

New England Section Newsletter

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Fall 2003

[2003 Fall Meeting](#)

[Fall 2003 Joint Meeting](#)

[News Around New England](#)

[Time Magazine's Varied Uses of
Physics in 2003](#)

[Rafting on a River in Arctic
Canada](#)

[Some People's Cats](#)

[The Last Bang](#)

[Executive Committee](#)

**2003 Fall Meeting of the New England Sections of the
American Physical Society and the American Association of
Physics Teachers
Bates College, Lewiston, Maine,
October 3 and 4, 2003**

The Fall 2003 Joint Meeting of the New England Sections of the American Physical Society (NES/APS) and the American Association of Physics Teachers (NES/AAPT) will be held at Bates College on Friday and Saturday, October 3 and 4, 2003. The theme is Physics We Haven't Told You Yet. The Bates contact person is Jack Pribram, <jpribram@bates.edu>. A website for the meeting is www.aps.org/meet/NEF03/. Bates has an attractive and informative website with travel directions and other needed items. Contributed talks and posters are welcome (students, take note), particularly on the theme of the meeting. Student expenses will be reimbursed up to \$100 by the Section. APS abstract deadline is Friday, Sept 19.

Registration begins Oct 3 at 1 pm with the first talk at 2:30. A banquet with poster session immediately preceding is planned for that evening. The website is expected to post details later in summer. The AAPT will independently hold teaching workshops on Saturday afternoon.

Not related to APS or AAPT but of certain interest to those who arrive on Thursday, Oct 2: Two talks for general audiences: Bill Phillips, 1997 Physics Nobel, and Lynn Margulis, Distinguished University Professor in Geosciences at UMass Amherst, are the speakers.

This space may be used to pencil in your schedule for the meeting:

The most important news I can give you is Announcement The Section seeks the next newsletter editor to succeed me (DM) when my present term expires. My last newsletter as editor will be issue 24 in fall, 2004. I

will assist the new person in every way possible during the expected year of transition. With the high-quality assistance of the national APS office of Special Publications, that takes care of printing and mailing the (typically) eight-pager and placing the online version on their website, the procedure works smoothly. Contact me as soon as you can. Perhaps we can meet at Bates, where you can also sample the Executive Committee meeting (the portion that includes newsletter duties and updates). Page 2 repeats this request.

Spring 2003 Joint Meeting at Williams College, April 11-12, 2003 The bare-bones summary will be fleshed out by additional news of the area and of the Executive Committee.

New England Section Joint Spring 2003 Meeting

The New England Section Joint Meeting was held April 11-12 at Williams College in Williamstown MA. Friday afternoon's plenary session shone the light on quantum bits, with engaging lectures on quantum entanglement, photonic qubits, and instruction of quantum mechanics to computer scientists. After dinner at the Williams Inn (incidentally, a fine place to park yourself for the night, after a few glasses of wine), Harvard University's Richard Wilson spoke on the role of physics in public policy. It should be larger.

Saturday morning fired the zingers of ultrafast pulses beyond the visible spectrum, terahertz wave sensing and imaging, and ultrashort Xray pulses. There was also a lively session on novel approaches to teaching physics to non-majors, plus a talk evaluating middle school physical science texts. These texts are a letdown in a common situation: a non-physical-science teacher does the teaching, relying on the text as authority. Saturday afternoon workshops followed.

The New York and Boston fine arts museums, the Wadsworth Atheneum in Hartford, and a host of others around New England are examples of one model. A counter-model is nextdoor to Williamstown in North Adams: MASS MoCA, the Massachusetts Museum of Contemporary Art. As described in the May Connecticut Magazine, contrasting with the jewel-like Clark Art Institute is the far ruggeder city's gritty and gulag-ish behemoth. This is the former home of the Sprague Electric Company factory, the area's longtime major employer. The works are immense, as befits the location. Anyone seeking an even larger version of the art mastodon can travel an hour farther to Dia: Beacon. This museum, described in the May 26 Time Magazine, should give a mathematician or an engineer (hence, a physicist) a real high, since it features sculptures of great power, harmony and symmetry. In Beacon, NY, a struggling Hudson River town, take an abandoned factory used for most of a century to print boxes for Nabisco crackers and add well-spent

fifty million dollars to arrive at this most imposing museum.

Every spring meeting and fall meeting of the Section is completed Saturday afternoon by a meeting of the Executive Committee, a set of leaders elected by you, supplemented by several appointed members, including the newsletter editor. No surprise, the section has a Constitution. I hold right now a document Bylaws of the New England Section. It spells out the rights and responsibilities of the officers and others. In particular, we have had an elected Section Councillor, liaison between the national organization APS and the Section. Now we have an appointed Council Observer. (The Councillor and the Observer both have eyes, and the Councillor has a mouth as well.) Our longtime Executive Committee stalwart Jagu has served as Councillor and now serves as Observer. The Committee gives resounding thanks to Jagu.

Article XI - Newsletter is managed and edited by an Editor (that's me), elected by the Executive Committee for a term of three years (thus, I am in the middle of my fourth term, and that's plenty). There shall be at least one issue per year (in fact, I've done two per year). I am spelling this out because after next year I will leave the post and have my uniform number retired. So, advertisement: **WANTED, NEWSLETTER EDITOR. A GREAT OPPORTUNITY TO EXERCISE IMAGINATION AND KNOWLEDGE AND TO HELP YOUR SECTION THAT IS DEVOTED TO HELPING YOU.** The new person can assist me right away, and I will assist the new person after that. We can arrange the smoothest transition possible. Once you are in the routine, each new issue is a simple pleasure to put together and turn out. On a separate note, the Committee found faults with the last newsletter. See page 7 for details.

DM

NEWS AROUND NEW ENGLAND

For purposes of this column, New England will be taken to include New York as well as the traditional six states. It was purely by accident that the Dutch preceded the English to found the former "New Holland." Indeed, from Greenwich to Westport and up to Litchfield, most folks think their governor is Pataki. Hence, the concept of a Greater New England.

Item taken from March Amherst College Notes: Robert Romer, Emeritus Professor of Physics, has recently been elected to the position of Vice-Chair of the Forum on the History of Physics, the history division of the physicists' professional society, the American Physical Society. After a year as Vice-Chair, he will automatically become, in successive years, Chair-Elect, Chair, and finally Past Chair. The Forum, with some 3200 members, serves as the professional society for historians of

physics.

Item taken from a description at the UConn Coop bookstore in June for the discussion and book-signing by Professor Mark Silverman (physics, Trinity College): *A Universe of Atoms, An Atom in the Universe* (Springer-Verlag, 2002), Dr. Silverman's fifth book, presents essays on a wide range of topics in quantum mechanics, atomic and nuclear physics, electromagnetism and optics, thermodynamics, fluids, gravity and cosmology, much of it based on the author's own research. Questions addressed in an engaging style will attract investigators, students and laymen. How does one know that atomic electrons move? How is it possible for randomly emitted particles to arrive at a detector preferentially in pairs? Can one influence electrons in London by not watching them in New York? Can particles be affected by magnetic fields through which they do not pass? Can one tell the difference between an electron that has jumped out of and back into a quantum state and one that has not jumped at all? Do radioactive nuclei decay randomly? Most intriguingly, one of the current mysteries: What are the dark matter and the dark energy that constitute over 90% of the content of the Universe?

In May, Sigma Pi Sigma, the physics honor society UConn chapter, held its Honors Day and Dinner. The Special Colloquium was presented by Jochen Heisenberg, Professor of Physics at the University of New Hampshire and son of Werner Heisenberg, one of the originators of quantum mechanics and of ways of thinking about measurements. His talk, *The Early Development of Quantum Mechanics*, attracted many undergraduates and filled the lecture hall in the new Biological Sciences/Physics Building. The evening before, Dr. Heisenberg presented a similarly well-attended talk, *Werner Heisenberg During the Third Reich*, at the Thomas J. Dodd Center. He discussed questions surrounding the war-related activities of his father and referred to the play *Copenhagen* by Michael Frayn that was motivated by these controversies.

Each year in late summer or fall, UConn Physics presents a Katzenstein Distinguished Lecture, endowed by Dr. Henry Katzenstein, recipient of the first Ph.D. in Physics given by the University. This year's lecture, *Exploring the Universe with Atomic Clocks*, will be given by Norman F. Ramsey, Professor Emeritus of Harvard. The talk, on Friday, September 5, at 4 pm in the Physics Building, is open to the public. If you receive this notice in time, you are more than welcome to attend the day's and evening's events. Contact me (DM) or Quentin Kessel or the Department Office for details. Norman Ramsey received the Nobel Prize in Physics in 1989. The Nobel Foundation has written "The work of the Laureates in Physics has led to a dramatic development in the field of atomic precision spectroscopy in recent years. The resonance method (of Ramsey) using separated oscillatory fields forms the basis of the cesium atomic clock, which is our present time standard. Ramsey and co-workers have also developed the hydrogen maser, which is at present our most stable source of electromagnetic radiation...."

The following descriptions were solicited by the editor (DM) of the UConn Physics Department newsletter for its latest issue. Like most

departments at most schools, UConn Physics welcomes news of its alumni and alumnae and is pleased to bear witness to their continuing success and fulfillment. These summaries, of former students working and living in Greater New England, are in the category Slightly Unusual Careers for Physics Ph.D.s.

Since fall 1999, Dr. G. Robert Wein has been a physics teacher at St. George's School, Newport, Rhode Island, candidate Howard Dean's prep school in the 60's. Bob writes, "It is a boarding school (grades 9-12) situated on a hilltop overlooking the ocean, and with 325 students from over 20 countries and 30 states, the atmosphere is quite unique. I teach four classes (two sections of AP, general and introductory), coach two sports (soccer and softball), and live in a dorm with my wife, two daughters and thirty-five teenage girls. The schedule is rather hectic, with classes and athletic practices six days a week and two or three nights of dorm duty.

"Why give up a university position for all of this? The answer is in the students. My classes average eleven students, and almost all of them are energetic and motivated. One of my advisees finished AP Physics, AP Chemistry and AP Calculus as a sophomore, so for this year and next he will work with me on special topics and projects. And another unusual senior has asked to borrow my copy of Lorrain and Corson!"

Earning Ph.D.s for research in related fields of solid state physics is not all Amanda Woods (1991) and Steve Blechner (1990) share. She reports, "We were married while vacationing in New Mexico in 1995 and live in West Bridgewater MA. We have a four year old son, Dylan Jack." Amanda is a tenured full Professor at the Massachusetts Maritime Academy (www.maritime.edu) on Buzzards Bay, a four-year state college specializing in the education of merchant marines. She has taught at the Academy for ten years, five of which she participated in the "semester at sea," teaching aboard a training vessel and visiting such ports as Amsterdam, Edinburgh, Barcelona, Naples, Costa Rica and St. John. She enjoys her work tremendously.

Steve trained as a post-doc at Los Alamos National Laboratories, studying proteins using Xray and neutron scattering. He then started the Molecular Computing Facility at Harvard and Beth Israel Hospital. He left for the pharmaceutical industry to become the Director of Scientific Computing. In 1999 he was awarded a Chartered Financial Analyst certification after a six-year program in quantitative finance. He is on sabbatical from his two businesses, SB Investment Management, focusing on financial analysis of high tech and biotech companies, and HobNob Industries, a software development company specializing in computational molecular biology issues. At present he plays drums for a Boston-based band and connects with his son.

David Madacsi recently retired from UConn physics (one of seven who accepted Governor Rowland's handshake in a timely way), where he was based on the beautiful Avery Point Campus on Long Island Sound. His most recent appointments were Interim Director and then Professor of Physics and Director of Arts and Cultural Programs, both on that campus. His numerous connections include the Institute of Materials

Science at UConn, Art/Science Collaborations Inc., various art galleries and sculpture projects, and Jazz...by the Sea as producer/founder. His fields of specialization have been natural lighting and the visual arts, magnetic and optical properties of single crystals, modeling of point defects in solids, and photoelectrochemical conversion of solar energy.

Edwin Lombridas received a UConn Ph.D. in particle theory. After graduating in 1996, he joined the Guardian Life Insurance Company of America in New York City, where he quickly advanced from a Junior Actuarial Analyst to a Senior Project Manager of the Business Technology unit of the Group Medical division. In addition to database application development, his present responsibility includes preparing in-house technical training materials and teaching Visual Basic and SQL programming classes. Edwin's computer skills developed entirely in grad school.

Edwin wanted to stay in academia. After unsuccessful tries for two years, he sought an alternative career, programming in a financial institution or in an internet company. The hardest part of his search was repackaging his skills in his resume, to get to an interview. After failed attempts, he revised his resume with new knowledge. In three months he received four interviews, one with Guardian Life. Although his job is unrelated to physics, he attributes his success to his physics training. Physics enables him to see and to solve problems satisfyingly differently from his co-workers.

Time Magazine's Varied Uses of Physics in 2003

Feb 24, page 48: The Purr of the Qubit, A bizarre experiment takes scientists one step closer to the unimaginable powers of quantum computing, by George Johnson, Santa Fe. This fine one-pager gives an inkling of Dr. Johnson's newest book, A Shortcut Through Time: The Path to the Quantum Computer. The magazine summarizes the summary in bold red and black: "A machine made of just 12 atoms could outperform the mightiest supercomputer." Your editor does not know much about this but wonders is it true and in what way if it is true. Anyone? Or else I will add the book to my to-read pile.

March 31, page A78: CNN senior analyst Jeff Greenfield is looking for lessons in humility from current events and states "History comes with its very own Doppler effect: as our point of observation changes, so does our understanding of what we are seeing." My question is does Herr Doppler know about this state of affairs?

April 14, lost page number in my excitement: Lev Grossman quotes James McManus writing about the World Series of Poker in his book Positively Fifth Street: "God may play dice with the universe, but serious gamblers ... prefer no-limit Texas hold'em," a particularly hard-boiled

poker variant, from whose slang expressions the book's title derives. And what I want to know: What would Albert say about the cosmic dice-wielder?

Rafting on a River in Arctic Canada

Rafting on a River in Arctic Canada: We went with Nahanni River Adventures of Yellowknife, Northwest Territory. There were three rafts, each holding a guide, up to four guests (mostly novice, like us), and well over a thousand pounds of supplies and equipment. Yellowknife is on the Great Slave Lake amidst healthy forests. Northward via pontoon plane (taking off and landing on water or on winter snow), we passed the tree line and touched down in Nunavut Territory in the vast Arctic tundra. We rafted 130 miles of the Burnside River, including class 3 rapids, over 11 days and camped each night. The guides prepared fantastic meals.

Everything about the tundra is amazing. Visible from the air or the ground are geologic features of the last ice age and more recent times, glacial eskers and puzzlingly regular polygons produced by freezing, thawing and refilling with snow. The river does the right things, like gouging canyons or otherwise meandering. From mid-June to July the sun doesn't set but, like the hawk in Oklahoma, it makes lazy circles in the sky. At bedtime (well, sleepingbagtime) it is in the north. No stars, no Canada Day (July 1) fireworks, no point to it.

We saw, and then viewed through spotting scopes, cameras and binoculars, grizzly bears, Arctic wolves, Arctic foxes, a wolverine, golden eagles, huge ravens. Immense herds of caribou, with mothers and babies, dashed through camp and forded the river next to us. Ducks rafted with us, on ice floating down the river, tickling the mega-trout. Mini-wildflowers abounded. One drawback: Permafrost underlies the seasonal snow and ice and prevents the water from sinking in. Thus we were in a million square miles of wetland, prime turf for mosquitoes about the size of hummingbirds. Bugshirts help. A longterm solution might be this: South central Texas has no mosquito problem because a million bats live there. So bats are the answer (in summer).

SOME PEOPLE'S CATS or Another Politically Atrocious Poem

Some people's cats are named Mordred or Monique and some Merriwether or Montague.

Others respond to Fancy Dan or Freaky Deak, still others to Fare Thee Well or Fooling You.

Some people's cats eat gourmet food straight from a bowl that is set on the table.

They would quickly adopt a hostile mood while a bowl on the floor would prove unstable.

Some people's cats take grand vacations in ritzy pet clubs out in the woods.

They would reward you with evacuations if you left them in their old neighborhoods.

Some people's cats live in condos larger than the typical home in a third world country.

Their electronic toybox with its own recharger waxes their interest when outside it's wintry.

Then there is our silly little cat, whose humble moniker is Schrodinger's. Psychically he is more like a rat. The mental scarscape eternally lingers.

His meal consists of scraps tossed away by those with wicked work to do.

They arrange dessert in a poison play and they seal his box with a dismal view.

He doesn't go out very much at all, being quite restricted in his movement.

A lot of the past is beyond recall, such as Master's voice or what his love meant.

He could spiel mit a maus or fledermaus if ein oder ander was provided. How many lives haben gehen heraus und was ist die tiniest stuck divided?

Über mein Deutsch we shouldn't grouse. Wie schlecht es ist hab Ich nicht gecided.

Wie die Katze, Ich bleib zu Haus. Vielleicht in der Nacht he'll be feliced.

PDQ

THE LAST BANG or The Age of Endarkenment

"Everything is politics," declares a character in Fiddler on the Roof (Teveye's Marxist son-in-law). That may be true, but to me almost everything is either physics or anti-physics. Everything consistent with physics, like traditional scientific fields, the arts, most literature and theater (even magical realism and the absurd, which plumb psychology and history), love, humor, sex, sports, the good things in life, in short, everything that reconfigures with the advent of new evidence: all this is on the physics side of the ledger. Superstition, creationism, astrology, voodoo econ, political spin, combative conservatism, the confluence of

financial advice and conflict of interest, falsified data, book banning and burning, people burning: donate to the mumbo-jumbo side.

About a dozen years ago I read an article Confront Your Fears. (It resurfaces frequently.) The idea was to go head-to-head until you conquer them. Thus, if you fear snakes, handle them until you are fine with them (doesn't work with mambas, for one). If it's public speaking, speak in public, friendly audience preferred. Fear heights? Climb a ladder, walk a tightrope. (They didn't explain what to do for fear of nuclear war.)

Now first I had to confront the question: What do I fear most? At that time a number of events, formerly considered bizarre, got big play in newspapers. (They too recur.) A man, voluntarily off his medication, pushed a woman under a New York subway train. Another, denied his medication, drew attention by stabbing a girl in downtown Middletown. Some cult leaders murdered their followers, including children. Some young mothers threw their babies out of high windows because A Voice told them the kids would fly. Some others watched their babies die of treatable diseases while praying over their fevered bodies. So, of course, I said what I fear most are homicidal maniacs, and I did not intend to confront them. This was at least a decade before Sept 11, 2001 turned homicidal mania into the question "Why don't they like us?"

In the Executive Committee meeting following the superb Williamstown section meeting, the committee justifiably found faults in the newsletter of spring, 2003. I think there were many but they pointed to a parody of a revered hymn, stereotyping of certain Eastern and Western prayer practices, and an innuendo of sex. A hymn, like a physics class, is not so fragile that it can't stand parody. We should see how our students act us out. Physicists are a lusty group, and sex does not faze us as long as it does not interfere with lab time. I will also say that some people have not been paying attention for ten years during which section newsletters have been on the same subjects with the same outlooks. (And why me? Why not me?)

Regarding the haikus I wrote in response to the abominable behavior of religious leaders of groups that pray the ways I described, didn't I see these jokers repeatedly on television news? The Sept 11 clash of cultures and the Columbia disaster have physics explanations, although the ethos that gave rise to each has a large component of anti-physics. What I said in 34 disciplined syllables is that it is despicable to turn someone else's tragedy to your advantage. Like war profiteering, religious triumphalism is among humans' worst tendencies. In the East they cackled that their deity caused these downfalls. In the West they mealymouthed that their deity allowed the downfalls as a warning against our sinning ways. What they are telling us is business is business, and there's no business bigger or more relentless than theirs.

How do we characterize our age? On one hand, science, technology and medicine are doing bigger and better things for society. On another, these disciplines are also pressed into service to ride roughshod over lots of people. On the third hand (counting the way Reagan did), the most sweeping tendency co-opting the gains of intelligent work is

anti-physics, mumbo-jumbo. We should know better, so I call this the Age of Stupidstition.

DM

I find major fault with the Ten Commandments. Maybe there should be thirteen. Three got lost. Don't abuse children and animals. (Abraham went halfway there.) Life is tough; don't add to the toughness. First of all, do no harm works for medicine; what about the rest of life?

I believe in the Bill of Rights without reservation. Half a billion unregistered guns sitting, running or flying around seem a small price to pay for Freedom of Speech.

Schrodinger's Cat

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[New England Section
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