

New England Section Newsletter

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[2002 Spring Meeting](#)

[A Book Or Two](#)

[Islands in the Sun, Clouds,](#)

[Fall 2001 Joint Meeting](#)

[News of the New England](#)

[Wind and Rain](#)

[Walking Back Schrodinger's
Cat](#)

[Section](#)

[Executive Committee](#)

[The Last Bang](#)

2002 Spring Meeting of the New England Sections of the American Physical Society and the American Association of Physics Teachers Brandeis University, Waltham, Massachusetts, April 5-6, 2002

The Spring 2002 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 Brandeis University on Friday and Saturday, April 5-6, 2002. Information on the conference appears on the website [/meet/NES02](#). The theme of the meeting is "Expanding Horizons of Physics" and the program is designed to introduce the audience to applications of physics in areas beyond the realm of traditional physics. For more information visit the website <http://www.physics.brandeis.edu/nas>. The preliminary program follows as it is known the week of January 21. Updates will appear on the Brandeis website.

If you enjoy visiting sites, try these. For NES/APS:

http://www.physics.ccsu.edu/aps_nes/, which has been provided by Dr. Peter LeMaire, Physics Department, Central Connecticut State University. For NES/AAPT: <http://webphysics.tec.nh.us/nasaapt/newsletters.html>. Recent joint meetings have been equally productive for members of either organization, doubly so for members of both. Doyle Davis of AAPT has expressed encouragement to his associates for continuation of joint efforts. Both organizations are requesting faculty to bring their students, students to speak and do posters, and visitors to attend talks and poster sessions. A Section policy to promote student participation is that any student may petition, via APS/faculty sponsor, for subsidy/reimbursement for expenses up to \$100.

Friday, April 5

1-4 pm. Registration. Gerstenzang Science Library Lobby.

2:15. Invited talk, APS.

2:45. Invited talk, APS. Gerstenzang Room 123.

3:15. Break.

3:45. AAPT invited talk.

4:30 - 6. APS/AAPT/SPS Poster Session. Wine/Cheese and Open Cash Bar. Library Lobby.

6:45 - 8. Banquet Buffet. Holiday Inn, 399 Grove Street, Newton.
8 pm. Speaker. Eric Mazur, Harvard University. (Eric is a noted innovator and author in the field of physics education. Ed.)

Saturday, April 6

7 am. Registration and coffee.

8. Contributed talks.

10. Break.

10:30. Sidney R. Nagel, University of Chicago. (Sidney has made many important contributions to condensed matter physics. Ed.) 11 am. AAPT invited talk.

Noon. Box Lunch.

Contributed and poster papers are welcome. The deadline for APS submission is March 22. Other information of travel, lodging, registration, submission and schedule updates are on the websites. Secretary is Maureen Meyer, Brandeis University, Department of Physics, MS 057, Waltham, MA, 02454. phone: (781) 736-2835. fax: (781) 736-2915. e: mmeyer@brandeis.edu

Fall 2001 Joint Meeting at Keene State College, November 2-3

The fall meeting at Keene State showed that a joint chemistry-physics theme can attract a throng of participants to a site that formerly may have been deemed small for the hosting of such a large and multifaceted gathering. Attendees were treated to unseasonably warm, sunny weather and presentations by skilled and motivational speakers from academia and industry. The parallel sessions filled the two rooms with audiences interested in both research topics and education reform.

The Friday portion of the meeting, opened by Local Chair Russ Harkay, the President of KSC Stan Yarosewick, and a physicist and the Dean of Sciences Gordon Leversee, consisted of three speakers, a cocktail hour/poster session in the new all-glass Student Center Extension, and an after-dinner speaker, George Ewing of Indiana University, in a room that looks out over the campus and the lights of the city of Keene. Alex Soldatov described advances in the polymerization of C60 and C70 in his laboratory, Joerg Appenzeller of IBM informed us of possible applications of carbon nanotubes as device scaling continues to shrink, and Susanne Yelin treated the audience to a review of the physics behind her group's efforts to "freeze" light and store the information in atomic states as a step toward quantum computing. Ten very well prepared posters were viewed by those at the social hour.

Saturday was a busy day with four parallel sessions of contributed papers at 8 and two parallel invited sessions from 9 to 12. Research papers were presented by Randy Headrick (surface patterning and real-time x-ray imaging using a synchrotron source), David Weitz (modeling and imaging phase transitions with colloidal suspensions),

and Richard Staples (applications of x-ray crystallography). Meanwhile, papers relating to education reform were presented by Sally Jean, Brian Holton, Peter Lindenfeld, and Fred Stein, including the move toward the inquiry approach to learning physics and chemistry. Several contributed papers expanded on that theme.

A number of vendors chose to exhibit their wares in the glassed-in atrium of Rhodes Hall. AAPT contributed papers and three workshops continued until the end of the day. Attendance exceeded expectations and necessitated the addition of extra seats in the hall. Responses from attendees have been highly positive with regard to both the program and the many changes visible on the campus, resulting in an atmosphere of mixing and congeniality in an attractive and well-equipped meeting site located in the heart of New England.

The Local Hosts, Russ Harkay (Physics) and Jerry Jasinski (Physical Chemistry) wish to thank heartily those who contributed to and attended one of the more successful sectional meetings in our memories.

(This is Russ Harkay's summary of the November meeting of NES/APS and NES/AAPT. The editor thanks all the hosts of the two New England Sections for a rewarding meeting. It was also gratifying to drive and walk in an area of beauty and of interesting shops and historic buildings.)

My mission is to battle superstition.
With your permission, a small admission:
It's a losing proposition.

I will uphold your right to burn the flag if you uphold my right to wave it.

Schrodinger's Cat

WALKING BACK SCHRODINGER'S CAT or *I ALWAYS ROOTED FOR THE LION*

Schrodinger's cat is inconsolable due to circumstance uncontrollable.
A collection of madmen homicidal is advantaged by being suicidal,
An unbeatable combination.
There isn't a cat, heart filled with murder, who would turn himself
voluntarily
Into a puff of smoke solely in order to destroy a thousand others
summarily,
To underscore his indignation.

Maniacs, morons, criminally insane, wild eyes fixed on a single vision,
Divorced from a recognizable brain, allowing a distant voice the
decision.
Is there anything stupider?
They lament, they abhor, they revile us and equate our death to their
rebirth.
Their aim at best is to exile us far off the face of our Mother Earth.

To Mars or farther to Jupiter?

Listen to The Cat:

Why did we domesticate humans and lodge good ideas in your heads
In four thousand years since Egyptian civilization stirred?
Why, we let you feed us and sleep many times in our beds
And hold us in your laps while we sat on your papers and purred.

And not only that:

We taught you to eat and do business in different places.
When we controlled your rat population, you escaped the worst disease.
You fixated on copulation that threatened to blur the races
And ignored the real dangers to you from infected ticks and fleas.

In Europe you burned women along with their cats
In order to fight unexplained misfortune.
Is there nothing of worth underneath your hats?
Is there no one to warn you to maintain caution?

Think of the cats who won't be petted. Think of the cats without their
food.

Think of the absences regretted in neighborhoods of fire and flood.
Think of all they've survived so far: the Crusades and neurological raids,
Medical students' instruments, diabolic experiments.

Schrodinger's cat will always hold dear every ground zero worker,
Stands on a rampart holding his fear and shouts "Ich bin ein Neu
Yorker."

So he forgets he is calling himself a magazine,
At least possibly the best that has ever been.

How many times must a cat put up with human stupidity?
And how many times must a cat put up with human cupidity?
Of the two worst defects forming mankind's curse,
Religion and greed, you decide which is worse.

The Cat has issued his final plea. Forever will he hold his tongue.
For him the tolling bell has rung. He takes misfortune personally.

PDQ

A Book Or Two

The Iron Bridge by my friend, fellow resident of Storrs, and deeply devoted troublemaker, David Morse. Try as I may, I can't keep up with his enviable record. At various times he has organized a student strike, visited Cuba (si), started an underground newspaper, waged a campaign against a nuclear power plant, and written investigative articles on racial discrimination. He comes at things from a different worldview, since he is a Quaker. I must say that I would feel perfectly safe if my American Airlines flight had all Quaker passengers plus me and my wife. I have not heard the expression "Quaker terrorist" ever.

My occasion for relating all this is that his novel is about the design and building of the first iron bridge, across the Severn River in Shropshire, England, as it happens, by Quakers, and, as it happens, during the unrest of the American colonies and the American War for Independence from Britain. It was a historic time, and one with a wrinkle; that is, the author gives it a pronounced wrinkle in time. An American woman from the future, Maggie Foster, travels back to make sure the bridge, in our history books a success, fails. Why?

Many futuristic novels and movies are based on the notion that our civilization collapses, usually near the end of this century. We are given some decades for our misbehavior to doom us. The collapse may be ecological, sociological, or otherwise, as varied as *The Handmaid's Tale*, *A Canticle For Liebowitz*, *Blade Runner*, *Red Planet*,... The imminent collapse of Maggie's world is biological. Pollution has rendered all women sterile.

Maggie's group traces the blame to the industrial revolution centered around iron. The success of the first largescale use of iron led to more effective despoiling of the environment and waging of war. To discredit the bridge, Maggie's assignment is to arrange it is built on seismically unstable ground (known to her, not to the builders) instead of stable ground (actually used). Anachronistic pairing of distant centuries requires the author to keep track of what was known and not known to the characters. Maggie, intending to conceal her origin, must keep track of it too. For example, efficient use of energy was not a concept but efficient use of fuel was. The "Quaker connection" brings up a problem of personal morality. Quakers opposed slavery (and were vilified for it) but some contributed to it, by manufacturing chain, for example.

The theme introduces an important philosophical question: Would the change in one historical event permanently alter the further evolution of Earth? Chaos theory shouts an affirmative and dialectical materialism a negative. Personally, I think the butterflies of the "butterfly effect" cancel each other's contributions, but I also think that not everything that has been done would be done. It may well be that calculus was in other minds than Newton's and Leibniz's and even that a second Mozart would have taunted Salieri if the first had not. But would there be Christianity if Jesus had had a shrewd lawyer? Suppose Johnnie Cochrane plea bargained or won over a jury to allow Jesus to spend his post-playing days arranging foursomes for golf or guest-hosting at pop music events. Would there now be two groups of a billion people in different quadrispheres with centuries of formation of belief systems regarding each other as dangerous infidels? (The belief systems, luckily not all two billion people susceptible to the systems.)

We in the United States know that there have been many "defining moments," instants or intervals, from which history took a new course. Without Lincoln in the White House, would civil war have followed secession and what would the war have looked like? What of the crucial assassinations, at least of Kennedy and King? And now the hideous morning of September 11. We feel our own moral ambiguities in the face of an uncertain future.

News of the New England Section

The Section has a website for rapid exchange of information; see page 1 for the address. You are invited to create a link between your department and an APS unit or section, for example a link with NES. You will reach a wide audience for events on your campus, such as distinguished lectures in science.

A committee of Section members may receive (partial, reasonable) funding from the treasury of the Section for a meeting on your campus or some other New England site. The conditions are that the topic be of some general interest and that any NES member (plus others) may attend. A Statistical Mechanics Meeting was held at Brandeis on October 20, 2001. About 80 people attended including 32 grad students. There were 30 contributed 3-minute talks. This allowed the essence to be stated (no frills), speakers and listeners to meet and discuss later on, with avoidance of parallel sessions. The approximate cost was \$800 (for lunches) and a side benefit was that 8 people joined NES.

There has been a revision of NES by-laws in keeping with requirements of APS and with actual practice of the Section over years. You may read the by-laws on the Section website. Like the United States Bill of Rights, the by-laws do not come up every day, but it is nice to know they are in place and are being adhered to (we hope). The practice of holding elections at meetings has been replaced by web-based elections. We do do it and now we must do it.

Our Section Advisor, Kannan "Jagu" Jagannathan, files reports of meetings of the APS Council. He gives them verbally to the Executive Committee of NES and in written form (often) to the Newsletter. Summaries of meetings formulated by others are in APS News and on the APS website. But the interests of sections are served mainly by Section Advisors.

At the previous Executive Committee meeting these points were brought up. At Keene State 135 registrants were somewhat evenly divided between APS and AAPT; some belong to both. The upcoming meeting at Brandeis was briefly described by Craig Blocker (blocker@brandeis.edu) with mention of one of the strengths of Brandeis, soft condensed matter. The next fall meeting at Bridgewater State College was thought to be October 25-26. Probably Ed Deveney of BSC is the one to contact for information. Welcome expressions of solidarity between APS and AAPT NES signify we will continue to have beneficial joint meetings.

Whoops! (A dramatization; imagine you are eavesdropping on a telephone monologue.)

Hello, is this the answering machine of Commander O? Oh. I said Oh! Osam -- I mean awesome. Listen, this is Number Twenty. Numero Vingt. I'm being held by the authorities and they allow me one phone

call, so of course I thought of you. I'm so embarrassed. I've never missed a flight before. I promise not to show up late next time. They're treating me well. It's quite remarkable. They don't know how to make a prisoner talk. You know, they don't chop off fingers one by one the way we do in the old country. Ha ha. Not that it would have any effect on me. What's a few fingers in the almighty scheme of things? The reason I'm calling: I just want to be sure you don't hold anything against me because I assure you I will do better in future. I know I did the unforgiveable: breaking the symmetry. And nineteen is such an ugly number. Ha ha. It's a prime when a prime isn't called for. So anyway -- Did my quarter run out? I'm afraid I have no more change. Just give my regards to all the other guys in long flowing robes with long flowing beards. I'm hanging up now.

Islands in the Sun, Clouds, Wind and Rain

My wife and I visited the Falkland Islands, a destination for birders and photographers that is growing in popularity. They are 300 miles east of Cape Horn and have a land area 4,700 sq mi, the same as Connecticut. Two large islands, East Falkland and West Falkland, are surrounded by hundreds of small islands. A typical island, perhaps a dozen sq mi, has a settlement of a family, a guesthouse, a thousand sheep, hundreds of thousands of seabirds, usually seals and sea lions. Most people consider themselves British and not South American. Chilean workers are the only speakers of Spanish.

It seems more recent, but this is the twentieth anniversary of the Argentine invasion and occupation and the British liberation of the islands. During a month of growing financial woes Argentina has just had five Prime Ministers. The fifth gave the automatic declaration of continued sovereignty over Las Islas Malvinas. In a guidebook for visitors John Fowler, the Director of Tourism, stated that more people cross the Brooklyn Bridge into Manhattan each day than have visited the Falklands since time began. That reminded me that the two places of very prominent military presence we have experienced recently are the Falklands and New York City. In October we walked across the Brooklyn Bridge and several other bridges that were heavily guarded against attack.

The Falklands have one of the Earth's unique tectonic histories and one of its unique geological formations. Extensive investigations show that there is a peculiar match of a "Falkland plate" to South American and African coasts, geometrically and mineralogically. All of them were part of one huge landmass that separated over hundreds of millions of years. The Falkland plate must have endured sustained torque because it rotated 180 degrees from its early to its present orientation. Although it is not hugely distant from Antarctic waters, it appears that the Falklands were not significantly glaciated during the many ice ages of the Earth. Instead it suffered a different climatically-induced surface transformation.

"In many parts of the islands the bottoms of the valleys are covered in an extraordinary manner by myriads of great loose angular fragments of the

quartz rock, forming 'streams of stones'... They are not thrown together into irregular piles, but are spread out into level sheets or great streams." Charles Darwin, 1845, *Journal of Researches...* during the voyage of HMS Beagle. This, plus much other information, is in a beautifully illustrated publication, *The Falkland Islands, Stone runs - rock in the landscape*, by aptly named Phil Stone and Don Aldiss for the British Geological Survey for Department of Mineral Resources, Falkland Islands Government. Seen from the air these rivers of rocks look like a giant's zen garden. They were produced by many millions of seasonal freezings and warmings, the same kinds of events that erupt as frost heaves on New England roads every winter. The current climate gives these kinds of summer weather: wind and sun, wind and clouds, wind and rain, wind and fog, and wind and hail.

A Look at a Book *An Hour Before Daylight Memories of a Rural Boyhood* by Jimmy Carter. A Georgia farmer becomes leader of a great country (Josef Stalin, according to a joke). In this case, a humane boy in a humane family became a humane citizen of the world. They lived through the Depression, racial and other strife, World War. This excerpt may entice students: "There was a cream separator on our back porch, a large aluminum bowl that could be spun rapidly by turning a handle. It served as a centrifuge, quickly separating the lighter cream from the remainder of the milk. I could understand the basic principle, but am still mystified by a little hinged metal clicker that swung back and forth on the handle. The tone of the click would change when the cream was separated. (I hate to do this but continued bottom page 8, Ed.)

New England Section Executive Committee Membership 2002

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**THE LAST BANG or *Preparation hh, the battle to rid us of
horrifying hijackers.***

Dramatization, a man and his wife, a room, a window, a desk.

him: Step back. You'll be seen. Tomorrow we fly.
her: I fear for you.
him: Do not fear for me. I will be cared for.
her: But what about our son, little M--
him: No names. The room may be bugged.
her: Will there be violence?
him: Only what is needed.
her: But we are guests in this country.
him: You need not remind me.
her: I know in our culture a woman gives no advice.
him: And a man takes none from her.
her: But in some ways we act almost American.
him: Never. It is a land of corruption.
her: But they have good practices. For example, you could list your
grievances in a letter to the editor.
him: Ineffectual.
her: They prize education and have made it available to us.
him: Education does not help some people. I am highly educated myself
so I can spot the defects in others.
her: If you go, what are we to do?
him: Here are your instructions. Burn the papers in my desk.
her: I have heard one can make money by selling stock now and
purchasing it later.
him: A time reversal. Very appealing. And where did you hear that?
her: In yoga class. I am covered and people speak without seeing me.
him: Need I remind you that investing is gambling and gambling is a sin.
Further instructions. Do not go to an airport. Stay at home until you are
contacted.
her: But there is school for little M--
him: Again, no names. He will be the son of a hero.

her: I know it is not for me to question, but did you ask whether he would prefer a live father to a dead hero?

him: You are right. It is not for you to question. And now we place ourselves in the hands of the highest power.

Leap to the last few seconds of his life (the one preceding life after death). He is piloting a plane hurtling hundreds of miles per hour toward a massive structure. He has a sudden vision of the almighty greeting new arrivals upon their departure from this life. This almighty rejects the pilot and consigns him to holy hell, saying we do not admit hamburger helper into our high heaven. The pilot manages to blurt "awsh--" and is obliterated.

Jimmy Carter continues from page 6: (Perhaps some reader can explain to me the relationship between what was happening inside the container and the small piece of iron hitting the end of the handle...) " Other instances where physics and chemistry bear upon farm activities occur in the book. One thing occurs to me: When you compare the youth and young manhood of John Kennedy, Lyndon Johnson, Jimmy Carter, you see why they were such different presidents. DM

[New England Section Home Page](#)

[Units Home Page](#)

[APS Home Page](#)