution 1 – Paleo- and rock magnetic databases

IAGA, recognising the importance of large palaeomagnetic, rock magnetic and related data sets for addressing problems in global geomagnetism, stratigraphy and tectonics, noting the major effort that has gone into generating such databases, appreciates the ongoing effort in maintaining and developing the databases by IAGA and MAGIC volunteers, and urges the continuation, further development and updating of the databases.

### Résolution 1 – Bases de données paléomagnétiques et de magnétisme des roches

L'IAGA, reconnaissant l'importance des ensembles des données paléomagnétiques, de celles du magnétisme des roches, et de toutes autres données magnétiques, pour la résolution de problèmes en géomagnétisme global, en stratigraphie, et en tectonique, notant l'effort important qui a été mené pour générer ces bases

de données, apprécie les efforts continus pour le maintien et le développement de bases de données par les bénévoles membres de l'AIGA et de MAGIC, et encourage fortement la poursuite, le développement, et la mise à jour de ces bases de données.

### IAGA Resolution 2 – Magnetometer networks

IAGA, recognising the importance of global observations of magnetospheric and ionospheric phenomena by ground-based magnetometer networks, and the contributions by the "Ultra Large Terrestrial International Magnetometer Array (ULTIMA)" consortium in facilitating collaboration among ground-based magnetometer networks and in enabling observations on a global scale, endorses the international coordination of ground-based magnetometer networks, urges funding agencies to contribute to the continuing operation of magnetometer networks, and encourages other international organisations to support such efforts.

### Résolution 2 – Réseaux de magnétomètres

L'AIGA, reconnaissant l'importance des observations globales des phénomènes magnétosphériques et ionosphériques par des réseaux de magnétomètres au sol , ainsi que les contributions du consortium "Ultra Large Terrestrial International Magnetometer Array (ULTIMA)" pour faciliter la collaboration entre les réseaux de magnétomètres au sol et pour permettre des observations à l'échelle mondiale, approuve et soutient la coordination internationale des réseaux de magnétomètres au sol , exhorte les organismes de financement à poursuivre leur contribution à la poursuite du fonctionnement des réseaux de magnétomètres , et encourage les autres organisations internationales à soutenir ces efforts.

### IAGA Resolution 3 – Polar Cap (PC) index

IAGA, noting that polar cap magnetic activity is not yet described by existing IAGA geomagnetic indices, considering that the Polar Cap (PC) index constitutes a quantitative estimate of geomagnetic activity at polar latitudes and serves as a proxy for energy that enters into the magne-

tosphere during solar wind-magnetosphere coupling, emphasising that the usefulness of such an index is dependent on having a continuous data series, recognising that the PC index is derived in partnership between the Arctic and Antarctic Research Institute (AARI, Russian Federation) and the National Space Institute, Technical University of Denmark (DTU, Denmark), recommends use of the PC index by the international scientific community in its near-real time and definitive forms, and urges that all possible efforts be made to maintain continuous operation of all geomagnetic observatories contributing to the PC index.

*Note: Renewal of Resolution No. 4 (1997) after a long-term dispute about the method to derive the PC index has been settled*

### Résolution – Indice magnétique Polar Cap (PC)

L'AIGA, notant que l'activité magnétique de la calotte polaire n'est pas encore décrite par les indices géomagnétiques de l'AIGA existants, considérant que l'indice PC constitue une estimation quantitative de l'activité géomagnétique à des latitudes polaires et qu'il sert de proxy pour estimer l'énergie qui entre dans la magnétosphère au cours du couplage vent solaire-magnétosphère, insistant sur le fait que l'utilité d'un tel indice dépend de la continuité des mesures magnétiques, reconnaissant que l'indice de PC est calculé sur la base d'un partenariat entre l'Institut de recherche sur l'Arctique et l'Antarctique (AARI, Fédération de Russie) et l'Institut National de l'Espace de l'Université technique du Danemark (DTU, Danemark), recommande l'utilisation de l'indice PC par la communauté scientifique internationale dans sa forme "temps réel" ou "définitive", et demande instamment que tous les efforts possibles soient faits pour maintenir un fonctionnement continu de tous les observatoires géomagnétiques contribuant à l'indice PC.

*Note: Renouvellement de la Resolution No.4 (1997) suite à la fin de la longue controverse sur la méthode de calcul de l'indice PC.*

### IAGA Resolution 4 – Visas for scientists to attend international conferences

IAGA, noting with concern issues with transit visas for scientists travelling to participate in this

Scientific Assembly urges relevant authorities to facilitate transit for those travelling to international scientific events.

#### **Résolution 4 – Visas pour les scientifiques à participer à des conférences internationales**

L'AIGA, notant avec préoccupation les problèmes liés aux visas de transit pour les scientifiques voyageant pour participer à cette Assemblée Scientifique, exhorte les autorités compétentes à faciliter le transit à ceux voyageant pour participer à des événements internationaux scientifiques.

#### **IAGA Resolution 5 – Resolution of thanks**

IAGA, noting the successful scientific outcomes, organisation and excellent atmosphere of the IAGA Scientific Assembly in Mérida, and appreciating the enormous amount of work required to organise the meeting expresses its deep gratitude to the members of the Local Organising Committee and the staff, led by Harald Böhnel, for their hard work and unfailing courtesy, helpfulness, enthusiasm and energy, which have made the Assembly a great success.

#### **Résolution – Résolution de remerciements**

L'AIGA, notant le succès des résultats scientifiques et de l'organisation, ainsi que l'excellente atmosphère de l'assemblée scientifique de l'AIGA à Mérida, appréciant l'énorme quantité de travail nécessaire à l'organisation de la réunion, exprime sa profonde gratitude aux membres du comité d'organisation et de l'équipe locale, dirigée par Harald Böhnel, pour leur travail acharné, leur courtoisie sans faille, leur servabilité, leur enthousiasme, et leur énergie qui ont fait de cette assemblée un grand succès.

### **2.7 Report of the Meetings of the IAGA Executive Committee**

Three meetings of the IAGA Executive Committee (EC) were held in Mérida, the first (EC-1) on Sunday August 25, 2013, 1200-1715, the second (EC-2) on Tuesday August 27, 1900-2150, and the third (EC-3) on Saturday August 31, 1000-1200.

The following were in attendance at all three meetings:

President: Kathryn Whaler (UK)  
Secretary General: Mioara Mandea (France)  
Vice-President: Eduard Petrovsky (Czech Republic)

#### **Members:**

László Szarka (Hungary)  
Archana Bhattacharyya (India)  
Iver Cairns (Australia)  
Jeffrey Forbes (USA)  
Toshihiko Iyemori (Japan)  
Monika Korte (Germany)  
Andrew Yau (Canada)  
Past-President: Eigil Friis-Christensen (Denmark)

The following provides a very brief summary of topics discussed and decisions and recommendations that were made.

#### **Summary of EC-1 minutes**

The following items were discussed:

- IAGA President's report for the first Council of Delegates (CoD) Meeting;
- IAGA Secretary General's report, including new IAGA awards, IAGA communications and reports, status of IAGA 2013;
- IAGA 2013 Summer School;
- EC member participation on Resolutions Committee and attendance at Division Meetings;
- IAGA sponsorship of topical meetings;
- IAGA budget and accounting; additional funding mechanisms for IAGA;
- EC preparations for IUGG 2015 and IUGG EC meeting in 2013;
- Items raised in connection with Division I, II and V leader presentations to the EC.

#### **Conclusions, Recommendations and Decisions**

- (1) The Summer School was very successful, owing in part to the small number (20) of participants and the camaraderie that developed between them. Another IAGA school will be held at IUGG 2015, again with a similar limited number of students.
- (2) The internal budget accounting will be performed exclusively in Euros (the currency in which IAGA accounts are held) from now on.
- (3) The EC will explore new funding mechanisms such as UNBSS (United Nations Basic Space Science) Program and industry sponsorships.

- (4) The EC will organize an IAGA book as part of IUGG's 100-year Anniversary.

#### **Summary of EC-1 minutes**

The draft IAGA flyer proposed by Toshihiko Iyemori was discussed and iterated upon until a final version was agreed upon by the EC.

#### **Summary of EC-1 minutes**

The following issues were discussed:

- details of expenses, registrations and other revenues for IAGA 2013;
- discussion of Summer School and improvements for the 2015 School;
- resolutions proposed to the Council of Delegates; improvements to the IAGA web site;
- preparations for IAGA Newsletter;
- discussion of an Interdivisional Commission on Space Weather;
- discussion of content and timeline for IAGA book;
- sessions for IUGG 2015, including an Inter-Association or Union Symposium centred around the ESA Swarm mission;
- minor changes to the draft IAGA flyer were agreed upon.

#### **Conclusions, Recommendations and Decisions**

- (1) Mioara Mandea will serve her full term as IAGA Secretary General (until 2017).
- (2) The EC will proceed with a proposal to establish an Interdivisional Commission on Space Weather.

### **3 Reports on IAGA Related Activities**

#### **3.1 IAGA workshop: Third Biennial Meeting of the Latin American Association of Paleomagnetism and Geomagnetism – LatinMag, October 23-25, Montevideo (Uruguay)**

The 3<sup>rd</sup> Biennial Meeting of the Latin American Association of Paleomagnetism and Geomagnetism – LATINMAG took place from 23 to 25 October 2013, in Facultad de Ciencias at the Universidad de la República, Montevideo-Uruguay.

It involved a total of 71 people from Argentina (28), Brazil (16), Chile (2), Colombia (1), Germany (3), Mexico (6), North America (1), Uruguay (12) and Venezuela (2). It was important that our meeting was attractive, in particular to young researchers; 37 graduate and undergraduate students took part in the conference.

The scientific part of the conference consisted of four sessions: Session A: Geomagnetism - Applied Geophysics; Session B: Paleomagnetism - Tectonics; Session C: Archeomagnetism - Paleointensity - Paleosecular Variations; Session D: Rock Magnetism - Environmental Magnetism - Magnetic Fabrics.

A total of 90 abstracts were submitted. Extended abstracts at: VOLUME 3, Number 3: Proceedings of Third Biennial Meeting of Latinmag, Montevideo Uruguay, October 2013, Special Issue, L. Sánchez-Bettucci, Associated Editor; C.I. Caballero-Miranda, Technical Editor; C. Gogorza, A.M. Soler-Arechalde, Editorial Board (<http://www.geofisica.unam.mx/latinmagletters/published.html>).

There were three invited lecturers: Joachim Linthe, from the GFZ Postdam (Germany), whose talk was about "Challenges of Geomagnetic Observatory Establishment, Management and Data Quality – The GFZ Postdam (Germany) Contributions and Experiences"; Roberto Molina Garza, from the Geophysical Institute-UNAM (Mexico) who presented "Paleogeografía Jurásica, transiciones climáticas y el origen del petróleo en la región Circum-Golfo de México"; and Ricardo Trindade, from the Astronomical, Geophysical and Environmental

Sciences Institute-USP (Brazil) presented "Paleomagnetism and Paleogeographic Reconstructions". The prize "Daniel Valencio a la Trayectoria en Paleomagnetismo, Magnetismo de Rocas y Geomagnetismo en América Latina" was given to Dr. Jaime Urrutia-Fucugauchi. The prize for the best postgraduate student presentation in oral mode, was given to Mauro Leandro Gómez Samus (Argentina) for the paper "Magnetostratigraphy in sediments of Late Cenozoic of the locality of Villa Cacique, Buenos Aires province". An undergraduate student received the prize for the best presentation in poster mode, Cecilia Pérez (Uruguay) for "Preliminary study of the magnetic fabric of rhyolites and rhyolitic dykes from the Sierra de Ríos Formation". There was a tribute to Roberto Lanza.

And finally, a Latinmag Assembly was held which discussed, among many topics, the site for the next workshop to be held in 2015.

IAGA financial support was used to part-fund the cost of accommodation and registration for foreign students. Lodging and registration was paid for 10 students, and only housing for another 10. We deeply appreciate the support.

The next workshop will be held in Maresías- São Paulo, Brasil in 2015 on dates around September - October.

Leda Sánchez Bettucci  
(Chair of the Organizing Committee)

### 3.2 Report on SCOSTEP Activities: from CAWSES to VarSITI

This is a report on the activities of SCOSTEP (Scientific Committee for Solar-Terrestrial Physics), which is an interdisciplinary body of the International Council for Science (ICSU) with the following principal tasks: (1) to promote, organize and coordinate international interdisciplinary programmes in solar-terrestrial physics, (2) to conduct and sponsor international meetings in the scientific area of solar-terrestrial physics, (3) to define the data relating to these programmes that should be exchanged through the World Data Centres, and (4) to conduct capacity building activities such as advanced schools on solar terrestrial physics.

The SCOSTEP Bureau consists of a President, Vice President, Scientific Secretary, and

one representative from each of the ICSU Participating Bodies. The current officers are: N.Gopalswamy (President), F.-J.Lübken (Vice-president), M.G.Sherpherd (Scientific Secretary), A.Seppälä (SCAR), V.D.Kuznetsov (IAGA & IUGG), M.Lester (IUPAP), L.-A.McKinnell (URSI), T.Nakamura (COSPAR), D.Siskind (IAMAS), M.Zhang (IAU). The SCOSTEP website is <http://www.yorku.ca/scostep/>

In 2009-2013, SCOSTEP promoted and coordinated the research on the CAWSES Program (Climate and Weather of the Sun-Earth System) (CAWSES-I and CAWSES-II). The International CAWSES-II Symposium organized by SCOSTEP (November 18-22, 2013, Nagoya, Japan) discussed the results obtained within the framework of CAWSES-II and outlined a new research program - VarSITI (Variability of the Sun and Its Terrestrial Impact), which will start in January 2014 and will last for five years (2014-2018).

The VarSITI program will strive for international collaboration in data analysis, modeling, and theory to understand how the solar variability affects the Earth. The VarSITI program will have four scientific elements that address solar terrestrial problems keeping the current low solar activity as the common thread:

**SEE (Solar Evolution and Extrema, Chairs P.C.Martens, D.Nandi, V.N.Obridko)**

**ISEST /MiniMax24 (International Study of Earth-affecting Solar Transients, Chairs J.Zhang, M.Temmer, N.Gopalswamy)**

**SPeCIMEN (Specification and Prediction of the Coupled Inner-Magnetospheric Environment. Chairs J.Bortnik, C.J.Rodger),**

**ROSMIC (Role Of the Sun and the Middle atmosphere/thermosphere/ionosphere In Climate, Chairs F.-J.Lübken, A.Seppälä, W.E.Ward).**

VarSITI website: <http://newserver.stil.bas.bg/varsiti/>

The main subjects of the VarSITI Program are closely related to those addressed by IUGG and its associated unions (IAGA etc.), which is the basis for a broad cooperation in the related fields

of research. VarSITI Co-Chairs: K.Georgieva, K.Shiokawa.

Prof. V.D. Kuznetsov  
(IUGG/IAGA Liaison to SCOSTEP)

## 4 The Swarm mission

Nine years ago (see IAGA News 41) ESA selected Swarm as the fifth explorer mission in ESA's Living Planet Programme. The mission consisting of three spacecraft was successfully launched on November 22, 2013. The three spacecraft shall deliver data that will provide new insight into the Earth's system by improving our understanding of the Earth's interior as well as the near Earth electro-magnetic environment important for space weather effects. The very first high-accuracy and high spatial resolution measurements of the strength, direction and time variations of the magnetic field, complemented by precise navigation, accelerometer and electric field measurements, will provide the required observations to model the various sources of the geomagnetic field.



The Swarm mission with its improved instrumentation and its carefully designed constellation of three satellites will significantly improve the knowledge of the magnetic field as well as its spatial and temporal variations. In order to take optimal advantage of the unique constellation aspect of the Swarm mission, considerably advanced data analysis tools have been developed in order to derive products, the so-called Level 2 data, that take into due account the constellation features. This facility, called "Swarm Satellite Constellation Application and Research Facility" (SCARF), has been developed, tested and validated by a consortium of six research institutions under a contractual agreement with the

Agency. The main aim with this facility is to derive in an operational way the basic elements in form of sources that constitute the measured magnetic field, from the core, the mantle, the crust and the various current systems above the Earth's surface, maintained by the radiation and plasma flow from the Sun.

A special issue of EPS, vol. 65 no. 11, 2013, describes each of the Swarm-based products in one or more articles, dealing with the scientific rationale, the methodology and limitations of the derivation, and the potential use in the form of examples of science investigations and applications.

Scientific users of data from the Swarm mission will benefit significantly from the free and open access to these derived products. ESA will provide all data products through the archiving and dissemination infrastructure of the Swarm mission.

## 5 Deceased IAGA Scientists

### Father Josep Oriol Cardús Almeda (1915 – 2012)

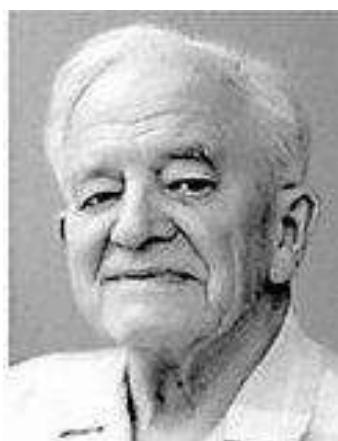
We announce with sadness that Father Josep Oriol Cardús Almeda, of the Society of Jesus, passed away on January 3 in St. Cugat del Vallès. He was 97 years old. Father Cardús, linked to the Ebre Observatory since 1942, had a degree in Philosophy (Pontifical Faculty of Avigliana, Italy, 1939) in Theology (Pontifical College Dublin, Ireland, 1948) and in Physics with honors (University of Barcelona, 1944). Father Cardús held positions at the Observatory of Chief of the Magnetic (1949-1991), Heliophysics (1949-1964, 1967-1986) and Seismic (1976-1987) Sections. He was also Deputy Director from 1952 to 1971 and Director from 1971 to 1985. Father Cardús was an outstanding scientist in the field of Geomagnetism and, more specifically, in the magnetic variations of external origin.

Among the various positions he held at the international level we highlight those of Vice Chair of the Committee for the World Magnetic Map, Member and Chairman of the Finance Committee of the International Union of Geodesy and Geophysics (IUGG), and Member of Executive Com-

mittee, Vice President and Secretary General of the International Association Geomagnetism and Aeronomy (IAGA). Father Cardús was appointed as Honorary Member of IAGA in 1988 for his long service, an award reserved for a handful of researchers. At the national level, he also served as delegate or president in various Spanish committees, such as Geodesy and Geophysics and its Section of Geomagnetism, Sun-Earth Relationships, Astronomy and Space Research. Father Cardús was also a tenure member of the Spanish Royal Academy of Sciences and he was awarded the Medal for Scientific Merit of the Ramon Llull University in 2004 for continuing dedication to the world of science.

J. J. Curto  
(Director of Ebro Observatory)

### **Knud Lassen (1921-2013)**



The Space Age started more than half a century ago. During the International Geophysical Year (IGY) 1957-58 the first Earth orbiting satellite, Sputnik, was launched and it was quickly followed by a whole fleet of satellites measuring

the physical conditions in the Earth's environment. The fast advances in our understanding of the underlying science can be attributed to a number of pioneers, who influenced a whole generation of scientists.

Only a few of those pioneers are still among us and one of the most prominent Danish scientists in this category, Dr. Knud Lassen, passed away on March 11, 2013 after a long life marked with scientific achievements and with active participation in research until the last few months of his life.

After receiving his degree from the University of Copenhagen, in 1946 Knud Lassen joined the staff at the magnetic observatory at Godhavn (now Qeqertarsuaq) operated by the Danish Meteorological Institute (DMI). Knud Lassen became the Director of the observatory during the

following years until 1956, when he returned to Denmark to take a position at the Geophysics Division of DMI.

Working at one of the few magnetic observatories located poleward of the auroral zone Knud Lassen was intrigued by watching the aurora behave quite differently from common knowledge at that time. He observed that many so-called polar magnetic storms did not only show the well-known southward expansion but also a poleward expansion, which many years later was identified as one of the characteristics of the substorm concept, developed during the IGY. His fascination of this feature was so great that he decided to systematically make visual observations of the aurora and its dynamics every night from 1952 to 1956.

After his return to Copenhagen he took part in the international cooperation during the IGY and established a small network of four automated all-sky cameras in Greenland. These observations together with his visual observations constituted the major foundation for his Dr. Phil. thesis, defended and obtained at the University of Copenhagen in 1963.

His scientific results made him an obvious member of an international committee chaired by Professor James Paton, Edinburgh University. The task of the committee was to prepare for the next international observational campaign after IGY, namely the International Quiet Sun Year (IQS) 1964-65. An important result was an Auroral Atlas, describing, defining, and naming the various manifestations of auroral forms.

During the IQS and the following years additional all-sky cameras were installed so that most of the sky over Greenland was covered. Of particular interest to Knud Lassen was the region of dayside discrete aurora, which he showed was located poleward of the auroral oval, coinciding with low energy particle precipitation and the day-side region 1 currents. Based on his experience from ground based observations Knud Lassen saw very early the potential in the US Defence Meteorological Satellite Programme. The optical measurements from Space allowed a hitherto unseen view of the distribution and dynamics of the aurora. This provided additional and improved observations in support of his view regarding the origin of the particles that create the aurora.

In 1966 Knud Lassen played a significant part

in the creation of a new education programme in Geophysics at the University of Copenhagen. In addition to giving lectures in Geomagnetism and Auroral Research Knud Lassen participated actively in study groups that students and researchers arranged in order to be able to follow a scientific field that during those days developed very rapidly because every new satellite brought observations and discoveries that could not immediately be explained by consulting current textbooks.

For Knud Lassen international cooperation and global competition was a natural framework of his research. He exchanged data and ideas with both American and Soviet scientists, across the boundary of the cold war, and he followed language courses in Russian in his spare time in order to be able to follow the newest scientific discoveries, which within his field during those days often were exclusively published in Russian in the Soviet Union.

Through his participation in auroral research, Knud Lassen was very conscious about the complex interaction between various physical processes in the atmosphere and in Space. Careful observations and experiments are crucial in order to develop and validate the proposed theories. Theories, which at first view seem plausible, are constantly being challenged, contradicted, and revised in view of new observations. This continuous dialog, which is the methodology and strength of science, he brought with him, when he after retirement from the position of Head of the Division decided to use his experience and scientific curiosity to try to understand the reason for some apparent correlation between solar activity and climate variations, manifested through systematic variations through centuries of the amount of sea ice around Greenland and Iceland.

Used to the constructive dialog in the science community within auroral research Knud Lassen, like other scientists, was surprised by the rather aggressive tone in the highly politicised climate debate. As a physicist Knud Lassen was of the opinion that climate change has always taken place and is the result of many different processes, among which also human activity plays a significant role. But he was also convinced that the established climate research community does make

a serious error by not seriously recognizing the existence of large natural variations of which the varying solar activity represents one of the sources that can be identified in many geological records. Knud Lassen will not only be remembered because of his important scientific achievements. His quiet and kind personality and his continuous effort to inspire his younger colleagues by his dedication to science combined with leaving them the necessary freedom to follow their own ideas will be remembered by all who had the privilege to work together with him.

Egil Friis-Christensen  
(DTU Space, Denmark)

### Santimay Basu (1933-2013)



Dr. Santimay Basu is internationally recognized for his work in the area of ionospheric scintillation, having made cutting edge research contributions to every aspect of the field encompassing diverse natural irregularity formation processes at high-, mid- and low latitudes, as well as artificial turbulence generation through high-power high frequency radio wave interactions and high-altitude chemical releases. After completing an illustrious career in the Ionospheric Physics Division of the Air Force Research Laboratory in Massachusetts, he contributed his expertise as a research physicist at Boston College, until the time of his passing.

Santi completed his Ph.D in Radio Physics at the University of Calcutta, in the field of solar radio astronomy, but shortly after moving to the United States as a National Academy of Sciences Research Associate in 1971 he transitioned to ionospheric physics with a focus on plasma irregularity formation and radio wave propagation. The transition also marked the beginning of an extremely productive collaboration with his spouse, Dr. Sunanda Basu, which accounted for over one-half of the more than 100 papers Santi published in his career.

Beginning in the mid-seventies Santi pioneered the use of global multi-technique campaigns combining satellite radio wave scintillation, VHF radar, in-situ (rocket and satellite) and optical measurements to characterize complex plasma structures. Such campaigns were performed for the first time to obtain insight into the generation, evolution and decay of multi-scale plasma phenomena at both high- and low-latitudes. Dr. Basu also documented the impacts of scintillation on the performance of space-based communication and navigation systems and thus scintillation has become recognized as the number one priority for the entire space weather field. His scientific results led the way to the subsequent development of a global scintillation monitoring network, the Scintillation Network Decision Aid (SCINDA), and the concept for a satellite system dedicated to scintillation forecasting, the Communication/Navigation Outage Forecasting System (C/NOFS) launched by the U.S. Air Force in 2008 and providing critical data for a new generation of space weather scientists. Most recently, he focused his attention on the generation of plasma structures in the equatorial ionosphere during intense magnetic storms due to the penetration of high latitude electric fields, demonstrating that during the main phase of a storm the penetration of the electric field causes plasma bubbles to form in the dusk sector where the zonal conductivity gradient attains its maximum.

In addition to his exemplary scientific career, Santi's passion to help early career scientists is reflected in the generous contributions to establish in 2008, the AGU Santimay and Sunanda Early Career Award, which is presented annually to honour an individual young scientist from a developing nation for making outstanding contributions to research in Sun-Earth Systems Science that further the understanding of both plasma physical processes and their applications for the benefit of society. This very generous award is now matched by the AGU Basu United States Early Career Award for Research Excellence in Earth Systems Science, made for the first time in 2013.

Santi's reputation for scientific excellence and generosity was matched only by his exemplary temperament, gracious and modest attitude and constant consideration for his fellow man. He possessed the characteristics of both a gifted sci-

entist and a concerned humanitarian and with actions, words and writings consistently served as a role model of the highest calibre for his colleagues, friends and family. Santi shall be missed by an international scientific community privileged to have known him.

Keith Groves, Cesar Valladares, and Patricia Doherty  
(Boston College Institute for Scientific Research, USA)

### **Roberto Lanza (1945-2013)**

Roberto was born in Saluzzo, Italy on April 24<sup>th</sup>, 1945, and passed away in Torino on August 8th, 2013, at the age of 68. He has been professor of Solid Earth Geophysics and member of Dipartimento di Scienze della Terra, at the University of Torino.

He started his scientific career performing magnetic surveys for the Italian magnetic network and magnetic rock studies applied to archeological prospecting in various sites of the Middle East and to geothermal reconnaissance in Central America. Thereafter his activity focused on paleomagnetism. He created the rock magnetism laboratory of the University of Torino and successively, with colleagues from the University of Milano, a new more modern Lab in Peveragno (Cuneo, Piedmont). While participating in international programs he conducted research work around the world including two expeditions to Antarctica, in the frame of the Italian Antarctic Program, mostly studying paleomagnetism of the Ferrar dolerite formation. Lately his interests were focused mostly on the applications of rock magnetism to volcanology; in particular the paleosecular variation of the Earth's magnetic field and archeomagnetism.

Roberto was practically the first Italian paleomagnetist addressing magnetic properties and anisotropy of magnetic susceptibility of volcanic rocks systematically. He wrote several papers on these subjects giving important contributions to volcanic rocks dating, interpretation of eruptive mechanisms and definition of ignimbrite emplacement temperature, in several active Italian and central American volcanoes. These studies were fundamental to show the importance of paleomagnetism to Italian volcanologists, therefore opening the way to the employment of rock magnetism in volcanic problems. He was very well

known for his rigor and extreme care during instrument operation and data handling.

Roberto collaborated extensively with the Italian and international scientific community, and was an excellent mentor for his students, who remember his thoughtful attention with gratitude. He was also very active with his Italian colleagues and his collaborators. Roberto was a very clever scientist, and a man full of great ideas, yet he was always humble and respectful for other people ideas. Roberto will deeply be missed in the community.

Antonio Meloni and Fabio Speranza  
(INGV, Roma, Italy)

### Ravipati Raghavarao (1929-2013)

Professor Ravipati Raghavarao was born in the year 1929 in Andhra Pradesh, India. He did his BSc and MSc, both from Andhra University, and DSc (1960) in Space Physics with Professor BR Rao. He pursued research on radio astronomy while working with NW Brotan of National Research Council (NRC) in Ottawa (1961-63), and then on space physics as a Research Associate in the University of Chicago for a year with CO Hines. Later upon returning to India he was a CSIR Pool Officer at Andhra University (1965-66) and subsequently he joined the Physical Research Laboratory (PRL), Ahmedabad.

Prof. R. Raghavarao is one of the pioneers in the field of Aeronomy, covering all aspects of it whether ground based radio probing or optical probing of the upper atmosphere, or satellite based experiments like topside sounders, rocket based experiments like vapour releases, or in situ measurements. On the other hand, he demonstrated his prowess in the formulation of equatorial electrojet models and numerical simulation of the challenging problem of the nonlinear development of an equatorial plasma bubble, and modelling the Equatorial F-region. He demonstrated the possible role of vertical winds in creating the counter electrojet and in assisting the development of an equatorial plasma bubble. He also modelled the Jovian ionosphere and predicted the existence of an equatorial electrojet therein. Some of his major findings are the discovery of a ledge of ionization in the topside ionosphere using satellite telemetry data obtained from PRL and

the discovery of the Equatorial Wind and Temperature Anomaly using the Dynamic Explorer satellite data. He gave a new dimension and impetus to the Optical Aeronomy Program in PRL that led to the innovation of Dayglow measurement technique and also to the development of state-of-the-art high resolution imaging and scanning spectrometers. Many of the experimental confirmations of his early theoretical predictions came decades later.

He had a unique style of functioning and was always objectively critical, true to his perfectionist nature. He guided and trained many scientists who have made a mark in their respective domains. He was a selfless person, with a farsighted vision, a passion for science and an indomitable spirit of pursuance and never hesitated to recognize talent wherever found. He played a major role through his advisory capacity in the shaping of the space science programme in India. Till his last day, he had been pursuing his scientific interests. He was a true beacon to the Aeronomy scientific community, much sought after by the subsequent generations and in his demise, on 2<sup>nd</sup> March 2013, the space science community has lost one of its true leaders and a fine human being.

Rajagopal Sridharan  
(Physical Research Laboratory, India)

### Reidar Lovlie (1944 – 2013)



Professor Reidar Lovlie of the Department of Earth Science, University of Bergen passed away on August 14, 2013. Up until the very end he was full of energy, planning new experiments, new fieldwork and improvements to his teaching.

Reidar completed his MSc at the Geophysical institute of the University of Bergen in 1970 in the new field of paleomagnetism. A grant from the Norwegian Research Council followed, enabling him to spend time at the Lamont Doherty Geological Observatory, before returning to the same

department as a research assistant. This was the start of a more than 40 year long career at the University of Bergen, the last 20 years as a full professor at the Institute of Solid Earth Physics, which later became part of the Department of Earth Science. During all those years the palaeomagnetic laboratory has been a cornerstone in Reidar's research, and he must take the main credit for building the laboratory up to a high international standard.

Reidar conducted basic research in the best possible sense, motivated more by true curiosity about how nature works than peer recognition and research funding, although these also followed naturally from his original ideas. Nothing was better than if the best way to investigate a scientific problem also challenged his practical abilities. Numerous pieces of apparatus on the shelves of the palaeomagnetic laboratory bear witness to Reidar's creativity and curiosity when asking the question "what if..., and how can I investigate that?"

As a colleague and teacher Reidar was always the one who loved to challenge accepted truths, and saw it as his mission to inspire colleagues and students to think outside the box. We learned to appreciate his unconventional perspectives and openness towards the natural phenomena that surround us. He was at his best when he could inspire young people, something which not only benefitted his students, but also led to him using much of his free time doing voluntary teaching at a Swedish high school, and a long-standing engagement in the local Steiner School and anthropological society.

Reidar had wide research interests, encompassing fundamental magnetization processes and properties of the Earth's magnetic field, as well as applications to plate tectonics, archaeology, Quaternary geology and paleoclimate. Through the years he acquired extensive field experience in both polar regions, but for the past 15 years, his work in China was probably closest to his heart. This led to annual trips to China for field work and meetings, the last one as recently as in May this year. He was also responsible for bringing to and educating numerous Chinese MSc students in Bergen, many of whom later became his scientific collaborators. The fact that he also meant a great deal as a mentor and friend to his Chinese

colleagues is among other things testified by his appointment as a Honorary Professor at Taiyuan University, and by all the condolences received by the Department from his Chinese friends and colleagues across the world.

The passing of Reidar Lovlie leaves a large gap at the Department of Earth Science. He will be sorely missed.

Friends and colleagues at the Department of Earth Science  
(University of Bergen, Norway)

### **Kenneth L. Zonge (1936 – 2013)**

On the 21<sup>st</sup> of November Dr. Kenneth L. Zonge (Founder of Zonge) passed away.

Ken was a pioneer in electrical geophysics and influenced much in the application of electrical and electromagnetic geophysics, creating many tools which are now standards in exploration. Ken was one of several leaders in the 1970's who brought electrical geophysics into the digital age. Ken's many accomplishments include developing the complex resistivity method, and based on this idea, founded Zonge Engineering and Research Organization in 1972. He also developed the world's first field-portable, digital electrical geophysical receiver in 1977, and greatly contributed to the commercial application of Controlled Source Audio-frequency Magnetotellurics (CSAMT) and Complex Resistivity (CR) services as practical exploration tools. Ken's instruments from 20 years ago are among the best in the industry and are still competitive today.

Ken was not only the quintessential scientist/engineer, but he was always the humble gentleman. His love of the outdoors, and in particular, his love of Alaska, blended perfectly with his application of geophysics, whether toward minerals or oil exploration, or studying environmental or groundwater problems.

As not only the founder but also the heart and soul of the company, he will be greatly missed.

The Friends and Employees of Ken Zonge

### **Evgeny Petrovich Kharin (1933 – 2013)**

Evgeny Petrovich Kharin was born on 6 February 1933. Graduated from the Lvov Polytech-

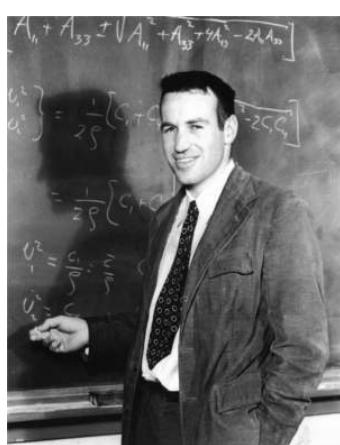
nic Institute, specialized in geophysics. Candidate (PhD) of geological and mineralogical sciences. He held positions in geophysical industrial organizations in Siberia, in Geology Institute of the USSR Academy of Sciences in Yakutsk, in Institute of Terrestrial Magnetism, Ionosphere and Radio Wave Propagation of the USSR Academy of Sciences (laboratory of polar geomagnetic researches), participated in the 17 Soviet Antarctic expedition in 1971-72.

Dr. Kharin works in the Geophysical Center of Russian Academy of Sciences for 41 years. During 30 years he was Director of the World Data Center for Solar-Terrestrial Physics. In 2012 the WDC, headed by him, was incorporated into the ICSU World Data System. Dr. Kharin was a highly qualified specialist in the field of geomagnetism, had extensive experience working with geophysical data. He did a lot to develop the international system of collecting and storing data on the Earth's magnetic field, the ionosphere phenomena, solar activity and cosmic rays. Especially great was the contribution of Dr. Kharin to the formation of long series of observations of geomagnetic variations and geomagnetic indices, which are included in the international system SPIDR. Under his leadership and direct involvement the international projects were carried out to save the historic magnetograms, projects of collecting data and information on the program of the International Polar Year 2007-2008. Since 2011 Dr. Kharin took an active part in developing of the national node of collection of geomagnetic data for servicing Russian INTERMAGNET.

The scientific interest of Dr. Kharin was connected to the study of geomagnetic variations and correlation between solar and geomagnetic activity and seismic activity. He was the author of more than 200 scientific publications. Dr. Kharin was awarded the Diploma of the Russian Academy of Sciences, the Diploma of the Organizing Committee for the participation of the Russian Federation in the preparation and carrying out activities for the International Polar Year (2007/08) and the medal of IAGA for long service and his great contribution to the accumulation, retention and dissemination of data on the Earth's magnetic field required for fundamental scientific research.

Dr. Natalia Sergeyeva  
(Director of the World Data Center for Solid Earth Physics)

## Theodore Madden (1925 – 2013)



Theodore Madden, or "Ted," an MIT alumnus and professor emeritus in the Department of Earth, Atmospheric and Planetary Sciences (EAPS) whose contributions to research and teaching influenced a generation of earth scientists, died Nov. 11 at the age of 88.

Madden, who was born in 1925, entered the Institute in 1942 and never left (with the exception of a three-year stint with the U.S. Marines during World War II). He received his bachelor's degree in physics in 1949 and his PhD in geophysics in 1961; he was already a professor of geophysics at MIT when he received his PhD. He continued teaching at the Institute until he retired in 1995.

Whether in the classroom or on the hockey rink, Madden was known for his breadth of academic interests, competitive spirit, and holistic approach to education. He was probably most celebrated for his work on methods for electrical exploration. In 1986, he received the Society of Exploration Geophysicists' Reginald Fessenden Award in recognition of his "pioneering efforts in the development of frequency domain IP, both in practice and in theory."

Few biographies, however, capture the scope of Madden's research, which spanned from the core of the Earth to the outer magnetosphere, and included topics as diverse as electromagnetics, seismology, gravity waves, plasma physics, and random networks.

Madden was also an accomplished athlete who loved all sports, particularly hockey, soccer, and lacrosse, and received MIT's award for the most outstanding athlete in 1949. He liked to say that he "majored in sports and minored in physics." His former students remember that he brought the same intensity to athletics as he did to inverse problems.

Ted will be missed by many friends and colleagues, but his enormous impact on MIT and the earth sciences will continue.

Rob van der Hils  
(MIT, USA)

## Ebong W. Mbipom

Prof. Ebong W. Mbipom died on February 6, 2013, in a ghastly motor accident on his way back from his village to Calabar. Prof Mbipom obtained his Ph.D degree from the University of Edinburgh with specialty in Magnetotelluric (MT) Induction studies.

Prof. Mbipom was a Lecturer in the Department of Physics, University of Calabar (Unical), Nigeria. He retired and was hired as a contract staff by the Management of the University of Calabar, Nigeria. Throughout his life in the University, the Late Prof Mbipom was an enthusiast and strong advocate of MT in a country where there is no functional MT system.

Anthony E. Akpan  
(University of Calabar, Nigeria)

## Ahmet Mete Isikara (1941 – 2013)

Prof. Dr. Ahmet Mete Isikara passed away on January 21, 2013, in Istanbul, Turkey because of heart failure.

Prof. Isikara was born in 1941 in Mersin, Turkey. After graduating from high school in his hometown, he studied geophysics at the Faculty of Science, Istanbul University. He got his B.Sc. degree in 1964 and Ph.D. degree in 1972 at the same university. His Ph.D. was entitled "The effect of the Sun and the Moon on the Earth's magnetic field near Istanbul". In 1977 he became an associate professor with his studies on the secular variation and the electrical conductivity structure of the Earth's crust.

During his career he served as the chairman of the Turkish National Geodesy and Geophysics Association (1976-1983), as well as the Aeronomy Commission (1980 - 1983). He presented Turkey in the Earthquake Prediction Committee of the Council of Europe (1980-1983). He moved to Bogazici University, Kandilli Observatory and Earthquake

Research Institute in 1985 as a deputy director. He became the director of the institute in 1991 and until his retirement in 2002 he stayed as a director. In 2003 he became the founding chairman of the Association of Preparation for Disaster and Training for Earthquake (2003). Especially following the 1999 Izmit earthquake, he became a public figure regarding public awareness about earthquakes and acted as a decision maker at the time of crisis. Prof. Isikara was last serving as the head consultant of the Turkish Red Crescent.

During his career he participated in numerous national and international scientific projects with Japanese, British and German colleagues. He is responsible for the education of many young scientists.

He was one of the members of the organization committee of 5th induction workshop held in Istanbul in 17-24 August, 1980. Turkish scientific community will remember him forever.

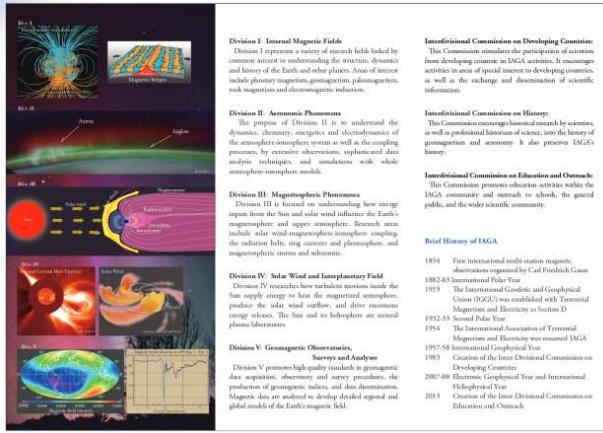
S. Bulent Tank  
(Bogazici University, Kandilli Observatory and Earthquake Research Institute Istanbul, Turkey)

## 6 General information about IAGA

### 6.1 IAGA new flyer and poster

During the XXII<sup>th</sup> SA in Mérida the final version of the new IAGA flyer was agreed upon by the EC.





#### Division I: Internal Magnetic Fields

Division I represents a variety of research fields linked by common interest in understanding the structure, dynamics and history of the Earth and other planets. Areas of interest include planetary magnetism, geomagnetism, paleomagnetism, rock magnetism and diagenetic indicators.

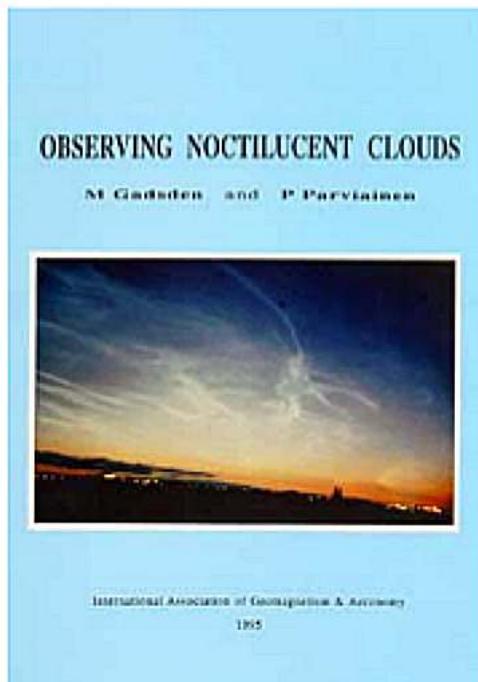
#### Division II: Atmospheric Plasmas

Division II focuses on understanding how energy inputs from the Sun and solar wind influence the Earth's magnetosphere and upper atmosphere. Research areas include ionosphere, magnetosphere, plasma physics, the radiation belts, ring currents and plasmaphysics, and magnetospheric storms and substorms.

#### Division III: Magnetospheric Plasma

Division III is focused on understanding how energy inputs from the Sun and solar wind influence the Earth's magnetosphere and upper atmosphere. Research areas include ionosphere, magnetosphere, plasma physics, the radiation belts, ring currents and plasmaphysics, and magnetospheric storms and substorms.

This manual and instruction book was written by a group of active researchers, both professional and amateur. There are chapters giving practical advice for taking visual observations, photographing the clouds with film or with video equipment. A summary of observations from space is included, as well as comments on the connection between noctilucent clouds, seen from the ground, and the polar mesospheric clouds that so far have been measured only from orbit. Noctilucent clouds are seen in the summer months, shining in the poleward sky at night-time. Measurements show that the clouds are higher than any others. Lying at a height of 80-85 kilometers, the clouds mark a boundary between meteorology and space physics.



This book is beautifully illustrated with photographs, and will help everyone recognize and appreciate these "sailors in the summer night".

This guide is out of print but it is available at the web site using the link ONC. (Prices do not include shipping and handling.)

### 6.3 IAGA website

Information on IAGA can be found at:  
<http://www.iugg.org/IAGA>

### 6.4 IAGA contact

The Secretary-General is the main point of contact for all matters concerning IAGA:

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