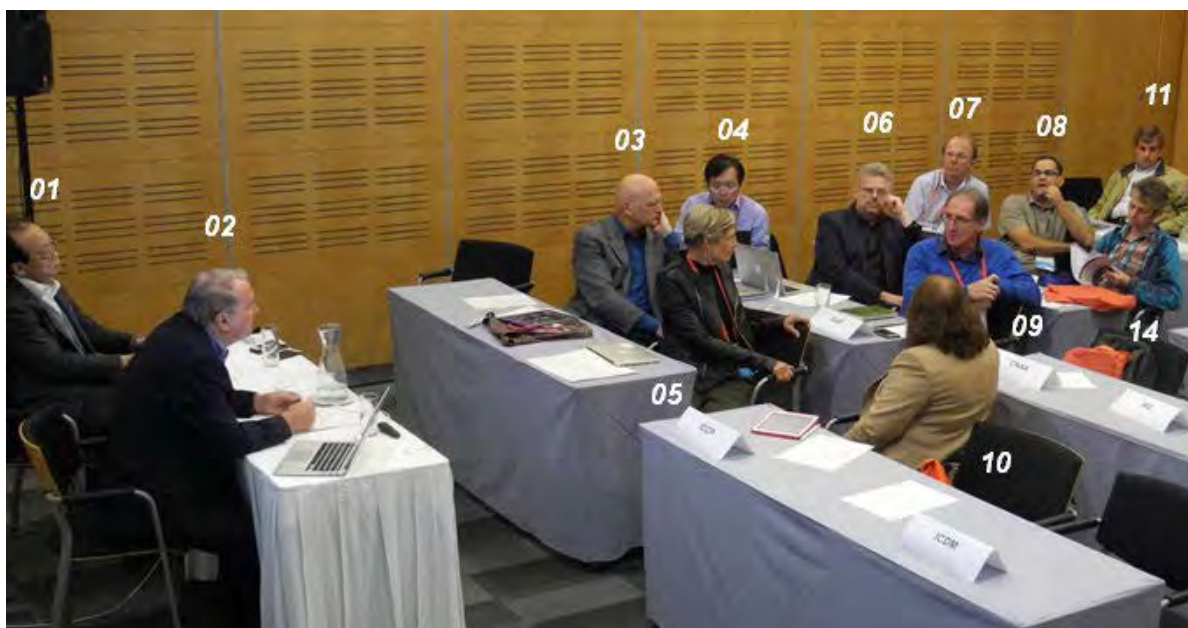


Minutes of the First 2017 IAMAS Executive Committee Meeting (EC1)

Sunday 27 August 2017, 13:30-17:15

Room 1.43, Cape Town International Convention Centre

Participants: John TURNER² (IAMAS President, UK), Teruyuki NAKAJIMA¹ (IAMAS Secretary-General, JP), Steve ACKERMAN³ (IAMAS Deputy Secretary-General, US), Joyce PENNER⁵ (IAMAS Vice-President, nat. delegate, US), Laura GALLARDO (IAMAS Vice-President, nat. delegate, CL), Jianping LI⁴ (Secretary ICCL, CN), Neil HOLBROOK⁶ (President ICCL, AU), Tom LACHLAN-COPE⁷ (President ICPM, UK), Matthew LAZARRA⁸ (Secretary ICPM, US), Colin PRICE⁹ (MaL, ICAE, nat. delegate, IL), Andrea FLOSSMANN¹⁰ (President ICCP, nat. delegate, FR), Peter PILEWSKIE¹¹ (Past Deputy Secretary-General, US), Igor MOKHOV¹² (nat. delegate, RU), Daren LU¹³ (nat. delegate, CN), Ian RENFREW¹⁴ (nat. delegate, UK), Byung-Ju SOHN¹⁵ (President IRC, KR), Richard GROTJAHN¹⁶ (President ICDM, US), Moira Evelina DOYLE¹⁷ (nat. delegate, AR), Hisashi NAKAMURA¹⁸ (nat. delegate, JP), Hans VOLKERT¹⁹ (IAMAS Honorary Treasurer, nat. delegate, DE), Takeshi KURODA²⁰ (Representative ICPAE, JP), Iracema CAVALCANTI²¹ (MaL, BR), Yoshinobu SASAKI²² (IAMAS Assistant Secretary-General, JP), John GYAKUM²³ (nat. delegate, CA), Tomas HALENKA²⁴ (nat. delegate, CZ), Zheng (Jenny) LIN²⁶ (staff AAS, IAMAS journal, CN), John BURROWS (President ICACGP, DE), James DRUMMOND (Secretary ICACGP, nat. delegate, CA)





1. Welcome and introductions (Turner/Nakajima)

The President welcomed those attending the meeting and reported the apologies from Athena Coustenis (IAMAS Past-President). He anticipated a successful IAPSO-IAMAS-IAGA assembly as there was almost 1,000 scientists registered, with 36% coming from IAMAS. IAMAS was leading 11 joint symposia and had also organised 15 IAMAS-only sessions.

2. Adoption of agenda (Turner)

The agenda was adopted without any changes.

3. Turner presented an overview of IAMAS activities since IUGG-2015

He highlighted:

- The great success of the 2015 IUGG assembly in Prague
- The monthly Bureau teleconferences that have been held and the physical meeting of the Bureau in Kyoto, Japan in April 2016.
- The site visit by the P, SG and Assistant SG to Cape Town in April for planning of the 2017 assembly
- The attendance of the P and SG at the IUGG Executive meeting in Paris in June 2016
- The eight major goals of the IUGG Strategic Plan
- The establishment of an IAMAS Facebook page
- The focus on trying to engage with Early Career Scientists involved with the atmospheric sciences.

- The membership of the IAMAS President on the Executive of SCOR
- The success of the relationship between IAMAS and Advances in Atmospheric Sciences.

There were some questions and comments from the floor:

- Who manages the IAMAS Facebook pages? – Turner at present although anyone is able to post to the page.
- Why is IAMAS on the Executive of SCOR but not that of SCAR? IAMAS does not co-sponsor SCAR.
- IAMAS makes a major contribution to initiatives such as IPCC, but still has a relatively low profile. How can we change this? Turner suggested that we could have more regional meetings and possibly produce a short promotional video with audio in different languages. But 36% of the participants at the Cape Town assembly were from IAMAS so that is promising.
- We seem old fashioned compared to EGU and AGU. It's difficult to do everything we want without a larger income and a permanent secretariat. But we are trying to make progress through greater exposure via social media and modernizing the organization.

4. SG Nakajima reported on IAMAS activities and finances for 2015-2017.

- He announced that he will stand down as SG at IUGG in 2019.
- Hans Volkert has indicated that he would like to step down as Honorary Treasurer at IUGG in 2019.
- He reported that the Deputy SG has been changed from Peter Pilewski to Steve Ackerman (University of Wisconsin, USA). Prof Ackerman has extensive experience with IRC, and also with the AMS and other organizations.
- IAMAS is in a good financial position and has reserves of close to \$300,000
- IAMAS is grateful to JAXA for supporting the IAMAS office

There were a number of comments and questions:

- There was a discussion about the IAMAS finances. Should we invest some of the IAMAS funds? This is best considered when the funds move from Germany in 2019.
- Previously we had made an annual financial contribution to each commission, however, there was general agreement that we should continue the present system of allocating our funds based on the submitted bids. This allows us to give more funds when the commissions have large meetings, such as the quadrennial conferences.

- There was support for our policy of helping early career scientists to attend our meetings, but it was noted that we should not forget scientists as they move into mid-career and beyond.
- The 15 minutes allocated to the keynote speakers in Cape Town was thought to be too short. In the future it would be better to give 30 minutes.

5. Vice-President Penner explained the review process and selection procedure for the 2017 Early Career Scientist Medal Award. Seven excellent applications were submitted, with the committee selected Corinna Hoose, Karlsruhe Institute of Technology, as the awardee. Penner proposed an increase in the number of nominations by the Bureau and EC members. IUGG now has their own ECS Award, with a cutoff date ahead of that of IAMAS, but there is little we can do about this. Both the IAMAS and IUGG medals are prestigious awards. We may think about instigating additional medals as other associations have multiple medals.

6. Turner described the decision process for the IAMAS-IAPSO-IACS Assembly in 2021. The National Correspondents will vote at the second EC meeting on Thursday. The EC members and NCs agreed the three associations hold a joint assembly. We have two bids, one from South Korea and one from UK. The final decision will be based on the three votes from the three associations. Each association has a different decision making system; IAPSO and IACS decisions are made by their Bureau. IAMAS has voting by its NCs, however, we should consider establishing a sub-committee in the future.

6-1. Prof. B. J. Sohn made a presentation on the Korean Busan proposal. He suggested that IUGG/IAMAS should try and maintain a good geographical distribution with their assemblies and pointed out that there had been few assemblies in the Far East. He said that Korean scientists in the three associations will work together, and the conference center will provide the professionals to run the conference. The registration fee would be 560 USD for early bird registration, which is higher than the Cape Town fee (about 450 USD). But it would be possible to reduce the fee if we reduce spending.

There were a number of questions from the EC:

- What is the cost of an air ticket from Europe? 1K to 1.5K USD for an economy seat
- The budget is based on 1,500 participants, but past assemblies have had about 1,000 including locals. MOCA in Montreal had 1,200 attendees. That estimate may be too large. However, a lot of Korean people will attend. In the case of a smaller attendance,

the revenue goes down, but it can be managed by reducing expenditure and/or asking more funding. Turner questioned the \$240,000 allocated for the conference banquet. It may be better to make the banquet optional and reduce the registration cost.

- The large auditorium may be too big.
- B J was asked about the weather at the proposed time of the conference. The rainy season starts in late June and we may have hot and humid weather. Some hotels are along the beach.
- The conference centre is very large and there may be other conferences happening during our event, although this was also the case in Cape Town.

6-2. Prof. Ann Webb made a presentation on the UK Manchester proposal. The conference would be based at the University of Manchester. The suggested dates were in early September.

Comments made were:

- French universities start in early September, which may affect attendance of French scientists. Prof Webb said that the dates could be shifted into August, but hotels would be more expensive.
- Our recent assemblies have been held in purpose-build conference facilities, but it was pointed out that the conference hall is not far from the university rooms and all the facilities are within 10 minutes walk.

7. Brief reports on commission activities (max. 5', 2 slides; <55', Comm. Presidents)

- iCACGP (James Drummond)

- ICAE (Colin Price)

- ICCL (Neil Holbrook)

Question: IUGG has a commission on climate, do you have interactions?

Answer: That is a cross association activity. Jianping, Secretary, is the person involved in the activity.

- ICPM (Tom Lachlan-Cope)

- ICCP (Andrea Flossmann)

- IRC (Byung-Ju Sohn)

- ICDM (Richard Grotjahn)

- ICPAE (Takeshi Kuroda)

Refer to Appendix 1: Combined report of all IAMAS commissions

8. Several National Representatives gave short reports:

- Germany (Hans Volkert): The German National committee meets once a year. The main consideration has been regarding IUGG 2023.

- Russia (Igor Mokhov): A conference will be held next year, probably May, for the IAMAS and IAMAP 100 years celebrations. This will be combined with schooling for young scientists. Russian IAMAS proposes a distinguished scientist medal.

- Australia (Neil Holbrook): Recent major news is the successful funding of Australian research council centers of excellence for climate science until 2024. There will be more focus on soil and adaption issue.

- China (Daren Lu): A report was given on the IAMAS relationship with the Springer journal Advances in Atmospheric Sciences. The journal has published a number of IAMAS meeting reports and scientific papers from IAMAS Early Career Scientist Medal awardees. The journal impact factor is 1.5.

- Japan (Hisashi Nakamura): There is close collaboration between IAMAS and the Science Council of Japan. Symposia were held on the Future Earth Project, UN Sustainable Development Goals and National planning of the earth observation satellites.

NCs were requested to send their written reports to the IAMAS SG office.

Refer to Appendix 2: Combined report of National Representatives

9. It was agreed that the following resolutions would be drafting by the time of the second EC meeting on Thursday.

1) Resolution of Thanks to the LOC of IAPSO-IAMAS-IAGA Assembly 2017 by the IAMAS Bureau (Turner).

2) A resolution regarding the cancellation of satellite programmes by the US government (Penner). The EC felt that it was essential to have continuity of data.

The meeting was closed by the President at 16:30.

Minutes of the Second 2017 IAMAS Executive Committee Meeting (EC2)

Thursday 31 August 2017, 12:00-13:30, Room 2.44, CTICC

Participants: John TURNER¹⁸ (IAMAS President, UK), Joyce PENNER¹⁷ (IAMAS Vice-President, nat. delegate, US), Laura GALLARDO¹² (IAMAS Vice-President, nat. delegate, CL), Teruyuki NAKAJIMA²⁴ (IAMAS Secretary-General, JP), John GYAKUM¹ (nat. delegate, CA), Takeshi KURODA² (Representative ICPAE, JP), Yoshinobu SASAKI³ (IAMAS Assistant Secretary-General, JP), Ottmar MÖHLER⁴ (Representative CNAA, DE), Nozomi TOMIZAWA⁵ (IAMAS Assistant Secretary-General, JP), Miyuki MIYAZAKI⁶ (IAMAS Assistant Secretary-General, JP), Igor MOHKOV⁷ (nat. delegate, RU), John BURROWS⁸ (President iCACGP, DE), Richard GROTTJAHN⁹ (President, ICDM, US), Iracema CAVALCANTI¹⁰ (MaL, BR), Hans VOLKERT¹¹ (IAMAS Honorary Treasurer, nat. delegate, DE), Ian RENFREW¹³ (nat. delegate, UK), Colin PRICE¹⁴ (MaL, ICAE, nat. delegate, IL), Andrea FLOSSMANN¹⁵ (President ICCP, nat. delegate, FR), Tom LACHLAN-COPE¹⁶ (President ICPM, UK), James Drummond¹⁹ (Secretary iCACGP, nat. delegate, CA), Byung-Ju SOHN²⁰ (President IRC, nat. delegate, KR), Hisashi NAKAMURA²¹ (nat. delegate, JP), Moira DOYLE²² (nat. delegate, AR), Matthew LAZARRA²³ (Secretary ICPM, US), Bernd FUNKE²⁵ (Vice-President ICMA, ES), Elisa MANZINI²⁶ (President ICMA, DE), Tomas HALENKA²⁷ (nat. delegate, CZ), Neil HOLBROOK²⁸ (President ICCL, nat. delegate, AU), Werner SCHMUTZ²⁹ (nat. delegate, CH), Daren LU³⁰ (MaL, nat. delegate, CN), Laszlo BOZO (nat. delegate, HU)



1. The residual agenda following EC1 was adopted.
2. The President explained the voting procedure for the location of the 2021 scientific assembly and noted that each nation has one vote, which would be made by the National Delegate. Members raised questions regarding the climate at the two venues and the possibility of shifting the dates of the conference. The vote on the location of the IAMAS-IAPSO-IACS Assembly 2021 then took place with, 15 national representatives being present. A count took place with the majority of the votes being cast for Busan. The President announced that IACS and IAPSO had also voted for Busan so provisionally our 2021 assembly is scheduled for that location. The destination will be confirmed at the IUGG General Assembly (GA) in 2019.
3. Two draft resolutions were discussed. The first stressing the need for the US to maintain continuity in their satellite observing programmes. There was general support for the resolution, but several points were raised by participants. It was agreed that Vice-President Penner would produce a second draft for circulation to the EC members and NCs. The second resolution was an expression of thanks to the LOC of the IAPSO-IAMAS-IAGA-2017 conference and the resolution was adopted unanimously.
4. A number of positions on the IAMAS Bureau will become vacant in 2019, including the President and Secretary General. A Nominating Committee was therefore established chaired by Past President Coustenis and including current President Turner (ex officio) and Cavalcanti (member at large). Additional members will be sought with the goal of ensuring a good geographical distribution.
5. Preparations for the IUGG 2019 GA were discussed. The following activities were noted:
 - An IUGG task force for IUGG's centennial events had been established. (TF100, Chair, Chris Rizos): Volkert and Coustenis are involved as members.
 - A monograph on IUGG History (paperback, 150-200 pages) will be prepared (Volkert, Ismail-Zadeh): Mike MacCracken agreed to lead the preparation of the IAMAS section.
 - There will be an Early Career Earth and Space Scientists event (Johanna M Salminen): Julia Keller will be the IAMAS contact point. An ECS workshop to be held ahead of the GA is one idea.
 - Ideas for joint symposia are being discussed by the commissions.
 - Grant proposals to IUGG should be made at the time of the 2018 IUGG call for conference

support.

- Lachlan-Cope proposed a brain-storming session by EC members for IUGG 2021 symposia. The event was held on 1 Sept (Fri), Rm 1.61, 12:00-13:30.

The SG office will collect further ideas/plans from the commissions until 10 September in order to prepare for the IUGG EC and Programming committee (20-22 Sept., Montreal).

6. Future activities for science promotion and networking were discussed as follows:

- More networking using various social networking services especially toward IUGG 2019.
- The voting system for venue selection should be improved with a more active role for the EC members.
- Budget management was discussed. So far, income and spending are nearly balanced with no large changes in the IAMAS reserves, even with large variability in the amount of money that we receive from the IAMAS Science Assemblies and IUGG GAs. The bureau decided to increase the IAMAS support for meeting and conference proposals made by commissions responding to the IUGG conference support call each year. Some commissions organize quadrennial science symposiums with 200 to 500 scientists attending and more funds are provided by IAMAS for these events. There was a discussion regarding whether there should be more investment, such as in IAMAS's own programme for meetings/lectures/conferences, including an ECS workshop in the IUGG 2021. There could also be strengthening of outreach activities and constructing an integrated system for commission web systems. There was a discussion on providing a commission allocation for more flexible commission operation. This system had been used in the earlier time. But the system was replaced by the present system based on the annual IUGG conference support call. The present system is more reasonable in a sense that active commissions are more supported, so this system will be continued.

The meeting closed at 13:30.

Appendix A: Notes on the IAMAS Plenary Panel discussion

- About 60 people attended.
- John Turner gave a brief introduction on the current state of IAMAS and some topics that could be discussed. The meeting was then opened for general discussion.
- To keep our assemblies relevant and well attended it was suggested that we have a number of keynote lectures given by outstanding scientists.
- There is a need for child care facilities and a good partner/spouse programme at our assemblies. A half day social event for all attendees would be good.
- There is a need for a clearer definition of the role of the members at large. This should be addressed when the statutes are revised ahead of IUGG 2019.
- There should be improved communication with and active role for the National Correspondents (NC)
- Richard Grotjahn asked the following questions, and received these answers.
 1. How many people at this meeting looked at the iamas.org website this year? (60%)
 2. How do you find out about meetings you attend? (can vote for more than one of these choices)
 - a. past habit/been to that meeting before (60%)
 - b. heard from colleagues (40%)
 - c. periodical/online information (e.g. CLIVAR list of upcoming meetings) (35%)
 - d. social media (5%)
 3. Would having a place where meeting talks are archived be useful? Yes (70%)
 4. Would having a group event/excursion be of interest? Yes (90%)

Appendix B: Notes on the IAMAS Early Career Scientist (ECS) event

- About 20 young scientists attended. *Refer to Attachment 1: Participant list
- John Turner gave a brief introduction to IAMAS.
- It was asked how those interested in IAMAS could find out the name of their National Correspondent. This information is on the IAMAS web site but we will attempt to distribute it more frequently.
- Julia Keller discussed the Young Earth System Scientist (YESS) organization, which now has 1,000 members in 83 countries. They had a workshop in 2015, monthly teleconferences since 2015 and a Webinar series on earth science. They published a BAMS article in 2017.
- It was noted that the number of PhD candidates is decreasing in Japan, whereas increasing in Germany.
- Marius W. Rossouw reported on the activities of APECS South Africa. APECS has 7,500 members worldwide since 2007 from 101 countries. They publish a monthly newsletter. 2017 is the tenth anniversary of APECS.
- Corinna Hoose, recipient of the 2017 IAMAS ECS Medal, gave a presentation on her career development. The presentation was useful for students and ECSs and focused on how to keep their motivation during difficult periods in their research career and private life.

Appendix C: Notes on the brain storming meeting for IUGG 2019 GA programming

Participants: John TURNER (IAMAS President, UK), Teruyuki NAKAJIMA (IAMAS Secretary-General, JP), Tom LACHLAN-COPE (President ICPM, UK), Iracema CAVALCANTI (MaL, BR), Matthew LAZARRA (Secretary ICPM, US), Marcia YANASOE (Secretary IRC, BR), Ottmar MÖHLER (Representative ICCP, DE), Neil HOLBROOK (President ICCL, nat. delegate, AU), Richard GROTHJAHN (President, ICDM, US), Nili HARNIK (Secretary ICDM, IL), Thomas SPENGLER (ICDM, NO), John P. BURROWS (President iCACGP, DE), James R. DRUMMOND (Secretary iCACGP, nat. delegate, CA), Elisa MANZINI (President ICMA, DE), Bernd FUNKE (Vice-President ICMA, ES)

- ICPM (Lachlan-Cope) proposed joint sessions on cryosphere-ocean-atmosphere system study:
 - ✓ Polar clouds and aerosols
 - ✓ Future evolution of the polar environment (John Turner, Tom Bracegirdle, Dave Reusch; joint with IAMAS and IACS)

- ✓ Instrumentation session (with Space weather scientists) (Matthew Lazarra, Tracy Moffat-Griffin)
- ✓ Polar modeling session (John Cassano, Andrew Orr (CORDEX))
- ✓ Vertical coupling interactions of the polar atmosphere (Tracy Moffat-Griffin)
- iCACGP (Burrows) pointed that separation of natural and anthropogenic factors in changing chemistry and physics is important. Attribution of long lived greenhouse gases (LLGHGs), especially methane, change is important.
- Several commissions raised the importance of Monsoon studies, interaction with vegetation (iLEAP community) and land process
- Extreme hydrology (Grotjahn) which is related to biomass burning (Drummond). Health impact is another important issue.
- Other events discussed were:
 - ✓ Lectures by outstanding scientists
 - ✓ 3 day YESS workshop prior to the GA.
 - ✓ Featuring of "Anthropocene"
- Enhanced press/media programme
 - ✓ Highlights of the presentations and outcomes to media
 - ✓ Talks and interviews with senior scientists (Crutzen, Hoskins, etc.) and young scientists
 - ✓ NASA-Hyperwall lectures for junior high/high school pupils
 - ✓ Video and TV program make
- Centennial milestones of the IAMAS science should be discussed with Mike MacCracken
 - ✓ Ozone measurements by Dobson spectrometer
 - ✓ Low pressure system theory by Bjerknes
 - ✓ CO2 measurement at Mauna Loa
 - ✓ Greenhouse theory
 - ✓ Meteorological observatory operation, such as 100 years of Lindenburg Observatory
 - ✓ Satellite system
 - ✓ Polar expedition

End of minutes

Attachment 1: ECS Event Participant List

No.	Name	Affiliation	Email
1	Julia Keller	WMO	jkeller@wmo.int
2	Marius Rossouw	Stellenbosch University	marius.w.rossouw@gmail.com
3	Corinna Hoose	Karlsruhe Institute of Technology	corinna.hoose@kit.edu
4	Fiona Tummon	ETH Zurich	fiona.tummon@env.ethz.ch
5	Pamela Harvey	Wits University South Africa	pamela.harvey@students.wits.ac.za
6	Natalia M. Crespo	University of Sao Paulo	natalia.crespo@iag.usp.br
7	Carolina B. Gramcianinov	University of Sao Paulo	carolina.barnez@iag.usp.br
8	Christian Kwisanga	University of Rwanda	kwistiand@gmail.com
9	Brigitte Language	University of North West South Africa	bl23034149@gmail.com
10	Michelle McCrystall	British Antarctic Survey	michmcr@bas.ac.uk
11	Mohamadou Diallo	IEK-1	m.diallo@fz-juelich.de
12	Chen Schwartz	Hebrew University	chen.schwartz1@mail.huji.ac.il
13	Ian White	Hebrew University	ian.white@mail.huji.ac.il
14	Kevin Reed	Stony Brook University	kevin.a.reed@stonybrook.edu
15	Stefan Lotz	SA National Space Agency	slotz@sansa.org.za
16	Newton Matandirotya	North West University (SA)	runyamore@gmail.com
17	Nkanyiso Mbatha	University of Zululand	MbathaNB@unizulu.ac.za
18	Thomas Bracegirdle	British Antarctic Survey	tjbra@bas.ac.uk
19	Tom Lachlan-Cope	British Antarctic Survey	tlc@bas.ac.uk
20	Isabelle Steinke	Karlsruhe Institute of Technology	isabelle.steinke@kit.edu
21	Andrea Flossmann	University Clermont Auvergne/CNES	Andrea.Flossmann@uca.fr
22	Laura Gallardo	University of Chile	lgallard@u.uchile.cl
23	Erik Behrens	NIWA (NZ)	Erik.Behrens@niwa.co.nz
24	Joyce Penner	University of Michigan	penner@umich.edu
25	John Turner	British Antarctic Survey	jtu@bas.ac.uk

26	Teruyuki Nakajima	Japan Aerospace Exploration Agency	terry-nkj@nifty.com
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Appendix 1



International Association of Meteorology and Atmospheric Sciences International Commission on atmospheric Chemistry and global pollution IAMAS – iCACGP

iCACGP Annual Report to IAMAS 2016

Introduction

The iCACGP comprises a commission of three officers (President, Vice President and Secretary), and a number of members and honorary members (for a full list, see Appendix A). Its role is to facilitate research of significance for atmospheric chemistry and global pollution.

iCACGP Objectives

iCACGP aims to:

- Promote research on chemistry and composition of troposphere related to global pollution and climate change
- Initiate, facilitate and coordinate the research programs in this field, which require international cooperation.

Administrative Matters

The current commission was elected at the iCACGP meeting within the 13th Quadrennial iCACGP Symposium and 13th IGAC Science Conference on Atmospheric Chemistry, Natal, Brazil, September 2014 and serves from 2014-2018.

The annual meeting of the commission was held in Boulder, CO on 22-23 September 2016. It was attended by sixteen members of the commission in person and four electronically. Also present were representatives of IAMAS, IGAC, SOLAS and WMO. Reports were received from IGAC, SOLAS, ILEAPS and GAW and a report on Future Earth as well as country reports from around the globe. Support of major atmospheric experiments was discussed and organisation and participation in future meetings was planned.

At this meeting it was decided to set up committees to plan the future of the commission and also to investigate the instantiation of a prize or prizes to recognise excellent work within the scope of the commission.

The main conclusion of the meeting was that iCACGP activities are proceeding well with much scientific work being performed. Concerns were again raised in many countries over continued funding and some cut-backs were noted with regret.

Activities

The Commission has been active in the following areas in the past year:

- i) International Global Atmospheric Chemistry (IGAC) Project 2016 Science Conference 26-30 September 2016 in Breckenridge, CO, USA. The commission meeting was held just ahead of this meeting and in the same vicinity, so many commission members participated in the conference. Prof. Maria Kanakidou gave a keynote talk where she presented research on 'Aerosols in atmospheric chemistry and biogeochemical cycles' connecting the two sponsored activities of ICACGP, IGAC and SOLAS as well as GESAMP.
- ii) Prof Maria Kanakidou co-organized an EGU session in Vienna in April 2016 and in April 2017 on Air Sea exchanges: Impact on Biogeochemical Cycles and Climate, where studies relevant to GESAMP and ICACGP have been presented. This session will be organized again in 2018.
- iii) Professor R. R. Dickerson and Professor J. P. Burrows were co conveners of the AGU session A13J: Emissions and Tropospheric Photochemistry on the Urban Scale I. This was dedicated to the late Professors Jack G. Calvert and Donald H. Stedman, who were leaders of our field.
- iv) Leading iCACGP members were involved in the scientific response to the decision to reduce funding on climate research by CSIRO in Australia. This international scientific response was very important but the final outcome with respect to funding is not clear.
- v) Session A0.1 of COSPAR 41 "Observing the Anthropocene from space" was organised by Professors Burrows and Drummond. Several commission members were to present relevant papers at the COSPAR 41st Scientific Assembly, 30 July – 7 August 2017, Istanbul, Turkey. Unfortunately, this conference was cancelled due to the security situation in Turkey. However, the session is being repeated at COSPAR 42 which will take place in Pasadena, will be held in Pasadena, CA, USA, 14 - 22 July 2018
- vi) Dr. Melita Keywood and Dr. Clare Murphy led the iCACGP contributions to the symposium and day of festivities, hosted by the Cape Grim program on 15 November 2016 in Stanley, Tasmania to mark the 40th Anniversary of Cape Grimm Oksana Tarasova iCACGP, chief of WMO's Atmospheric and Environment Research Division, presented a certificate to Sue Barrell (Bureau of Meteorology) and Larry Marshall (CSIRO).
- vii) The 7th GEMS Science Team Meeting was held on 10th – 12th October in Yonsei University, Seoul, which was hosted by Prof. Jhoon Kim (GEMS PI). The CEOS

ACC-12 Meeting followed by 15th October in Yonsei University, which was lead by Ben Veihelmann, ESA (co-chair ACC) and Jay Al-Saadi, NASA (co-chair ACC).

The commission has also written letters of support for numerous regional, national and international experiments in atmospheric chemistry.

Planned Future Activities

Key activity for 2017 and 2018 – succession planning

The selection of the officers and new members of iCACGP. New iCACGP committee to be announced after the iCACGP annual business planning meeting 23rd and 24th of September 2018.

Meetings

- i) iCACGP Annual Meeting Business meeting 26th and 27th August 2017
- ii) IAMAS Cape Town - 27 August – 3 September 2017 – iCACGP will be organising some sessions. The annual commission meeting will be held on 26-27 August in Cape Town just ahead of this meeting.
- iii) The EMERGe in Europe Research campaign, which is funded by the DFG (Germany Research Foundation) and involves a large using the DLR HALO and other aircraft will take place in 2017
- iv) iCACGP leading IAMAS Session M01 and participating in JM1 IAPSO IAMAS IGA General Assembly 28th August to 3rd September 2017
- v) The Clean Air Society of Australia and New Zealand is hosting the 23rd Biennial International Clean Air and Environment Conference on the 15 - 18 October 2017 at Pullman Brisbane, King George Square. CASANZ 2017 will embrace the theme of The Critical Atmosphere.
- vi) Professor John Burrows will attend the 17th SOLAS Scientific Steering Committee meeting at CNR Bologna on the 19th and 20th June 2017
- vii) Professor Burrows will be part of the COSPAR team and represent iCACGP at the United Nations Office for Outer Space Affairs and Committee on Space Research coordination meeting in support of the preparations for UNISPACE+50, 22-23 May 2017 in Vienna.
- viii) Dr. Mary Barth leads the organisation, iCACGP contribution and UPP proposal to support the Second Atmospheric Composition and the Asian Monsoon (ACAM)

Training School on Observations and Modelling of Atmospheric Chemistry and Aerosols in the Asian Monsoon, Jinan University, China, 10-12 June 2017

- ix) iCACGP will support the Australia and New Zealand Aerosol Assembly (ANZAA) 2-3 November 2017 in Melbourne
- x) 2017 Atmospheric Composition and Chemistry Observations and Modelling Conference incorporating the Cape Grim Annual Science Meeting 8-10 November, 2017
- xi) Prof. Shaw Liu is a member of the organizing committee of the Fifth International Symposium on Regional Air Quality Management in Rapidly Developing Economic Regions (RAQM Symposium), which will be held on 16-19 November 2017 in Guangzhou, China. Web site for the Symposium is <http://raqm5.jnu.edu.cn/en/index.php>
- xii) 3rd Sino European school on atmospheric chemistry (SESAC3) to be held at Shanghai from November 21st to 30th 2017.
- xiii) Professor Olga Mayol is leading the Aerosol Training School of the Caribbean Aerosol-Health Network (CAHN) that will take place in Camaguey, Cuba, January 2018
- xiv) Session A0.1 of COSPAR 42 "Observing the Anthropocene from space" was organised by Professors Burrows and Drummond. Commission members will be contributing to this and other sessions at the Scientific Assembly, which will take place in Pasadena, will be held in Pasadena, CA, USA, 14 - 22 July 2018
- xv) iCACGP annual business planning meeting 23rd and 24th of September 2018 Takamatsu Kagawa, Japan
- xvi) 14th Quadrennial iCACGP Symposium and 15th IGAC Science Conference Takamatsu Kagawa, Japan 25-29 September 2018 see www.icacgp-igac2018.org Contact icacgp-igac2018@igacproject.org
- xvii) IUGG 27th General Assembly in Montreal in 2019.

Appendix

iCACGP Commission 2014-2018 Officers

President:

Prof. Dr. John P. Burrows, (president 2010-2014) (2002-2014) Germany,
E-mail: burrows@iup.physik.uni-bremen.de

Vice President:

Dr. Melitta Keywood (vice-president 2015-2018) (2006-2018) Australia,
E-mail: Melita.Keywood@csiro.au

Secretary:

Prof. James Drummond (secretary 2015-2018) (2006-2018) Canada,
E-mail: james.drummond@dal.ca

iCACGP Commission 2014-2018 Members

Dr. Maria de Fatima Andrade (2010-2018) Brazil, E-mail: mftandra@model.iag.usp.br
Dr. Mary Barth, (2015-2018) USA, E-mail: barthm@ucar.edu
Prof. Lucy Carpenter (2015-2018) UK, E-mail: lucy.carpenter@york.ac.uk
Prof. Russell Dickerson (2010-2018) USA, E-mail: russ@atmos.umd.edu
Prof. Frank Dentener (2002-2018) Italy, E-mail: frank.dentener@jrc.ec.europa.eu
Dr. Cristina Facchini (2015-2018) Italy, E-mail: MC.Facchini@isac.cnr.it
Dr. David Fahey (2015-2018) USA, E-mail: david.w.fahey@noaa.gov
Prof. Laura Gallardo (2006-2018) Chile, E-mail: laura@dgf.uchile.cl
Dr. Michael Gauss (2015-2018) Norway, E-mail: michael.gauss@met.no
Dr. Christian George (2010-2018) France, E-mail: christian.george@ircelyon.univ-lyon1.fr
Prof. Sergey Gromov (2010-2018) Russia, E-mail: gromov.igce@gmail.com
Prof. Sachiko Hayashida (2010-2018) Japan, E-mail: sachiko@ics.nara-wu.ac.jp
Prof. Shaw Liu (2010-2018) Taiwan, E-mail: shawliu@rcec.sinica.edu.tw
Prof. Olga Mayor (2015-2018) Puerto Rico, E-mail: omayol@ites.upr.edu
Prof. Paul Monks (2006-2018) UK, E-mail: P.S.Monks@leicester.ac.uk
Dr. Manish Naja (2010-2018) India, E-mail: manish@aries.res.in
Prof. Stuart Piketh (2015-2018) S. Africa, E-mail: Stuart.piketh@nwu.ac.za
Prof. Nobuyuki Takegawa (2015-2018) Japan, E-mail: takegawa@tmu.ac.jp
Dr. Geoffrey Stuart Tyndall (2015-2018) USA, E-mail: tyndall@ucar.edu
Dr. Claire Murphy-Paton-Walsh (2015-2018) Australia, E-mail: clarem@uow.edu.au
Prof. Jason West (2010-2018) USA, E-mail: jwest@email.unc.edu
Dr. Caradee Yael Wright (2015-2018) S. Africa, E-mail: cwright@mrc.ac.za
Prof. Renyi Zhang (2010-2018) USA, E-mail: zhang@ariel.met.tamu.edu
Prof. Yuanhang Zhang (2010-2018) China, E-mail: yhzhang@pku.edu.cn
Prof. Mark Lawrence (2015-2018) Europe - IGAC co-chair, E-mail: Mark.Lawrence@iass-potsdam.de
Dr. Oksana Tarasova (2015-2018) Europe - WMO, E-mail: otarasova@wmo.int
Prof. Xuemei Wang (2015-2018) China - ILEAPS, E-mail: eeswxm@mail.sysu.edu.cn

iCACGP Commission 2014-2018 Honorary Members

Prof. Hajime Akimoto, Japan, E-mail: akimoto@jamstec.go.jp
Prof. Paul Crutzen, Germany, E-mail: paul.crutzen@mpic.de
Prof. Robert Duce, USA, E-mail: rduce@ocean.tamu.edu
Prof. Ian Galbally, Australia, E-mail: ian.galbally@csiro.au
Prof. Phillip Goldsmith, E-mail: Ppggold@aol.com
Prof. Maria Kanakidou, Greece, E-mail: mariak@chemistry.uoc.gr
Prof. Mario J. Molina, USA, E-mail: mjmolina@ucsd.edu
Prof. Henning Rodhe, Sweden, E-mail: rodhe@misu.su.se
Prof. Anne Thompson, USA, E-mail: anne@met.psu.edu

Summary of ICAE activity
(from 2015.7 to present) and
preliminary plan for the coming year

Colin Price (ICAE Committee)

Daohong Wang (President of ICAE)

Tomoo Ushio (Secretary of ICAE)

Summary of the past main activities

- Publication of four issues of ICAE newsletters
- Preparation of 16th ICAE meeting
- Expansion of ICAE colleague mailing list
- Feb 2017 Workshop on Global Electric Circuit

Publication of four issues of ICAE newsletter

Newsletter on Atmospheric Electricity

Vol. 28, No. 1, May 2017

International Commission on Atmospheric Electricity (IAMAS/IUGG)
AMS Committee on Atmospheric Electricity
AGU Committee on Atmospheric and Space Electricity
European Geosciences Union
Society of Atmospheric Electricity of Japan

ICAE 2018: Call for Abstracts Open Now

The 16th International Conference on Atmospheric Electricity (ICAE) will be held June 17-22, 2018, at Nara Kasugano International Forum/TRAKA, Nara, Japan. The ICAE brings together scientists from all over the world to discuss the latest research on atmospheric electricity.

The call for abstract is open until October 1, 2017. A list of topics includes:

- Lightning Physics
- Lightning and Meteorology
- Meteorological Applications of Lightning Data
- Energetic Radiation from Lightning and Thunderstorms
- Thunderstorm Electrification and Microphysics
- Lightning Effects on the Middle and Upper Atmosphere
- Lightning Climatology and Chemical Effects
- Lightning and Thunderstorm Detection Technologies
- Satellite Measurements
- Lightning Hazards and Mitigation
- Fair-Weather and Atmospheric Ions
- Global Electric Circuit
- Related Topics

For more details, visit <http://www.icae2018.org/>

Newsletter on Atmospheric Electricity

Vol. 27 • No 2 • Nov 2016

INTERNATIONAL COMMISSION ON ATMOSPHERIC ELECTRICITY (IAMAS/IUGG)
AMS COMMITTEE ON ATMOSPHERIC ELECTRICITY
AGU COMMITTEE ON ATMOSPHERIC AND SPACE ELECTRICITY
EUROPEAN GEOSCIENCES UNION
SOCIETY OF ATMOSPHERIC ELECTRICITY OF JAPAN

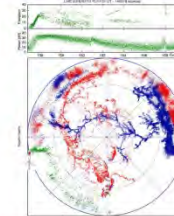


Comment on the photo above: This is the negative upward connecting leader of a downward positive CG lightning discharge that caused severe damage to the blade of a windmill. The picture was one frame of the high speed video taken at Uchinada, Japan by using Phoscam camera operated at 20000 fps. If you watch the video through ICAE official website <http://www.icae.jp>, you will be able to see how leader steps dance along different branches. The detailed description of the lightning flash can be found in the ICAE2016 paper titled "A positive lightning discharge that caused severe damage to the blade of a windmill" by Dazhong Wang, Norio Sawamura and Nobuyuki Takagi of Gifu University, Japan.

Newsletter on Atmospheric Electricity

Vol. 27 • No 1 • May 2016

INTERNATIONAL COMMISSION ON ATMOSPHERIC ELECTRICITY (IAMAS/IUGG)
AMS COMMITTEE ON ATMOSPHERIC ELECTRICITY
AGU COMMITTEE ON ATMOSPHERIC AND SPACE ELECTRICITY
EUROPEAN GEOSCIENCES UNION
SOCIETY OF ATMOSPHERIC ELECTRICITY OF JAPAN

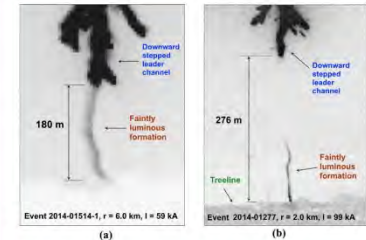


Comment on the photo above: A complex winter IC lightning flash that triggered an upward lightning discharge from a wind turbine at Uchinada, Japan as seen by LIVE (Lightning Imaging via VHF Emission). In the still image, the beginning of the flash is shown in blue, the middle green, and the end red. The majority of the lightning channels were produced by negative breakdowns, with several channels growing at the same time. VHF emission from this type of growth tends to interfere with itself, making both interferometric and time-of-arrival mapping more difficult. The upward flash began at 18.4 ms (green in the still figure), and produced bright, continuous VHF emissions. Study of this and other Japanese winter lightning flashes is ongoing. The complexity of this flash is not unusual in comparison to other winter flashes, showing that there is still quite a lot to learn about Japanese winter lightning. Video is provided by Michael Stock, RIKEN Pre-Ltd, Japan.

Newsletter on Atmospheric Electricity

Vol. 26 • No 2 • Nov 2015

INTERNATIONAL COMMISSION ON ATMOSPHERIC ELECTRICITY (IAMAS/IUGG)
AMS COMMITTEE ON ATMOSPHERIC ELECTRICITY
AGU COMMITTEE ON ATMOSPHERIC AND SPACE ELECTRICITY
EUROPEAN GEOSCIENCES UNION
SOCIETY OF ATMOSPHERIC ELECTRICITY OF JAPAN

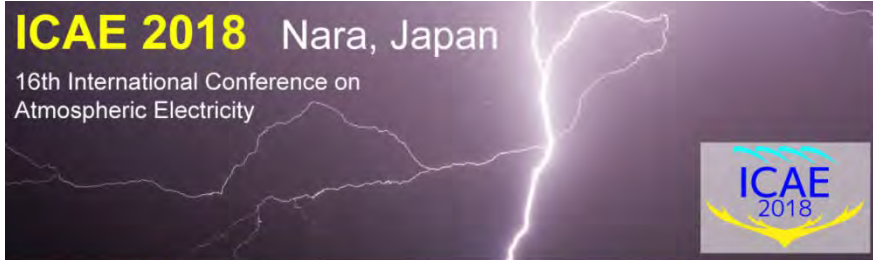


Comment on the photo above: Attachment process of two negative first strokes to natural lightning imaged with a high-speed video camera at the Lightning Observatory in Gainesville (LOG), Florida. Shown in (a) is the break, through (that jump) phase. The faintly luminous formation (FLF) is a common streamer zone with an estimated average electric field of about 12.4 kV/m. Shown in (b) is most likely an 11 ms long positive UCL with a long streamer zone. In both cases the return stroke occurred in the next frame. About one-third of 50 examined records showed FLFs as seen in (a) and (b). Adapted from a paper published in JGR by M.D. Tran and V.A. Rakov (University of Florida).


The ICAE newsletters are published and distributed to registered members twice a year and have several tens of pages. The articles are mainly conference reports, research group activities, and paper references.

Preparation of 16th ICAE meeting

- The International Conference on Atmospheric Electricity (ICAE) is held every four years, and has a history of more than 50 years.
- The meeting will be held at Nara, Japan 17-22, June 2018.
- The conference website was opened on June 1, 2017 (<http://icae2018.saej.jp>)




ICAE 2018 Nara, Japan
16th International Conference on Atmospheric Electricity



Home
Important Dates
Sessions
Abstract Submission
Registration
Venue
Access to Nara
Contact
LOC

ICAE 2018 Nara, Japan

- Location : Nara city, Nara, Japan
- Date : 17-22 June 2018
- Venue : Nara Kasugano International Forum / IRAKA



[Welcome Message]


Welcome to the 16th International Conference on Atmospheric Electricity (ICAE2018), the world's largest event devoted to the science of atmospheric electricity. Following the successful ICAE2014 (<http://icae2014.nwc.ou.edu>) in USA, ICAE2018 provides a platform for researchers from all over the world to present discoveries, exchange ideas, reacquaint with colleagues and make new friends.

ICAE2018 will take place in Nara, Japan's first permanent capital established in the year 710. It is full of historic treasures, including some of Japan's oldest and largest temples, such as Todaiji Temple, the world's largest wooden building. In Nara, you may also see large numbers of deer, chasing you for "deer-crackers". Nara is about one and a half hour driving distance from Kansai International Airport. The airport limousine bus provides a convenient access to Nara. From Nara, if you like, you can have day trip to Kyoto and Osaka easily. We hope you will enjoy the conference, and have fun by visiting these ancient and modern cities of Japan.

Zen Kawasaki (Honorary Chair)
Daohong Wang, and **Tomoo Ushio** (Co-chairs)

[Organizers]

- International Commission on Atmospheric Electricity (ICAE) (<http://www.icae.jp/>)
- Society of Atmospheric Electricity of Japan (SAEJ) (<http://www.saej.jp/>) LOC Members



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Maintenance of ICAE homepage

ICAE official website
<http://www.icae.jp/>



4. Expansion of mailing list

From 750 to more than 800

We wish more and more colleagues especially from developing countries can benefit from the activity of ICAE

5. Batsheva de Rothchild Seminar on the Atmospheric Electric Circuit

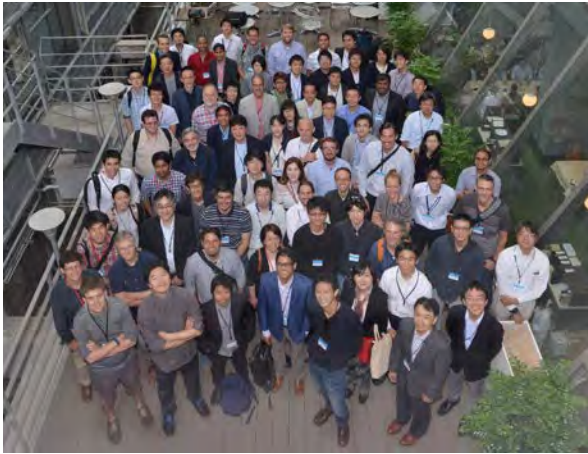


Partially sponsored by IAMAS

Preliminary plan for the coming year

1. Special issue of 16th ICAE
2. Two issues of ICAE newsletter
3. Continuous expansion of ICAE mailing list

International Commission on Climate Biennial Report to IAMAS/IUGG 2015-2017



Tokyo, Japan, 16-19 May 2017

1. Changes of Human Forcing and Terrestrial Feedback
2. Changing Climate and the Natural-Human System
3. Satellite Remote Sensing and Model Integration
4. Uncertainties in Model Simulations
5. Delivering Science to Society

1. Detection and Attribution
2. Climate Variability
3. High-Impact Weather and Extremes
4. Predictability, Prediction and Projection

Perth, Australia, 19-21 January 2015



Beijing, China, 24-25 March 2016

1. Defining Marine Heatwaves
2. Drivers and Mechanisms of Marine Heatwaves
3. Long-term Trends in Marine Heatwaves Globally

International Commission on Climate Biennial Report 2015-2017



- The scope of the ICCL is potentially very large: Chosen to focus attention on ***decadal climate variability*** and ***climate extremes*** (including marine heatwaves)
- Decadal climate prediction and climate extremes are **WCRP Grand Challenges**

Workshop Title (2015-2017)	When? Where?	Partici- pants	ICCL publications
6. Studies of Climate Change Using Dynamic Scale Reduction Appl.: Case of Panama	18-29.9.17 Panama	?	
5. IUGG/WCRP-SPARC Training School on Stratosphere-Troposphere Interactions (ICMA Lead , ICCL co-sponsor/co-organise)	2-5.9.17 Cape Town, RSA	~20+	
4. Climate Extremes and Global Energy, Water and Carbon Cycles (IAMAS USD1500)	16-19.5.17 Tokyo, Japan	~80+	
3. 13 th General Circulation Model Simulations of the East Asian Climate Workshop	24-25.3.16 Beijing, China	~100	
2. ENSO Extremes and Diversity: Dynamics, Teleconnections and Impacts (CSIRO, ARCCSS, CLIVAR, ICCL)	4-6.2.15 Sydney, Australia	~60	1 publ
1. Physical Drivers and Properties of Marine Heatwaves (WG, ARCCSS, UWA, ICCL)	19-21.1.15 Perth, Australia	15	1 publ, 1 sub, 1 in prep + more
0. ICCL Expert Assessment W'shop: Decadal Climate Variability and X-Scale Interactions	16-17.4.13 Beijing, China	~40	1 publ

International Commission on Climate Biennial Report 2015-2017



- ICCL has 26 members [2 Exec, 12 Regular, 12 Emeritus]
 - Tosiyuki Nakaegawa (Japan) and Juan Feng (China) new since 2015
- ICCL Co-sponsored Symposia
 - Five (5) Symposia for IUGG 2015 Assembly in Prague, Czech Repub.
 - Six (6) + One (1) Joint Symposia for IAPSO-IAMAS-IAGA 2017, Cape Town, South Africa
- Several awards and honours for ICCL members (see ICCL 2017 Biennial Report)

Publications

- Hobday AJ, LV Alexander, SE Perkins, DA Smale, SC Straub, ECJ Oliver, JA Benthuyesen, MT Burrows, MG Donat, M Feng, NJ Holbrook, PJ Moore, HA Scannell, A Sen Gupta and T Wernberg, 2016: A hierarchical approach to defining marine heatwaves. *Progress in Oceanography*, **141**, 227-238, doi:10.1016/j.pocean.2015.12.014.
- Holbrook NJ, HA Scannell, A Sen Gupta, JA Benthuyesen, M Feng, ECJ Oliver, LV Alexander, MT Burrows, MG Donat, AJ Hobday, PJ Moore, SE Perkins-Kirkpatrick, DA Smale, SC Straub and T Wernberg. A global assessment of marine heatwaves and their drivers (in prep.).
- Holbrook NJ, J Li, M Collins, E Di Lorenzo, F-F Jin, T Knutson, M Latif, C Li, SB Power, R Huang and G Wu, 2014: Decadal climate variability and cross-scale interactions: ICCL 2013 Expert Assessment Workshop. *Bulletin of the American Meteorological Society*, **95**, ES155-ES158. doi: 10.1175/BAMS-D-13-00201.1.
- Oliver ECJ, JA Benthuyesen, NL Bindoff, AJ Hobday, NJ Holbrook, CN Mundy and SE Perkins-Kirkpatrick, 2017: The unprecedented 2015/16 Tasman Sea marine heatwave. *Nature Communications*, DOI:10.1038/ncomms16101.
- Oliver ECJ, MG Donat, MT Burrows, PJ Moore, DA Smale, LV Alexander, JA Benthuyesen, M Feng, A Sen Gupta, AJ Hobday, NJ Holbrook, SE Perkins-Kirkpatrick, HA Scannell, SC Straub and T Wernberg, 2016: Ocean warming brings longer and more frequent marine heatwaves (submitted to *Nature Communications*).
- Santoso A, W Cai, M Collins, M McPhaden, F Jin, E Guilyardi, G Vecchi, D Dommenges and G Wang, 2015: ENSO extremes and diversity: dynamics, teleconnections, and impacts. *Bulletin of the American Meteorological Society*, Meeting Summary, pp 1969-1972, doi:10.1175/BAMS-D-15-00141.1.



International Commission on Climate Biennial Report to IAMAS/IUGG 2017

Neil Holbrook (President) and Jianping Li (Executive Secretary)
18 August 2017

1. Introduction

The interests and concerns of the **International Commission on Climate (ICCL)** extend across all areas of climate science (climate variability and climate change) – as well as impacts and adaptation – and on all times scales. The potential scope of the ICCL is very large. There is considerable activity in the climate space, with numerous programmes ongoing, including the World Climate Research Programme (WCRP), Intergovernmental Panel on Climate Change (IPCC), and the Climate Variability and Predictability Programme (CLIVAR), to name just a few. There are also many organisations and activities ongoing around the world.

In an attempt to complement some of the important ongoing activities and programmes around the world, the ICCL has focused its efforts over the past several years on contributing to, and better understanding, two topic areas in climate science. These are: (1) decadal climate variability, and (2) extremes – with the extremes' focus being on marine heatwaves, an area that is poorly understood. First, there is still a way to go to understand the key mechanisms that underpin decadal climate variability. Improving understanding of decadal climate variability is essential in order to improve the prospects for better decadal climate prediction – one of the WCRP Grand Challenges (near-term prediction). Second, understanding climate extremes (including heatwaves) is also one of the WCRP Grand Challenges. Several **ICCL contributed publications** have been produced around these themes (see **Section 6**).

2. Membership

Dr Tosiuyuki Nakaegawa (Japan) and Dr Juan Feng (China) have been appointed as new members of the ICCL in the past two years. Assoc Prof Neil Holbrook and Prof Jianping Li were re-elected as President and Executive Secretary, respectively, of ICCL at IUGG2015 in Prague, Czech Republic. The ICCL currently comprises of 26 members, including two Executive members, 12 regular members and 12 Emeritus members.

Full membership details are provided in **Appendix A**.

3. Summary of ICCL contributions to the IUGG 2015 Conference

The ICCL (co-) organised and (co-) sponsored five (5) IAMAS symposia for the IUGG 2015 Assembly in Prague, Czech Republic.

Details of these symposia are provided in **Appendix B**.

4. Summary of ICCL contributions to the IAPSO-IAMAS-IAGA 2017 Conference

The ICCL (co-) organised and (co-) sponsored six (6) IAMAS symposia and one (1) Joint symposium at the IAPSO-IAMAS-IAGA 2017 Conference in Cape Town, South Africa.

Details of these symposia are provided in **Appendix C**.

5. ICCL workshop contributions to climate science

ACTIVITY 1

The **13th General Circulation Model Simulations of the East Asian Climate (EAC) workshop** took place at Beijing Normal University in Beijing, China from 24-25 March 2016 with about 100 participants, among which 13 were from Japan, South Korea, USA, and about 50 were students and early careers researchers. The workshop was organised by Beijing Normal University, National Natural Science Foundation of China (NSFC), Ministry of Science and Technology (MOST), State Key Laboratory of Numerical Modelling for Atmospheric Sciences and Geophysical Fluid Dynamics (LASG), Institute of Atmospheric Physics (IAP), Chinese Academy of Sciences, the International Commission on Climate (ICCL), and IUGG Union-Commission on Climatic and Environmental Change (CCEC).

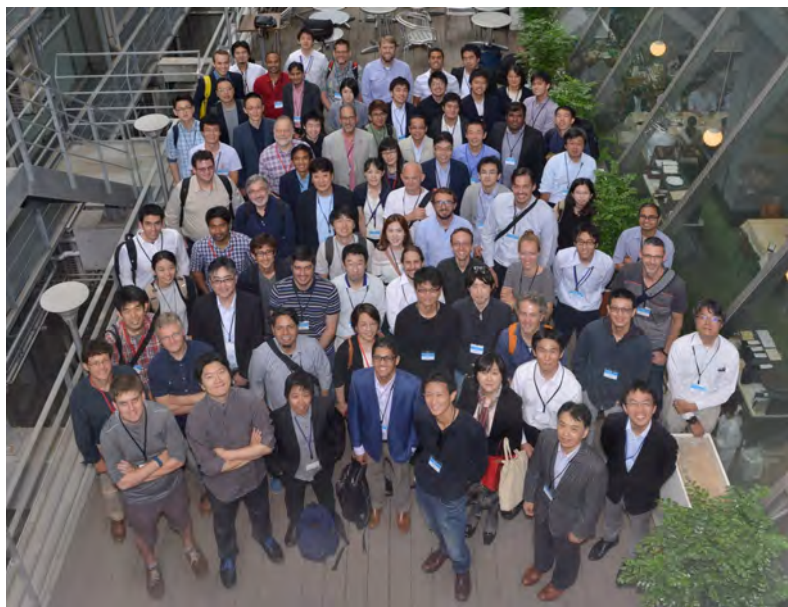
The workshop included 4 sessions (1. Detection and Attribution, 2. Climate Variability, 3. High-Impact Weather and Extremes, and 4. Predictability, Prediction and Projection) with 33 Oral presentations and 34 posters.



ACTIVITY 2

The **Fourth international conference of Hydrology delivers Earth System Sciences to Society (HESSS)** took place from 16 to 19 May 2017 in Tokyo, Japan. The series of workshops have provided forums for strengthening synergies between the modelling and monitoring research communities in hydrology and water resources since 2007. This fourth conference was hosted by the Institute of Industrial Science, the University of Tokyo (IIS) and co-sponsored by ICCL/IAMAS and the GEWEX Global Land Atmosphere System Study (GLASS) Panel. The workshop focused on “Climate Extremes and Global Energy, Water and Carbon Cycles: Improving and Integrating Knowledge Across Disciplines” and discussed on-going model intercomparison projects (MIPs) including both natural and anthropogenic hydrological cycles: the Global Soil Wetness Project Phase 3 (GSWP3), the Inter-Sectoral Impact MIP (ISIMIP), Earth System Model-Snow MIP (ESM-SnowMIP), Land Surface, Snow, Soil-moisture MIP (LS3MIP) and Land Use MIP (LUMIP).

The workshop provided five symposium sessions in the program on the following topics: (1) Changes of Climate Forcing and Terrestrial Feedback, (2) Changing Climate and the Natural-Human System, (3) Satellite Remote Sensing and Model Integration, (4) Uncertainties in Model Simulations, and (5) Delivering Science to Society.



4th International Conference of the Hydrology delivers Earth System Science to Society 2017, May 16-19

ACTIVITY 3

Workshops: Understanding Marine Heat Waves

Workshop 1: Physical Drivers and Properties of Marine Heat Waves

Venue: Oceans Institute, University of Western Australia

Dates: 19-21 January 2015

Conveners: Thomas Wernberg (University of Western Australia), **Neil Holbrook** (President ICCL, University of Tasmania), Eric Oliver (University of Tasmania), Dan Smale (Marine Biological Association, UK)

Objective: *To define marine heat waves, and examine temporal trends in their frequency, magnitude, and distribution, using both historical hand-collected temperature datasets, more recent remotely-sensed datasets at global scales, and where possible climate models*

Brief Description:

The conveners co-led a targeted three-day workshop on marine heat waves – an area of research that is currently in its infancy – from 19-21 January 2015 at the University of Western Australia. The workshop brought together 15 invited international participants from the United Kingdom (Plymouth, Aberystwyth (Wales) and Oban (Scotland)), United States of America (Portland, Maine), and Australia.



Workshop: Physical Drivers and Properties of Marine Heat Waves, Oceans Institute, University of Western Australia, 19-21 January 2015.

Five theme areas were considered during the workshop, and tackled in both breakout group and plenary sessions. These themes comprised:

- #1: Drivers and mechanisms of marine heat waves
- #2: Refining definitions of marine heat waves and how to measure them
- #3: Changing frequency of marine heat waves from observational records
- #4: The spatial distribution of marine heat waves
- #5: Climate projections and the detection and attribution of marine heat waves

Outcomes: Key outcomes of the workshop were:

- 1) A hierarchy of definitions for marine heat waves (led by Alistair Hobday)
- 2) An improved understanding of the links between climate drivers, ocean processes and marine heat waves globally (led by Neil Holbrook)
- 3) An improved understanding of the spatial and temporal distribution of marine heat wave trends globally (led by Eric Oliver)

Outputs: Three substantial manuscripts drafted. These are:

- 1) Paper entitled “A hierarchical approach to defining marine heatwaves (Hobday et al. 2016)
- 2) Paper entitled “A global assessment of marine heatwaves and their drivers” Drivers” (in prep., and led by Assoc Prof Neil Holbrook)
- 3) Paper entitled “Ocean warming brings longer and more frequent marine heatwaves” (submitted, and led by Dr Eric Oliver)

Acknowledgments: Funding and/or co-sponsorship for the first workshop included a University of Western Australia Research Collaboration Award, a UWA School of Plant Biology Synthesis Grant, the ARC Centre of Excellence for Climate System Science, with the workshop making a contribution to the interests and activities of the International Commission on Climate of IUGG.

Workshop 2

A separate paper is being prepared that will link the marine heatwave definition and physics to marine ecological impacts. This was advanced at a second workshop held in Plymouth, UK, in July 2015.

Workshop 3

A third international workshop, entitled “Marine Heatwaves – Global Patterns of Impacts and Risks”, was held at Ao Nang Beach, Krabi, Thailand from 21-23 February 2017. This workshop was funded by a UK National Environmental Research Council (NERC) grant. The key motivation for this third workshop was to better connect biological impacts with marine heatwave event frequencies, intensities and duration. Various papers are being drafted from this workshop that will make contributions to the ICCL. The co-conveners of this workshop were Dan Smale (MBA, UK), Thomas Wernberg (University of Western Australia), Neil Holbrook (President ICCL, University of Tasmania) and Eric Oliver (University of Tasmania). There were 10 international participants from Australia, New Zealand, and UK.

ACTIVITY 4

Training School on stratosphere-troposphere interactions

Venue: University of Cape Town, Cape Town, South Africa

Dates: 2-5 September 2017

The IUGG/WCRP-SPARC training school on stratosphere-troposphere interactions is jointly organised by SPARC (Stratosphere-troposphere Processes And their Role in Climate, a core project of the World Climate Research Programme), the Climate Systems Analysis Group (CSAG) at the University of Cape Town, and the International Commission on the Middle Atmosphere (ICMA). **The President of the ICCL, Associate Professor Neil Holbrook**, is one of the organisers of the workshop, and representative of the ICCL.

The training school will take place directly after the IAPSO/IAMAS/IAGA international conference (Cape Town from 28 August to 1 September 2017).

The training school is supported by:

- IUGG (International Union of Geodesy and Geophysics)
- WCRP-SPARC
- CSAG (Climate Systems Analysis Group)
- University of Cape Town
- ACCESS (Applied Centre for Climate and Earth System Science)
- EGU (European Geosciences Union)

The first three days of the training school will be dedicated to introducing the themes (mornings) and to exercises using reanalysis and model data as well as discussions (afternoons). During the discussion time, the topics of the mini-projects will be selected and worked on. The last day is fully dedicated to the mini-projects, with time for working on writing the reports in the morning and discussing these reports in the form of oral presentations (one per project) during the final afternoon session.

Organising committee

- Elisa Manzini (Max Planck Institute, Hamburg)
- Bernd Funke (Instituto de Astrofísica de Andalucía, Granada)
- Babatunde Abiodun (CSAG, University of Cape Town)
- Fiona Tummon (SPARC Office, ETH Zurich)
- Neil Holbrook (University of Tasmania, Hobart)**
- Katja Matthes (GEOMAR, Kiel)
- Olivia Rompainen-Martius (University of Bern, Bern)

ACTIVITY 5

International Workshop on STUDIES OF CLIMATE CHANGE USING DYNAMIC SCALE REDUCTION APPLICATIONS: CASE OF PANAMA

- Climatic Projections

Date: 18-29 September 2017

Venue: The Water Center for the Humid Tropics of Latin America and The Caribbean (CATHALAC)

The Technological University of Panama (UTP), Panama City, Panama

<http://proyeccionesclimaticas.utp.ac.pa/>

ACTIVITY 6

ENSO Extremes and Diversity: Dynamics, Teleconnections and Impacts

Venue: The University of New South Wales, Sydney, Australia;

Dates: 4-6 February 2015

Organisers: Agus Santoso (UNSW, Australia), Wenju Cai (CSIRO, Australia), Mat Collins (University of Exeter, UK), Fei-Fei Jin (University of Hawaii, USA), Mike McPhaden (NOAA/PMEL, USA), Eric Guilyardi (LOCEAN/IPSL, France), Dietmar Dommenget (Monash University, Australia), Gabriel Vecchi (GFDL, USA), Guojian Wang (CSIRO, Australia)

Objective: To review recent progress in El Niño – Southern Oscillation (ENSO) research and determine the present state of understanding of ENSO in terms of its extreme and diverse behavior and its overarching physical implications.

Publication: Santoso A, W Cai, M Collins, M McPhaden, F Jin, E Guilyardi, G Vecchi, D Dommenget and G Wang, 2015: ENSO extremes and diversity: dynamics, teleconnections, and impacts. *Bulletin of the American Meteorological Society*, Meeting Summary, pp 1969-1972, doi:10.1175/BAMS-D-15-00141.1.

The workshop summary is available at:

<http://journals.ametsoc.org/doi/abs/10.1175/BAMS-D-15-00141.1>

Acknowledgments: It was formally acknowledged that the ENSO workshop makes a contribution to the interests of the International Commission on Climate of IAMAS/IUGG. Prof Mat Collins (ICCL member) was an organizer of this meeting and coauthored the BAMS Report. Neil Holbrook (President, ICCL) also participated in the workshop, and was acknowledged for providing comment on, and helping proofread, the BAMS Report.

6. Publications: ICCL contributions

The following include papers published, submitted for peer-review, or in preparation. All of these publications are contributions by or to the International Commission on Climate. They make contributions to the focus areas of climate extremes (marine heatwaves) and climate variability (decadal climate variability and ENSO).

Hobday AJ, LV Alexander, SE Perkins, DA Smale, SC Straub, ECJ Oliver, JA Benthuisen, MT Burrows, MG Donat, M Feng, NJ Holbrook, PJ Moore, HA Scannell, A Sen Gupta and T Wernberg, 2016: A hierarchical approach to defining marine heatwaves. *Progress in Oceanography*, **141**, 227-238, doi:10.1016/j.pocean.2015.12.014.

Holbrook NJ, HA Scannell, A Sen Gupta, JA Benthuisen, M Feng, ECJ Oliver, LV Alexander, MT Burrows, MG Donat, AJ Hobday, PJ Moore, SE Perkins-Kirkpatrick, DA Smale, SC Straub and T Wernberg. A global assessment of marine heatwaves and their drivers (in prep.).

Holbrook NJ, J Li, M Collins, E Di Lorenzo, F-F Jin, T Knutson, M Latif, C Li, SB Power, R Huang and G Wu, 2014: Decadal climate variability and cross-scale interactions: ICCL 2013 Expert Assessment Workshop. *Bulletin of the American Meteorological Society*, **95**, ES155-ES158. doi: 10.1175/BAMS-D-13-00201.1.

Oliver ECJ, JA Benthuisen, NL Bindoff, AJ Hobday, NJ Holbrook, CN Mundy and SE Perkins-Kirkpatrick, 2017: The unprecedented 2015/16 Tasman Sea marine heatwave. *Nature Communications*, DOI:10.1038/ncomms16101.

Oliver ECJ, MG Donat, MT Burrows, PJ Moore, DA Smale, LV Alexander, JA Benthuisen, M Feng, A Sen Gupta, AJ Hobday, NJ Holbrook, SE Perkins-Kirkpatrick, HA Scannell, SC Straub and T Wernberg, 2016: Ocean warming brings longer and more frequent marine heatwaves (submitted to *Nature Communications*).

Santoso A, W Cai, M Collins, M McPhaden, F Jin, E Guilyardi, G Vecchi, D Dommenget and G Wang, 2015: ENSO extremes and diversity: dynamics, teleconnections, and impacts. *Bulletin of the American Meteorological Society*, Meeting Summary, pp 1969-1972, doi:10.1175/BAMS-D-15-00141.1.

7. Nominations, awards and honours

- Professor Mat Collins (UK) was nominated to the IAMAS bureau as liaison to WCRP in 2015
- Dr Ruiqiang Ding (China), recommended by the ICCL, was awarded an Early Career Scientist Award from IUGG in 2015
- Prof Jianping Li (China) was elected as IUGG Fellow in 2015
- Associate Professor Lisa Alexander (Australia) was co-nominated by ICCL and appointed as IAMAS Member at Large in 2015

APPENDIX A

Bureau

HOLBROOK, Neil [President]	Australia	2011
LI, Jianping [Executive Secretary]	China	2011

Members

DING, Ruiqiang	China	2011
DIODATO, Nazzareno	Italy	2011
HALENKA, Tomas	Czech Republic	2009
RODHE, Johan	Sweden	2009
MYSAK, Lawrence	Canada	2007
ABE-OUCHI, Ayako	Japan	2013
COLLINS, Matthew	UK	2013
DIMA, Mihai	Romania	2013
LATIF, Mojib	Germany	2013
YIN Qiuzhen	Belgium	2013
FENG, Juan	China	2015
NAKAEGAWA, Toshiyuki	Japan	2015

Emeritus Members

McGUFFIE, Kendal	Australia
HENDERSON-SELLERS, Ann	Australia
BERGER, Andre	Belgium
LI, Chongyin	China
FU, Congbin	China
JONES, Phil	United Kingdom
MacCRACKEN, Michael	USA
ALVERSON, Keith	UNEP/DEPI
MASSON-DELMOTTE, Valerie	France
BROCCOLI, Anthony	USA
MOKHOV, Igor	Russia
STEFAN, Sabina	Romania

APPENDIX B

ICCL (co-)sponsored IAMAS symposia at IUGG 2015 in Prague, Czech Republic

1. M10 Global Monsoons and Climate Change

Convener: **Jianping Li**

Co-conveners: Andrew Turner, Tianjun Zhou, Bin Wang, Ernesto Hugo Berbery, Harry Hendon, Jun Matsumoto, Allesandra Giannini, Serge Janicot

2. M17 Science of Adaptation to Climate Change

Convener: **Keith Alverson**

Co-convener: Tom Beer

3. M18 Past Climate Changes: a Key for the Future

Convener: **Andre Berger**

Co-conveners: Alan Haywood, Kurt Lambeck, **Mike MacCracken**, Andrew Mackintosh, Axel Timmermann, **Qiuzhen Yin**

4. M19 El Niño / Southern Oscillation and Decadal Variability under Climate Change

Convener: Fei-Fei Jin (Manoa, USA)

Co-convener: **Jianping Li** (Beijing, China), Soon-Il An (Seoul, Korea)

5. M20 The Ocean's Role in Climate Variability, Change and Predictability

Convener: Shang-Ping Xie

Co-conveners: **Ruiqiang Ding**, Hisashi Nakamura, **Mojib Latif**

[Note: **boldface** identifies ICCL members]

APPENDIX C

ICCL (co-)sponsored IAMAS symposia at IAPSO-IAMAS-IAGA 2017 Conference

1. M04 - Past Climate Changes: a key for the future

Convenor: **Andre Berger**

Co-Convenors: A.Haywood, **Q.Z.Yin**, A Timmermann, **M.MacCracken**

2. M16 - Resilience: The Science of Adapting to Climate Change

Convenor: **Keith Alverson**

Co-convener: Zinta Zommers

3. M17 - High-impact Weather and Climate Extremes

Convenors: Richard Grotjahn, Julia Keller

Co-conveners: Lisa Alexander, Brian Golding, **Neil Holbrook**, Richard Swinbank, Xuebin Zhang

4. M18 - Advances and Frontier challenges in Global Monsoon Studies Climate Change

Convenors: **Jianping Li**, Andrew Turner

Co-conveners: E. Hugo Berbery, Harry Hendon, Jun Matsumoto, Kyung-Ja Ha, R. Krishnan, Fred Kucharski, Allesandra Giannini, Serge Janicot

5. M20 - Role of Ocean-Atmosphere Interactions in Climate Variability, Change and Predictability

Convenors: Hisashi Nakamura, Noel S. Keenlyside

Co-convenors: **Mat Collins**, Meghan F. Cronin, **Ruiqiang Ding**, **Mojib Latif**, Shoshiro Minobe, Mathieu Rouault, Tomoki Tozuka, Tim Woollings, Shang-Ping Xie

6. M22 - Sub-seasonal to Seasonal Prediction--except extremes

Convenors: Frederic Vitart

Co-convenors: Iracema Cavalcanti, Chris White

Joint symposia from ICCL at IAPSO-IAMAS-IAGA 2017 Conference

1. JM4 - Future Climate for the African Continent (IAMAS, IAPSO)

IAMAS: Charlie Williams

Co-convenors:

Richard Washington (IAMAS), Katye Altieri (IAPSO), Ross Maidment (IAMAS), Rosalind Cornforth (IAMAS), Amadou Gaye (IAMAS)

[Note: **boldface** identifies ICCL members]

Report ICCP activities since Prague

- **26th IUGG General Assembly** in Prague, Czech Republic for 22 June – 2 July 2015;
co-organization of symposia M01, M05, M06 and M07
+ ICCP Business meeting
- **Secondary ice multiplication symposium** in Manchester (UK) on 34 November 2015 -> chapter in an AMS Monograph
- **The 9th International Cloud Modeling Workshop**
held in Exeter, UK on 18-22 July 2016.
- **17th International Conference on Clouds and Precipitation**, in Manchester, UK from 25-29 July 2016

Over 450 scientists, among those 104 early career scientists, from 26 countries attended the conference. More than 560 abstract submissions were received 230 abstracts were selected for oral presentations during two parallel sessions.

selection of venue due 2020: Pune, India

+ 2 ICCP business meetings (president + secretary confirmed; new vice president + members)

- **3rd ICCP Workshop on Cloud Microphysics July 23-24, 2016 in Manchester:** Data Processing, Analysis and Presentation Software (Co-sponsored by EUFAR).
- **4th ICCP Workshop on Software Training History;** 7 to 9 July 2017; DLR (Germany)
- **20th International Conference on Nucleation and Atmospheric Aerosols 25.-30.6.2017 in Helsinki , Finland** (next venue: 2021 in Brisbane, Australia) president confirmed; members renewed
- **the joint assembly of IAPSO/IAMAS/IAGA** from 27 Aug-1 Sept 2017 in Cape Town, South Africa
 - co-organisation of symposia M05, M06 and M07
 - + ICCP business meeting
- **AMS Monograph on Ice Formation and Evolution in Clouds and Precipitation: Measurement and Modeling Challenges.** (11 chapters, in press)
- Other information: webpage + presence on LinkedIn; facebook page (over 430 likes) : <http://www.facebook.com/pages/ICCP/318220008285622>

ICDM Activities since last report

- Organized or co-organized sessions for Cape Town. 2 joint, 5 IAMAS
- Organized or co-organized session for Prague (3 Joint, 8 IAMAS)
- co-sponsored and commission members helped plan the “Workshop on Atmospheric Blocking” held at the University of Reading, United Kingdom on 6-8 April 2016
- Publication of Cambridge Univ. Press book on High-Impact Weather and Climate Extremes in 2016.
- Four new members: Calvalcanti, Repina, Reeder, Riviere
- Nominated Sillmann for IRDR (no word yet)
- Elected new Secretary, succession of past Secretary to President
- Currently dealing with Secretary declining to continue as President. Electing a first-ever ICDM Vice President

International Commission on the Middle Atmosphere (ICMA) Report on activities during 2015-2017

- Successful application for IUGG Grant to support ICMA-SPARC training school on stratosphere-troposphere interaction, U. Capetown, 2-6 September 2017.
- Proposal and preparation of the M12 Middle atmosphere symposium at the present assembly. Other ICMA-sponsored symposia.
- Preparation of the ICMA-SPARC training school.
- New ICMA website (<http://icma-iamas.org>).

ICMA-sponsored meetings (no direct support but ICMA recommendation for IUGG support):

- 6th International HEPPA-SOLARIS Workshop, 13-17 June 2016, Helsinki, Finland
- 9th IAGA - ICMA/IAMAS - ROSMIC/VarSITI/SCOSTEP workshop on Long-Term Changes and Trends in the Atmosphere, 19-23 September 2016, Kühlungsborn, Germany.

Training School on stratosphere-troposphere interactions

2-5 September 2017, University of Cape Town



The training school is supported by:

- IUGG (International Union of Geodesy and Geophysics)
- WCRP-SPARC
- CSAG (Climate Systems Analysis Group)
- University of Cape Town
- ACCESS (Applied Centre for Climate and Earth System Science)
- EGU (European Geosciences Union)

	2 Sep. <i>Troposphere</i>	3 Sep. <i>Stratosphere</i>	4 Sep. <i>S-T Interactions</i>	5 Sep. <i>Reports/Presentations</i>
09:00-10:30	Lecture 1.1 (Nili Harnik)	Lecture 2.1 (Thando Ndarana)	Lecture 3.1 (Katja Matthes)	Project Work
10:30-11:00	Coffee	Coffee	Coffee	
11:00-12:30	Lecture 1.2 (Joan Alexander)	Lecture 2.2 (Michaela Hegglin)	Lecture 3.2 (Mark Baldwin)	Lunch
12:30-13:30	Lunch	Lunch	Lunch	
13:30-15:30	Exercises	Exercises	Exercises	Project Presentations
15:30-16:00	Coffee	Coffee	Coffee	
16:00-17:30	Discussion + Projects	Discussion + Projects	Discussion + Projects	

Organising committee:

Elisa Manzini (Max Planck Institute, Hamburg), Bernd Funke (Instituto de Astrofísica de Andalucía, Granada), Babatunde Abiodun (CSAG, University of Cape Town), Fiona Tummon, (SPARC office, ETH Zurich), Neil Holbrook (University of Tasmania, Hobart), Katja Matthes (GEOMAR, Kiel), Olivia Rompainen-Martius (University of Bern, Bern)

New Executive and Members

Executive 2015-2019

President:	Elisa Manzini (MPI, Germany)
Vice President	Bernd Funke (CSIC, Spain)
Past President	Dan Marsh (NCAR, USA)

Members

Date of election	President	Vice President	Elected Members
2015	Manzini, Elisa	Funke, Bernd	Sassi, Fabrizio Stiller, Gabriele Mironova, Irina A. Pulido, Manuel Calvo, Natalia Schmidt, Hauke Son, Seok-Woo Watanabe, Shingo Sundararajan, Sridharan Birner, Thomas Kawatani, Yoshio Orsolini, Yvan J.
2011	Marsh, Daniel	Langematz, Ulrike	Harvey, V. Lynn Bailey, Scott Charlton-Perez, Andrew Chipperfield, Martyn Chun, Hye-Yeong Fujiwara, Masatomo Hegglin, Michaela I. Konopka, Paul Matthes, Katja Morgenstern, Olaf Polvani, Lorenzo M. Rodger, Craig

International Commission
on Planetary
Atmospheres and their
Evolution



Report to the IAMAS Executive Council

By

Dr. T. Kuroda

On behalf of

Sanjay S. Limaye, Feng Tian, and Christina Plainaki

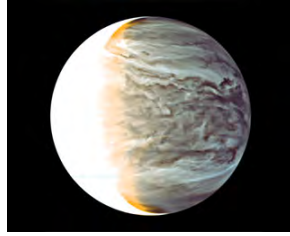
27 August 2017, Capetown





- ICPAE Symposium on Comparative Planetary Atmospheres had to be cancelled due to poor subscription/attendance
- Lack of Co-sponsoring commissions
- Competition with ICPS commission of the IUGG
- Too many meetings during July – October (ICPS, AOGS, IPPW, EPSC and DPS) not including mission project meetings (Cassini, Juno, ExoMars, Akatsuki) that pose travel challenges under constrained budgets
- Remote location (Cape Town) and travel time may also have been a factor
- No visible planetary science community in the continent

JAXA's Akatsuki orbiter is observing Venus since December 2015 and images reveal new details of night side dynamics and influence of topography on features seen at the cloud tops.

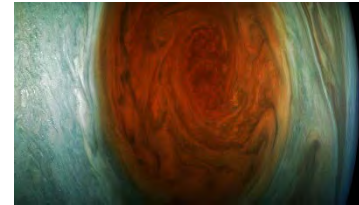


In June 2017, NASA released a study report on potential future missions to Uranus and Neptune with some ESA involvement.

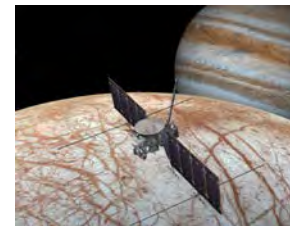
Cassini orbiter will finish its long mission to observe the Saturn system by diving into the planet on 15 September 2017.



Juno (NASA) spacecraft acquired its first science observations of Jupiter, passing within 3000 km of the equatorial cloud tops. Images of Jupiter's poles show a chaotic scene unlike Saturn's poles. Weather features, down at least to 100 bars pressure and the Jupiter InfraRed Auroral Mapper (JIRAM) on board Juno observed the Jovian South Pole aurora and detected H₃⁺ and CH₄ emissions.

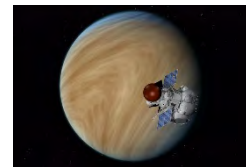


ExoMars-TGO (ESA/Russia) is in aerobreaking orbit around Mars. ExoMars Lander/Rover



NASA's Europa Clipper mission is in development towards a 2022 launch

Russia/NASA studying Venera-D mission to Venus (orbiter, lander) with potential NASA contributed aerial platform and/or a long lived surface lander



ICPAE Status

President: Sanjay S. Limaye, USA (2019)

Vice President: Feng Tian, China (2021)

Secretary: Christina Plainaki, Italy (2023)

Will solicit nominations for officers and members via e-mail in the near future

Discuss future meeting plans and coordinate efforts with ICPS

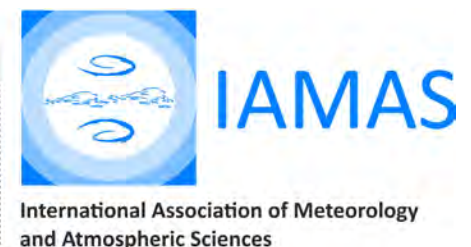
Consider co-sponsoring established meetings (AGU, EGU, EPSC, DPS, COSPAR)

Would welcome other IAMAS commissions to co-sponsor sessions at future IAMAS Symposia

INTERNATIONAL COMMISSION ON POLAR METEOROLOGY (ICPM)

Tom Lachlan-Cope, President

Matthew Lazzara, Secretary



ICPM ACTIVITIES

2015-2016

- 11th Antarctic Meteorological Observations, Modeling and Forecasting Workshop (AMOMFW)
 - Columbus, Ohio, USA – June 6-8, 2016
 - IAMAS sponsored Boundary Layer Meteorology Symposium/session at AMOMFW
- 3rd ANtartic Gravity Wave Instruments Network (ANGWIN) Workshop
 - Cambridge, UK –April 12-14, 2016
- EGU 2016
 - Antarctic Cloud Database project to start
- Logo for ICPM created and accepted by the Commission
- Social Media outreach on Facebook and Twitter begins

2016-2017

- 12th Workshop on Antarctic Meteorology and Climate
 - Formerly AMOMFW
 - Boulder, Colorado, USA – June 26-28, 2017
 - IAMAS support for students and young scientists to attend and present at the meeting
 - Report to be submitted to AAS for publication (in progress...)
- EGU 2017
- EUFAR/ ICCP/ IUGG/ IAMAS Expert Workshop on Processing of Cloud Particle Measurements
 - DLR, Oberpfaffenhofen, Germany, July, 7-9, 2017
 - ICPM attendance
- Polar Meteorology and Oceanography Session at Good Hope for Earth Sciences, 2017 Joint IAPSO-IAMAS-IAGA Assembly
 - Cape Town, South Africa
- History of the ICPM
 - Research underway
 - (Help requested for any information....)



International Association of Meteorology and Atmospheric Sciences (IAMAS)

International Ozone Commission (IO₃C)

President
Dr. Sophie Godin-Beekmann
Tel: +33 1 80 28 54 99
Fax: +33 1 80 28 53 30
sophie.godin-beekmann@latmos.ipsl.fr

Secretary
Dr. Irina Petropavlovskikh
Tel. +1 303 497 62 79
Fax; +1 303 497 55 90
Irina.petro@noaa.gov

Vice President
Dr. Paul Newman
Tel: +1 301 614 59 85
Fax: +1 301 614 59 03
paul.a.newman@nasa.gov

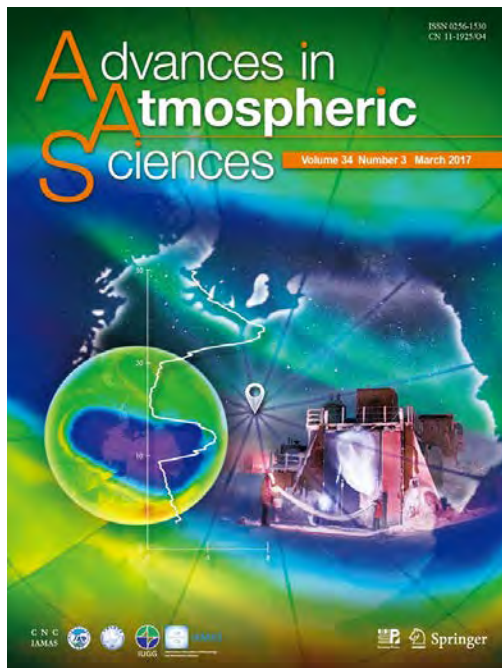
Boulder, August 21, 2017

To: Terry Nakajima, SG IAMAS

SG Office (Yoshi Sasaki, Miyuki Miyazaki, Nozomi Tomizawa)

IO3C report for IAMAS Commission EC1 meeting during the Cape Town Assembly, August 31, 2017.

This report covers International Ozone Commission (IO3C) activities during 2015-2017 time period.



1) Quadrennial Ozone symposium was organized and took place in Edinburgh, Scotland, UK in September 5-9, 2016. More than 300 scientists attended the symposium to discuss ozone science with respect to the reduction of the ozone depleting substances under the Montreal protocol agreement, effects of climate change on current and future ozone layer recovery, and effects of climate and ozone pollution on air quality and ecosystems. An article summarizing the Quadrennial Ozone symposium discussion was published in Advances in Atmospheric Sciences in 2017. The cover of the issue was dedicated to the science of ozone layer recovery.

2) IO3C Dobson and Farman awards were presented to Dr. Birgit Hassler (NOAA US, currently in Germany) and to Dr. Robert Evans (NOAA, US) respectively for the advancement in the ozone research and measurements.

3) Quadrennial Ozone Symposium also featured various side meetings and events, including the EUBrewNet operators training school as part of COST Action ES1207, Dobson Ad Hoc committee meeting, SI2N workshop on the ozone trend uncertainties, and WMO-GAW-SHADOZ-NDACC Ozone Sonde Expert Workshop concerned with homogenization of long-term ozone sonde records.

4) During the 2016 QOS the IO3C held its meeting, during which new IO3C commission members were elected and new honorable members were announced, including Susan Solomon, Richard Stolarski and Christos Zerefos. The new commission members for the period 2016 – 2020 include 16 new members (11 men and 4 women). The new members are coming from the USA (5 people), Canada (1), Belgium (1), Greece (1), France (1), Spain (1), UK (1), Switzerland (1), Japan (1), and Egypt (1).

- 5) The new Webpage for IO3C was developed and unveiled in June of 2017: <http://www.io3c.org/>. It provides information on ozone and climate news, upcoming meetings, by-laws of IO3C, and historical information on IO3C organization.
- 6) Preparations started for 2020 Quadriennial Ozone Symposium. Two proposals from Korea and Japan were submitted in 2017. Proposals are undergoing discussion by the IO3C members and selection of the 2020 QOS meeting will be made in September of 2017.
- 7) In order to celebrate the 30th anniversary of the Montreal protocol, a symposium will gather scientists, students, public and policy makers in Paris, France on September 19-20, 2017. The theme is "From the safeguard of the ozone layer to the protection of the Earth climate". Hailed as an example of exceptional international cooperation for the protection of the ozone layer, the Montreal Protocol became in 2010 the first international treaty to achieve universal ratification. In October 2016, the Kigali amendment was added to the Protocol for controlling the growth of the substitutes of ozone depleting substances, some of which are powerful greenhouse gases and thereby mitigating their impact on the Earth's climate. Further information can be found at <http://www.montreal30.io3c.org/>
- 8) Letters of support for ozone observation stations under the danger of closing were prepared and sent to representative of the institutions in charge:
 - a. January 2016 – letter to Stratospheric Ozone and Fluorinated Gases Team, Department for Environment, Food and Rural Affairs to prevent closure of three ground-based stations in UK (Lerwick, Reading, Manchester) that would interrupt long-term monitoring of the UV radiation in the Arctic region,
 - b. September 2016 – letter to RIVM (Netherlands) to support continuation of ozone lidar operation at NIWA station at Lauder, New Zealand,
 - c. September 2016 – letter to the Minister for the Environment and Energy, director of the Bureau of Meteorology and Director of the Australian Antarctic Division to prevent closure of the long-term Dobson operations at the Macquarie Island, Australia.
 - d. July 2017 – letter to KNMI (Netherlands) to prevent closure of long-term ozone sonde and Brewer measurements in Paramaribo (Suriname).
- 9) Absorption Cross Sections of Ozone, "ACSO" committee is the joint ad hoc commission of the WMO and IO3C. It was created to evaluate sensitivity of various measurement types (ground-based or satellite) to the ozone absorption cross-section (<http://igaco-o3.fmi.fi/ACSO/index.html>). Results are presented in the GAW final report # 218 (2015) and published paper by Orphal et al., 2016.

Johannes Orphal, Johannes Staehelin, Johanna Tamminen, Geir Braathen, Marie-Renée De Backer, et al. Absorption cross-sections of Ozone in the ultraviolet and visible spectral regions – Status report 2015. *Journal of Molecular Spectroscopy*, Elsevier, 2016, 327, pp.105-121. <10.1016/j.jms.2016.07.007>.
- 10) IO3C sent a recommendation to the Dobson and Brewer observation community to develop a strategy to convert total column ozone data processing based on the new "Bremen" (Serdyuchenko, 2014) ozone cross sections. It also recommended to assess methods to apply temperature corrections to minimize the well-known seasonal bias relative to other total ozone datasets.

Serdyuchenko, A., V. Gorshchev, M. Weber, W. Chehade, and J. P. Burrows (2014), High spectral resolution ozone absorption cross-sections ; Part 2: Temperature dependence, *Atmos. Meas. Tech.*, 7(2), 625-636, 10.5194/amt-7-625-2014.
- 11) IO3C supports the SPARC LOTUS initiative. The LOTUS (Long-term Ozone Trends and Uncertainties in the Stratosphere) activity aims to update and extend stratospheric ozone profile observations to recent years, improve our understanding of crucial yet poorly

known sources of uncertainties in trend retrieval, investigate how uncertainties interact and propagate through the different stages of analysis chain, re-evaluate current best practice(s) and possibly establish more suitable alternatives. A LOTUS workshop was held in Paris, France, 13-15 March 2017. It was supported by IAMAS, IUGG and IO3C. The meeting was organized by Dr. Sophie Godin-Beekmann, Dr. Irina Petropavlovskikh and Dr. Daan Hubert, and hosted by the LATMOS at the Université Pierre et Marie Curie, Paris, France.

- 12) IO3C provided annual press releases on the state of the ozone layer for the ozone day (September 16th, in 2016 and 2017).
- 13) The WMO/UNEP scientific assessment of the state of the ozone layer 2018 has begun in 2017 with selection of authors and reviewers for the report chapters. Several IO3C members are contributing to the report. The work on the chapter's first draft is ongoing.

Cordially,



Dr. Sophie Godin-Beekman
President



Dr. Paul Newman
Vice-President



Dr. Irina Petropavloskikh
Secretary



International Radiation Symposium

- Auckland, New Zealand; 16–22 April, 2016
- 272 delegates from 28 countries
- *Gold Medal Award*: Teruyuki Nakajima, Japan
- *Young Scientist Award*: Zhibo Zhan, U.S.A.
- *Sponsors*: Physics Department/University of Auckland,
Kipp and Zonen, EKO Instruments
- *Proceedings (open access)*: “Radiation Processes in the Atmosphere and Ocean (IRS2016): Proceedings of the International Radiation Symposium (IRC/IAMAS)”, Roger Davies, Luca Egli and Werner Schmutz, Eds., *AIP Conf. Proc.* 1810; doi: 10.1063/1.4975496, 2017.
- *Summary*: “The International Radiation Symposium 2016”, N. Edkins, W. Schmutz, L. Egli, R. Davies, T. Aoki and G. McFarquhar, *Adv. Atmos. Sci.*, 33(12), 1325–1328; doi:10.1007/s00376-016-6180-1, 2016.

New IRC Officers and Commissioners

- Officers for the 2017-2020 term :
 - President: Byung-Ju Sohn, Seoul Nat. University, Seoul, Korea
 - Vice-president: Peter Pilewskie, LASP, University of Colorado, Boulder CO, USA
 - Secretary: Marcia Akemi Yamasoe, Univ. São Paulo, São Paulo, Brazil
- New commissioners

Appendix2

IAMAS-ARGENTINA

In April 2015 the Argentinean National Committee of the International Association of Meteorology and Atmospheric Sciences elected the new members of its national board for the following period 2015-2018.

President: Moira Doyle

Secretary: Sandra Barreira

Co Secretary: Maria Elena Segura

Since January 2016 Moira Doyle has been appointed member of the Capacity Building and Education Committee of IUGG (2016-2019)

The following activities took place in Argentina:

- Climate downscaling and scale interaction. Organized by *Centro de Investigaciones del Mar y la Atmósfera (CIMA/CONICET-UBA) & Departamento de Ciencias de la Atmósfera y los Océanos (DCAO/FCEN/UBA) Ciudad Universitaria, Pabellón 2, piso 2 Ciudad Autónoma de Buenos Aires, Argentina* March 9-12, 2015
- XII Congreso Argentino de Meteorología (CONGREMET XII) organized by Centro Argentino de Meteorólogos (CAM) took place in the city of Mar del Plata, Argentina with a large attendance of argentine meteorologists. May 2015
- WORKSHOP: BIG DATA AND ENVIRONMENT Buenos Aires, 10-13 November 2015. Organized by Organized by *Centro de Investigaciones del Mar y la Atmósfera (CIMA/CONICET-UBA) IFAECI UMI-3351*
- Climate Geopolitics: International Relations in a Warming World. *Organized by the French-Argentinean Institute for the Study of Climate and its Impacts (UMI-IFAECI CNRS-CONICET-UBA), the French- Argentine Center for Advanced Studies (CFA-UBA), the Center for Oceanic and Atmospheric Research (CIMA/CONICET-UBA) and the Faculty of Exact and Natural Sciences of the University of Buenos Aires (FCEN-UBA).*24-28 October 2016

Australian Report to IAMAS/IUGG

The Australian Academy of Science, the adhering body to IUGG, has notified the Secretariat that Associate Professor Lisa Alexander has replaced Dr Tom Beer as the Australian representative for IAMAS.

In Australia, the committee of the Australian Academy of Science that deals with IUGG is the National Committee for Earth Sciences (<https://www.science.org.au/supporting-science/national-committees-science/national-committee-earth-sciences>). However, as the name implies, this committee does not oversee meteorology or atmospheric sciences. This is the purview of the National Committee for Earth System Science which, according to its web site, has aims that include: "communication and reporting of Earth system science, advocacy for the funding needs of the ESS community, championing the ESS agenda and promoting Australian connections to international Earth system science. The NCESS Plan envisages development of a broader cross-academy approach to ESS in Australia that meshes with the new Future Earth initiative of the International Council for Science (ICSU)."

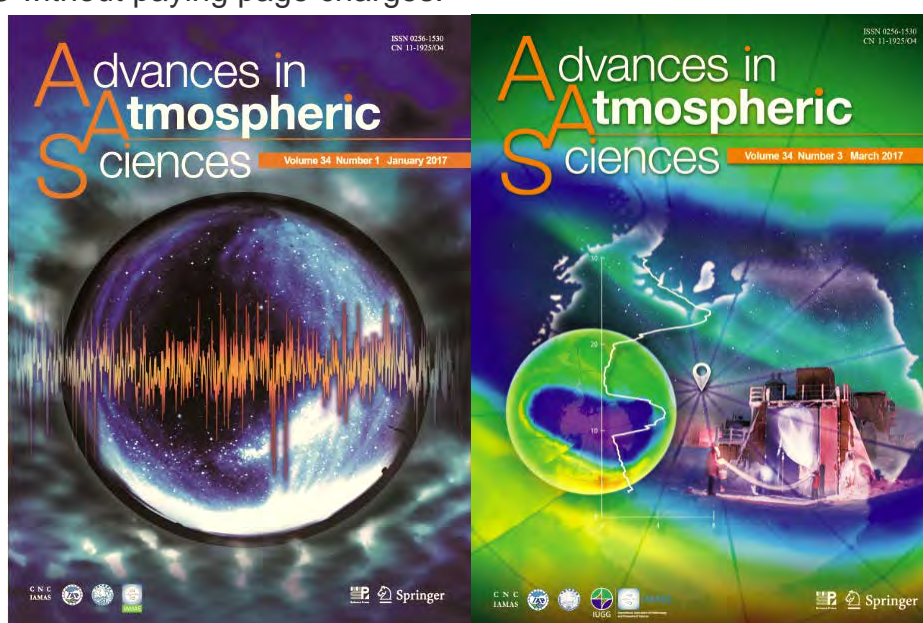
The Australian Meteorological and Oceanographic Society (AMOS) publishes information. As its web site states: "The Bulletin of AMOS (BAMOS; published quarterly) is the best place to keep up-to-date with the latest news in the community, while the Journal of Southern Hemisphere Earth Systems Science (which AMOS publishes in partnership with the Bureau of Meteorology) is a great option for those looking to publish scientific papers in the AMOS sciences."

In addition to research conducted within the Bureau of Meteorology and within CSIRO - the Australian Government's scientific research organisation - Australia has an active university sector that undertakes research related to meteorology and atmospheric sciences. The strength of Australian involvement in IAMAS is evident through the involvement of Australians as officers of the Association - Lisa Alexander (University of New South Wales) as IAMAS Executive Member-at-large; Neil Holbrook (University of Tasmania) as President of the International Commission on Climate; and Melita Keywood (CSIRO) as Vice-President of ICACGP.

Activities of IAMAS-Associated Journal: *Advances in Atmospheric Sciences* (AAS)

1. IAMAS–AAS MoU (signed in October 2015)

- AAS will periodically publish special issues, reports and articles on the work of IAMAS and its commissions and medalists;
- AAS will feature the logo and name of IAMAS on the front cover of each issue along with an indication that AAS is an associated journal of IAMAS;
- There will be no publication charges for IAMAS meeting reports and they will also be free access. AAS will not apply page charges for the first six scientific papers. IAMAS Early Career Scientist Medalists and IUGG Fellows nominated by IAMAS will be able to publish one paper each in AAS without paying page charges.



The cover on the left (No. 1 of 2017) features an ICPM meeting report on Antarctic gravity waves. The cover on the right (No. 3 of 2017) features an IO3C meeting report on ozone. The new IAMAS logo, as required by IUGG, has been included on the cover since Issue No. 3.

2. Progress

During 2015–2017 (as of September 2017), AAS published (see Annex):

- 4 meeting reports by IAMAS commissions;
- 1 highlight article by IAMAS former SG Hans Volkert;
- 4 original articles by IAMAS officers and Medalists.

These articles are all **free of publication charge**. Meeting reports and research highlights, published in the News and Views section, are **free access**.

AAS also organized two special issues in 2016 (to be published in 2017), with some IAMAS scientists as Guest Editors:

- Special Issue: Impact of a Rapidly Changing Arctic on Eurasian Climate and Weather (Guest Editor: Andrew Orr from ICPM)
- Special Issue: Aerosols, Clouds, Radiation, Precipitation, and Their Interactions (Guest Editors: Teruyuki Nakajima and Byung-Ju Sohn from IRC)

ANNEX

List of papers published (reviewed) under the IAMAS–AAS MoU:

- **ICPM:**

10th Antarctic Meteorological Observation, Modeling, and Forecasting Workshop

<http://link.springer.com/article/10.1007/s00376-016-6012-3>

3rd ANtarctic Gravity Wave Instrument Network (ANGWIN) science workshop

<http://link.springer.com/article/10.1007/s00376-016-6197-5>

- **IO3C:**

Quadrennial Ozone Symposium 2016

<http://link.springer.com/article/10.1007/s00376-016-6309-2>

- **IRC:**

International Radiation Symposium 2016

<http://link.springer.com/article/10.1007/s00376-016-6180-1>

- **Hans Volkert**

Putting faces to names: Snapshots of two committee meetings, 95 years apart, emphasize continuous international cooperation in the atmospheric sciences

<https://link.springer.com/article/10.1007/s00376-017-6329-6>

- **B.J. Sohn** (IRC president)

A new IASI channel selection and assessment of its impact on Met Office NWP forecasts

(Early Online Release, to be officially published in September 2017)

- **James Screen** (2013 IAMAS Early Career Scientist Medalist)

Atmospheric precursors of and response to anomalous Arctic sea ice in CMIP5 models

(Under review)

- **Yuan Wang** (2015 IAMAS Early Career Scientist Medalist)

Aerosol microphysical and radiative effects on different types of continental clouds

(Under reviewed)

➤ **Ruiqiang Ding** (2015 IUGG Early Career Scientist Medalist)

Determining the spectrum of the nonlinear local Lyapunov Exponents in a multidimensional chaotic system

(Published with Open Access at

<http://link.springer.com/article/10.1007/s00376-017-7011-8>)

IAMAS executive meeting in Cape Town, 27 August 2017

Brief report from Germany by the national correspondent Hans VOLKERT (DLR-IPA)

The German national committee NKGK (cf. www.nkgg.de) meets once per year, typically in November. Arne BIASTOCH (Geomar Kiel) recently joined as IAPSO correspondent. In the international IAMAS commissions quite a number of colleagues are engaged, who are affiliated at German research institutions, e.g.

- for ICACGP: John BURROWS (Univ. Bremen) as president;
- for ICMA: Elisa MANZINI (MPI-M) as president; Paul KONOPKA (FZ Jülich), Katja MATTHES (Geomar Kiel), Hauke SCHMIDT (MPI-M Hamburg), Gabriele STILLER (KIT) as members;
- for ICCP: Corinna HOOSE (KIT), Martina KRÄMER (FZ Jülich), Ottmar MÖHLER (KIT), Heike WEX (Tropos) as members;
- for ICDM: Christian KEIL (Univ. Munich) as member;
- for IOC: Markus REX (AWI), Wolfgang STEINBRECHT (DWD-Hohenpeißenberg), Mark WEBER (Univ. Bremen) as members;
- for IRC: Hartwig DENEKE (Tropos), Bernhard MAYER (Univ. Munich), Manfred WENDISCH (Univ. Leipzig) as members.

Some indication of the overall engagements of German scientists and the institutions they are affiliated with is given by fact that 26 of the 364 IAMAS delegates in Cape Town work in Germany (7%).

National report (Japan)

IAMAS related activities in Japan have been conducted under close collaborations with the Science Council of Japan (SCJ) and Meteorological Society of Japan (MSJ). Important specific activities are listed below:

- 1) A recommendation on Earth observing satellite missions was released in July 2017 through SCJ to the government and community. The recommendation urges the need to establish a more effective and strategic mission planning system under the Japanese government and, in parallel, to introduce a peer review system for evaluating proposals from the community.
- 2) Through SCJ, we supported inter-disciplinary and trans-disciplinary activities related to the Future Earth (FE) as well as the Sustainable Development Goals (SDGs) designed by the United Nations, through contributing to open conferences, for example, to summarize the (former) IGBP activity (November 2015) and discuss future relationship between FE and WCRP (July 2017).
- 3) With a serious concern about the recent decision by the government (specifically, Nuclear Regulation Authority) that excludes the use of model predictions in making an evacuation plan in case of a nuclear power plant accident, we encouraged activity in the community on model prediction of radio-substances released from a nuclear power plant. Related activities include publication of a book and helping SCJ with hosting an open science forum (August 2017) to discuss the effective use of model prediction outcomes with a certain level of uncertainties included for making an evacuation plan in case of an accident.

IAMAS
Russian Report (Cape Town, 2017)

In 2016-2017, reviews of Russian studies were published in *Izvestiya, Atmospheric and Oceanic Physics* (WoS citation) on key areas of IAMAS activity, prepared in 10 corresponding Commissions.

Atmospheric Chemistry:

Larin I.K. Russian investigations in atmospheric chemistry for 2011-2014. *Izvestiya, Atmospheric and Oceanic Physics*, 2016, Vol. 52, No. 2, 147-153.

Atmospheric Electricity:

Mareev E.A., Stasenko V.N., Bulatov A.A. et al. Russian studies of atmospheric electricity in 2011-2014. *Izvestiya, Atmospheric and Oceanic Physics*, 2016, Vol. 52, No. 2, 154-164.

Climate:

Mokhov I.I. Russian Climate Studies in 2011–2014. *Izvestiya, Atmospheric and Oceanic Physics*, 2017, Vol. 53, No. 5, pp. 550–563.

Clouds and Precipitation:

Bezrukova N.A., Chernokulsky A.V. Russian studies on clouds and precipitation in 2011-2014. *Izvestiya, Atmospheric and Oceanic Physics*, 2016, Vol. 52, No. 5, 512-523.

Dynamic Meteorology:

Kurgansky M.V., Krupchatnikov V.N. Research in dynamic meteorology in Russia in 2011-2014. *Izvestiya, Atmospheric and Oceanic Physics*, 2016, Vol. 52, No. 2, 117-131.

Middle Atmosphere:

Krivolutsky A.A.; Kukoleva A.A. Results of Russian investigations into the middle atmosphere (2011-2014). *Izvestiya, Atmospheric and Oceanic Physics*, 2016, Vol. 52, No. 5, 497-511.

Ozone:

Elansky N.F. Russian studies of atmospheric ozone in 2011-2014. *Izvestiya, Atmospheric and Oceanic Physics*, 2016, Vol. 52, No. 2, 132-146.

Planetary Atmospheres:

Korablev O.I. Studies of planetary atmospheres in Russia (2011-2014). *Izvestiya, Atmospheric and Oceanic Physics*, 2016 Vol. 52, No. 5, 483-496.

Polar Meteorology:

Lagun V.E., Klepikov A.V., Danilov A.I. Polar meteorology: the results of Russian research in 2011–2014. *Izvestiya, Atmospheric and Oceanic Physics*, 2017, Vol. 53, No. 5.

Radiation:

Timofeev Yu.M., Shul'gina E.M. Russian investigations in the field of atmospheric radiation in 2011-2014. *Izvestiya, Atmospheric and Oceanic Physics*, 2016, Vol. 52, No. 5, 467-482.

International Symposium "Atmospheric Radiation and Dynamics" (ISARD-2017) was organized in Saint-Petersburg (Petrodvorets) on June 27–30, 2017 (<http://www.rrc.phys.spbu.ru/English/msard17.html>). This symposium is organized regularly (every two years: 2017, 2015, 2013, ...) by the Russian Radiation Commission (Chairperson Prof. Yu.M. Timofeev).

The traditional school-conference of young scientists "Atmospheric Composition. Atmospheric Electricity. Climate Processes" is organized every year in different parts of Russia. It is organized by the A.M. Obukhov Institute of Atmospheric Physics of the Russian Academy of Sciences, Institute of Applied Physics of the Russian Academy of Sciences and Geophysical Observatory "Borok" of the Schmidt Institute of Physics of the Earth of the Russian Academy of Sciences. In 2017, this school-conference was held in the Geophysical Observatory "Borok", in 2016 – in Nizhny Novgorod, in 2015 - in Shepsi (North Caucasus).

In May 2018, a conference is planned in Moscow dedicated to the centenary of the birth of Academician Alexander M. Obukhov (1918-1989) - President of the IAMAP in 1963-1967, the founder of the Institute of Atmospheric Physics. Russian Academy of Sciences established the gold medal in honour of academician A.M. Obukhov for outstanding achievements in the atmospheric research. The first award will be held in 2018.