AMERICAN PHYSICAL SOCIETY

New England Section Newsletter

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Paul H. Carr & Laurence I. Gould, Co-Editors

Brown University Physics Department hosts the

Nanobiophysics in the 21st Century

Joint Fall Meeting of the New England Sections of APS and AAPT

October 29-30, 2010
Brown University
Providence, Rhode Island

The theme of the conference is Nanobiophysics, and plenary sessions will highlight leading research in the manipulation, imaging, and study of biological systems at the nanoscale. Recent insights into the teaching of physics, as well as teaching workshops will also be showcased. The meeting will feature an evening of astronomical observations at the Ladd Observatory after the banquet dinner on Friday evening. Nobel Laureate, Prof. Leon Cooper will be the banquet speaker.

Plenary Speakers

All plenary talks will be aimed at a general physics audience

Patrick Doyle, MIT
Naomi Halas, Rice
Peter Nordlander, Rice
Mark Reed, Yale
Rohit Karnik, MIT (*tentative*)
David Pritchard, MIT (*tentative*)

Organizing Committee

Derek Stein (Brown U) • Domenico Pacifici (Brown U) • Rashid Zia (Brown U) • Don Donovan (Thayer Academy)

More information is available by visiting:
http://www.physics.brown.edu/HET/APS-AAPT_stein/Conference.html

Spring 2010 Meeting of the New York Section and New England Sections of the APS

April 23-24, 2010
Union College
Schenectady, NY

Topic: Modern Nuclear Applications

The joint Spring 2010 Meeting of the New York State and New England Sections of the American Physical Society was held at Union College. Historically, the first meeting of the NYSS of the APS was held at Union College in the spring of 1938. The biannual section meetings have been a great venue for the exchange of ideas and for empowering students. In light of this, Modern Nuclear Applications: Medicine, Power, and Non-Proliferation was selected as the topic for the 102nd Topical Symposium.

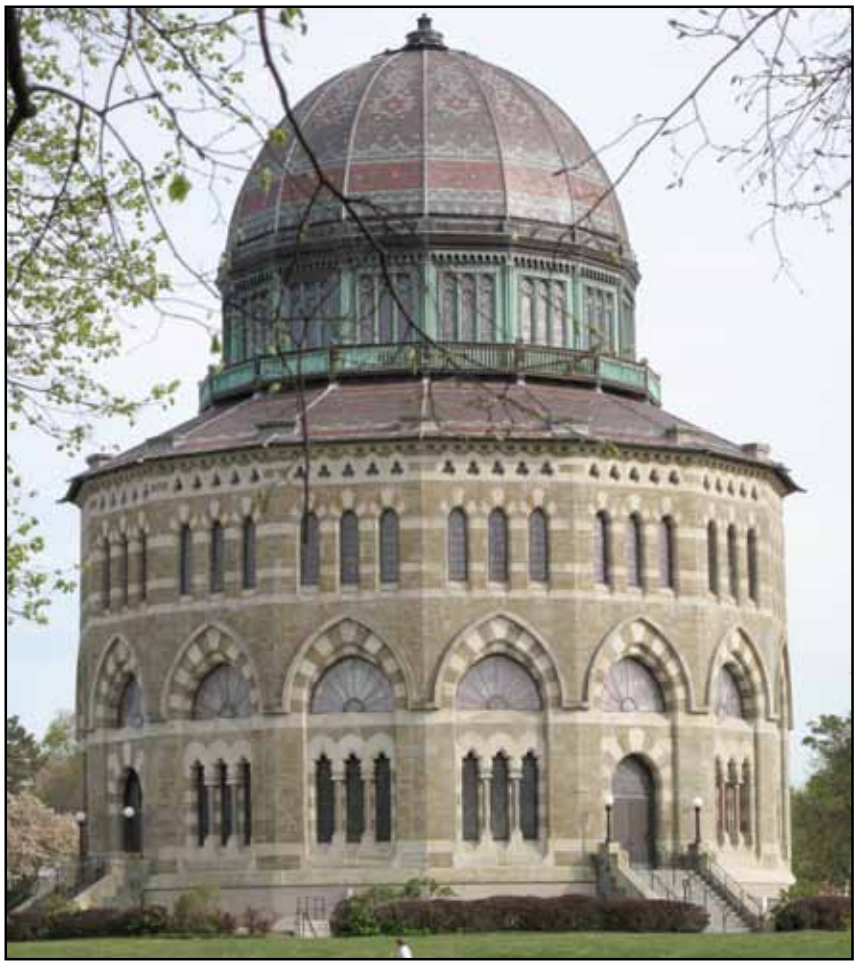

Photo credit: L.I. Gould

ANNOUNCEMENTS

Joint Spring Meeting of the New England Sections of the APS and AAPT

8-9 April 2011
University of Massachusetts Lowell

Theme: "Materials: the Foundation of Our Future"
Banquet Speaker: Eric Mazur

12th Annual Greater Boston Area Statistical Mechanics Meeting

Saturday, October 9, 2010
Brandeis University

The format will be about the same as in past years with four invited speakers, 25 to 30 three-minute contributed talks, and plenty of time for informal conversations. Speakers who are giving contributed talks should save them in pdf format so that they are platform independent. The number of slides should be limited to no more than four to ensure enough time for questions.

Invited speakers for this fall's meeting:

Ginestra Bianconi, Northeastern
"Bose-Einstein distribution, condensation transition and multiple stationary states in multi-loci evolution of diploid populations"

Jeff Gore, MIT
"Cooperation and reversibility in microbial evolution"

L. Mahadevan, Harvard
"Statistical and continuum mechanics of ribbons and small plates"

Pankaj Mehta, Boston University
"The statistical mechanics of transcription-factor binding site discovery using hidden Markov models"

The number of contributed talks is limited, so please register early.

Thanks to a subsidy by the New England Section of the American Physical Society, bagels, coffee, tea, and lunch will be provided at no cost if you register by Tuesday, October 5.

More information about the meeting is at physics.clarku.edu/gbasm/, where a web-based registration form is available. Make sure that you include Einstein's miracle year (1905).

We look forward to seeing you this fall.

Bulbul Chakraborty, Claudio Chamon, Harvey Gould, Mark Hagan, Bill Klein, Sid Redner

Newsletter Editorial Board Appointed

As required by the American Physical Society, an Editorial Board for the NES Newsletter has been established, and its first (but not only) responsibility is to review drafts of the Newsletter before publication. The primary impetous for this requirement was what appeared to be a political endorsement in a section newsletter (not ours) that endangered the tax exempt status of the APS. Other concerns of the national APS have been addressed by the disclaimer that now appears at the bottom of every page of the newsletter. The Executive Committee of NES/APS has asked that the Chair appoint three board members for staggered three-year terms. This could be accomplished without a change in the Section By Laws. Peter Parker has appointed Bill Donnelly (MIT) to serve until December 31, 2011, June Matthews (MIT) to serve until December 31, 2012, and Russ Harkay (USHN Keene) to serve until December 31, 2013. Wade Sapp (AS&E and past Chair of the Section) will serve ex-officio until a draft of the charter for the Editorial Board has been completed. Please feel free to contact the Newsletter editors and/or members of the new board with any comments or suggestions.

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Chair's Column: October 2010

This is the first of a regular column to be contributed by the sitting Chair. Given publication deadlines, the first will address only the need for contributions to the newsletter. Future statements may include a "State of the Section" or whatever thoughts the Chair would like to share with the membership.

It has become clear from ongoing discussions with the Executive and the Publication Committees that the Content, Breadth, and Balance of our NewsLetter is a major item for consideration.

As part of the input for an initial discussion at our upcoming Fall Meeting at Brown on October 30th, I am inviting, *urging* members to send me your comments. What do you want to see in the NewsLetter and, for example, what could and should be done to encourage more input from Section members about themselves and faculty peers, events, developments, innovations, etc. at their local institutions and laboratories?? It is my recollection that this is something that used to be a significant part of our NewsLetter.

Peter Parker
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EDITORIALS and LETTERS TO THE EDITORS

Please Note: The content of what follows expresses each writer's considered opinion and should not be construed as representing any official position of any organization, including the Executive Board of the New England Section of the American Physical Society.

The issue of anthropogenic global warming (AGW) is not settled. This can be seen from the Letters below as well as contributions to the debate existing in recent publications of this Newsletter (Fall 2007 through Spring 2010 issues). These can be obtained from the NES APS website http://www.aps.org/units/nes/newsletters/).

Given the importance of the topic, we welcome letters (positive or negative) about the issues. The Newsletter is published twice yearly (Fall and Spring).

Paul Carr and Larry Gould, Co-Editors NES APS Newsletter

BP: Beyond Petroleum

Paul H. Carr

Reference: 13 Aug 2010 Special Issue of Science "Scaling Up Alternative Energy"
http://www.sciencemag.org/content/vol329/issue5993/index.dtl#p-forum

Because of its investment in alternate energy sources, BP, originally British Petroleum, has over the years tried to redefine itself as "Beyond Petroleum." Ironically, its oil spill in the Gulf of Mexico, our worst environmental disaster, dramatizes the importance of ending our oil addiction.

The billion dollars per day we spend to import oil from countries, often hostile and politically unstable, puts our national security and economy at risk. An energy bill which prices carbon would keep American dollars at home to reduce unemployment with renewable energy jobs. The Congressional Budged Office has just released its finding that such a bill would reduce the 2011-2020 federal budget deficits by $19 billion.

In 2009, ten Northeastern states launched a successful a "carbon-cap-and-invest" program, called Regional Greenhouse Gas Initiative (RGGI). The states' analysis shows that this innovative pairing of a pollution cap and increased efficiency will actually reduce the energy bills for the average household by over $100 per year. A similar success was reducing the acid rain polluting our waters by placing a cap on the sulfur emissions from mid-western coal plants. This market based approach cost far less than anyone ever predicted.

Wind and solar energy is FREE, after the up-front and maintenance costs are paid, and will last until the sun burns out, billions of years from now. The US, with 5 per cent of the world's population, is using 20% of the earth's energy resources. This and a renewed appreciation of the intrinsic beauty of nature can motivate its conservation.* "Energy efficiency and conservation

can be very sexy and very high tech," according to Energy Secretary Dr. Steven Chu.

Global climate change, driven largely by the combustion of fossil fuels and by deforestation, is a growing threat to human well-being. Glaciers are melting, causing ocean levels to rise and threaten coastal populations. Increasing carbon dioxide levels cause the oceans to become more acidic, dissolving the calcium carbonate shells of tiny phytoplankton and killing them. These plants convert carbon dioxide into oxygen, which supports animal and human life. The phytoplankton's demise from the bottom of the food chain will result in starvation for fish and whales and the loss of this major sink for carbon sequestration. The challenge now is to keep climate change from becoming a catastrophe.

The solution to climate change and national security is the same: wind, solar, biomass, nuclear, and tidal energy. Wind power is and thermal solar is rapidly becoming cost-competitive with fossil fuels. The First Solar Inc. proprietary technique of making solar photovoltaic cells, by depositing thin CdTe/CdS films on large sheets of glass, promises to be competitive with coal within five years. Stirling Energy Systems has achieved a record high efficiency of 31% by using a parabolic dish to focus sunlight on a Stirling engine which drives an electrical generator. Chinese industry has already captured half the world's solar cell market with support from their government. Let's give American companies a break.

Nuclear reactors provide France with 80% of its electrical energy. Similarly, nuclear energy has powered US submarines and aircraft carriers for many decades. There has been no loss of life from nuclear accidents in France and in our Navy, in contrast to the 11 persons who died recently on the BP Gulf oil tower and the 23 miners killed in a coal mine explosion. Research is underway for new nuclear reactors which use a larger fraction of the available energy before having to be stored or recycled. New renewable energy technology is the most lasting legacy that we can leave to our grandchildren.

** Carr, P.H. 2006. Chapter 9 "Nature's Beauty versus its Utility: The Environmental Challenge," of Beauty in Science & Spirit, Beech River Books, Center Ossipee, NH.*

Anthropogenic Global Warming

A Continuing Erosion of the Scientific Method

Laurence I. Gould, Past Chair (2004) of the NES APS

There are now (including the current one) *seven* issues of this Newsletter that contain arguments *against* Anthropogenic Global Warming (AGW). Those arguments have explained major errors in the scientific claims as well as errors in the scientific methodology. To make matters worse, there have been allegations — based on evidence — of scientific misconduct (such as the manipulation and suppression of scientific data) by certain members of the AGW community; the scandal has been popularly referred to as "Climategate." Furthermore, a recent document by Ross McKitrick ("Understanding the Climategate Inquiries") gives details about the whitewash of high-profile investigations into allegations of such scientific misconduct — the following URL can be loaded into a Firefox browser:

http://rossmckitrick.weebly.com/uploads/4/8/0/8/4808045/rmck_climategate.pdf

[McKitrick is one of the key scientific debunkers of the AGW-oriented "hockey stick" model (see, e.g., the popular book, *Taken by Storm* by him and Essex).]

Yet my Co-Editor (with whom I clearly disagree about AGW) and I continue to publish articles and Letters (both pro and con) on the AGW issue, in the hope that our readers will become more engaged in what appears (to me, at least) as one of the critical issues facing science and the integrity of science. So I urge readers to see what has been written on the AGW topic through this plus past issues of the Newsletter (Fall 2007 through Spring 2010 issues). These can be obtained from the NES APS website http://www.aps.org/units/nes/newsletters/.

What follows are my brief remarks about some of the issues from a more general consequence-oriented point of view:

1. On the belief that capping greenhouse emissions will be beneficial

If we cap our greenhouse emissions — which predominantly means capping carbon dioxide — much of our problems will be even worse than they are now! Indeed, those problems have already begun through the rise in food prices due to removing corn for food by cultivating it for fuel. This will continue to increase food costs for all families, including (with particularly severe effects on) poor people. I think about this every time I go to the gas pump and learn that 10% of what goes into my tank comes from ethanol (a corn product).

Wind and solar-generated power have provided only a miniscule fraction — 0.33% (in 2006) — of the US energy needs. The overwhelming portion of those energy needs — about 85% (in 2006 and about the same today) — came from carbon-based fuels.

To see what is really involved for wind and solar to provide the huge amounts of energy required for a US economy of over 300 million people — such as the energy needed to run their factories and light and heat their homes — one needs to see a way of clearly overcoming many technical problems (such as how the energy gets distributed, the amount of land required for solar panels, and what happens when the wind stops blowing).

To claim that we should eliminate carbon-based fuels through such alternate sources of energy is a great idea — but not now. Those who claim that we can do it in a short time (e.g., 10 years), if we just put our minds to it, are engaged in dangerous wishful thinking. It is worth recalling here that we still have not produced a national source of energy through fusion — even though the effort was begun over 50 years ago — and even though there have been important advances toward that goal in the interim.

2. On the belief that catastrophes imply AGW as their cause

Some argue that a catastrophe or a potential catastrophe — such as observations of melting glaciers, rising sea levels, or decreasing sea ice coverage — shows that we have a problem due to "global warming." But a catastrophe, *per se*, shows nothing of the sort. It is specious to

claim that "global warming" is the cause of the catastrophe. In science (at least) claims must be supported by reasoning and evidence. That they are not is, from my observation, the most widespread of the methodological errors.

3. On the belief that our leaders (in scientific societies, for example) know what's best

It is important for all people to be well-informed citizens about the "skeptics" side of the debate before advocating policies based on claims by the believers in dangerous AGW. Then people can ask themselves if they are prepared to pay the economic consequences — including the creation of widespread human suffering — from potential legislation which would dramatically reduce the use of energy in the United States while significantly increasing both taxes and the costs of all items across the economy (such as food, fuel, cell phones, and computers).

It is very important to understand that carbon dioxide is not a "pollutant." It is a vital component of the earth's biosphere, enhancing the growth of many plants as well as their resistance to heat stress. Carbon dioxide is therefore essential for agriculture and thus for feeding the world's people. To push for legislation that would cap carbon dioxide emissions — in view of the fact that there is so much scientific evidence against it being a dangerous greenhouse gas and so much evidence for it being a boon to mankind — is a corrupt application of the scientific method. And, in view of how heavily technology depends on the fruits of that method, it is a threat to civilization itself.

4. Some Resources

(a) OPEN LETTER to the COUNCIL of the AMERICAN PHYSICAL SOCIETY regarding their National Policy Statement on Climate Change [Please find, at top of page that opens, links to: "Nature_Letter", "signatures", and "Add_name"]
http://www.openletter-globalwarming.info/Site/HOME.html

(b) A recent publication (bolstered by 167 scientific references and a list of 41 books) argues for the science and exposes the flaws in the IPCC (Intergovernmental Panel on Climate Change) report that, among other things, carbon dioxide is dangerous to the climate. The report is titled, "Nature, Not Human Activity, Rules the Climate: Summary for Policymakers of the Report of the Nongovernmental International Panel on Climate Change" — Science and Environmental Policy Project, edited by climate-scientist/physicist S. Fred Singer; http://www.sepp.org/

Related: A beautifully presented website — enabling access to both scientific and associated topics pertaining to AGW — is that of the Nongovernmental International Panel on Climate Change (NIPCC). The URL is http://www.nipccreport.org/index.html. Its first page contains a link for those who would like to receive weekly summaries (or more often if there is breaking news) of new material — such as latest research on climate change as well as on related topics.

(c) Further information about AGW: http://uhaweb.hartford.edu/LGOULD

LETTER TO THE EDITORS

Energy issues, and how we as a society respond to them, will determine the shape of the 21st Century. While reading the APS Energy Efficiency Study Group report (http://www.aps.org/energyefficiencyreport/report/aps-energyreport.pdf) I was struck with the idea that the innovation centers of our nation's universities could best be engaged by the creation of Energy Grant Universities. Similar in spirit to Sea and Space Grant, but with the potential to be as transformative as the creation of Land Grant Universities and agricultural experiment stations after the Civil War, Energy Grant Universities would serve as centers for research on energy creation, storage, transport, efficiency, policy, and technology transfer. In addition to the obvious technical focus, Energy Grant Universities would conduct research and outreach on the social, political, policy and business impacts related to energy issues.

Energy Grant Universities will serve as model communities of sustainability, where energy conservation, energy recycling, computer control of energy use, and application of new energy sources and technologies are combined to operate at high levels of efficiency. Energy Grant Universities can be early adopters, and serve as test beds, with private partners, of near term developing technologies such as LED lighting and sophisticated climate control systems, among others. Retrofitting existing university buildings provides benefits that do not need years to come to fruition; employment for retrofitting building, enhancement of US manufacturing/assembly base that provides the technology, and the energy savings and reduction of pollution, including green house gasses, that results from the retrofit. These technology systems should speed the adoption of these technologies by the government and private sectors.

Each state, with its unique natural and human resources, should have one (or more) Energy Grant Universities to take advantage of these resources. While more details are needed to determine what level of funding is needed, a reasonable ongoing investment of 2.5 billion dollars a year could provide each state with nearly 50 million dollars a year.

Many of the goals espoused in the open letter to then President-elect Obama from the Association of American Universities (12/12/08) could be accomplished by the formation of Energy Grant Universities. I urge my colleagues to support this effort and request that APS take a leadership role in helping guide this idea to reality.

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