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Newsletter



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President's Message

During these past six months, planning and preparation for the IAMAS 2005 Scientific Assembly have been non-stop. Our thanks and congratulations go to Secretary General Roland List and his Deputy John Turner, to the Local Organizing Committee chaired by Dr. Guoxiong Wu, to the IAMAS2005 Secretariat, and to all the conveners of the 45 symposia that will be held—all have done an outstanding job.

With so much interest in so many aspects of meteorology and atmospheric sciences, over 1400 abstracts were submitted for presentation at the Beijing meeting. This is the largest number of submissions for any IAMAS scientific assembly, and the meeting will provide a very important opportunity for both hearing presentations on the most recent progress in our field and for interacting with scientists from around the world (and given the high pace of research activities, perhaps even those from down the hall in your own institute).

We will also be meeting in association with the Second Open Science meeting being held by PAGES. Their meeting will provide a special opportunity for learning about the latest results from paleoclimatic investigations and how these findings can enrich our understanding about what is happening now and what can be expected in the future. Arrangements are being made so attendees at each meeting can also attend

the other meeting for a very modest cost.

IAMAS 2005 will also provide an opportunity for a number of the IAMAS commissions to meet and for the IAMAS Executive Committee to meet.



Particularly important issues to be addressed include: initial recommendations for the 2007 program in Perugia, Italy (see page 2), when IAMAS will be participating with the other IUGG Associations; moving forward on the emerging proposal that IAMAS and IAPSO hold a joint assembly in Montreal, Canada in 2009; and appointing a nominating committee for the IAMAS elections in 2007. We would welcome suggestions on other matters needing our attention.

See you in Beijing.

Mike MacCracken
(mmaccrac@comcast.net)

IAMAS 2005: a few highlights

Presidential talks, Tuesday 2nd August

14:55-15:55. Ghassem Asrar. The US vision for space exploration: NASA's contribution to Earth System science.

16:30-17:30. Kevin Hamilton. Ultrafine resolution modelling of the global atmosphere

17:30-18:30. Huw Davies. Large-scale weather systems: a future research priority

Also, at lunchtime on Wednesday 3rd August, Brian Hoskins will be giving a briefing on the Coordinated Observation and Prediction of the Earth System (COPES), the new WMO strategic framework for climate research over the next 10 years.

IAMAS 2005: a message from the Local Organizing Committee

On behalf of the Local Organizing Committee (LOC), I would like to report on the exciting preparations for the upcoming IAMAS Scientific Assembly to be held in Beijing, China from 2-11 August 2005. The Assembly's theme, "The Fascinating Atmosphere: Changeable and Changing," provides the framework for 45 symposia covering all areas of meteorology and atmospheric sciences, including dynamics, radiation, chemistry, electricity, clouds and precipitation, and climate variability and change. The conference will also hold a special symposium with talks from an international set of speakers to honor the many contributions to meteorology and atmospheric sciences of Senior Chinese Academician Prof. Duzheng Ye on the occasion of his 90th birthday.

As of May 11, 2005, 1395 scientists and students from 82 countries had registered and more than 1400 abstracts describe papers that will be presented at the Assembly. This great participation will certainly result in an exciting meeting. The symposium schedule is posted on the official IAMAS 2005 website <http://www.iamas2005.com>. A more detailed schedule of papers within each session is also available.



Plenty to see in and around Beijing: the Jade Belt Bridge at the Summer Palace - YudaiQiao



Inside the Beijing International Convention Center (BICC)

In addition to the IAMAS2005 Assembly, PAGES will be holding its Second Open Science Meeting from 10-12 August (see <http://www.pages2005.org/schedule.html>) and attendees will be able to participate in both meetings for a nominal registration fee that covers conference materials.

Both IAMAS2005 and the PAGES Meeting will be held at the Beijing International Convention Center (BICC), the biggest and best venue in Beijing. The conference hotels are located within easy walking distance of the Center. Quite a number of tours and other events are being planned so participants can tour our many historic sites.

The LOC looks forward to hosting the largest IAMAS Assembly ever, and we will be doing everything possible to make all of our guests feel really enjoy the scientific sessions and their visit to Beijing. We hope to see you there.

Dr. Guoxiong Wu
Chairman, Local Organizing Committee
for IAMAS2005

After Beijing: where is IAMAS going next?

The 24th General Assembly of the International Union of Geodesy and Geophysics in 2007 is entitled 'Earth Our Changing Planet' and will celebrate the 50th anniversary of the International Geophysical Year. It is scheduled to take place between 2-13 July, 2007, with Perugia, Italy, being the venue. Preliminary information, mailing list form and the First Call can now be obtained at <http://www.iugg2007perugia.it>

Looking even further ahead, plans are currently being drawn up for a joint IAMAS/IAPSO Scientific Assembly in 2009. The probable location is Montreal, Canada.



Featured Commission: The International Radiation Commission (IRC)



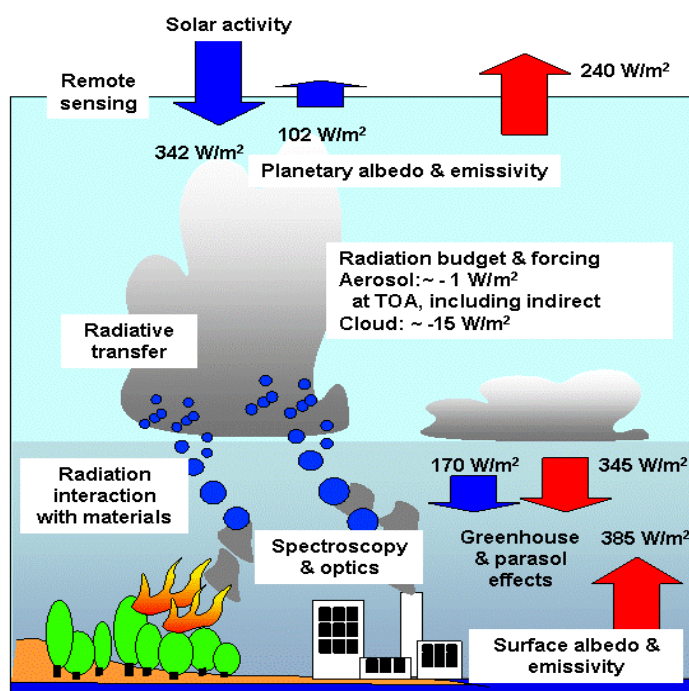
Fundamental breakthroughs in the understanding of the interaction of radiation and matter, such as Max Planck's blackbody radiation theory, led in part to the initiation of scientific studies of atmospheric radiation in the late 19th century. These studies were also fueled by the recognition that solar radiation absorption and terrestrial radiation emission are the fundamental driving forces of the climate system. During the mid-20th century, large segments of the radiation community focused their attention on understanding, measuring and calculating absorption spectra of minor atmospheric gaseous constituents, because such data are important for calculating radiative heating (e.g. the atmospheric greenhouse effect) and because of their necessity to the advancement of remote sensing of atmospheric thermodynamic properties from satellite observations. Instrument calibration and definition of radiation standards were also important activities of the radiation community during the early days. Many of the early studies were guided in part by two different radiation commissions, the activities of which were combined in 1948 into the International Radiation Commission (IRC) under the auspices of the International Association of Meteorology (IAM-later to IAMAP and then IAMAS).

The IRC is now one of the ten commissions of IAMAS (The International Association of Meteorology and Atmospheric Sciences). The commission elected for the 2005 to 2008 term is composed of 41 members from 18 countries. Topics of current concern for the IRC include optical phenomena in the atmosphere, radiative properties of atmospheric constituents and the Earth's surface, radiative properties of planetary atmospheres, radiant energy transfer, radiant energy interaction with other features of the atmosphere (dynamics, climate, etc.) and remote sensing of the Earth's atmosphere and surface. The responsibilities of the IRC include: maintaining and improving radiation measurement techniques, calibration and standardization; promoting and publicizing radiation-related science and engineering research; providing a forum for the scientific community to exchange relevant results and ideas; and encouraging international cooperation. In order to cover such a wide spectrum of activities, the IRC now has six working groups:

Observational Vertical Sounder) Working Group), ICRCM (InterComparison of Radiation Codes in Climate Models), ICLAS (International Coordination group for Laser Atmospheric Studies), ASA (Atmospheric Spectroscopy Applications), RSMA (Remote Sounding of Middle Atmosphere), 3D RT (3D Radiative Transfer), and ISCCP (International Satellite Cloud Climatology Project), and three rapporteurs: Clouds and Radiation, UV-B, and Baseline Surface Radiation Network (BSRN). Detailed information concerning the working groups may be found on the IRC website (<http://www.irc-iamas.org/>).

An important activity of IRC, the International Radiation Symposium has been held every four years to promote atmospheric radiation studies. The number of IRS participants has grown substantially from the early meetings and reached more than 400 for IRS2000 in St. Petersburg, Russia, and 350 for IRS2004 in Busan, Korea. Several daughter programs have also been established, i.e., activities by the Russian radiation commission, the Asian-Pacific Radiation Symposium, and so on. This rapid increase of related activities is the result of the large attention of the research community to significant issues related to radiation studies, such as the Earth's radiation budget, greenhouse and aerosol effects, and the expanding role of satellite remote sensing science and technology.

Figure 1 is a schematic diagram of the various natural processes and human activities that



ITSWG (*International TOVS (Tiros*

Figure 1. Atmospheric radiation processes and transfer.

The International Radiation Commission (contd.)

contribute to and/or can alter the Earth's radiation budget. The same figure also serves to highlight some of the IRC research issues and physical tools that are used to investigate radiative atmospheric processes. Over a sufficiently long period of time, the temperature of the Earth-Atmosphere system is determined in such a way that outgoing thermal infrared fluxes are emitted and balanced by absorbed solar fluxes. Radiative processes are the only means by which the Earth and its atmosphere lose energy to space. For illustrative purposes, Fig. 1 also shows our current estimate of the energy balance at the top of the atmosphere (TOA) and quantifies the magnitude of various fluxes relevant to the energy exchange within the surface-atmosphere system. The exact balance, and especially the uncertainties of the many energy terms that contribute to that balance, are still an open research issue. Nowadays, much research effort is put towards an improved estimation of TOA fluxes. Direct observation of these fluxes is today available thanks to two satellite experiments, the American CERES (Clouds and the Earth's Radiant Energy System) and the European GERB (Geostationary Earth Radiation Budget). The long-term accumulation and analysis of the CERES and GERB data are expected to clarify the entity and quality of the Earth's energy budget. The radiative balance of the Earth is influenced strongly by radiative cooling associated with emission of radiation by atmospheric gases. It is feared that the Earth energy balance could be altered through a "forced" radiative cooling, as a result of a feedback response to human activities (e.g. carbon dioxide increase due to the combustion of fossil fuels).

The use of terminology from atmospheric radiation studies has become commonplace in many scientific discussions (e.g., 'radiative forcing' and 'global dimming'). The study of 'radiative forcing' is a current important research issue directed at establishing an accurate assessment of the radiative effects of water vapor, clouds and aerosols that determine the forcing to the climate system. This is achieved through satellite remote sensing, such as BSRN. Recent radiative forcing estimates of the indirect effect of anthropogenic

aerosols at the TOA, which may be as large as about -1 W/m^2 , have updated our understanding of the processes regulating the warming of the Earth's climate. The term 'global dimming' is now becoming popular, though we need more measurements to quantify this effect. Modeling an increased downwelling thermal radiative flux, as observed by BSRN, is still a challenge for modeling the global climate.

These examples among many IRS-concerned subjects show that our activity needs interaction with a wide range of disciplines, i.e., atmospheric dynamics, cloud physics, atmospheric chemistry, solar physics, biology and even solid state physics. Due to the demands by such a wide range of subjects, we are continuing our collaboration with various international research organizations, such as WCRP (*World Climate Research Programme*), IGBP (*International Geosphere-Biosphere Programme*), GEWEX (*Global Energy and Water Cycle Experiment*), GCOS (*Global Climate Observing System*), GEOSS (*Global Environment Outlook Support System*) etc. Strong cooperation with the GRP (*GEWEX Radiation Panel*) is also an important collaboration.

The IRS revisited Asia in 2004, holding IRS2004 in Korea 32 years after the first visit by IRS1972 in Sendai, Japan. The first IRC gold medal was presented to Prof. Richard Goody at IRS2004 for his many contributions to atmospheric radiation, especially for his detailed text book 'Atmospheric Radiation.' Many students and young scientists have learned about atmospheric radiation processes from this book. It is impressive to see that this year's IRC award for young scientists went to Dr. Toshihiko Takemura, who studied Prof. Goody's textbook in the 1990s: he and many other young scientists have added significant new contributions that are not yet included in books such as Goody's. This is a good example of our long succession of healthy heritage of radiation studies in the radiation community.

Teruyuki Nakajima, President
Robert Ellingson, Vice President
Carmine Serio, Secretary

The IAMAS newsletter

The newsletter editor welcomes short reports from the forthcoming IAMAS 2005 meeting in Beijing from all the individual IAMAS Commissions and symposium conveners for inclusion in the next newsletter to be published in December. Ideally these should be 300-500 words long with the addition of a couple of figures or images.

In addition, I would also welcome a 'featured commission' piece similar to that kindly supplied by the International Radiation Commission for this issue.

Gareth Marshall (gjma@bas.ac.uk)
Editor IAMAS newsletter