New England Section Newsletter

Volume 11 **Number 10** **Fall 1997**

1997 Fall Meeting of the New England Section of The American Physical Society

October 24 and 25, 1997

The 1997 Fall Meeting of the New England Section of the American Physical Society will be held at the Science Center, Air Force Phillips and Rome Laboratories, Bldg 1106, Hanscom Air Force Base in Bedford MA, on Friday and Saturday, 24 and 25 October 1997. Plenary sessions will be of special interest to physics students on Friday afternoon and Saturday morning.

Friday session, **RESEARCH IN THE U.S., HANSCOM AFB, & MIT**. Current Trends in Science Policy, Mildred Dresselhaus, Institute Professor MIT, President AAAS Geophysics Research at the Phillips Laboratory, Harold Roth, Director Electromagnetics and Condensed Matter Research at Rome Laboratory, Horst Wittmann, Dir. Condensed Matter Research at the MIT Lincoln Laboratory, R. Ralston, Assoc. Director Optical Information Storage, Processing, and Display, Cardinal Warde, MIT

Saturday session at 0900, Saturday session at 1030, **MARKETING HIGH TECHNOLOGY** *Developing Miniature Microphones & New Venture Startups*, James West, Lucent Technologies *Managing Broad Research Applications*, Anthony Loumidis, Thermo Electric Corp, Waltham *Is Technology Commercialization Tougher than the IronMan Triathlon?*, Roger Little, SPIRE Corp

BANQUET. The banquet will be held Friday evening and will be followed by a presentation: Creativity in Physics and Technology Transfer, Paul H. Carr, AF Rome Laboratory, Moderator Discovery of Minimum Diffraction SAW Cuts, A. J. Slobodnik Jr., AF Rome Laboratory The Discovery of the Diode Laser, Benjamin Lax, Director, National Magnet Lab, Retired

ABSTRACT SUBMISSION: Submit contributed papers for presentation on either Friday afternoon or Saturday morning. Abstracts should follow the standard APS format. The deadline for

WORKSHOP ON PHYSICS IN INDUSTRY What my company does. What we are looking for in a new graduate. Microwave Applications of High Temp. Superconductors, Alfredo Anderson, MIT Lincoln Lab Progr. in Developing High-T Superconducting Wires, Steve Fleshler, Amer. S'conductor Corp Physics-Based Technology at the Raytheon Company, Joseph Callerame, Raytheon Co. SAW Devices for Cellular Phones, Robert Potter, Vectron Technologies Inc., Hudson NH Microwave Device Phys. of Commercial and Military Use, Nicholas Jansen, M/A-COM, Lowell MA

submission is **14 October 1997**. State whether you prefer oral or poster presentation. Meeting space is limited. Abstracts go to: nesaps97@maxwell.rl.plh.af.mil Dr. Lionel Friedman, ATTN: RL/EROC, 80 Scott Rd, Hanscom AFB, MA 01731-2909.

For **FURTHER INFORMATION**: Dr. Paul H. Carr, Dr. Steven D. Mittleman, AF Rome Laboratory, ATTN: RL/ERAC, 31 Grenier St, Hanscom AFB, MA 01731-3010, 617 377-3686 or -4038, FAX -1074, or above email address.

SPRING 1997 MEETING AT THE UNIVERSITY OF MAINE IN ORONO

The APS New England Section held its spring meeting in April at UMaine, organized jointly with the New England zones of the AAPT and the SPS. Friday afternoon's plenary session provided an overview of tribology by Jacqueline Krim (Northeastern). While most physics courses treat friction simplistically, in a way that often does not match the evidence, recent advances in theory and experiment have inspired interest in basic aspects of friction. Insights into friction processes and measurements were given by Irwin Singer (Naval Research Lab) and Frank Ogletree (Lawrence Berkeley National Lab). Friday evening's banquet featured a keynote address by Edward Tenner on the subject of his excellent book "Why Things Bite Back: Technology and the Revenge of Unintended Consequences."

Saturday morning afforded a special plenary address by Lillian McDermott (University of Washington) on bridging the gap between teaching and learning of physics. She is a leader of a sizable group engaged in research in physics education. Here is an engaging problem she uses to probe the thinking of students in basic courses. A light mass and a heavy mass are at rest on a starting line. Equal uniform forces push them straight ahead on a frictionless surface to a finish line. Illustrate with parallel sides of a smooth table, using a dime and a quarter. As each coin passes the far side, imagine you measure the momentum and the kinetic energy. Which mom is higher and which KE is higher (or are they equal)? The morning continued with a discussion of recruiting and retention of minority students. It concluded with a session on the large scale structure of the Universe, including studies by David Batuski (Maine) and Adrian Melott (Kansas). AAPT workshops and papers resumed in the afternoon, as is customary.

Other highlights of the trip: Lobster dinner at the Black Bear Inn. A diversion to L L Bean in Freeport, open all night, where it snowed April 12-13. A stop at Portsmouth, New Hampshire.

ENTROPY ENTERS

Schrodinger's cat has proofread his prose, judging it clear as the face round his nose.
Just as he's sure all that's motional froze, he gets in the way when a cruel wind blows.
He casts a stately look, a fately look, a rately look, say what?
Takes the cake, tokes the coke, hikes with bikes, cooks the books.
He rarely looks, he barely cooks, by crooks or hooks, that's what.
You don't need monkeys to act as flunkies,
To type away by night and day, to work and play, to strike and stray.
Shakespeare couldn't write a Shakespeare play sans copious corrections that still won't stay.
Friday the Thirteenth and Hallowe'en hold night terrors.
What most scares Claws is the need to right errors.
Light errors, bright errors, slight errors, tight errors.
Why the distress? Because they're all errors nevertheless.
Entropy bites, entropy fights, entropy kites, say what again?
Breaks some eggs, trips your legs, switches kegs, stirs the dregs.
Entropy spills, undermines skills, eventually kills, so that's what.
For the cat that that's that, with his bedset, he ain't dead yet.
Put on your hat and pack your heat. Puff up your coat, that's all she write,
Right? Wrong! No, that's all she wro o o o ote.

PDQ

Putting your personality into your papers. A physics paper is often colorless. Why not have it reflect the personality, especially the personality defects, of the author?

> **Original version:** Measurements were taken for the first time of the spectrum of einsteinium hexafluorochloride. Results were interesting.

Obsessive: Set the dial. Took the spectrum. Checked the dial. Took the -- Rechecked the dial. Took -- Wait a min. Did I remember that dial?

Neurotic: Painstakingly took the data. I mean painfully. What a headache. Don't ask. I'll tell you. You shouldn't know from it.

Compulsive liar: These measurements are the very first, in line for department award, maybe APS award. Or Nobel Prize, yeah, why not. Already have one. Why not another.

Psychotic: Dazzling colors moving all around open the window it's stifling can't breathe can't see. Demons laughing in the spectrum. Turn it off. At last back to unreality.

Paranoid: I measured the spectrum but I can't tell you what I got. I can see you want it, sure you'd love to have it.

Schizo: This is David. Let me refer you to my collaborator, David. Fun spectrum, don't you think? So you say.

What are you planning?	Yes I do. Keep talking. Last word, is that it? Last word.

Hints for authors. What the style manual should say.

1. A sentence should have one idea or okay maybe two and not be too complicated but a little complication may not be such a bad thing.
2. The passive voice is not to be used.
3. Avoid cliches like the plague.
4. Define terms, where define = tell the meaning of and terms = words or symbols.
5. Be sure to state what is the nothing new under the sun, ie reason for publishing.
6. Never ever under any circumstances resort to a redundancy.
7. Do not utilize compendious words when ... I forgot what I was going to say.
8. Oh yes, don't interrupt a train of

Book Review. "Les Bons Mots: How to Amaze Tout le Monde With Everyday French" by Eugene Ehrlich (Henry Holt, $24 = how many francs?) My own interest is the close connection of Gallic literary and philosophical musings to foundations of physics. Plus ca change, plus c'est la meme chose (the more things change, the more they remain the same) is the First Law of Thermodynamics. Tout lasse, tout casse, tout passe (everything palls, everything breaks, everything passes) is the Second Law. (You can't get there from here en francais = Third L.)

DM

NEW ENGLAND SECTION ADVISOR REPORT

The American Physical Society Council met November 10 in Denver after honoring Ben Bederson, retiring Editor-in-chief, at a dinner the night before. Happily, Harry Lustig, long associated with APS, was in good health. Characteristically, present at these meetings are council officers (9 people), divisional and forum councillors (27), general councillors (16), and council advisors (20). Also in attendance are guests, usually a few representatives from societies in other countries.

1. It was announced that the Executive Committee had elected Thomas McIlrath as Treasurer and appointed Harry Lustig Treasurer Emeritus. Martin Blume was elected the new Editor-in-chief of the APS and David Lazarus (former Editor) was appointed Editor-in-chief Emeritus.

2. Executive Officer Judy Franz is forming a task force on careers in physics.

3. President Robert Schrieffer has informed the National Academy of Sciences that APS is ready to help in efforts to preserve the nation's reserves of helium. In a separate item, Schrieffer distributed copies of a letter he sent to the Director of the National Institutes of Health expressing the dismay of physicists with statements linked to the Office of Alternative Medicine that "seriously misrepresent basic laws of physics." He stated the concern over

"distortions that make it appear that discoveries of modern physics lend support to unscientific claims." Examples from NIH publications refer to bodily "energy fields" and invoke quantum mechanics in a far-fetched explanation of "the ability of humans to affect physiological systems at a distance by mental means." Schrieffer ended the letter by offering the services of the APS in any program to better inform the public.

4. The Committee on Committees has completed a review of the Committee on Education and ended by reaffirming that it should continue independently, but maintain its coordination with the Forum on Education of AAPT and AIP. (Roy Cook of UMass Amherst is Chair of COE.)

5. Auditors have said that the APS is very strong financially compared with almost all other non-profits they audit.

6. APS has made a commitment not to increase library subscription costs of its journals by more than 10% per year for five years. This follows a twenty year period of 15% per year increases. This is part of a plan for the next five years to try to contain costs during a period of changing technologies. Financially, about three quarters of APS is in journals and about three quarters of the journals is in libraries.

7. Ben Bederson reported on progress toward electronic publishing, but stated that it is possible to see at most five years ahead. He noted that in 1992 one committee thought that e-journals might be here by 2020. A long term goal might be to do everything electronically, from submission to review to publication. He also envisions a time when all journal articles from the distant past are archived electronically and linked backward and forward. (PROLA = Phys Rev On Line A is the first try.) Judy Franz reported that discussions have begun to link APS/AIP and IOP (British) articles. Bederson said he would like to see a new journal with five or ten generally significant articles to allow us to keep up with related fields, and he has spoken of this with AIP.

8. Planning for the Centenary continues. The weeklong set of events will be March 20-26, 1999, in Atlanta. It will involve APS and AAPT and combine the traditional March and April meetings. Nobel Prize winners and all units have been contacted and invited to play roles. "Moments of Discovery" is a kickoff event on Sunday, March 21. The first draft of a wall chart is being circulated and was shown to attendees of the March meeting in Kansas City. Foreign societies will be present.

9. Currently the APS constitution includes "The objective of the Society shall be the advancement and diffusion of the knowledge of physics." An amendment was proposed to add "with concern for the public good," but was tabled after several attempts to change wording.

10. Herwig Schopper, President of the European Physical Society, reported on its structure and activities. It consists of 36 member societies with 70,000 physicists (for comparison, APS has 40,000), and is in the process of moving from Geneva to Muhlhouse, France, where salaries are lower, where facilities will be free, and where they will be in an EU country.

11. A motion passed that will allow a member of APS to present in person two

contributed and two invited papers at an APS meeting, provided the second paper in each case deals with issues of broad concern to the physics community. There is a context for this move in that it responds to an event in which abuses of the privilege seem to have occurred.

12. Mike Lubell reported on Public Affairs in Washington. This year the science budget has not been mistreated. NSF and DOE are in a holding pattern except for fusion projects, which were seriously cut. There is concern because NSF and, even more, DOE will be reduced by 2002. A problem situation is that NSF is placed in the same bill in Congress with the VA, a potent force on the Hill, often taking funds from NSF. Lubell stated that in the Senate eight moderates (both Republican and Democratic) were replaced by small-government confrontational people.

13. The Forum on Industrial and Applied Physics has 5,000 members after its first year of operation. There is a FIAP homepage that provides job and career information.

Editor: This report was submitted to the Section Executive Committee by John K. Pribram of Bates College and includes a few comments made at the Executive Committee meeting.

CAT UNDER A HOT TIN ROOF

Schrodinger's cat is checking his state to learn how lively he is on this date.
The amplitudes are one over root two that death will be proud or life will be true.
Enclosed in a light-proof sight-proof box sealed by sealing wax and deadbolt locks,
The cat from the world is isolated and hence unknown, it is stipulated.
This situation will remain till his keeper, or handler, tests his brain.
vBut how do we know the keeper's alive unless we observe him bestow a high-five
Or show some other animation subject to our corroboration?
As far as Schrodinger's cat is concerned, nothing outside is sure till it's learned.
The Sox did not lose yesterday's game if the papers don't print the very same.
Before you read it, it didn't occur, and after, it did, of course, for sure.
The cat does not know his keeper's status during this unmeasured hiatus.
That has no bearing on him because he knows his own heart beats without pause.
You cannot tell the degree of his health but still he thrives while he speaks for himself.

PDQ

NEWS FROM THE UNIVERSITY OF CONNECTICUT

David Lee (Uconn MS 1956), who shared the 1996 Nobel Prize in Physics, delivered the Commencement address for the Graduate School ceremonies on May 18. He received his undergraduate degree from Harvard, served in the military, and then came to Storrs for his Master's Degree. With a Ph. D. from Yale he went to Cornell where he is currently a Professor of Physics. In his address he mentioned that while serving as a Corporal of the Guard he met a young soldier named Herbert Fried (UConn MS 1952, now a Professor at Brown), who had been a graduate student at Storrs studying with Professor Paul Zilsel. A discussion about superfluid helium 4 and his parents' move to Connecticut resulted in his enrollment at UConn to learn experimental physics. His first project was to build an ionization gauge control circuit for the late Professor Edgar Everhart's Cockcroft-Walton accelerator. He stated that while at Storrs he was most influenced by the late Professor Charles A. Reynolds (a co-discoverer of the isotope effect in superconductors) and by John D. Reppy (UConn MS 1957, now a Professor at Cornell). In his address Lee described the exciting seven month period of 25 years ago in which the discovery of superfluid helium 3 was made. He told the audience that basic science provides long term benefits to society and that many Nobel Prizes result from fortuitous discoveries. His conclusion to the graduate students was "What I would say is that it is best to devote your lives to what you believe is important and interesting."

Editor: This paragraph is closely based on Edward Pollack's account, which he wrote for the Physics Department Newsletter. Lee received an honorary degree from the University of Connecticut at the Commencement.

In other news, Dr. Henry S. Katzenstein has established the Katzenstein Endowment in Physics at the University of Connecticut. The first priorities for the income from this fund are to establish a Distinguished Lectureship and to make permanent the Katzenstein Prize in Physics. Since 1991 this prize has been awarded to the undergraduate writing the best paper in physics. The first Katzenstein Distinguished Lecture takes place in a lecture hall in the Physics Building at UConn on September 12 at 4 pm. The lecture is to be given by our distinguished alumnus David Lee, profiled above. It is preceded by a reception in the Physics Building and followed by a dinner at the William Benton Museum of Art on the Storrs campus. As this announcement is being written, the day is weeks in the future, but, alas, as you read it, it is perhaps weeks in the past. The Katzenstein gift is being matched by "UConn 2000," a forward-looking State program to encourage development of a substantial endowment for the University. Many departments and other sectors of the University, such as museums, are participating in this initiative.

Most of the intent and most of the financing of UConn 2000 are to build new buildings and to renovate older ones. A chemistry building is being built this year. A biological sciences building with a substantial space for physics, particularly biophysics, will begin to go up next year. The project description tells us this will become one of the tallest buildings on campus. It will house and support laboratory research, and archival and academic work, for six interdependent

programs: the Department of Molecular and Cell Biology, the Biotechnology Center, Ecology and Evolutionary Biology Research Collections, E and E B R Greenhouses, the Electron Microscopy Center, and Physics laboratories. The site for this building is the fourth side of a presumptive square, the other three sides being Math Sciences, Physics, and the Institute of Material Science, all of which have already experienced a quarter century of existence.

An annual teaching award has been named for Professor Marshall J. Walker. The department's Outstanding Graduate Teaching Assistant Award is established in his memory. Walker joined the UConn faculty as an instructor in 1949. He rose through the ranks and served as Acting Head from 1962 to 1967. Among his accomplishments, he introduced an interdepartmental course and wrote a book with the same name: "The Nature of Scientific Thought." Because of his devotion to teaching, it is apt that this award is named for him.

The Harold S. Schwenk Jr. family has established a major endowment, matched by UConn 2000 funds, the proceeds of which are to be used for innovative education in science. The Schwenk family also endowed the Harold S. Schwenk Sr. Distinguished Chair in Chemistry, in honor of Harold S. Schwenk Sr., a UConn alumnus and faculty member. Collectively these endowments form the largest individual gift ever made to the University. Many innovative proposals were submitted by various science departments for the first year of the portion of the endowment for education. Those funded in physics included two projects on internet and multimedia presentations, one on a sonoluminescence laboratory experiment, and one to provide two additional summer "Research Experience for Undergraduates" (REU) Fellowships for UConn physics students to participate in our NSF-supported REU Site in Physics. The current program brings some fourteen talented undergrads from around the U.S. to Storrs each summer.

Editor: The foregoing news items were summarized from Quentin Kessel's contributions to the Physics Department Newsletter. That periodical, hence this one, benefited from the guidance of Department Head William C. Stwalley.

The State of Connecticut profferred a "golden handshake" to state employees "of a certain age." Many employees shook the hand and retired. This included a host of faculty and staff at the public institutions of higher ed. In physics we are sustaining the retirements of Dwight Damon, David Markowitz, and Richard Mindek. A department dinner to recognize the retirees will take place on November 8. But you know we can't stay completely away from physics. It wouldn't feel right.

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THE LAST BANG

The Office of University Communications at UConn sends huge stacks of reprinted brief articles from magazines and newspapers to faculty on any subject with implications for education. So here is one from The Day (New London) of June 1. The headline reads "Massachusetts could ax physics, 13 other majors at state colleges." Continuing: "Boston (AP) -- French and physics could soon be history at Massachusetts state colleges under a plan being considered by education officials."

Several paragraphs follow and then: " "When an entire public system produces an average of 40 physics graduates a year, you have to face squarely the question, 'Should campuses be all things to all people?' " said Stanley Kolik, chancellor of public higher education." Does any reader know more about this? Kindly inform me.

DM

A CHILD'S FIRST GARDEN OF PHYSICS VERSE.

ACE DOSE TRACE

One two three, a bound state is not free.
Four five six, amplitudes may mix.
Seven eight nine, with plus or minus sign.
Ten and another ten, square the result again.
King queen knave, a particle is a wave, write it on my grave.

PDQ