

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

Foreword



The IAGA highlight of 2019 was the 27th General Assembly of the International Union of Geodesy and Geophysics which was held from July 8 to 18, 2019 in Montréal, Canada. The meeting was characterized by the central theme: "Beyond 100: The next century in

Earth and Space Science". The meeting was a big success with nearly 4000 participants from all over the world, and from students to distinguished scientists, contributing to more than 500 sessions in total. This issue of the IAGA News contains information about the IAGA participation. It reports on decisions taken during the Assembly by the IAGA Conference of Delegates and the Executive Committee, including adopted resolutions. Some structural changes in Executive Committee and Divisions are also reported. Following the tradition and IAGA statutes, the term of office of the IAGA Executive Committee and IAGA Officers came to its end at the IUGG General Assembly and new leadership were elected.

I am honoured to serve you in my new capacity as IAGA Secretary General for the coming years. Let me take this opportunity to express my deep gratitude to Eduard Petrovsky, who led IAGA as president during the past 4 years. I also deeply thank all my fellow Executive Committee members who constructively shared the past term of office with me. Most of all, however, I wish to thank Mioara Manda, who took care of all IAGA business as secretary general over the past 10 years. She ensured smooth Scientific Meetings and General Assemblies and thanks to her commitment IAGA is in good and healthy condition in the year of the centennial of its host organisation, IUGG. Last but not least, I also wish to acknowledge the valuable service to the IAGA community provided by the outgoing Division, Commission and Working Group leaders and other committee members over the past 4 years, without whose dedication and commitment IAGA could not operate.

This issue of IAGA News also contains further reports on IAGA activities of different kinds and provides information about deceased IAGA scientists. The reader is also referred to the IAGA website (<http://www.iaga-aiga.org>) for more on IAGA and for updates between the annual Newsletters.

Contents

1	Message from the President	2
2	The 27 th IUGG General Assembly, Montréal, Canada	2
2.1	Participation	2
2.2	Report from the Meetings of the IAGA Conference of Delegates	3
2.3	Report from the IAGA Executive Committee Meetings	7
2.4	New Leadership of Divisions and Commissions	7
3	IAGA Awards	8
3.1	IAGA Award for Interdisciplinary Achievements - Shen Kuo	8
3.2	IAGA Long Service Award	10
3.3	IAGA Young Scientist Award	10
4	The 4 th IAGA School	11
5	IAGA Activities	12
5.1	Introduction of the new EC	12
5.2	EC activities	15
5.3	The International Geomagnetic Reference Field IGRF, 13 th generation	16
5.4	Geomagnetic data availability	16
6	IAGA Resolutions - 2019	17
7	Swarm mission – probing the geomagnetic field	20
8	Reports on Meetings: IAGA-Sponsored or of IAGA interest	21
8.1	AGS Conference on Space Weather	21
8.2	6 th Latinmag	21
9	In Memorium	21
10	General information about IAGA	25
10.1	Book: Geomagnetism, Aeronomy and Space Weather	25
10.2	IAGA books series	25
10.3	IAGA Guides	25
10.4	IAGA History	26
10.5	IAGA website	26
10.6	NEW: IAGA on Social Media	26
10.7	IAGA contact	27

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, mainly to the national policy makers and leaders, whose decisions can affect the activities of IAGA.

Monika Korte
(Secretary-General)

1 Message from the President

It was an emotional moment for me when, last July, I attended the 27th IUGG General Assembly, in Montreal and when I was elected IAGA President. I am profoundly honored by the opportunity to continue my service to the community: after acting as Secretary General over nearly a solar cycle (2009-2019), I am ready to act as President for the next four years.



IAGA is on its great ascending slope, thanks to the tireless enthusiasm shown by the many of its members, and, above all, to the remarkable leadership shown by my predecessors, Eigil Friis-Christensen, Kathy Whaler and Eduard Petrovsky with whom I had the chance to work in my capacity as Secretary General. Here, I would also like to thank the members of the Executive Committee who have completed their terms and those who served as Division, Working Group and Interdivisional Commission leaders. I also thank very warmly all IAGA members, for the flawless commitment and fidelity to our Association, through their involvement in IAGA activities.

Year 2019 was a remarkable one for IAGA. Firstly, IAGA Awards were presented during 27th IUGG General Assembly: Catherine Johnson for intrinsically interdisciplinary contributions to the holistic understanding of bodies throughout the solar system, especially with respect to the magnetic field of Mercury and Earth (Shen Kuo Award), Martin Berg for his sustained efforts to produce the highest quality geomagnetic field data at Dombås observatory (IAGA Long Service Medal), and Thomas

Gonet, Deepak Kumar Karan, Kseniia Tlatova, Evgenii Shirokov (IAGA Early Career Award). I should like to congratulate them once more.

On the occasion of the IUGG centennial, IAGA have been involved in many activities in order to increase awareness of its role in the promotion of Earth and space sciences via international cooperation, and to stimulate public interest in the scientific achievements of the last century. One of the results of these activities is the IAGA book published with Cambridge University Press, providing a comprehensive overview of the IAGA fields of research, entitled "Geomagnetism, Aeronomy and Space Weather - A Journey from Earth's Core to the Sun" (ed. Mioara Mandea, Monika Korte, Andrew Yau and Eduard Petrovsky). I would like to thank all contributors for their efforts to participate in this great achievement. On the same occasion of the centennial celebration, the paper entitled "Major role of IAGA in Understanding our Magnetic Planet" was published in a special issue of "History of Geo- and Space Sciences".

We now look forward to 2020, with a series of smaller meetings and workshops. I believe that such activities are essential in order to maintain the vivacity of the IAGA community and its science. These meetings represent platforms for sharing science with younger scientists and with those from developing nations involved in IAGA. Moreover, many activities are organized in the frame of Inter-Associations and Inter-Union bodies. IAGA members need to play a constant and important role in the new dynamics of the scientific world and, furthermore, to strengthen the productivity of our community addressing the current scientific questions and societal issues.

During the following years, IAGA needs to raise awareness on its role in promoting and enhancing fundamental research in the geomagnetism and aeronomy, in understanding the contributions our science makes to everyday life, and in solving crucial geo-problems in collaboration and coordination with major international or inter-governmental initiatives and programs. For this we need to foster greater collaboration with partner organizations, private industry, national and regional agencies and also to encourage early-career geoscientists to participate in international science activities. IAGA needs to continue to support the use of its scientific research as a tool for education, development and science diplomacy. On the whole, these are tremendous activities, and I look forward to working with you towards a productive four years for IAGA.

Mioara Mandea
(President)

2 The 27th IUGG General Assembly, Montréal, Canada

2.1 Participation

The 27th IUGG General Assembly was held July 8-18, 2019 at the Palais des Congrès in Mon-

tréal, Québec, Canada. The Scientific Program of IUGG 2019 involved more nearly 4000 participants. More than 4580 presentations were given in over 500 sessions in total, including workshops.

Among the presentations at the General Assembly were 9 Union lectures, 437 invited presentations, 2329 oral presentations, and 1814 poster presentations.

IAGA was very well represented with 22 own symposia, 12 joint ones led by IAGA and contributions to another 6. Nearly 400 participants from 36 countries gave IAGA as their main affiliation. The IAGA contribution to the Union Lectures was given by Lisa Tauxe (USA), an excellent and well-received lecture entitled "Hunting the magnetic field". The IAGA programme efficiently ran in a conference centre which provided an excellent space, giving us the chance to catch up with latest developments in our own research specialities, as well as take in some of the more inter-disciplinary topics. The meeting provided many opportunities for scientists to discuss different topics over breaks, poster sessions, and the IAGA dinner. A highlight was the IAGA Ceremony, where the IAGA awards were presented (see 3) and Catherine Johnson, recipient of the Shen Kuo Medal gave an exciting lecture on planetary magnetism entitled "The Magnetic Field of Mars: Progress and Puzzles".

It is also worth noting that the financial budget of the meeting was able to partly support the attendance of 47 IAGA participants, mainly young scientists from developing countries.

2.2 Report from the Meetings of the IAGA Conference of Delegates

Two Conferences of Delegates (CoD) took place during the General Assembly.

2.2.1 First Conference of Delegates, July 12, 18:00 - 19:30

The Secretary General conducted a Roll Call of the Chief Delegates from all IAGA member countries. This established that 23 Chief Delegates (with voting rights) were present. Although this is less than half of the accredited 48 voting Member Countries it is more than half of fully accredited Member Countries attending the Assembly (only 36 Countries represented). A quorum of Delegates according to Statute 14.1 was therefore present and the meeting could proceed.

The agenda was approved and the President called the meeting to order and welcomed all the delegates.

Moment of remembrance for IAGA members deceased

The President led the remembrance of 16 deceased members over 2018-2019 period, and the delegates stood for a minute of silence.

Approval of the Minutes of the 2017 Conference of Delegates

The minutes of the 2017 CoD were approved unanimously with a correction to the sentence regarding the delegates present, and a slight change to a formulation requested by the Indian ND from the 2017 Conference of Delegates. The modifications had been requested previously by e-mail and were presented to and approved by the delegates.

Reports

Report of the President (Eduard Petrovsky)

The President reported on the following activities:

- Six EC meetings were held by teleconference between 2016 and 2018 in addition to the personal meetings at the Assemblies
- 25 topical meetings were sponsored since the last IUGG General Assembly
- In 2017, IAGA started a petition regarding the continuation of the USGS geomagnetism program
- Support letters were provided for the Belgium seafloor observatory (2017), for accreditation of the Japanese Institute of Space-Earth Environmental Research as an International Joint Usage/Research Centre (2017), and, together with INTERMAGNET, concerning the new USGS funds reduction plans
- The strong IAGA contribution to the IAPSO-IAMAS-IAGA Assembly 2017
- The IAGA Awards given in 2017 and 2019
- Increasing IAGA visibility by a re-design of the internet pages (see <http://www.iaga->

aiga.org), updates of the IAGA flyer and poster, and a special article and a book publication on the occasion of the IUGG centennial, see below.

Secretary General and President authored a special paper on the role of IAGA in "History of Geo- and Space Sciences". A book, entitled "Geomagnetism, Aeronomy and Space Weather, A journey from the Earth's core to the sun" with contributions from all fields of the IAGA community and edited by Secretary General, President, Vice-President and EC member Andrew Yau and with strong support from the rest of the EC as part editors was in press with Cambridge University Press at the time of the report.

The President's Report was approved by the Delegates.

Report of the Secretary General (Mioara Manda)

In addition to the activities reported by the president, the SG reported on the following

- Mailing lists have been established for EC, National Delegates and Division Chairs, all hosted by the GFZ in Potsdam
- A general IAGA member mailing list where everyone can subscribe or unsubscribe has been created: iaga_ms@gfz-potsdam.de
- The external audit of IAGA finances for the period 2015 – 2018 in 2019 has been organised

Secretary General specific activities in the past two years also include the annual production of the IAGA News; management of the IAGA account; preparation of General Assembly, in which the contributions of symposium conveners and division leaders are much appreciated.

The Secretary General's Report was approved by the Delegates.

Report of the Finance Committee (Toshihiko Iyemori)

The Finance Committee consists of Michel Menvielle (chair), Volodya Papitashvili, Laszlo Szarka and Igor Veselovsky. It was mandated to ensure IAGA's fulfilment of IUGG's commitment to legal auditing, and to analyse the way the budget is

managed by the EC in terms of priorities. As neither the chair, nor another member of the finance committee was available to present the report, it was presented by Toshihiko Iyemori, as a former member of the IAGA EC.

The report covers the period of January 1, 2017 to December 31, 2018, and was prepared based on documentation provided by the SG. This consists of the IAGA bank accounts for 2017 and 2018, and the report of the external audit conducted for the period 2015 – 2018. The IAGA Finance Committee considers that it is good practice to have an external audit conducted once every four years, during the months preceding each IUGG General Assembly.

The external audit gave the following conclusions and recommendations

- Conclusion: "I therefore recommend that the financial statements be approved, and that the General Assembly gives discharge the Executive Committee for the period 01/01/2015 to 31/12/2018."
- Budget management - administration: "The Finance Committee recommends pursuing such policy that results in maximizing the percentage of IAGA incomes that is dedicated to support scientific activities through symposium sponsoring and support to the participation to IAGA Assemblies."
- Budget management - reserves: "The Finance Committee asks that the next EC addresses this issue, and decides on a policy regarding the desirable level for the reserves, and the use of any surplus."
- Budget management - balance: "If the balance on January 1, 2020 is above 5% of the IAGA Reserve, the Finance Committee urges the IAGA EC to consider increasing the support of scientific activities, and undertaking new initiatives for the IAGA Education and Outreach activities."
- IAGA Schools: "The Finance Committee congratulates the EC and the organizers of IAGA Schools, and encourages IAGA to continue organizing such IAGA Schools before each Assembly, with related tutorials posted on-line on the IAGA web page."

The overall conclusions from the Finance Committee are as follows

- The Finance Committee recommends continuing the current policy of limitation of expenditures related to administration, and increasing the support to science with the objective of equilibrium between yearly incomes and expenditures.
- The Finance Committee considers that the IAGA Executive Committee and Secretary General should be commended for their excellent management of IAGA financial matters during the years 2017-2018.
- The Finance committee also wishes to express its warmest congratulations to the IAGA EC and Secretary General for their initiative to promote IAGA contributions and their applications to societal needs through the publication of a collective book.

The President called for a vote regarding the financial activities. The National Delegates unanimously approved the financial statements and gave discharge the Executive Committee for the period 01/01/2015 to 31/12/2018.

Report on the 4th IAGA School (Monika Korte

The Vice President reported on the 4th IAGA School (see section 4 for details).

The National Delegates thanked Monika Korte and Andrew Yau for their efforts in organizing the School.

Reports on Division Activities

Reports on Division activities were given by the attending Division Chairs.

Division I (Chair: C. Constable, represented by L. Tauxe): Three workshops were held related to WGs 1.1 and 1.2 in 2017 and 2018. The Division supported the nomination of Catherine Johnson for the Shen Kuo award and nominated an early career scientist for the Young Scientist Award. Five databases covering paleomagnetic to historical data, that have been developed by different groups in the community over the past years, are advertised by IAGA now.

Division II (Chair: P. Fagundes): Six topical workshops were organized within the Division in the past 2 years, and significant scientific contributions were made through publishing papers in high rated journals JGR, GRL, Science, Nature, Annales Geophysicae, JASTP, ASR etc. The Division organised 5 sessions and co-organised 2 more for this General Assembly, and received 205 abstracts.

Division III: There was no report from Division III.

Division IV (Chair: S. Patsourakos): Five topical workshops were held in 2018, and it was positively noted that more topical meetings were supported by IAGA than in the past. The Division had 5 own and 1 inter-association symposia at this GA. The concept of “single-shot” symposia was introduced, and planned to be kept in future. The Division acknowledged that two young scientists received support to attend the meeting.

Division V (Chair: A. Chambodut): WG V-Obs organised the geomagnetic observatory workshop in 2018 and is working on the next one for 2020, to be held in Russia. There are on-going actions regarding magnetic data and products referencing in WG V-Dat, that include a DOI task force, a license task force and the establishment of a metadata system. WG V-Mod is very active regarding reference geomagnetic field models, currently with IGRF-13 candidates being called for, for timely model release at the end of this year, and ongoing efforts to update the WDMAM.

Division VI (Chair: N. Palshin): The Division continues to work on an update on their Division Statutes and By-laws. Electronic voting has been established. They have an active website with 476 registered members from 50 countries. They held a very well attended EM Induction Workshop in Denmark in 2018, with a one-day Pre-workshop in August 2018 in Copenhagen. The next EM Induction workshop is planned for 2020 in Turkey.

ICEO (Chair E. Bering): The ICEO reported on successful education and outreach sessions at the Scientific Assembly in 2017 and with particularly high attendance at this General Assembly.

ICDC (Chair: S. Gurubaran): The ICDC organised one session at the 2017 Scientific Assembly, and was involved in a joint session with WG II-C at this General Assembly.

ICH (Chair: A. Soloviev): The ICH organised one session and another joint one with Div. V at this General Assembly.

Report on the preparation of the 2021 IAGA-IASPEI Scientific Assembly (Virenda M. Tiwari)

Virenda M. Tiwari, head of the Local Organising Committee (LOC), reported on the status of preparation of the 2021 IAGA-IASPEI Scientific Assembly. Due to time constraints, the report was kept short. More details are to be discussed at a dedicated meeting between representatives of the National Advisory Committee (NAC), local organising committee (LOC) and of IAGA and IASPEI ECs on July 17.

A suitable logo has been designed. The NAC had a first meeting in December 2018. A local organising committee has been established and contracts have been signed with the venue, the HICC in Hyderabad and Novotel for closest accommodation. A program outline and website have been established. Tentative deadlines for abstract submission, registration etc. are suggested, and suggestions for scientific excursions and cultural program are made.

Report of the Nominating Committee (Toshihiko Iyemori)

The Nominating Committee consists of Toshihiko Iyemori (Chair), Harald Böhnelt, Jeffrey Forbes, David Kerridge, Petra Koucka Knizova and Ute Weckmann. The National Delegates were first reminded of the EC members to be elected according to the new statutes from 2015.

Process of nomination

Announcement of pre-nomination was sent to the National Correspondents on January 18, 2019 by the Secretary General. The reminder was sent to the National Correspondents on March 5th by the chair of the NC. Because the number of candidates recommended by the National Correspondents was only 4 and no Early Career Scientist (ECS) was included, the NC conducted its own search for candidates to serve for the period 2019-2023. The candidates nominated were selected on the basis of the following criteria:

- eligibility,
- personal capability/suitability,

- commitment to IAGA and past service (on the Executive Committee, Divisions, Working Groups, and Inter-divisional Commissions, and in other ways), and
- balanced representation both scientifically and geographically.
- EC members who will stay in academia.
- Treasurer lives in a country where EURO is used.

The result of pre-nomination list of the candidates combined with those recommended by the NC was sent to the National Correspondents on May 28th based on the By-Law 10.2, and no additional recommendation was received by June 18th, i.e., 4 weeks before the election (By-Law 10.3).

List of candidates

The list of candidates was presented and the collection of their statements was distributed. The eligibility of present EC members for the respective positions in the new EC was presented.

Business

Election of Honorary Members of IAGA

Archana Bhattacharyya (India) and Toshihiko Iyemori (Japan) were unanimously elected as Honorary Members of IAGA.

Resolutions Committee

The National Delegates unanimously approved the nomination of Alan Thomson, Anna Kelbert and Erwan Thebault for the Resolution Committee.

2.2.2 Second Conference of Delegates, July 15, 18:00 - 19:30

The Secretary General conducted a Roll Call of the Chief Delegates from all IAGA member countries. This established that 24 Chief Delegates with voting rights were present.

The agenda was approved and the President called the meeting to order.

Reports

The Secretary General reported on the EC meetings during the General Assembly (see 2.3) and presented the list of newly elected Division, Commission and Working Group leadership (see 2.4). In preparation for the IAGA-IAMAS 2021 Scientific Assembly she presented the sessions proposed by the IAGA Divisions and Commissions, which will be coordinated and finalized over the next months.

Business

Election of EC members for the 2019 – 20123 Quadrennium (Toshihiko Iyemori)

With the exception of Early Career representative, there was exactly one candidate for each EC position to be filled. The voting scheme thus was to choose between the two nominated Early Career representatives, and approve or leave blank any of the other candidates. Barbara Leichter (Austria) and Adrian Hitchman (Australia) were appointed as scrutineers. Due to the new Statutes adopted in 2017 the EC newly contains a second Vice President, a Treasurer, an Early Career Representative and overall comprises 12 members.

All nominated EC members were approved with at least 19 out of 23 votes. For the Early Career representative (ECR), Loren Chang was elected with 14 votes over Erin Dawkins with 6 votes. The new EC, whose term of office started with the end of the General Assembly, thus consists of

President	Mioara Manda (France)
Vice Presidents	Alan Thomson (UK) Andrew Yau (Canada)
Secretary General	Monika Korte (Germany)
Treasurer	Aude Chambodut (France)
Members	Kusumita Arora (India) Loren Chang (ECR, China Taipei) Anna Kelbert (USA) Michael Kosch (S. Africa) Huixin Liu (Japan) Klaus Spitzer (Germany) Ricardo Trindade (Brazil)
Past President	Eduard Petrovsky (Czech Rep.)

Resolutions of the 2019 General Assembly (Alan Thomson)

Alan Thomson presented four resolutions, that had been suggested by Divisions / Commissions and deliberated by the resolutions committee consisting of Alan Thomson, Anna Kelbertand Erwan Thebault.

All four resolutions were approved unanimously by the National Delegates without discussion (see section 6 for the resolution texts).

The second Conference of Delegates ended with Secretary General Mioara Manda thanking the EC, Division and Commission leaders and the National Delegates for their involvement in IAGA activities.

2.3 Report from the IAGA Executive Committee Meetings

The Executive Committee had three meetings, on July 11, 13 and 16.

The first EC meeting was mainly devoted to prepare the reports for the first CoD, and to set up a Resolution Committee.

In the second EC meeting, the new IAGA officers were endorsed. It was noted that the business meetings of working groups of Div. I, and of Div III and IV had very low attendance. Strategies on how to revive activity in these subject areas within IAGA were discussed. It was concluded that the suitability of the present Divisional structure should be investigated by a task group and discussed within the communities.

The third EC meeting was preceded by a get-together of all available outgoing and incoming EC members and the newly elected Division and Commission Chairs and Co-Chairs. EC tasks and future business were discussed.

2.4 New Leadership of Divisions and Commissions

Contact details and Division Working Group leaders can be found on the IAGA website <http://www.iaga-aiga.org/about/>

Division I - Internal Magnetid Fields

Chair: Jan Simkanin (Czech Republic)
Co-Chairs: Julie Carlut (France)
Nicolas Gillet (France)
Liu Qinsong (China)

Note: Division I discarded its previous three Working Groups, and instead elected three Co-Chairs to represent the topical diversity.

Division II - Aeronomic Phenomena

Chair: Christoph Jacobi (Germany)
Co-Chair: Petra Knizova (Czech Republic)

Division III - Magnetospheric Phenomena

Chair: Simon Wing (USA)
Co-Chair: Georgios Balasis (Greece)

Note: Due to very low attendance a new Division III leadership could not be established in Montreal. IAGA Vice Presidents Alan Thomson and Andrew Yau searched in the community and Division III leaders were appointed by the Executive Committee in November 2019.

Division IV - Solar Wind and Interplanetary Field

Chair: Mari Paz Miralles (USA)
Co-Chair: Noé Lugaz (USA)

Division V - Geomagnetic Observatories, Surveys and Analyses

Chair: Masahito Nosé (Japan)
Co-Chair: Roman Leonhardt (Austria)

Division VI - Electromagnetic Induction in the Earth and Planetary Bodies

Chair: Ute Weckmann (Germany)
Co-Chair: Kiyoshi Baba (Japan)

Note: Following the traditional rules of this Division the Co-Chair was determined after the IUGG General Assembly by electronic voting in October 2019.

Interdivisional Commission on Developing Countries

Chair: Geeta Vichare (India)
Co-Chairs: Igo Paulino (Brazil)
Marta M. Zossi (Argentina)

Interdivisional Commission on History

Chair: Anatoly Soloviev (Russia)
Co-Chair: Justin Mabie (USA)

Interdivisional Commission on Education and Outreach

Chair: Barbara Leichter (Austria)
Co-Chairs: Jayashree Bulusu (India)
Carlo Laj (Italy)

Interdivision Commission on Space Weather

Chair: Antti Pulkkinen (USA)
Co-Chair: Stefan Lotz (South Africa)

Note: No Co-Chair had been suggested in Montreal yet. The Co-chair was proposed by the Commission and appointed by the Executive Committee shortly after the IUGG Assembly.

3 IAGA Awards

3.1 IAGA Award for Interdisciplinary Achievements - Shen Kuo



The Award aims at recognizing and acknowledging outstanding scientists whose activities and achievements cross several fields of research covered by IAGA.

The Shen Kuo Medal for interdisciplinary achievements was given to Catherine Johnson (Canada). The research activities of Dr. Johnson span the range of comparative planetary geophysics. She started her career investigating the paleomagnetism of lava flows from the last 5 million years of Earth's history with C. Constable as a means of understanding the time averaged geomagnetic field and the long term structure of the geomagnetic field. (IAGA Div I) In parallel, she worked with D McKenzie, D Sandwell, and J Suppe on lithospheric mechanics and dynamics on Venus as



Figure 1: The awardees with IAGA EC members at the IAGA Ceremony in July 2015. From left to right: M. Korte (IAGA vice president), C. Johnson (Shen Kuo Medalist), D. K. Karan and T. Gonet (Young Scientist Awardees), M. Manda (IAGA Secretary General), K. Tlatova and E. Shirokov (Young Scientist Awardees), M. Berg (Long Service Medalist), E. Petrovsky (IAGA President) [photo: J. Simkanin].

revealed by NASA's Magellan spacecraft. During her postdoc with S Solomon she worked on lithospheric mechanics and dynamics on Mars as modulated by the northern polar cap. With her student Renee Bulow (now Weber) she began an investigation of Moonquake clusters from the Apollo seismic network. Dr. Johnson also was the author of two chapters in the first two editions of the *Treatise of Geophysics*, one on Paleosecular Variation and the time-averaged paleomagnetic field with coauthor P. McFadden (IAGA Div. I), and one on Planetary Seismology with first author P. Lognonne.

Dr. Johnson then turned her attention to the planet Mercury, and was selected by NASA to be a participating scientist on the mission MESSENGER to orbit Mercury for four years. With the other instrument Cols, the PI Sean Solomon, the other participating scientists, and her students, she engaged in a very successful research program to understand Mercury from the MESSENGER observations. She also served on the MESSENGER science steering committee for the latter parts of the mission. Her contributions to understanding the 'first rock from the sun' are substantial, and include the discovery of an ancient crustal magnetic field on the planet (IAGA Div I), the first comprehensive model of Mercury's magnetic field, incorporating magnetic fields from the

core and magnetosphere (IAGA Div V), and the discovery of field-aligned current systems (IAGA Div III) and induction (IAGA Div IV). The discovery of Mercury's ancient crustal field was especially significant and the findings indicate that a global magnetic field driven by dynamo processes in the fluid outer core operated early in Mercury's history. Ancient field strengths that range from those similar to Mercury's present dipole field to Earth-like values are consistent with the observations, and with the low iron content of Mercury's crust inferred from MESSENGER elemental composition data. Dr. Johnson, with her student L. Philpott, constrained secular variation and developed a magnetic disturbance index for Mercury's magnetic field (IAGA Div V). Finally with her student R. Winslow, she was one of the first to describe the northern cusp region and its magnetic signature. She was selected to lead the internal magnetic field chapter for the Cambridge University Press book on 'Mercury from MESSENGER', which was showcased at the recent American Geophysical Union meeting in Washington at the Cambridge Press booth.

After the MESSENGER mission, Dr. Johnson has continued her work with her students on the Martian magnetic field, characterizing the large scale external field there, and with student A. Mittelholz, developed a new magnetic activity index for

Mars (IAGA Div. V). Dr. Johnson's accomplishments look to be just beginning, because she is now a Co-I on the recently landed InSight Discovery mission to map the interior of Mars with seismology, and also a Co-I on the OSIRIS-Rex mapping and sample return mission to the asteroid Bennu, which went into orbit about Bennu on 3 December of 2018.

The interdisciplinary character of Dr. Johnson's research activities is demonstrated by her mastery of, and creative usage of, both traditional potential field science AND space plasma physics. Her research also includes both spacecraft remote sensing and traditional field-based geological and geophysical data collection.

The impact of Dr. Johnson's research is especially significant, with her work forming the basic observational framework for many areas, especially with respect to the magnetic field of the planet Mercury, and the Earth's magnetic field within the past five million years.

3.2 IAGA Long Service Award



The IAGA Long Service Award in recognition of valued services to the IAGA community over many years was given to Martin Berg (Norway).

The magnetic observatory at Dombås, Norway was set into operation April 1st

1916 initiated by Ole Andreas Krogness (1886-1934) one of Professor Birkeland's (1867-1917) devoted assistants when he was head of the Halde Observatory in Kåfjord, Finnmark from 1912 to 1919.

Krogness realized that the distance between the magnetic observatories in Scandinavia was too large and therefore proposed to set up a magnetic observatory at Dombås in the middle part of Norway. He contacted the renowned and skilled observer, the astronomer Sigurd Enebo (1866-1946) who on March 12 1912 had discovered a Super Nova (Nova Geminorum nr. 2 Sigurd Enebo) and asked for his assistance. Enebo agreed to

install a magnetic observatory at his home and to take responsibility for keeping regular watch of the recordings for a limited favour. Enebo was in control of the observatory with the help of his sons until he died and his oldest son Per (1911-55) took over the responsibility. When Per died his younger brother Knut (1914-91) continued.

Martin Berg, farmer and part time teacher started to relieve Knut in 1980 by changing recording paper on the variometers. He continued helping out for a few years and learned how to treat the measurements. Finally he was engaged by the University in Bergen to take on full responsibility for the observatory from 1985. From year 2000 the Dombås Magnetic Observatory has been a part of the portfolio of Tromsø Geophysical Observatory and Martin Berg became an employee of UiT - The Arctic University of Norway.

Martin Berg has been working at the Dombås Magnetic Observatory for more than 35 years and to the full satisfaction of the science. Taking into account the rather isolated conditions he has been working under far from any scientific community it is a very remarkable achievement.

3.3 IAGA Young Scientist Award

The IAGA Young Scientist Award is given to young scientists who have made outstanding contributions at specialist meetings and workshops for which IAGA is a sponsor. This year, certificates were given by the President to 4 award winners. More information about the workshops in which they participated and nominated can be found on the IAGA web site.

Tomasz Gonet (UK)

Nominated by the 16th Castle Meeting on New Trends in Paleo, Rock and Environmental Magnetism.

Deepak Kumar Karan (India)

Nominated by the 15th International Symposium on Equatorial Aeronomy (ISEA-15).

Evgenii A. Shirokov (Russia)

Nominated by the 8th VLF/ELF Remote Sensing of Ionospheres and Magnetospheres Work-

shop (VERSIM).

Andreevna Kseniia Tlatova

Nominated by the IAU Symposium 335 - 'Space Weather of the Heliosphere: Processes and Forecasts'

4 The 4th IAGA School



The 4th IAGA School, prior to the IUGG General Assembly in Montreal, Canada, was held at the Station de biologie des Laurentides (SBL), ca. 80 km NW of Montreal. This venue provided two ideally sized lecture rooms and accommodation and full board for all participants. The School was attended by 20 students out of more than double the amount of nominations from the IAGA Divisions, and including four IAGA Young Scientist awardees. The selection criteria combined scientific excellence and good diversity regarding IAGA Division topics, geographical origin and gender. The group comprised 9 female and 11 male PhD students, with 5 from Europe (France, Germany, Poland), 3 from Russia, 5 from Asia (India, Japan, China), 6 from North America (USA, Mexico, Canada) and 1 from South America (Brazil).

Topics across all the disciplines of IAGA were covered by lectures given by experts in their fields: The geomagnetic field (David Kerridge, BGS Edinburgh, UK), Core dynamics (Mathieu Dumberry, University of Alberta, Canada), Ionosphere and Magnetosphere (Andrew Yau, Univer-

sity of Calgary, Canada), Electromagnetic Induction (Stephan Thiel, Geological Survey of South Australia), Solar Physics (Alexandre Lemerle, Collège de Bois-de-Boulogne, Canada) and Planetary Magnetism (Manar al Asas, University of British Columbia, Canada). Lectures were accompanied by practical exercises prepared by David Kerridge and Martin Connors (Athabasca University, Canada).

Both the students and the lecturers gave very positive feedback on the event. Interactions among students and between students and lecturers were very friendly and informal and friendships and networks were formed. This was facilitated by the convenient location where all students and lecturers stayed together, so that not only coffee breaks, but also meal times and evenings were used for lively scientific discussion. A half day outing to Mont Tremblant and a hike at the SBL complemented the event. The students initiated an online time-table to visit each others' presentations at the following IUGG General Assembly. The main aims, increasing the visibility and attractiveness of IAGA to young researchers, provid-

ing the young promising researchers with 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. We are very grateful to the European Geophys-

ical Union (EGU) and GEM Systems, who both provided valuable financial support. We thank the Biology Department of the University of Montreal for use of the SBL and in particular for the tremendous hospitality and support of the local staff.

5 IAGA Activities

5.1 Introduction of the new EC

In the following, the new IAGA EC members briefly introduce themselves and their scientific interests.

Mioara Manda, President

Mioara is currently the Programme Manager for Solid Earth at the Earth Observation / Directorate for Innovation, Applications and Science at Centre National d'Etudes Spatiales Paris (French Space Agency). Over the last decades, she has been involved in many activities in the frame of IAGA, the European Geosciences Union, the American Geophysical Union, the International Space Science Institute, the Commission for the Geological Map of the World, etc. Mioara has published more than 200 papers (publications in ISI journals, further journals, books and chapters in books, proceedings and reports), and has been involved in organising many workshops and conferences. She has also led several multi-partner research projects or work packages within projects at different national and EU levels. She has tutored PhD students from many countries around the world. Mioara is a member of the Academy of Romanian Scientists, Academia Europea, Académie Royale de Belgique. She received the International Award of AGU, the Petrus Peregrinus medal of EGU, and the prestigious French "Ordre National de Mérite". Mioara is currently the IAGA liaison for the Interdivisional Commission on History.

Alan Thomson, Vice President

Alan leads Geomagnetism research at the British Geological Survey. He specializes in the geomagnetic hazard to ground-based infrastructure,

such as power transmission and pipeline networks, caused by space weather. He has also carried out global geomagnetic field modelling to understand the sources of the Earth's magnetic field. Alan has scientific interests across all Divisions of IAGA and is a past-chair of Division V. He has more than 90 publications in journals, proceedings, major reports and book chapters, on space weather hazard and on geomagnetic field modelling and applications. He chairs the Executive Council of the INTERMAGNET magnetic observatory network and is a member of the SuperMAG project scientific steering committee. Alan is a member of the European Space Agency Swarm satellite mission 'Data, Innovation and Science Cluster' (DISC) Advisory Board. Alan is a past vice chair of the IUGG Geophysical Risk Commission. He was a member of the UK Royal Academy of Engineering commission on space weather hazard to technological systems and he is an original member of the UK government 'Space Environment Impact Expert Group'. Alan has led several industry and European Space Agency supported space weather research projects and he currently leads a UK multi-institute collaboration on 'Space Weather Impact on Ground-based Systems'. Alan is currently the IAGA liaison for Div IV.

Andrew Yau, Vice President

Andrew is a Professor at University of Calgary, Department of Physics and Astronomy since 1999; and currently Editor of Geophysical Research Letters, Vice President of IAGA, Vice Chair of COSPAR Commission C, and Principal Investigator (PI) of the Swarm-E/e-POP (Enhanced Polar Outflow Probe) mission. His primary research interest is in the Earth's ionosphere, magnetosphere, and related space weather; his current research is focused on space

weather effects in the topside ionosphere. An active member of the international space research community, he has participated in several international space science missions as PI or Co-Investigator over the past 4 decades, including Canadian, ESA, JAXA, NASA, and Swedish/German satellite and sounding rocket missions. He obtained his doctorate in physics from York University in 1978; he was Senior Research Officer and Space Plasma Group Leader at Herzberg Institute of Astrophysics prior to his move to Calgary in 1999, and Senior NSERC Industrial Research Chair in Experimental Space Science in 2003-2014, and he is the author of over 130 publications in peer-reviewed international journals. Andrew is currently the IAGA liaison for Div III.

Monika Korte, Secretary General

Monika leads the group 'Geomagnetic Field Evolution' within the Geomagnetism section of the German Research Centre for Geosciences, GFZ, in Potsdam, Germany. From 2003 to 2014 she was scientific head of the Adolf-Schmidt-Observatory for Geomagnetism of GFZ in Niemegk and later lead the group dealing also with the international collaborative and supported observatories of GFZ. She has been strongly involved in collaborative geomagnetic repeat station surveys in Germany, Europe and Southern Africa. One of Monika's research interests remains the separation of internal field secular variation and long-term magnetospheric variations. Since her time as a post-doctoral research fellow of Alexander von Humboldt-foundation at Scripps Institution of Oceanography, University of California at San Diego in 2001-2002, Monika has been interested in the reconstruction of the global long-term magnetic field evolution, from Holocene time-scales to geomagnetic excursions, using archeo- and paleomagnetic data produced in laboratories all over the Earth. She has been active in several roles for IAGA and the American Geophysical Union, was or is an (associate) editor for *Geochemistry*, *Geophysics*, *Geosystems*; *Nature Scientific Reports* and *Geophysical Research Letters*, and she is co-editor of two IAGA books. Monika also is a member of the Scientific Board of the Bureau Central de Magnétisme, France Terrestre (BMCT) and of the International Advisory Board (IAB) of the Institute of Geophysics Prague.

Kusumita Arora, Member

Kusumita is a geophysicist, working at the National Geophysical Research Institute of the Council for Scientific and Industrial Research under the Ministry of Science and Technology, Govt of India, for the last twenty years. She completed her graduation and post-graduation from the Indian Institute of Technology, Kharagpur and subsequently completed her Ph.D. in Osmania University, Hyderabad and Freie Universitaet, Berlin under a DAAD Sandwich program. Her early work focussed on applying potential field methods to investigate the structure and processes of the Earth. She has worked in several team projects viz. Gravity Map Series of India, projects sponsored by OIL, ONGC, etc. involving the analysis and modeling of gravity and magnetic anomalies for deciphering subsurface structure. Her doctoral work focused on developing a 3D model of the western passive margin of India based on gravity and geoid data. In continuation, she pursues investigations of structural patterns in the Koyana-Warna region of western India, based on airborne as well as borehole data.

Over the last decade Kusumita has devoted herself to geomagnetic observations and research on dynamics of low latitude and equatorial ionosphere. She has led the efforts for the upgrade of geomagnetic observatories HYB and CPL and their integration into the global network. She has also installed new recording sites in Andaman-Nicobar, Lakshadweep and Kumaun Himalaya. The new data is aimed at studies of the magnetospheric and ionospheric characteristics of low and equatorial regions in Indian sector. She has 45 peer reviewed publications to her credit. Kusumita is currently the IAGA liaison for Div V.

Loren Chang, Member, Early Career Representative

Loren is a Professor at the Department of Space Science and Engineering at National Central University (NCU) in Taiwan. He conducts research on the Earth's upper atmosphere and its role in space weather, analysis of satellite data from the COSMIC/FORMOSAT-3 and TIMED missions, and also serves as the Taiwan PI for INSPIRESat-1 as well as the Taiwan lead for the International Satellite Program in Research and Education (INSPIRE) consortium. Loren is also currently leading the development of the IDEASSat (Iono-

sphere Dynamics Explorer and Attitude Subsystem Satellite)/INSPIRESat-2 spacecraft funded by NSPO (Taiwan's space agency), as well as the SCION-X (SCintillation and IONosphere Network eXtended) mission. Loren is working to establish spacecraft design and operations capacity, as well as an aerospace engineering academic program focused on astronautics at NCU. He received his PhD in Aerospace Engineering Sciences from the University of Colorado at Boulder in 2010, and is currently serving as International Representative on the U.S. CEDAR (Coupling Energetics and Dynamics of Atmospheric Regions) Science Steering Committee, as well as Pillar 2 co-leader of the SCOSTEP / PRESTO (Predictability of Variable Solar-Terrestrial Coupling) program. Loren is currently the IAGA liaison for the Interdivisional Commission on Space Weather.

Anna Kelbert, Member

Anna graduated in mathematics from Cambridge University, UK and obtained her Ph.D. in geophysics from Cardiff University, UK in 2006. She subsequently worked at Oregon State University until joining the United States Geological Survey (USGS) in Colorado, USA in 2015. Anna is currently a Research Geophysicist at the USGS Geomagnetism Program, serving on IAGA EC in her personal capacity. Anna's research interests focus on the use of magnetotelluric data and ground geomagnetic observatory data for geophysical interpretation and geomagnetic hazard assessments. To this end, she develops analysis techniques for electromagnetic induction in the solid Earth at regional to global scales. She contributes to the sun-to-Earth modeling efforts insofar as they inform estimation of geomagnetically induced currents that constitute a hazard to human-made infrastructure. Anna is a long-standing advocate for scientific reproducibility and more generally, for the FAIR (Findable, Accessible, Interoperable and Reusable) principles in the geosciences. Anna has served on multiple committees of the U.S. National Science Foundation's EarthCube initiative since 2014 and on the EarthCube Leadership Council in 2017-2019. Within magnetotellurics, she leads, and contributes to, efforts on data format and metadata convergence. Anna is a lead author of a widely used community code for magnetotelluric modeling and inversion (ModEM), as well as the creator and manager of

a global database of community magnetotelluric data (ds.iris.edu/spud/emtf). Anna has regularly contributed to the biennial Electromagnetic Induction Workshops (EMIW) as Program Committee member or as session convener since 2010, and has organized and convened sessions at the AGU, IUGG, and multiple other conferences since 2008. Anna is currently the IAGA liaison for Div VI.

Michael Kosch, Member

Mike is currently the chief scientist and research manager at the South African National Space Agency, based in Hermanus South Africa, as well as a professor at the Universities of the Western Cape and KwaZulu-Natal in South Africa. He is the PI of the South African SuperDARN radar located in Antarctica. Current active research projects include: (1) Black auroras, and the newly discovered anti-black auroras, using EISCAT incoherent scatter radar data in Norway and optics; (2) polar mesospheric summer echo (PMSE) studies using the EISCAT ionospheric modification facility in Norway; (3) transient luminous events (sprites) in the mesosphere over South Africa, using radio wave and optical instruments; (4) meso-scale ion-neutral coupling and Joule heating in the E-region ionosphere close to auroral arcs using SuperDARN and scanning Doppler imagers; (5) thermospheric neutral density studies using SuperDARN (for improving models); and (6) atmospheric radiation studies using high-altitude balloons over South Africa (to generate a regional model). All these projects involve postgraduate students and, where possible, the student does field work to get their own observations and gain experience. Mike is currently the IAGA liaison for the Interdivisional Commission on Developing Countries.

Huixin Liu, Member

Huixin is an Associate Professor in space physics in the Department of Earth and Planetary Science, Kyushu University, Japan. She did her PhD in Max Planck Institute for Aeronomy (now for solar physics) on magnetosphere-ionosphere coupling via ion up/outflows. After graduation, she worked first in HAO/NCAR, USA as a postdoc with the TIEGCM model, then in GFZ Potsdam, Germany as a Humboldt fellow with the

CHAMP satellite mission. Huixin also worked in Hokkaido University and Kyoto University in Japan as a JSPS fellow before moving to her current position. Her current research focuses on atmosphere-ionosphere coupling, which includes ion-neutral coupling in the upper atmosphere of Earth and other planets, thermosphere-ionosphere response to external forcing from the Sun and the lower atmosphere. She has organized various workshops and symposiums on vertical atmosphere coupling and served on many review panels and steering committees. Dr. Liu is an editor for AGU Space Weather journal, and a current member of AGU CIP committee. Huixin is currently the IAGA liaison for Div II.

Klaus Spitzer, Member

Klaus studied physics at the University of Göttingen and received his PhD in 1991. He worked as a researcher and lecturer at the Geological Survey in Hannover and the École Polytechnique in Montreal/Canada before he completed his habilitation at the University of Leipzig in 1999. He became a full Professor of Applied Geophysics at the Technical University Bergakademie Freiberg in 2000 and was head of the Institute of Geophysics and Geoinformatics from 2003 to 2018. His research focus is on geoelectromagnetic methods, particularly on their numerical simulation and inversion. He has been working in close cooperation with the Institute of Numerical Analysis and Optimization of his university for more than 15 years. He was dean/vice dean of the Faculty of Geosciences, Geoengineering and Mining, a member of his university's senate, chairman/designated chairman of the German Research Council Physics of the Earth, elected member of the Review Board of Geophysics and Geodesy of the German Research Foundation DFG, and served for more than a decade as a reviewer for the German Academic Exchange Service. In 2007, he became a trustee of the Gerald W. Hohmann Trust for Teaching and Research in Applied Electrical Geophysics (USA). He has been active in chairing and convening sessions at international conferences and hosted and organized several national and international conferences including the 4th International Symposium on Three-Dimensional Electromagnetics in Freiberg 2007. He was associate editor for *Acta Geophysica* and guest editor for *Geophysics*, *Journal of Applied Geophysics*, and

Earth, Planets and Space. He has been active as a reviewer for almost all major geophysical journals and several national research foundations. Klaus is currently the IAGA liaison for Div VI. Klaus is currently the IAGA liaison for the Interdivisional Commission on Education and Outreach.

Eduard Petrovsky, Past President

Eduard graduated in 1984 from solid phase physics at the Faculty of Natural Science of the P.J. Šafárik University in Košice (Slovakia). He received his PhD degree in 1995 at the Geophysical Institute of the Academy of Sciences in Prague, where he has worked until present. He focuses on magnetic properties of rocks and their application to environmental problems. Since 2003 he acts as Chair of the Department of Geomagnetism and since 2017 as Deputy Director. Eduard is an internationally highly recognized expert in his research field. Among others, in 2007-2001 he was member of the Executive Committee of the International Association of Geomagnetism and Aeronomy (IAGA), in 2001-2015 its Vice-President, and in 2015-2019 he acted as the IAGA President and member of the Executive Committee of the International Union of Geodesy and Geophysics (IUGG). In 2019, he was elected the IUGG Bureau member. Between 2000 and 2014, he was the main organizer of biennial international meetings on Paleo, Rock and Environmental Magnetism. Since 2012 he acts as an editor of the *Geophysical Journal International*. Eduard is also active in education. During 1998-2001 he lectured on the physical properties of rocks at University Aix-Marseille III in France. Until 2017 he taught the same course at the Faculty of Natural Sciences, Charles University in Prague. He also gives lectures on iron oxides in environment (Magnetomineralogy) at Faculty of Natural Sciences, Charles University in Prague, and Helsinki, Finland. He established Summer Schools of IAGA and initiated the IAGA Young Researcher Award.

5.2 EC activities

In addition to the three EC meetings at the 27th IUGG General Assembly, IAGA activities by the EC were coordinated by e-mail discussions and teleconferences.

5.2.1 IAGA Book for the IUGG 100th Anniversary.

The book "Geomagnetism, Aeronomy and Space Weather: A Journey from the Earth's Core to the Sun" has 5 parts, each consisting of multiple chapters. Two EC members have been in charge of each part. The book was in the proof-reading stage in 2019 and has been published with Cambridge University Press in November (see section 10.1).

5.2.2 Participation in a Workshop to establish a national geomagnetism consortium in INDONESIA



The Indonesian national agency BMKG operates five geomagnetic observatories and also does repeat station measurements for declination maps. As an attempt to build cooperation among providers and users of geomagnetic data and build a cohesive community of geomagnetic data users a Geomagnetic Focus Group Discussion was organized by the University of Mataram, Lombok during 20-21 Nov 2019. All the national organisations who acquire such data and who use these data along with others for interpretations were invited. EC member Kusumita Arora followed the invitation to attend as a representative of IAGA. The Workshop included many presentations on use of geomagnetic data and national and international data sharing. The signing of national Indonesian agreement to form a geomagnetic consortium was the culmination of all the presentations. IAGA commends the Indonesian colleagues for the establishment of this consortium that shall fit neatly into the global geomagnetic community.

5.3 The International Geomagnetic Reference Field IGRF, 13th generation

The International Geomagnetic Reference Field (IGRF) is a data-based model specifying the large-scale internal time-varying portion of the Earth's magnetic field on or above the planet's surface. It is updated every five years by an international team of research scientists under the auspices IAGA Working Group V-MOD. The IGRF is produced from observations collected by satellites, ground magnetic observatories, and dedicated magnetic surveys, and spans 1900 to the present. It is widely used by researchers in studies of space weather, electric current flow in Earth's upper atmosphere, and local magnetic anomalies beneath the planet's surface. It is also used by commercial organizations and private individuals as a means to provide orientation information (for example in satellite attitude determination or solar panel orientation).

On 28 August 2017, during an IAGA V-MOD working group meeting in Cape Town, South Africa, the task force for the 13th generation of IGRF (IGRF-13) was assembled, whose aim is to issue the call for candidate models, perform evaluations of all candidates, and lastly build the final IGRF-13, which will extend the model's validity range through 2025. On 26 March 2019, the IGRF-13 Task Force issued the worldwide call for candidate models. Fifteen international teams responded to the call and submitted candidate models for consideration. At present, the task force is finalizing their evaluations of the candidates and plans to release the final IGRF-13 in December 2019.

Patrick Alken
IGRF-13 Task Force Chair
IAGA V-MOD Working Group Chair
29 November 2019

5.4 Geomagnetic data availability

Free exchange of and easy access to geomagnetic data has always been advocated by IAGA. In this regards, IAGA decided to tighten links with the International Real-Time Geomagnetic Observatory Network INTERMAGNET (linked particularly to IAGA Division V activities). Moreover, following on a tradition from the 1990's, when

several paleomagnetic databases got adopted by IAGA (an activity mainly of IAGA Division I), IAGA is happy to promote currently active databases that hold a wealth of histori-

cal, archeo- and paleomagnetic data with relevant metadata. More information can be found on the IAGA website <http://www.iaga-aiga.org/products-services/>.

6 IAGA Resolutions - 2019

These resolutions were adopted during the 27th IUGG General Assembly, Montréal, Canada, July 2019.

Resolution No.1 (2019): World Data Center SILSO and the international sunspot number

IAGA

Recognising

The importance of the long-running international sunspot number in an increasing number of studies into Solar Activity and related studies into Space Weather, Space Climate and Global Change in the Earth environment,

Noting

The leadership role of the World Data Center SILSO (Sunspot Index and Long-term Solar Observations) in the production, collection, preservation and dissemination of the international sunspot number over several decades,

Urges

Funding agencies to make every possible effort to continue the operation of the WDC-SILSO and the production of the International Sunspot Number in a long-term sustainable manner.

Resolution n° 1 (2019): World Data Center SILSO et le nombre international de taches solaires

AIGA,

Reconnaissant

l'importance du nombre international de taches solaires depuis longtemps dans un nombre croissant d'études dédiées à l'activité solaire et aux études connexes relatives la météo spatiale, au climat spatial et aux changements globaux de

l'environnement terrestre,

Notant

le rôle de premier plan joué par le World Data Center SILSO (indice des taches solaires et observations solaires à long terme) dans la production, la collecte, la préservation et la diffusion du nombre international de taches solaires sur plusieurs décennies,

Demande instamment

aux agences de moyens de déployer tous les efforts possibles pour poursuivre l'exploitation du WDC-SILSO et la production du numéro international de taches solaires de manière durable.

Resolution No.2 (2019): Space Weather and the ESA Lagrange Mission

IAGA

Recognising

- Recent international efforts by COSPAR and other organisations and researchers to determine the potentially severe societal and economic impact of space weather
- The expressed need of organisations and agencies, including the UN Committee on the Peaceful Uses of Outer Space (COPUOUS), for improved space weather forecasting, mitigation and preparedness across a wide range of environments, which include near-Earth space, the ionosphere, the upper atmosphere and on the ground,

Noting

The activities of agencies and individuals over recent years to define and develop space weather monitoring platforms off the Sun-Earth line, to provide significant improvement in our knowledge

of the evolution of conditions at the Sun and in the corona, and the in situ properties of the solar wind and interplanetary magnetic field,

Expresses

Deep appreciation of the work of the European Space Agency (ESA) in developing the Lagrange project to monitor the terrestrial environment from the L5 Lagrange point, and

Urges

ESA, together with collaborating institutes and agencies, to make every effort to support the implementation of the Lagrange project at the earliest opportunity.

Résolution n° 2 (2019): Météorologie Spatiale and la mission ESA Lagrange

AIGA,

Reconnaisant

- les efforts internationaux réalisés par le COSPAR, ainsi que par d'autres organisations et chercheurs, pour déterminer l'impact sociétal et économique potentiellement sévère de la météorologie spatiale,
- le besoin exprimé par les organisations et agences, y compris par le Comité des Nations Unies sur l'espace extra-atmosphérique (COPUOUS), pour améliorer la prévision et anticiper les effets de la météorologie spatiale dans une large gamme de conditions et d'environnements, notamment dans l'espace proche de la Terre, l'ionosphère, la haute atmosphère et sur le sol,

Notant

les activités des agences et des personnels scientifiques au cours des dernières années pour définir et développer des plates-formes de surveillance de la météorologie spatiale au large de la ligne Soleil-Terre, afin d'améliorer de manière significative notre connaissance de l'évolution des conditions solaires, de la couronne solaire, et des propriétés in situ du vent solaire et du champ magnétique interplanétaire,

Exprime

sa profonde appréciation de l'implication de l'Agence Spatiale Européenne (ESA) dans le développement du projet Lagrange visant à surveiller l'environnement terrestre à partir du point L5 de Lagrange, et

Demande instamment

à l'ESA, en collaboration avec les instituts et les agences partenaires, de tout mettre en œuvre pour soutenir la mise en œuvre du projet Lagrange le plus rapidement possible.

Resolution No.3 (2019): Magnetotelluric survey data

IAGA

Considering

- The importance of geoelectric field monitoring and forecasting for mitigation of geomagnetic hazards to ground-based technological conductors such as electrical power transmission networks
- The potential societal impact of severe geoelectric fields on ground-based infrastructure
- The challenges of long-term wide-spread direct monitoring of geoelectric fields

Noting

The critical importance of magnetotelluric data in indirect estimation of geoelectric fields from well-established geomagnetic field measurements including from geomagnetic observatories and variometer networks, and the added value of magnetotelluric data in imaging and understanding geophysical imprints,

Endorses

National magnetotelluric survey initiatives, and

Urges

Funding agencies to support continued acquisition of magnetotelluric survey data and efforts in historical magnetotelluric data recovery, and

Encourages

Governments and the international magnetotelluric community to endorse open data sharing practices for magnetotelluric time series and data products, particularly magnetotelluric impedances and related transfer functions.

Résolution n° 3 (2019): Données des levés magnétotelluriques

AIGA,

Considérant

- l'importance de la surveillance et de la prévision des champs géoélectriques pour atténuer les risques géomagnétiques sur les conducteurs technologiques au sol tels que les réseaux de transport d'énergie électrique,
- l'impact sociétal potentiellement sévère des champs géoélectriques sur les infrastructures au sol
- les défis liés à la surveillance directe, à grande échelle, et à long terme des champs géoélectriques,

Notant

l'importance cruciale des données magnétotelluriques pour l'estimation des champs géoélectriques à partir de mesures de champs géomagnétiques, y compris celles réalisées aux observatoires géomagnétiques et par les réseaux de variomètres, et la valeur ajoutée des données magnétotelluriques pour l'imagerie et la compréhension des structures géophysiques,

Approuve

les initiatives nationales concernant la mise en oeuvre des levés magnétotelluriques,

Demande instamment

aux agences de moyens de soutenir la poursuite de l'acquisition des données magnétotelluriques et les efforts de valorisation des données magnétotelluriques historiques, et

Encouragement

les gouvernements et la communauté internationale de magnétotellurique à approuver et promouvoir la pratique du partage des données, des séries temporelles, et des produits de données magnétotelluriques, en particulier des impédances magnétotelluriques et de leurs fonctions de transfert associées.

Resolution No.4 (2019): Importance of the Rapid Magnetic Variation Service and the lists of Sudden Commencements (SC) and Solar Flare Effects (SFE)

IAGA

Recognizing

The outstanding importance of the SC (sudden commencement) and SFE (solar flare effect) data in geomagnetic, ionospheric, space weather, and space climate research,

Noting

That in accordance with IAGA Resolution no 6 at the XVI IUGG General Assembly (1975), and Resolution no 8 at the 8th IAGA Scientific Assembly (1997), the institute of "Ebro Observatory" is responsible for the collection and preparation of the SC and SFE lists as part of its Rapid Magnetic Variation Service,

Expresses

Deep appreciation for the work performed to date by Ebro Observatory, and

Urges

Funding agencies to make every possible effort to continue the long-term production of SC and SFE lists for the Rapid Magnetic Variation Service by Ebro Observatory.

Résolution n° 4 (2019): Importance du service de variations magnétique rapide (RMV), de la liste des commencements soudains (SC) et des éruptions solaires (SFE)

AIGA,

Reconnaissance

l'importance exceptionnelle des données SC (commencements soudains) et SFE (éruptions solaires) pour la recherche géomagnétique, ionosphérique, météorologique et climatique,

Notant

que, conformément à la résolution n°6 de l'AIGA lors de la XVI assemblée générale de l'UIGG (1975) et à la résolution n°8 de la 8e assemblée scientifique de l'AIGA (1997), l'institut de l'observatoire de l'Èbre est responsable de la collecte et de la préparation des indices SC et SFE

dans le cadre de son service "Rapid Magnetic Variation",

Exprime

une profonde appréciation du travail accompli à ce jour par l'observatoire de l'Èbre, et

Demande instamment

aux agences de moyens de faire tout leur possible pour que le service "Rapid Magnetic Variation" de l'observatoire de L'Èbre maintienne la production à long terme des listes SC et SFE.

7 Swarm mission – probing the geomagnetic field

The Swarm trio of low-Earth-orbiting satellites, launched in November 2013, is the fourth of the Earth Explorer missions of the European Space Agency. The three Swarm satellites are performing well, and the orbital geometry of the constellation evolves in line with expectations, with all three platform and payload units active. Scientific studies based on Swarm data span a wide range of spatial and temporal scales, from the long-term variations of the core dynamo, through the induction processes in the mantle and oceans, the detailed mapping of the lithospheric field, to the small-scale ionospheric events. The Swarm satellites are expected to continue until 2021, and probably beyond. Important 2019 Swarm-related events are:

- Numerous talks on scientific achievements obtained with Swarm data were presented at the 27th General Assembly of IUGG in July 2019. A few sessions were explicitly dedicated to the analysis of Swarm data.
- WebAMPS, a service showing predictions of polar ionospheric currents and corresponding magnetic ground variations based on solar wind observations has been implemented at <https://birkeland.uib.no/data/amps/>. This service is based on the AMPS (Average Magnetic Field and Polar Current System) model that is derived from magnetic observations taken by the Swarm and CHAMP satellites.

- Magnetic field modelling effort include determination of numerous core field models as input for the next generation of the IGRF (International Geomagnetic Reference Field), which will be released at the end of this year. Swarm observations are the main data source for this activity, and different international groups submitted Swarm-based "IGRF candidate models" in October 2019.
- The 9th Swarm Data Quality Workshop took place from September 16 to 20 in Prague, hosted by the Czech Technical University, The Astronomical Institute of the Czech Academy of Sciences, and the Charles University. More than 130 participants from 20 countries provided the latest updates on the mission status, and presented the latest research results. High multi-mission synergy is a valuable activity; we note here the achievements obtained by combining the Swarm measurements with those taken by the Canadian Space Agency's Cassiope mission and/or the China Seismo-Electromagnetic Satellite, and by reprocessing and calibrating the platform magnetometer data from other missions, such as CryoSat-2.

Mioara Mandea (CNES)
Jakub Velímský (SDQW – LOC Prague)

8 Reports on Meetings: IAGA-Sponsored or of IAGA interest

8.1 2019 Annual African Geophysical Society (AGS) Conference on Space Weather

Cairo, Egypt, 25-28 March, 2019



The African Geophysical Society (AGS) formally established on 2012 during the first Chapman Conference on Space Weather in Africa, organized by the American Geophysical Union AGU at Addis Ababa, Ethiopia. This year it was held in Cairo, Egypt from 25-28 March 2019. The workshop was attended by 80 participants: South Africa - 6, Japan - 1, Algeria - 1, Sudan - 2, USA - 2, France - 1, UK - 1, Kenya -1, Korea -1, Saudi Arabia -1, China -2, Norway -1, Egypt -60. More than 180 applied for the workshop, 50 abstracts were accepted. After some cancellations, 36 oral and 8 posters were presented. A 20-min time slot was given for each oral talk. The following session themes were identified, being held in a sequence:

- Space Weather Capacity Building
- Ionospheric Irregularities and geomagnetic disturbances
- GNSS and communication systems
- Space Environment effects on satellite systems
- Solar Active phenomena and its impact on different aspects.

The meeting was supported by VarSITI, IAGA, ISWI, SANSA, SCOSTEP and COSPAR. A more detailed summary of the meeting including the program and abstracts can be found at <http://www.spaceweather.edu.eg/AGS2019.html>.

Ayman Mahrous
On behalf of the Organizing Committee

8.2 The 6th LATINMAG Workshop

Rancagua, Chile, 18-22 November, 2019

The 6th LATINMAG Workshop was planned to be held in Rancagua, Chile on 18-22 November, 2019. The Workshop unfortunately had to be cancelled at short notice due to some unexpected socio-political developments shortly before.

9 In Memorium

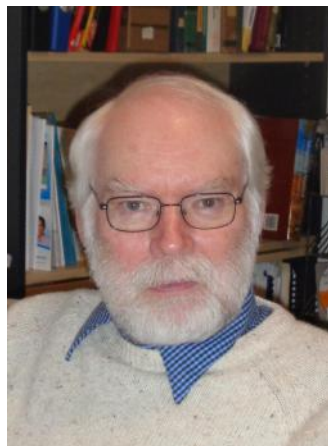
Peter Robert Milligan (1951 - 2019)

It is with much sadness that we note the passing of Dr Peter Milligan, a long term employee of Geoscience Australia, on Saturday 2nd March 2019.

Peter joined the Bureau of Mineral Resources (BMR) in 1985 and retired from Geoscience Australia (GA) 29 years later in 2014. Over this time

period, Peter became an institution in the fields of geomagnetism, magnetotellurics, airborne surveying, and non-seismic geophysical data processing. Having taught maths and science at secondary schools prior to joining the BMR, he was well trained as a mentor and a tutor. But more than this, he was incredibly generous with his time and knowledge. He would patiently share his insights, or if the need arose, jump straight in to

help out. His presence would instantly bring a sense of confidence to any team that he joined since he demonstrated over and over that he could play a key part in bringing large projects to completion.



In the later part of his career, Peter played a leading role in the expansion of magnetotelluric surveying within GA. But he may be best known for his contribution to the AWAGS long baseline aeromagnetic and radiometric traverse project, and the subsequent production of the 5th and 6th editions of the Magnetic Anomaly Grids of Australia in 2010 and 2015 respectively. These were massive undertakings. More than 30 million line km of low level airborne survey data from over 800 individual surveys were combined and levelled to produce a high fidelity grid of magnetic data that covers the entire continent. This was an internationally-recognised achievement, the envy of many other geoscience organisations outside Australia.

The Magnetic Map of Australia that Peter produced adorns the walls and pin-up boards of hundreds of geoscience organisations, businesses, universities, and consultancies. It has a prominent place here in the foyer at GA - cast your eye high up on the huge cloth banner that hangs against one of the lift wells. The coloured TMI magnetic image of Australia must also have appeared in thousands of presentations given by GA staff. Despite this widespread distribution and usage, most would not be able to say who produced these products - Peter was the epitome of the quiet achiever and never sought out the recognition that he deserved.

The Magnetic Map of Australia that Peter produced adorns the walls and pin-up boards of hundreds of geoscience organisations, businesses, universities, and consultancies. It has a prominent place here in the foyer at GA - cast your eye high up on the huge cloth banner that hangs against one of the lift wells. The coloured TMI magnetic image of Australia must also have appeared in thousands of presentations given by GA staff. Despite this widespread distribution and usage, most would not be able to say who produced these products - Peter was the epitome of the quiet achiever and never sought out the recognition that he deserved.

Peter was an executive committee member of the Task Force of the World Digital Magnetic Anomaly Map, the recipient of an ASEG Service Certificate in 2016, author or co-author of numerous scientific publications, and the recipient of countless GA awards. To most of us, however, he was simply the quietest, kindest, happiest, most valued fellow team member of the geophysics sec-

tion of GA that we have known.

Peace and comfort be with you, Peter.

Adrian Hitchman
Geoscience Australia

Neil Opdyke (1933 - 2019)

I am sad to report that Neil D. Opdyke passed away on April 7. Neil attended Columbia University in NYC on a football scholarship where he eventually became the Captain of the football team and earned a Bachelor's Degree in Geology. He attended Cambridge and



Durham University in England where he received his Doctorate degree. After post-graduate work at Rice University and later in Australia, he moved to another post-doctorate fellowship in what was then called Southern Rhodesia in Africa. He returned to the United States in the early 1960's joining the Lamont-Doherty Geological Observatory of Columbia University as a researcher and eventually becoming its Director. In the early 1980's Neil joined the faculty of the University of Florida. He eventually retired from UF as a Distinguished Professor Emeritus.

Neil was well known for his groundbreaking research in the 1960's on magnetostratigraphy, paleoclimate and continental drift. He worked on the documentation of magnetic reversals in deep-sea sediments, which led to proof of the Vine-Matthews-Morley hypothesis (the governing paradigm for marine magnetic anomalies). Neil pioneered magnetic stratigraphy in terrestrial sediments and produced impressive records notably from Pakistan and the southwestern USA. These studies led to a vastly improved time frame for vertebrate evolution and allowed the documentation of mammal migration. Professor Opdyke was a member of the National Academy of Sciences, the American Academy of Arts and Sciences, a fellow of the Geological Society of America and a fellow of the American Geophysical Union. He

received an honorary Doctor of Sciences from the University of Newcastle upon Tyne.

Brad Clement
Texas A&M University

Ole Rasmussen (- 2019)

It is with deep personal regret that we announce that Ole Rasmussen passed away 23rd of February, 2018.

Ole was the director of the World Data Centre Copenhagen and head of the geomagnetic observatory in Brorfelde (BFE), Denmark, and in Qaanaaq (THL), Qeqertarsuaq (GDH), and Narsarsuaq (NAQ), Greenland. He was a quiet person, but was adventurous and had a curious mind. His many adventures around the world included living for extended periods in Qeqertarsuaq and Qaanaaq to operate the geomagnetic observatories established there.

Ole was known for the widely used FGE 3-axis linear-core fluxgate magnetometers which were designed and built under his supervision alongside Emil Kring Lauridsen and Michel Genevey. He was also a main partner in the Greenland West-coast Chain with thirteen magnetometer stations. He was active in INTERMAGNET, where he worked as Chair of the CD-ROM Subcommittee of INTERMAGNET Operation Committee from August 25th, 1991 until June 26th, 2006. He taught observatory practice with great enthusiasm during many IAGA Workshops, where he made a point to include and motivate the audience.

Ole's scientific work covered several research areas within geomagnetism, including the external field in the cusp, cap, auroral, and subauroral regions by using data from the magnetometer chain in Greenland, the conjugate chain in Antarctica, the northern polar cap (PCN) index, and data from the Ørsted satellite.

During the XIth IAGA Scientific Assembly in 2009 Ole was presented with the Long Outstanding



Service Medal in recognition of valued service to the IAGA community over many years.

Ole will be missed and remembered by both national and international colleagues for his professional achievements as well as for his calm and warm personality.

Lars W. Pedersen and Anna Willer
DTU Space - Technical University of Denmark

Peter Robinson (1932 - 2019)

It is with great sadness that I report the death of Peter Robinson on March 25, 2019, in Trondheim, Norway. Peter was trained in structural geology and metamorphic petrology, with degrees from Dartmouth College (AB, 1954), the University of Otago (MS, 1958)



and Harvard University (PhD, 1963). He was a professor in the Geosciences Department at the University of Massachusetts, where he received the Chancellor's Medal in 1994. After his retirement in 1999, he split his time between Emeritus status at UMass and a consulting position with the Norwegian Geological Survey. He was a brilliant scientist, an active researcher, and a splendid teacher, advisor, and colleague. His research on the tectonics of the Northern Appalachians and the European Caledonides changed the way we look at ancient mountain ranges. He was a Fellow of the Geological Society of America, the Mineralogical Society of America, and the Royal Norwegian Society of Science and Letters. He published over 100 peer-reviewed journal articles with his many students and colleagues. His impact on the magnetism community came late in his career, when he was very instrumental in identifying, describing, and interpreting lamellar magnetism. When he learned of the presence of metamorphic rocks with very high (up to 60 A/m), exceedingly stable, remanent magnetism, but little or no magnetite from his wife, Susanne McEnroe, he was intrigued and challenged. With Suzanne, Richard Harrison, Rob Hargraves, and

others he delved into the mineralogy of these rocks, and then into their predominant oxides – intergrowths of hematite and ilmenite. His 2002 paper in *Nature* is a combination of crystallography and crystal chemistry at the nanometer scale blended with rock magnetic measurements. It introduced the magnetics community to a new and potent form of remanent magnetism – lamellar magnetism. In numerous subsequent papers Peter and colleagues further developed the theory and reality of lamellar magnetism and showed its importance from the nanometer scale to continental anomalies to planetary possibilities. His insight, curiosity, collegiality, and scientific brilliance will be greatly missed.

Laurie Brown
University of Massachusetts Amherst

Kiyohumi Yumoto (1951 - 2019)

With our deepest sorrow we announce that Emeritus Professor Kiyohumi Yumoto of Kyushu University has passed away on 7 October 2019 at the age of 68 in Fukuoka, Japan.



Prof. Yumoto received his Ph.D. in Geophysics at Tohoku University in 1988 based on his research on global Pc3-4 ULF pulsations. He started his academic career in 1979 at Tohoku University as a research associate. He later joined the Solar-Terrestrial Environment Laboratory (STEL) at Nagoya University in 1988 as an associate professor, and in 1995 he joined Kyushu University as a professor and stayed at that position until his retirement in 2016.

At Kyushu University, Japan, Prof. Yumoto was the executive director of Space Environment Research Center (SERC) which later became International Center for Space Weather Science and Education (ICSWSE). He was also the PI of the MAGDAS/CPMN/210MM ground magnetometer network project. He is also a founding member of the ULTIMA Consortium for an ultra-large terrestrial international magnetic array, and a key member of the International Space Weather Initiative (ISWI) through this magnetometer array. Prof. Yumoto made numerous pioneering contributions to the development of this global magnetometer network with his international colleagues. In addition to his outstanding research, Prof. Yumoto will be remembered for his tireless mentorship that motivated both domestic and international students, including many from developing countries. He was truly a friend to many of us all over the world.

Prof. Yumoto should be remembered not only as a remarkable scientist, but also as a global leader of international collaboration. Through the MAGDAS/CPMN/210MM project, he made a great contribution to the nurture of space weather science, especially in Asian and African countries.

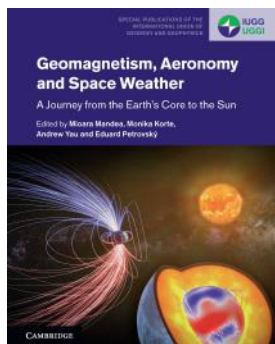
We are collecting information, anecdotes, remembrances about Prof. Yumoto's career and life. If you would like to share with us such material, please contact me <<mailto:yoshikawa.akimasa.254@m.kyushu-u.ac.jp>>.

Condolences and other messages will be forwarded to his wife, Shiori Yumoto, through the same address.

Akimasa Yoshikawa, Kyushu University
Kazuo Shiokawa, Nagoya University

10 General information about IAGA

10.1 Book: Geomagnetism, Aeronomy and Space Weather



On the occasion of the IUGG centennial IAGA published a book with Cambridge University Press providing a comprehensive overview of the IAGA fields of research. The volume, edited by M. Manda, M. Korte, A. Yau and E. Petrovsky and entitled "Geomagnetism, Aeronomy and Space Weather – A Journey from Earth's Core to the Sun" was published in November 2019.

10.2 IAGA books series

A series of five books, representing the five IAGA Divisions, provides a comprehensive overview over all fields of IAGA science, including the state of the art at the time of writing (~2010). The books are written and edited by experts in their fields. Published by Springer, the income from the books supported scientists to attend the IAGA Scientific Assembly in Sopron.



10.3 IAGA Guides

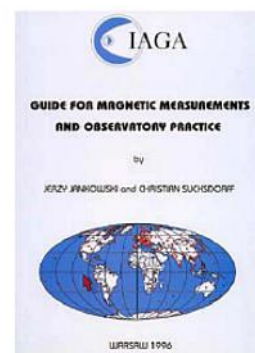
IAGA has published four practical guides to observation. These are available as pdf documents from the [IAGA web site](#), or they may be ordered from the IAGA Secretary General.

IAGA Guide for Magnetic Measurements and Observatory Practice

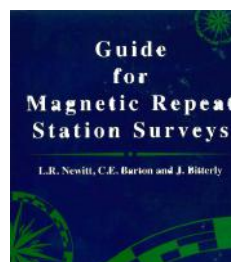
by J. Jankowski and C. Sucksdorff, 1996, 232 pages, ISBN: 0-9650686-2-5; Price: USD 50.

This Guide provides comprehensive information about how to organize and run a magnetic observatory and make magnetic measurements. The main topics are:

- A brief description of the magnetic field of the Earth
- Selection of observatory sites and layout
- Magnetometers
- Absolute magnetic measurements
- Recording of magnetic variations
- Data processing
- Testing and calibrating instruments



IAGA Guide for Magnetic Repeat Station Survey



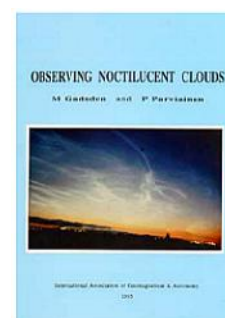
by L.R. Newitt, C.E. Barton, and J. Bitterly, 1997, 120 pages, ISBN: 0-9650686-1-7; Price: USD 25.

This Guide provides a comprehensive description of the theoretical basis, operational details, and instrumentation for making magnetic repeat station survey measurements.

IAGA Guide to Observing Noctilucent Clouds

by M. Gadsden and P. Parviainen, 1995, ISBN: 0-9650686-0-9; Price: USD 25.

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 kilometres, 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”.

IAGA Guide for Calibrating a Compass Swing Base

by L. Loubser and L.R. Newitt, 2009, 35 pages, available only as Electronic version (PDF).

In this guide a general description of a compass swing base calibration procedure is presented which was developed at the Hermanus Magnetic Observatory. The procedure is based on the use of DI flux magnetometers as these types of magnetometers are widely in use. Although there are also other methods in use the 'DI-method' should be seen as an IAGA recommendation.



10.4 IAGA History

A special issue of the open access journal History of Geo- and Space Sciences (HGSS) was published on the occasion of the IUGG centennial in 2019. It contains articles about the history of IUGG and its eight associations. The IAGA con-

tribution is authored by M. Manda and E. Petrovsky, entitled "IAGA: A major role in understanding our magnetic planet" (Hist. Geo Space. Sci., 10, 163–172, <https://doi.org/10.5194/hgss-10-163-2019>).

10.5 IAGA website

Information on IAGA can be found at: <http://www.iaga-aiga.org>

10.6 NEW: IAGA on Social Media

A dedicated task group within the Interdivisional Commission on Education and Outreach (ICEO) on social media activities is beginning to form.

Tereza Kameníková has kindly agreed to be the chair of the task group. She's a young researcher from Charles University in Prague, Czech Republic, and has social media experience and agreed to play an active role. Also Rogers Hannah from the University of Edinburgh has joined up with Tereza to work on the IAGA Outreach through social media. Loren Chang, the Early Career representative in the IAGA Executive Committee (EC) agreed to be a liaison person for these activities and provide advice.

The activities have kicked off in November 2019 and you can now follow IAGA on Facebook, Twitter and Instagram at the following sites:

 www.facebook.com/IAGAandAIGA/

 www.twitter.com/IAGA__AIGA

 www.instagram.com/iaga_aiga/

If you notice any exciting IAGA Science that should be advertised there or even would like to get permanently involved in generating content for regular social media posts and become part of the task group please contact the IAGA SG at iaga_sg@gfz-potsdam.de.

10.7 IAGA contact

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

Monika Korte

GFZ German Research Centre for Geosciences
Telegrafenberg
14473 Potsdam
Germany

email: iaga_sg@gfz-potsdam.de

Imprint

Executive Editor: M. Korte (GFZ - German Research Centre for Geosciences, Potsdam, Germany)
Layout by L^AT_EX & A. Jordan (GFZ - German Research Centre for Geosciences, Potsdam, Germany)