A G U A T M O S P H E R I C S C I E N C E S

Atmospheric Sciences Section of AGU Newsletter

Volume 1, Issue 2 July 6, 2007

Section News From the Executive Committee

Report from the AGU Joint Assembly, Acapulco, Mexico, May 22-25, 2007

Alan Robock

Having fewer attendees than the Fall Meeting gave the AGU Joint Assembly a more relaxed and cozy atmosphere. Nevertheless, our section had more attendees than any other section. Highlights of the meeting included a new session, which we will continue at Joint Assemblies, in which newly-elected AGU Fellows from our section each presented a talk on the subject of their choice. At this meeting we heard either surveys of their past accomplishments or new, exciting work from Bill Lau, Sam Oltmans, John Gille, Anne Douglass, Kevin Trenberth and Brian Farrell. The Atmospheric Sciences reception featured Mexican food and drinks (see photo from our first newsletter) and a Mariachi band. The conference fiesta on the beach by Acapulco Bay, following the awards ceremony, outdid even that by including fireworks. The opening ceremony featured a wonderful concert by the Acapulco Philharmonic Orchestra, including classical music, the Beatles, and Mexican folk music. We would like to thank Brenda Weaver, Director of Meetings, and her staff for such an interesting and enjoyable meeting.

The next Joint Assembly will be in Fort Lauderdale, Florida, in May, 2008. Plan now to submit special sessions and attend.

Peter Webster gave Charney Lecture at Joint Assembly

Warren Wiscombe

Peter Webster gave a wonderful Charney Lecture on "Interactions between climate and tropical cyclones" at the Joint Assembly in Acapulco. Peter told us how Bill Gray once put his arm around him and told him that the hurricane field needed his talents, then probably regretted it later as Peter found a distinct effect of global warming on hurricane intensity while Bill Gray continues to argue for no effect. Peter critically reviewed the various criteria that Bill Gray discovered in 1969 for predicting the next hurricane season, finding that some criteria withstood scrutiny well, while others did not. Then he went on to show his evidence for changes in hurricanes with global warming. Peter also discussed how hurricanes need to be looked at not in isolation but as part of the whole climate system, interacting with it and not merely being affected by it.

Peter is one of the most distinguished members of our field, the winner of both the AMS Rossby and Charney Awards and a Fellow of no less than four societies. Among many accomplishments in tropical meteorology, he is known for his leadership in several large field campaigns, including TOGA-COARE. On a historical note, Peter was a graduate student of Jule Charney for a time. Also, the first of Peter's 20 PhD students, Bill Lau, was honored as a new AGU Fellow at the Joint Assembly. It was fun to watch Bill stand up at the end of Peter's lecture and argue vigorously for his theory that aerosols from Africa suppress hurricanes (especially during the weak 2006 hurricane season).

Fellow Nomination Deadline Extension

Warren Wiscombe

The deadline for the receipt of Fellows nominations at Headquarters has been moved from 15 July to 15 August. This extended deadline provides more time to assure that all of the Sections and Focus Groups can be appropriately involved and participate effectively.

The outstanding scientists in the AS Section cannot be elected Fellows unless we in the section prepare and submit strong nomination packages. The directions can be found at http://www.agu.org/inside/fellguides.html.

Continued on Page 3

HIGHLIGHTS

AGU Fellows Committee nominations deadline changed to Aug. 15: http://www.agu.org/inside/fellguides.html

2007 Fall AS Section Banquet is planned for Tuesday, December 11, at the Empress of China.

AS Newsletter

As a newcomer to atmospheric science from the world of field geology, I quickly learned what many of you have known for years - much of our research is deeply tied to computer science. The accuracy of our models is either limited or enhanced by the computational power at our disposal. In this issue, Will Anderson reports on the Earth Simulator, which is enabling models to run very high resolution simulations.

Because of the strong ties between the atmospheric and computer sciences, dialogue between members of both fields is mutually beneficial. Michel dos Santos Mesquita tells us about the International Polar Year, which began this March, and the opportunities it presents for furthering this dialogue.

In this issue, you'll also find news about the European Union Commission's proposed strategy on energy and climate change, as reported by Juan Añel. The Commission has set forth the goal of limiting global warming to 2ºC and explains the necessary steps for attaining the goal.

And as always, we've included important section news from Alan Robock and Warren Wiscombe.

We are looking for reader input on the newsletter. If you have suggestions for articles please send me an e-mail (abharper@atmos.colostate.edu). Also, we are still accepting submissions for a newsletter logo. You can send those to me, as well.

Anna Harper, Editor

Newsletter Reporters:
Will Anderson - Texas Tech University
Juan A. Añel - University of Vigo, Spain
Michel dos Santos Mesquita - Univ. of Alaska, Fairbanks

The Earth Simulator

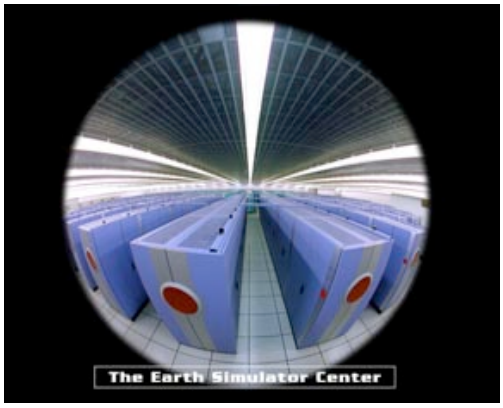
Will Anderson

The Earth Simulator (ES), one of the world's most powerful supercomputers, is housed at the Earth Simulator Center (ESC) in Japan. The ES illustrates the changing state of contemporary science. In the 21st century, high-performance computing technology is being embraced for its ability to reproduce and predict physical phenomena. In this article, which spans two editions of the AGU AS Section newsletter, the history, technical components (theory, software and hardware) and results from the ES are explored.

History

Although the ES became operational in 2002, the first planning became official much earlier in 1996. In the years between 1996 and 2002, a series of decisions were made, such as NEC being chosen to develop and provide the ES machine, based on expert opinions of scientists in relevant fields. The ES is funded by Japanese organizations including the National Space Development Agency of Japan (NASDA), Power Reactor and Nuclear Fuel Development Corporation (PNC), Japan Atomic Energy Research Institute (JAERI), and Japan Agency for Marine-Earth Science and Technology (JAMSTEC). However, this project is essentially international, given that its results are not oriented to benefit a single particular geographical region.

Since becoming operational, the ES has gained a variety of awards. For contributions to high-performance computing and computer science technology (e.g. code architecture), the ES won Gordon Bell Awards in 2002, 2003, and 2004, as well as a variety of TOP500 Awards. In addition, the ESC has gained significant media coverage and public interest at an international level, illustrating broad social interest in the ability of computers to predict the physical earth.



The Earth Simulator supercomputer, housed at the Earth Simulator Center in Japan. Photo courtesy of ESC.

ESC Structure

Research at the ESC is divided into four categories: (a) Computational Earth Science Research Group (CESRG); (b) Advanced Simulation and Technology; (c) Holistic Simulation Research Program; and (d) Industrial Application Group. Simulations and predictions of the atmosphere, ocean and atmosphere-ocean interactions are conducted within the CESRG. The atmospheric simulations are conducted to "understand the mechanism of the variability with time scale from a few days to decades and to study the predictability in the atmosphere." Such predictions may reveal when and where heat waves, hurricanes or snow storms will occur.

A defining characteristic of the ES is that it simulates evolution of the entire system. In this respect, the ES may represent the physics of the entire planet (enclosed within an atmosphere) and moves closer toward prediction of whole-earth interactions. In numerical simulations of atmospheric physics, whether using large-scale numerical weather prediction software (e.g. MM5) or smaller scale (mesoscale) codes (e.g. large-eddy simulation), prescription of lateral boundary conditions is of consequence to simulation results. In contrast, results from ES are not vulnerable to this because the atmosphere is modeled as a continuous media.

In The Next Issue

In our next issue, we'll tell you what makes the ES so computationally powerful and what kinds of predictions the the machine is capable of.

Computational Science and the International Polar Year

Michel dos Santos Mesquita

The International Polar Year (2007 – 2008) will bring the world's attention to the importance of polar research in the global context. Although most IPY activities are field-based, the availability of powerful computational capacity has advanced our knowledge of high latitude processes. Computational

Continued on Next Page

IPY, continued from page 2

research associated with IPY is being highlighted in a series of six thematic articles in the journal *Computing in Science and Engineering* (CiSE). The series is guest-edited by Dr. Uma S. Bhatt and Dr. David E. Newman, faculty at the University of Alaska Fairbanks in Atmospheric Science and Physics, respectively. According to Dr. Bhatt, the goal is to bring IPY to a broader audience.

The first issue was published in January as a lead-in to the start of the IPY in the January/February 2007 issue and introduced the high latitudes with an article on remote sensing. The remaining five articles will be published throughout this year in the bimonthly journal and will cover modeling of glaciers and climate, ice-oceans, vegetation, auroras and space weather and, finally, mechanisms for the maintenance of the ozone hole.

To find out more about the series, or to share aspects of IPY that would be interesting to a computational audience, e-mail Dr. Bhatt at bhatt@gi.alaska.edu.

The IPY (International Polar Year) is a scientific program related to Arctic / Antarctic research and will run from March 2007 to March 2009. It is organized by the International Council for Science and the World Meteorological Organization. Previous polar years occurred in 1882-3, 1932-3 and 1957-8. More than 60 nations and thousands of scientists are working on approximately 200 projects in order to make the International Polar Year a success.

The main research areas of the IPY include climate change studies; development of an arctic system model using international collaboration; ocean/sea ice research; atmospheric research; studies on permafrost/frozen soil, biota/vegetation, hydrology, the carbon cycle, and solar processes; as well as engagement with the northern people . For more information on the IPY, see the IARC/UAF IPY fact sheets at:
http://www.iarc.uaf.edu/news/media
or visit the IPY website at www.ipy.org.

New Energy and Climate Change Strategy Presented by the EU Commission

Juan Añel

On Jan. 10, 2007, the European Union Commission published a proposal for a new energy and climate change strategy. The communication is entitled *Limiting Global Climate Change to 2 degrees Celsius. The way ahead for 2020 and beyond*, and it shows the intention of continued emissions reductions after the Kyoto Protocol expiration. The communication highlights other benefits of limiting climate change, such as increasing the EU's energy security, health benefits estimated at €8 to 27 billion and reducing CO2 emissions and air pollution.

The basis of this communication is that global warming has to be limited to no more than 2ºC above the pre-industrial temperature to prevent dangerous levels of climate change. This will limit the impacts of climate change and the likelihood of massive and irreversible disruptions of the global ecosystem. The communication shows that this is technically feasible and economically affordable if major emitters act swiftly. Moreover, the benefits far outweigh the economic cost.

The communication states that to have a 50/50 chance of staying within the 2ºC limit, the world will need to cut greenhouse gas emissions by as much as 50% of 1990 levels by 2050. Additionally, to achieve this target, worldwide emissions will need to peak before 2025. The communication breaks the necessary reductions down further. Particularly, the EU currently is responsible for 14% of worldwide emissions. EU emissions should be at the most 80% of 1990 levels by 2020. Developed countries need to reduce their emissions by an average of 30% below 1990 levels by 2020. Emissions resulting from the loss of forest cover must come to a complete halt within two decades and be reversed afterwards. Another condition to have a 50/50 chance of respecting the 2ºC limit is that atmospheric concentrations of greenhouse gases should stabilize around 450 ppmv CO2 in the long term. This is the concentration that has guided the commission in its most recent economic analysis. The Commission has suggested a unilateral adoption of the proposed strategy by the EU until an international agreement is concluded.

To achieve these objectives, the European Union's budget for environmental, energy and transport research in the period from 2007 to 2013 has increased to €8.4 billion, which is nearly four times the budget for 2002 to 2006. The distribution will be:

Energy: € 2300 million
Environment (including Climate Change): € 1900 million
Transport (including aeronautics): € 4180 million

Moreover the research budget should be increased again after 2013 which should be mirrored by similar national efforts of the EU member countries.

For more information, visit the following links:
http://www.climatechange.eu.com
http://ec.europa.eu/environment/climat/home_en.htm
http://ec.europa.eu/environment/climat/future_action.htm

Section News, continued from front page

Atmospheric Sciences Website

Alan Robock

I have taken over as webmaster for the Atmospheric Sciences website. Please visit and send comments and suggestions to me at robock@envsci.rutgers.edu. I have updated all the pages, including Atmospheric Sciences Links, Education Resources, and Funding Opportunities. I also have included a link to our newly revised bylaws.

New Aerosols and Clouds Division

Warren Wiscombe

Because of the large number of sessions and papers in the aerosols and clouds area, we have received approval from the AGU Council for an AS Bylaws revision creating a new division within AS: Aerosols and Clouds. This division will have its own Secretary, who will be elected for the first time next Fall. This new Secretary will provide much-needed help and expertise to our existing Secretaries in organizing and promoting sessions for the two major AGU meetings.

In the same bylaw revision, we renamed our existing divisions to conform to the categories employed at JGR-Atmospheres: "Atmospheric Chemistry" became "Atmospheric Composition and Chemistry," while "Atmospheric Physics and Climate" became "Atmospheric Physics, Climate, and Dynamics." Finally, we cleaned up, simplified, and modernized our bylaws to make things easier for the officers who follow us.

Section News, continued from previous page

Our Section now second largest in AGU

Warren Wiscombe

Within the past year, our Section has passed Hydrology to become the second largest AGU Section, with Oceanography first.

AGU meeting size (again)

Warren Wiscombe

In case you missed our request in the first newsletter, we are soliciting input on Fall AGU meeting size. We anticipate growth of more than 9% per year, leading to perhaps 20,000 registrants by 2010 or so. This will require some belt-tightening – higher ratio of posters to oral talks, half-day poster sessions, merging of similar sessions, etc. We'd like your input on how you feel about the meeting size, both pro's and con's, and how you would suggest dealing with it. Send email with a Subject line "AGU meeting size" to me at wwiscomb@bnl.gov.

AS Newsletter Logo Contest

Anna Harper

We are still accepting submissions for a logo for our newsletter. Don't miss this chance to show off your creativity to thousands of scientists! Send submissions to abharper@atmos.colostate.edu, subject: AS Logo.

Fall Meeting News

Atmospheric Sciences Dinner at the Fall Meeting

Alan Robock

Following the success of our Atmospheric Sciences 8-course Chinese banquet at the Empress of China restaurant in Chinatown at the Fall Meeting in 2006, we will repeat the event this year, on Tuesday, December 11, 2007. After the banquet, President Warren Wiscombe will present the James R. Holton Junior Scientist Award. Then Lynda Williams, the Physics Chanteuse, will perform science songs especially written for the occasion on global warming, geo-engineering, aerosols, clouds, climate modeling and other atmospheric topics, as well as some old standards from her repertoire. This year, she promises new songs on the eigenfunction solutions to the Hemholtz time-stepping problem, coupled

Lynda Williams, the Physics Chanteuse, performs at the AS dinner last December.

atmosphere-ocean general circulation models and nuclear winter.

We expect the event to be bigger and better than ever. The size limit will be about 400 people, so remember to sign up early when you register in the fall.

Susan Solomon to Give Bjerknes Lecture at Fall Meeting

Warren Wiscombe

Susan Solomon has agreed to give the Bjerknes Lecture at the Fall meeting. Susan is well known for her work on the ozone hole problem and has most recently co-chaired the IPCC Working Group I (The Physical Basis of Climate Change), leading to the release of the 4th assessment report in the near future. No matter what Susan chooses to talk about, this is guaranteed to be an exciting lecture.

Opportunities

Compiled by Anna Harper

Note: You may be asked for your AGU member # to open the following links. Visit the AS Section website for links to other job opportunities not listed here: http://www.agu.org/sections/atmos/ click on Job Listings/Resources.

AGU job postings can be found at:

http://www.agu.org/cgi-bin/membership_services/joblistings.cgi

Below is a list of the postings in <u>Atmospheric Sciences:</u>

- Optical Sensor Engineer/Post Doc., Science Systems and Applications, Inc.
- Postdoctoral Fellowship, Jet Propulsion Laboratory / Caltech - deadlines July 1 and Nov. 1, 2007
- Postdoctoral position, Institute of Environmental Physics and Remote Sensing, University of Bremen, Germany - deadline Aug. 30, 2007
- Postdoctoral position in atmospheric chemistry modeling, Atmospheric Sciences and Global Change Division, Pacific Northwest National Laboratory
- Postdoctoral scholar in atmospheric chemistry/biosphere-atmosphere exchange, University of California, Berkeley - reviews begin July 26, 2007
- Research Scientist, Boulder, Colo. Planetary Atmospheres Section
- Research Scientist, Cloud Microphysics, Princeton University's Atmospheric and Oceanic Sciences Program / NOAA's Geophysical Fluid Dynamics Laboratory - reviews begin Aug. 1, 2007.
- Postdoctoral Fellowships, Naval Research Laboratory in Monterey, Calif.

<u>Interdisciplinary/Other</u>

- Director, Center for the Environment, Plymouth State University - reviews begin July 27, 2007
- Research Positions/Postdoctoral Fellows, Earth System Science Interdisciplinary Center, University of Maryland - deadline July 20, 2007
- Tenure-tract faculty, Appalachian Laboratory, University of Maryland Center for Environmental Science - reviews begin Sept. 1, 2007
- Full Professor, Optical and laser remote sensing, Delft University, the Netherlands
- President and Chief Executive Officer, the Consortium for Ocean Leadership - deadline Aug. 1, 2007
- Research scientist, quaternary paleoclimate,GNS Science, New Zealand - deadline July 31, 2007

Student Opportunities

- National Ocean Sciences Bowl - question writers needed
- PhD Student, numerical simulation of the response of the Earth's atmosphere to solar

variability, Max Planck Institute for Meteorology, Hamburg, Germany - deadline July 31, 2007

Conferences

- AGU Joint Assembly (Dec. 10-14) - San Francisco, Calif.

  http://www.agu.org/meetings/fm07/

- Polar Dynamics: Monitoring, Understanding, and Prediction (Aug. 29-31, 2007) - Bergen, Norway. Visit: http://web.gfi.uib.no/conference2007/program.html, or email Dr. Tore Furevik (tore.furevik@gfi.uib.no)

Other Opportunities

- The Committee on Space Research (COSPAR) of the International Council for Science is seeking nominees for various awards and medals which recognize the outstanding achievements of space scientists throughout the world. Details of the awards and past recipients can be found at http://cosparhq.cnes.fr/Awards/awards.htm. Awards will be presented at the 37th COSPAR Scientific Assembly to be held in Montreal, Canada, July 13-20, 2008.

  Nomination forms and instructions can be found at http://www7.nationalacademies.org/ssb/COSPAR_nominations2007.html. Completed nomination packages must be submitted to the National Research Council's Space Studies Board, the U.S. National Committee for COSPAR, no later than September 28, 2007.

- Call for papers on "Diagnosing and Modeling of the Tropopause: Structure, Dynamics, and Variability" for JGR-Atmospheres - deadline Dec. 12, 2007. http://www.agu.org/pubs/call/TROPO1.html

- Call for authors: Encyclopedia of Global Warming and Climate Change. The work will be marketed to public and academic libraries. Each article will range from 550 to 5,000 words. Payment for the articles are honoraria that range from a $50 book credit at Sage Publications for article submissions totaling 500 to 1,000 words up to a free set of the finished encyclopedia (a $400 value) for contributions totaling 10,000 words. For more information, please contact Dr. Maria Siano by email at golsonbooks2@hotmail.com. Please include a very brief summary of your background in environmental and geographic issues.