New England Section Newsletter

Volume 11 **Number 25** **Spring 2005**

Celebrate Einstein!

April 1st - 2nd, 2005
Massachusetts Institute of Technology
Cambridge, MA

The Joint New England Sections of the American Physical Society and the American Association of Physics Teachers will celebrate Einstein's "miraculous" year at the 2005 Spring Meeting.

Photo (right) credit: Copyrights from Cal-Tech.

General Information

The Joint New England Sections of the American Physical Society and the American Association of Physics Teachers 2005 Spring Meeting will be held on Friday, April 1st and Saturday, April 2nd at the Massachusetts Institute of Technology, Cambridge, MA. MIT, which is widely recognized for its leadership in science and technology, offers an ideal setting to celebrate this spring's theme, "Einstein". The meeting will take full advantage of the Institute's evolving campus bringing to it several local speakers from the Cambridge/Boston physics community as well as other notables from across the U.S. Organizers anticipate a large number of attendees due the theme of Einstein and the fact that the meeting will coincide with the promotion of the World Year of Physics 2005 Centennial of Albert Einstein's work.

More details will be available January 2005 on the NES/APS/AAPT 2005 Spring Meeting website at www.lns.mit.edu/nes-aps-aapt. Please check again for updates and complete conference information.

Submissions

All abstracts must be submitted directly to the American Physical Society. Please read the submission guidelines carefully.

The **DEADLINE is MARCH 4, 2005**

The online program will be posted on March 25th.

Visit: **http://www.aps.org/meet/abstracts/**

Once all submissions have been recieved and sorted, the APS will notify presenters by email by March 25th.

Publication

Abstracts can be printed in the APS Spring Supplemental. The fee is $35. Payment will be collected at the Spring Joint Meeting

Schedule

The Planning Committee will post a schedule of activities as soon as it's available. In the meantime, you will find important related information posted on the following site:

APS General Announcement Page: http://www.aps.org/meet/NES05/

If you have a question, you may contact Sheela Hulsoor, conference secretary, at 617-253-2361 or email your inquiry to the Local Organizing Committee, email address: **LOC@lns.mit.edu**.

Friday, April 1st

Registration, Plenary Talks, Workshops, Poster Session and Banquet

Saturday, April 2nd

Parallel Meetings, Workshops, Demonstrations

Speakers (Current Information; updated as needed)

Speaker Topic

- Howard Berg, Harvard University *Brownian Motion*
- Wolfgang Ketterle, MIT *Bose-Einstein Condensation*
- Nergis Mavalvala, MIT *Gravitational Waves and LIGO*
- Dave Pritchard, MIT *Testing E=mc2 and Weighing Chemical Bonds*
- Tilman Sauer, Caltech *The Adventure of Studying Einstein's Manuscripts*
- Pratrap Misra, MIT Lincoln Labs *GPS* (tentative title)
- Peter Galison, Harvard University *Einstein's Clocks, Poincare's Maps* (tentative title). Banquet talk

Fall 2004 NES APS Joint Meeting at Pratt & Whitney
October 22 and 23, 2004

The Fall 2004 Meeting of the New England Section of the American Physical Society (NES/APS) was held at Pratt & Whitney (East Hartford, CT) on Friday and Saturday, October 22 and 23, 2004. Pratt & Whitney is well known for its innovative and commercially successful aerospace products. Thus, the theme Climate and Flight was appropriate.

Below you co-editor Paul H. Carr is standing next to a Pratt & Whitney Engine.

There were 73 attendees; of these, 10 were students and 9 were Emeriti. Attendees also includes members of the New England Section of the American Association of Physics Teachers (NES/AAPT); one of the organizers. There were 20 members of the NES/APS, 42 members of the NES/AAPT, and 2 members of the Society of Physics Students. There were 10 Contributed talks and 4 Posters. A total of 54 people attended the Banquet.

Donald Rethke's banquet talk "Life After Liftoff - The Moon and Beyond," was interesting, informative, and lively as he encouraged audience participation. He is a well-known figure in NASA's manned spaceflight program, who developed life support technology and systems for every major program from Apollo to the space station. Dr. Rethke retired as principal engineer in the Advanced Technology Group of Hamilton Sundstrand Space Systems International.

Donald Rethke's Banquet Talk, Life After Liftoff

Global Warming Speakers

The summaries below appear in the order in which the talks were given. Each of the speakers was given the opportunity to review the summaries and make any changes. The PowerPoint presentations of each speaker can be found on the NES APS website: http://www.physics.ccsu.edu/aps-nes/ (access details are below)

Fall Meeting Talk Summaries

"The Discovery of Global Warming."

Spencer R. Weart, Director of the Center for History of Physics of the AIP and noted author and editor.

This is also the title of his well-illustrated book described on http://www.air.org/history/climate. He described the emerging importance of global warming from the 1930s and concluded with the following statement. "The world's governments devised a novel mechanism to coordinate scientific advice, and by 2001 discussions concluded in a broad consensus: there is a serious risk, although no absolute certainty, of harmful warming in coming decades."

"Consensus Concerning Global Warming and Its Meaning"

Richard S. Lindzen, Alfred P. Sloan Professor of Meteorology in the Department of Earth, Atmospheric and Planetary Sciences of MIT and a member of the National Academy of Sciences and its panel on climate change.

Despite the claim that global warming is a scientifically contentious issue, there really is relatively little disagreement among scientists on many of the basic aspects of the issue. The real problem in public communication is that simple facts about climate are often presented, and/or perceived as having ominous implications -- even when they don't. Although there is certainly room for skepticism, the emphasis on controversy often gets in the way of understanding the meaning of what is agreed on.

Thus, much is made over the fact that globally averaged surface temperature has probably increased by about 0.5C over the past century, and that mans' activities have likely contributed to this. However, concerns for the future are based on models which predict responses of 2-4C for a doubling of CO2. Such an increase would result in radiative forcing of about 3.7 Wm-2, and, as it turns out, the increase in radiative forcing over the past century is already about 2.8 Wm-2. Thus, if these models are correct, we should have seen much more warming than we have. Instead, the public is told that these models are capable of simulating the past climate change. As physicists, we know that simulation is not the same as prediction. In this case simulation involves adjustable parameters such as the amount and radiative properties of aerosols, the unmeasured variability of the sun, the impact of volcanos, etc.

Instead of explaining this to the public, the notion of scientific consensus is used to relieve the public of any need to understand. However, sometimes consensus is invoked for the opposite of what is a consensus within the scientific community. Thus we would expect a warmer world to have weaker extratropical storms and less variance. We are told exactly the opposite is the consensus. Even hurricanes have been less numerous over the past thirty years than they were during the preceding 70 years. Another point of scientific consensus is that the proposed emission reductions associated with Kyoto would have little impact on climate regardless of what one believes about climate. This consensus is rarely presented to the public.

Lindzen concluded by noting that scientific progress on climate would benefit from disentangling science from policy preferences, and eliminating alarmism as a factor in establishing funding priorities.

"Climate Change in the New England Region: Lessons Learned From the New England Regional Assessment"

Barrett N. Rock, Professor of Natural Resources, University of New Hampshire,

Overall, New England and upstate New York have warmed by 0.7º F since 1895, yet some states (RI, NH) have warmed by two to three times the regional average. One state (ME) has cooled. The cooling in Maine is attributed to the increase in forests. The warming in Rhode Island and New Hampshire is attributed to deforestation and increasing urbanization. Warming in winter months has been greater than summertime warming. The milder winters, earlier maple sap flows, earlier dates for ice melting on lakes, and reduced snowfall recently experienced across the New England region are all likely responses to this increase in temperature. Human activities are affecting climate. There is now strong scientific evidence and consensus that much of the global warming experienced in the last half of the 20 th century is attributable to human factors.

Significant warming of 6-10º F projected over the next century. Two respected climate models project significant warming and an increase in precipitation for the New England Region. The Hadley Model projects a warming of 6º F in annual minimum temperatures and a 30% increase in precipitation for the region, while the Canadian Model projects a 10º F warming in minimum temperatures and a 10% precipitation increase over the next century. The Hadley Model projecting an increase of 6º F assumes more cloud cover than the Canadian Model, which projects 10º F warming. Either temperature increase would be greater than any climatic variation experienced in the region in the past 10,000 years. If either scenario occurs, the climate of the New England Region will be profoundly different than the climate of today. See http://www.necci.sr.unh.edu

Prof Rock said that his Toyota Prius saves him $2000 per year is gasoline and its nitrous oxide emission is ninety per cent of a conventional engine. Nitrous oxide combines with volatile organic compounds on a hot surface to form ozone.

"Global Warming by the Numbers."

John R. Christy, Director of Earth System Science Center and Professor of Atmospheric Science and Alabama State Climatologist, University of Alabama in Huntsville,

Prof. Christy noted that the average American has experienced about 4 degrees F of warming. A large part of the increase is due to people moving south to warmer climates! He also said that average temperatures in his home state of Alabama have decreased. The number and intensity of hurricanes have not increased to date. Prof. Chirsty showed data on the declining ice thickness of the North Pole and the increasing ice thickness of the South Pole. Christy gave several examples of how important climatic processes are poorly expressed in current climate models.

Editorial Comments

Paul Carr: During the discussion period, Prof. Lindzen referred to his colleague at MIT, Institute Professor Mario Molina,who was awarded the Nobel Prize in 1995 for research establishing that chlorofluorides were causing the thinning of the ozone layer in the upper atmosphere. Your editor heard Prof Molina give a presentation of his research at the 2002 Sigma Xi Annual Meeting in Galveston, TX. During the question period, your editor asked Prof. Molina his view of global warming. He replied that the climate is so complex that it is difficult to model reliable projections, but if you ask, "Should we do something about it," my answer is "Yes." Prof. Molina is currently researching air pollution in cities, including his own native Mexico City.

Prof. Rock, in his presentation, showed a graph of the increasing ozone layer resulting from the banning of chloroflurides in the Montreal Protocol

Prof. Chirsty showed data on the declining ice thickness of the North Pole and the increasing thickness of the South Pole. His interpretation was that this does not agree with climate models. You editor notes that most of the population of the industrialized

countries, except for low population Australia and Brazil, is in the Northern Hemisphere. The fastest developing countries, India and China, with about 2 billion people, are both in the Northern Hemisphere!

Laurence Gould: As to the comments attributed to Mario Molina: "Should we do something about it [global warming]," Molina's answer being, "Yes." --- According to my reading of the NRC 2001 report (Climate Change Science) there is about as much uncertainty for global warming as for global cooling! So it's not clear what, if anything, should be "done." The other issue is whether “consensus” on a scientific issue is the same as “best scientific argument”!

From above, the reader can see that the comments of the speakers (as well as the editors) indicate that there is disagreement about both the data for, and interpretation of, “global warming.” This shows up what the organizers of the meeting (the NES APS, in conjunction with the NES AAPT) hoped — that the controversy would be made evident by the speaker/panel members, each of whom is very familiar with issues pertaining to “global warming.”

You can find pdf slides of each speaker’s PowerPoint presentation through
http://www.physics.ccsu.edu/aps-nes/

Once there just click on the further link "Click here for meeting highlights"! Finally, two books, which have contrary assessments, may also be of help to those interested in the issues: One is by Spencer R. Weart, “The Discovery of Global Warming” (Harvard University Press, MA, 2003). The other is by Bjorn Lomborg, “The Skeptical Environmentalist: Measuring the Real State of the World” (Cambridge University Press, NY, 2001).

The Newsletter Editors and Executive Committee of the NES APS would like to thank David Markowitz (University of Connecticut) for his many years of dedicated and creative service as the Editor of the Newsletter for the New England Section of the APS.

Paul H. Carr and Laurence I. Gould, Editors

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