University of Cincinnati

OMI College of Applied Science

Department of Mathematics,
Physics, and Computing Technology

2220 Victory Parkway
Cincinnati, Ohio 45206
Phone (513) 556-6565

January 9, 1992

Nicole Wagschal
AAPT Announcer
5112 Berwyn Road
College Park, MD 20740-4100

Dear Ms. Wagschal,

In response to your memo of December 2nd, here are details on future meetings of the Southern Ohio Section / AAPT (SOS/AAPT).

The Spring, 1992 meeting will be a joint meeting with the Ohio Section / AAPT. It is being hosted by The Ohio State University and will occur on March 14th in Columbus, Ohio. Contact person is William D. Ploughe (614) 292-8841.

The Fall, 1992 meeting will be hosted by Sinclair Community College in Dayton, Ohio on Saturday October 17th. Contact person is Fred Thomas (513) 226-2886.

Please let me know if I can be of additional help to you. My private office number is (513) 556-4872.

Sincerely,

Jim Sullivan

James F. Sullivan
Professor of Physics
Secretary SOS/AAPT

SOUTHERN OHIO SECTION
AMERICAN ASSOCIATION OF PHYSICS TEACHERS
FALL, MEETING, 1991

The Southern Ohio Section (SOS/AAPT) met on Friday October 11th and Saturday October 12th at Wright State University in Dayton, Ohio. This was a joint meeting with the Ohio Section of the American Physical Society.

The invited speakers (and their papers) were:

Dr. John Sheffield, Oak Ridge National Laboratory (Magnetic Confinement Fusion: Present Status and Future Technical Problems)

Dr. Eric Storm, Lawrence Livermore National Laboratory (Inertial Confinement Fusion: Status and Future Projects)

Marjorie G. Bardeem, Fermilab (Collaboration of Fermilab Physicists in Science Education Reform)

Dr. Ian Hutchinson, Plasma Fusion Center MIT (Progress and Prospects in Understanding the Physics of Tohamak Experiments)

Dr. Thomas Boehly, University of Rochester (Omega Reactor: Physics and Diagnostics)

Seventy-six (76) contributed papers were presented in the Saturday morning sessions. Those presented by SOS / AAPT members included:

K. Riehl, L. Packer, D. Determan, and P. Haaland, Air Force Institute of Technology Analysis of ion Motion in an Ion Cyclotron Resonance Trap

Edward L. Patrick, Donald L. Mosteller, Jr., and Merrill L. Andrews, Wright State University The Suitability of Xenon-Nitrogen Gas Mixtures in Gas-Filled Detectors

Warren F. Stubbens, University of Cincinnati Monte Carlo Simulation of Ion Migration in Gasses

Elaine Brunsman and John E. Erdei, University of Dayton The Scaling Behavior and Fractal Dimension of an Electroencephalogram

Bradley D. Paul and Philip A. Macklin, Miami University The Isotropic SHO Envelope - Discovery and Confirmation

R. S. Jones, The Ohio State University The 1-Dimensional, 3-Body Problem with Finite Square Wells

R.J. Furn-Stahl, The Ohio State University From QCD to Relativistic Nuclear Physics

P.D. Scholten, Miami University Critical Behavior of the Three-Dimensional Four State Clock Model

Yizhang Mo and Robert J. Perry, The Ohio State University Numerical Calculation of the Massive Schwinger Model

S. Delucia, B. Luther, D. Marchlenski, and E. Sugerbaker, The Ohio State University, C. Goodman, W. Huang, Y. Wang, and A.Smith, IUCF, J. Rapaport, Ohio University, R. Byrd and T. Taddeucci LANL Gamow-Teller Strength Distributions For Solar Neutrino Detectors Viathe (p.n) Reaction

R. R. Winters, Denison University The Maxwellian-Averaged Neutron Capture Cross Section for ^{16}O

J. A. Dorian, R. L. Henghold, and Y. K. Yeo, Wright-Patterson Air Force Base, S. J. Bglash, Lincoln Laboratory MIT, K. J. Keefer, Phillips Laboratory Photoluminescence of MBE Grown Gallium Antimonide

T. Vaughan and F. Szmulowicz, University of Dayton, M. O. Manasreh, K. R. Evans, and C. E. Stutz, Solid State Electronics Directorate, D. W. Fisher, Materials Directorate Theoretical Modeling of the Intersubband Transition in an Al 0.3 Ga 0.7 As/GaAs Multiple Quantum Well Structure

M. M. Chi, T. D. Steiner, Y. K. Yeo, and R. L. Henghold, Wright-Patterson Air Force Base, D. J. Godbey and P. E. Thompson, Naval Research Lab, G. S. Pomrenke, Air Force Office of Scientific Research Broad-Band Photoluminescence from Sil-Ge/Si Superlattices

T. D. Steiner, M. M. Chi, R. L. Henghold, and Y. K. Yeo, Wright-Patterson Air Force Base, D. J. Godbey and P. E. Thompson, Naval Research Lab, G. S. Pomrenke, Air Force Office of Scientific Research Effects of Annealing on Photoluminescence from Sil-Ge/Si Superlattices

A. Kangarlu and B. D. Smith, University of Dayton, P. W. Yu, Wright State University High Pressure Study of the GaAs Antisite Acceptors in GaAs

G. Aubrecht, The Ohio State University at Marion A New Innovative Course for Undergraduate Physics

Special thanks to Professor Merrill Andrews of Wright State University and Robert Henghold of the Air Force Institute of Technology for Organizing this fine meeting.

James F. Sullivan
Secretary SOS/AAPT

DUTIES OF SECRETARY

SOUTHERN OHIO SECTION
of the
AMERICAN ASSOCIATION OF PHYSICS TEACHERS

Prepared by James F. Sullivan
January 25, 1992

1. Attend all business meetings of the Southern Ohio Section of the American Association of Physics Teachers (SOS/AAPT), take and maintain minutes of these meetings.

2. Attend all executive committee meetings of the SOS/AAPT, take and maintain minutes of these meetings.

3. Send copies of the minutes of the business meetings and executive committee meetings to the editor of The Dialog for publication for the members.

4. Send copies of the abstracts of contributed papers at SOS/AAPT meetings to the editor of The Dialog for publication.

5. Send abbreviated versions of the contents of past SOS/AAPT meetings to the appropriate editor of the Announcer for publication on the national level under "Section News". Note that this is not a copy the minutes of the business meetings but rather an overview of the entire meeting (including authors' names, titles of presentations, etc.). The entire abstracts are not published in the Announcer

6. Send information regarding future SOS/AAPT meetings to the appropriate editor of the Announcer for publication on the national level. This normally includes the meeting dates, the meeting locations (institution and city), and the contact persons (name and phone number) for each of the next two SOS/AAPT meetings.

7. Compile a list of the officers of the SOS/AAPT. This list should contain the office held, name, address, phone number, and (in the case of the vice-presidents) the date when the term expires. A copy of this list should be sent to:
   a. The Editor of The Dialog for publication for the members,
   b. The national AAPT office for publication in the Announcer and for AAPT records.
   c. Each SOS/AAPT officer on the list.

   In addition (if possible) each SOS/AAPT officer will be supplied with the home addresses and phone numbers of the SOS/AAPT officers.

8. Maintain master copies of documents of specific interest to the SOS/AAPT and make copies of these available to SOS/AAPT members on request. These documents should include the current Constitution and By-Laws of the SOS/AAPT and "Hosting a Meeting of the SOS/AAPT". The number of documents maintained by the secretary should be kept to an absolute minimum to prevent this task from becoming extremely time consuming in the future.

9. Some of the above tasks may be delegated by the Secretary to an Associate Secretary when an Associate Secretary has been appointed by the President.

THE DIALOG

February, 1992

A Publication of
The Southern Ohio Section
American Association
of Physics Teachers

SPRING MEETING IN COLUMBUS

by Bill Ploughe

The spring meting of the Southern Ohio Section of the AAPT will be held Saturday, March 14, 1992 on the campus of the Ohio State University in Columbus, Ohio. This meeting will be a joint meeting with the Ohio Section of the AAPT and will be packed with many intersting items from both sections. Abstracts and registration for any of the workshops are due on Friday, February 28, 1992. Please send two copies of the abstract, if you are giving a ten minute paper, along with your registration to: Bill Ploughe, Physics Department, Ohio State University, 174 West 18th Avenue, Columbus, Ohio 43210. The preregistration form is elsewhere in this issue of the Dialog.

Ray Carpenter and Dick Minnix from Virginia Military Institute will be at the meeting to put on one of their famous demonstration shows. Of course, that should not stop each of us from bringing along out own "How I do it" or "favorite demonstration" for sharing with the assembled group. Ray and Dick are always looking for new ideas. They will be the first to admit that they have not seen all possible demos. Maybe they will be able to incorporate yours into their future shows.

Edward F. Joe Redish from the University of Maryland will be there to bring us up to date on the latest developments in the uses of computers in physics instruction. His and Jack Wilson's work on the M.U.P.P.E.T. project is showing the way computers can effectively be used in our physics classes and by our students.

Dick Zitto will be putting on the electronic flash workshop described in The Physics Teacher, January, 1990. This workshop has been given several times at the national meeting and has been highly successful. Each attendee at the workshop will construct and take with them a sound activiated trigger to set off an electronic flash. Each attendee is requested to bring along a 35mm camera which has manual control and one roll of 400 speed color film. In addition each should bring along a Vivitar 283 electronic flash unit if possible. The trigger was designed to be used with this flash unit. Others may also work by there is no assurance that they will. Do not let the lack of exactly the recommended equipment deter you from signing up for this workshop.

The *How I Do It* session is the opportunity for you to show off your favorite demonstration. These are three to five minute informal presentations. Challenges as to "what is it?" are also welcome. Join the fun and bring yours. Sign up for a time slot at the door.

The spring meeting is the time the officers for the coming year are elected. Come to the business meeting and help determine the future of your organization.

Editor's Note:

I had the great fortune to have attended a Carpenter & Minnix demonstration workshop at VMI one summer. They are marvelous demonstrators and truely wonderful people. They alone are worth the trip to Columbus.

SOS/AAPT PHYSICS PRIZE CONTEST

The 1991 SOS/AAPT Physics Prize Contest was a success. 103 students from 7 high schools participated in the contest. The top scoring student was Robert Parrott from Circleville High School in Circleville, Ohio. The top scoring school with 5 or more students participating (based on the sum of the top five scores) was Mariemont High School, Cincinnati, Ohio. An order form for the 1992 Physics Prize Test is printed below.

ORDER FORM

I wish to order ____ tests at $.50 each. Total enclosed: $_____. Make checks payable to "SOS/AAPT"

Name_____

Address:_____

_____

_____

Telephone:_____

School:_____

School Address:_____

_____

_____

School Phone:_____

Send order to: Dwight J. Portman
Winton Woods High School
1231 West Kemper Road
Cincinnati, OH 45240
Phone: (513) 825-7840

The summer meetings will continue to be on college campuses as long as the AAPT can find campuses which are large enough. Representatives of the Western Pennsylvania Section and the Indiana Section approached J. Poth about holding future joint meetings with the SOS/AAPT - the W.Pa. section also suggested that the Ohio Section and the Applachian Sections also join their joint meeting (thus making a four-way joint meeting).

A discussion of future meetings followed. The spring 92 meeting is in Columbus at OSU on March 14, 1992. The fall 92 meeting will be in Dayton at Sinclair Community College on October 17, 1992. The spring 93 meeting will possibly be in Dublin, OH and the fall 93 meeting could be in Cincinnati. The spring 94 meeting could be the joint meeting with the W.Pa, Ohio, and Appalachian Sections. No plans have been yet made for the fall 94 meeting. The spring 95 meeting could be the joint meeting with the Indiana section. It was suggested that joint meetings be held in locations near the mutual borders of the sections involved. Also non-traditional meeting sites should be explored if there are no campuses able to haldle the anticipated crowds. To this end R. Teese volunteered to get information about meeting facilities at Salt Fork Lake State Park (in Eastern Ohio) for possible use in the spring 94 meeting. J. Sullivan agreed to contact a person in the Cincinnati area about hosting the Fall 93 SOS/AAPT meeting.

Secretary J. Sullivan passed out four documents to those present: a revised list of the names and addresses of the SOS/AAPT officers, the minutes of the business meeting of October 12, 1991 (to be approved on March 14th), "Hosting a Meeting of the SOS/AAPT", and The Duties of the Secretary of the SOS/AAPT. No action was necessary on any of these items.

J. Poth suggested that the section must send out a letter requresting dues payments from thsoe persons who are delinquent.

Treasurer R. Teese distributed a trasurer's report. The section's finances are approximately the same as in the last report.

W. Ploughe reported that the abstract deadline for the March 14th meeting would be March 2nd.

The Ohio State Science Fair is on Saturday, April 25, 1992 in Delaware, Ohio. The SOS/AAPT needs many judges for the physics awards. Please contact W. Dollhopf (513-327-7822) if you might be interested.

The science Education Council of Ohio (SECO) meeting is February 13, 14, and 15 in Cincinnati's Convention Center. The SOS/AAPT and the Ohio Section/AAPT are jointly sponsoring a booth at this meeting. President R. Monnier will see that the AAPT booth is set up and run by SOS/AAPT members.

F. Thomas gave a report on the October 17, 1992 meeting at Sinclair State Community College in Dayton. Plans are well under way and will be published in future editions of The Dialog.

It was agreed that one issue of The Dialog will be published in late spring and another issue on approximately September 1, 1992. The spring issue will be sent only to paid-up members, but the fall issue will be sent to the entire mailing list.

D. Portman reported on the Physics Prize Contest. It was agreed that while the contest should continue to be self-supporting, the section would guarentee the costs of two plaques to be awarded as prizes in the contest.

Submitted by James F. Sullivan, Secretary.

PLEASE HOST A FUTURE MEETING

by James F. Sullivan

If you are considering the possibility of hosting a future SOS/AAPT meeting, you will probably want to get a copy of "Hosting a Meeting of the SOS/AAPT." This paper discusses the behind-the-scenes details based primarily on the Fall, 1990 meeting. Copies may be obtained from any SOS/AAPT officer or directly from the SOS/AAPT Secretary: James F. Sullivan, OMI College of Applied Science, 2220 Victory Parkway, Cincinnati, Ohio 45206. Phone: (513) 556-4872.

SOS-AAPT

SPRING MEETING

SATURDAY, MARCH 14, 1992
OHIO STATE UNIVERSITY
PHYSICS DEPARTMENT
SMITH LABORATORY

TENATIVE PROGRAM

8am-noon Registration, Room 1036
Commercial Exhibits & Refreshments, Room 1042-1048

MORNING SESSIONS
9 til noon

9am Contributed Papers
10am Demonstrations from VMI
Ray Carpenter and Dick Minnix-Virginia Military Institute
11am How I Do It Session

LUNCH (noon til 1:00)
Fast Food on High Street (a block away)

AFTERNOON SESSIONS

1pm M.U.P.P.E.T - Computer Assisted Physics Program
Edward (Joe) Redish - University of Maryland

2pm Business Meetings for Individual Sections
Drawing for door prizes

2:30pm WORKSHOP & OPEN HOUSE-PARALLEL SESSIONS

Fast Action Flash Photogrpahy-
Dick Zitto

Macs in the Introductory Physics Lab

CD-ROM and Laserdisc Technology

Pasco's 6500 Interface Workshop

PARKING

Use visitor parking. On street parking on the OSU campus and surrounding area is restricted. We cannot be responsible for tickets or towing.

attend the antional meetings, please contact you Section Representative prior to the next Winter meeting.)

6) We now begin the first full year of the three-meeting model. The Winter Meeting will be held the first week in January for the next two years and will then move later in the month. The Joint Meeting will be the APS/AAPT Spring Meeting in Washington, D.C. in April, and the Summer Meeting will be held within the first two weeks of August on a college campus.

7) Future national AAPT meetings:

1992 Spring - Washington, D.C. - April 20-24
1992 Summer - University of Maine, Orono, Maine - August 10-15
1993 Winter - New Orleans - January 2-7
1993 Spring - Washington, D.C. - April 12-15
1993 Summer - Boise State University, Boise, Idaho - August 7-12
1994 Winter - San Diego - January 2-7
1994 Spring - Washington, D.C. - April

FALL 1992 MEETING

The fall meeting of the Southern Ohio Section of the SOS/AAPT will be held on Saturday, October 17, 1992 at Sinclair Community College in Dayton. The theme of the meeting will be "Physics: The Critical Difference for All Students," and will emphasize the role of physics in the education of all types of students at all levels. If you have questions or suggestions, please contact Fred Thomas, Physics Department, Sinclair Community College, 444 West Third Street, Dayton, Ohio 45402. Phone (513) 226-2886. Abstracts for contributed papers should be sent to arrive by Friday, October 9, 1992.

Minutes of the Business Meeting of the Southern Ohio Section of the American Association of Physics Teachers.

Wright State University
Dayton, Ohio
Saturday October 12, 1991

The meeting of the Southern Ohio Section of the American Association of Physics Teachers (SOS/AAPT) was called to order by President-elect W. Ploughe at 12:20 pm on Saturday October 12, 1991 in room 101 Fawcett Hall on the campus of Wright State University in Dayton, Ohio. An agenda was distributed.

W. Ploughe explained that he was conducting the meeting since President R. onnier was recuperating from injuries sustained in a recent automobile accident.

The minutes of the April 20, 1991 executive committee and business meetings were approved as published by Secretary J. Sullivan in The Dialog.

The treasurer's report was distributed to the members by Treasurer R. Teese. The section had approximately $500 income this year and has approximately $1000 in the bank.

Vice President S. Yerian commented favorably on the paper by J. Sullivan entitled "How to Host a Meeting of the SOS/AAPT." Draft copies has been distributed to SOS/AAPT officers. J. Sullivan assured the members that copies of the final draft would be available to SOS/AAPT members in the spring.

W. Ploughe announced plans and hopes for future SOS/AAPT meetings. A listing appears elsewhere in The Dialog.

Past President W. Dollhopf reminded the officers that the job descriptions are due.

There was agreement that the SOS/AAPT membership must be increased. Possibly the president could send a letter to prospective members. W. Ploughe indicated that OSU maintains a mailing list of all high schools in Ohio and SECO has a list accessible via modem.

An executive meeting was scheduled for January 25, 1992 at Wittenberg University. The meeting adjourned at 12:44 pm.

Submitted by James F. Sullivan, SOS/AAPT Secretary.

MINUTES OF THE EXECUTIVE COMMITTEE OF SOS/AAPT

WITTENBERG UNIVERSITY
SPRINGFIELD, OH
Sunday February 2, 1992

The executive committee of the Southern Ohio Secion of the American Association of Physics Teachers met in room 304 of the Science Building at Wittenberg University. Those present were M. Grote, W. Dollhopf, W. Ploughe, D. Portman, J. Poth, J. Sullivan, R. Teese, and F. Thomas.

The meeting had been originally scheduled for January 25, 1992, but was postponed to this date due to the severe weather in central Ohio on January 25th.

The meeting was called to order at 1:15 by Past President W. Dollhopf.

Section Representative J. Poth gave a report on the recent national AAPT meeting in Orlando, Florida. This was the first national meeting held without the American Physical Society. By all accounts, this meeting was a success. The national AAPT is actively working towards collecting section dues. The new building will probably be called The American Center for Physics. It will contain 115,000 sq. ft and the AAPT will be housed on the fifth (top) floor. It will be on a twelve acre site in College Park, MD. The estimated cost is 22 M$ with the AAPT share being 1.8 M$. In the new PTRA plus program, some PTRA's (Physics Teacher Resource Agents) will be retained. The AIP (American Institute of Physics) is developing a new curriculum for high school students.

NATIONAL AAPT WINTER MEETING IN ORLANDO

James Poth, Section Representative

The 1992 Winter Meeting of the AAPT was held in Orlando, Florida, on January 4-9 at the Clarion Plaza Hotel. Orlando lived up to its reputation for sunshine, oranges, and moderate winter temperatures and was a beautiful site for the meeting. The Plaza, a new hotel that opened this year next to the Orange County Convention Center, provided excellent facilities conveniently located in one area of the hotel. The hotel is also located near Sea World and seemed to be in the middle of the world's largest tourist center.

This was the first Winter Meeting without the APS. The general feeling was that the APS presence at the Joint Winter Meeting had slipped so badly in recent years that it was difficult to notice that a new era has bugun. The meeting continues to grow in size, and a new record was set with nearly 1200 registrations. There were 38 workshops at this meeting, and they were again held primarily on Saturday and Sunday. A convenient place to see and talk with other teachers has become the traditional Welcoming Reception on Monday evening, sponsored by the exhibitors at the Physics Show. It seemed that almost everyone at the meeting turned out for the reception this year.

The popular Plenary Sessions always offer an opportunity to keep up to date, and this year they included Low-Temperature Laboratories (On the Road to Absolute Zero), Frontiers in Magnetism (The National High Magnetic Field Laboratory), and Physical Phenomena at High Magnetic Fields (Science and Research Opportunities). There were Cracker Barrel Sessions on the Physics of Toys and the Introductory Laboratory. One of the highlights of the meeting was Instant Replay, an evening demonstration show sponsored by the Florida Section and put on by a group of Florida's physics community of high school and college teachers.

The Joint Ceremonial Session has become the AAPT Ceremonial Session, with the only noticeable changes being the omission of the Gemant Award and the lengthening of the retiring AAPT President;s address. The Oersted Medal was awarded to Eugen Merzbacher of the University of North Carolina. He sopke on "Frills or Fundamentals, Fervor and Phobia," an intriguing account of his education in Germany, Turkey, and the United States during the early years of what we now call modern physics. The Fifty-First Richtmyer Memorial Lecture was given by Kip S. Thorne of the California Institute of Technology and was entitled "Black Holes and Gravitational Waves."

Notes from the National Council Meeting on Tuesday Evening

1) As a result of the 1991 elections, the present AAPT officers are President James Stith (U.S. Military Academy), President-Elect Reuben Alley (U.S. Naval Academy), Vice-President Howard Voss (Arizona State University), Secretary John Layman (University of Maryland), Treasurer Robert Sears (Austin Peay University), Past-President Thomas Rossing (Northern Illinois University), and Member of the Executive Board for Four Year Colleges Larry Kirkpatrick (Montana State University).

2) This was the first meeting for Jack Hehn, the first appointee to the newly-created position of Associate Executive Officer. Jack is from Tarrant County Junior College in Texas and spent 14 years at the University of North Texas. One of Jack's specialities is computers, and one of his duties is planning for the AAPT information system. Executive Officer Bernie Khoury announced that one of the aspects of the new system that is being investigated is the collection of section dues by the national office.

3) Plans for the American Center for Physics, a joint venture of the AAPT, APS, and AIP, are continuing to go forward, and the architect has completed drawings of the building. The purchase of the twelve-acre site in College Park will no doubt be finalized soon, pending completion of improvements by the developer. The building will be five stories and 115,000 square feet, with AAPT to occupy 11,000 square feet on the top floor. The cost of the building is now estimated to be 22 million, and the AAPT share is approximately 1.8 million. The uniting of the three major physics organizations in the United States under one roof remains an interesting prospect.

4) NSF has awarded a three-year grant to AAPT for PTRA Plus, the new PTRA program designed to retain 125 of the present PTRA's and train 25 new ones each year for a total of 200, with selection of the veteran PTRA's based on their recent activity. NSF has also made a major grant to AAPT, which with AIP is working to develop a new curriculum for high school students who might not otherwise have an opportunity to study physics. The College of William and Mary has been chosen as the site of the XXIV International Physics Olympiad in 1993.

5) It was announced that Larry Badar, Section Representative of the Ohio Section, has been elected Secretary of the Section Representatives and that James Poth, Section Representative of the Southern Ohio Section, has been lected to a position on the 1993 National Nominating Committee. This committee nominates candidates for national office and appoints members to the Area Committees. (If you have an interest in an area of physics education and are willing to

ADVANCED REGISTRATION FORM

OS - SOS/AAPT 1992 SPRING MEETING

PHYSICS DEPARTMENT
OHIO STATE UNIVERSITY

SATURDAY, MARCH 14, 1992

NAME _____

AFFILATION _____ PHONE(_____) _____

ADDRESS _____

_____ ZIP _____

( ) SOS/AAPT Annual dues (if not already paid).....$5.00 _____

( ) SOS/AAPT Student dues (if not already paid)....$2.00 _____

( ) SOS/AAPT Retired Membership.....No Fee

( ) Member Registration Fee OS or SOS section.....$3.00 _____

( ) Student Registration Fee .....No Fee

( ) Retired Person Registration Fee.....No Fee

( ) Workshop, Fast Action Flash Photography.....$12.00 _____
(limit 18 - See note 2 below)

( ) Workshop, Pasco's 6500 Interface Workshop.....No Fee
(limit 20)

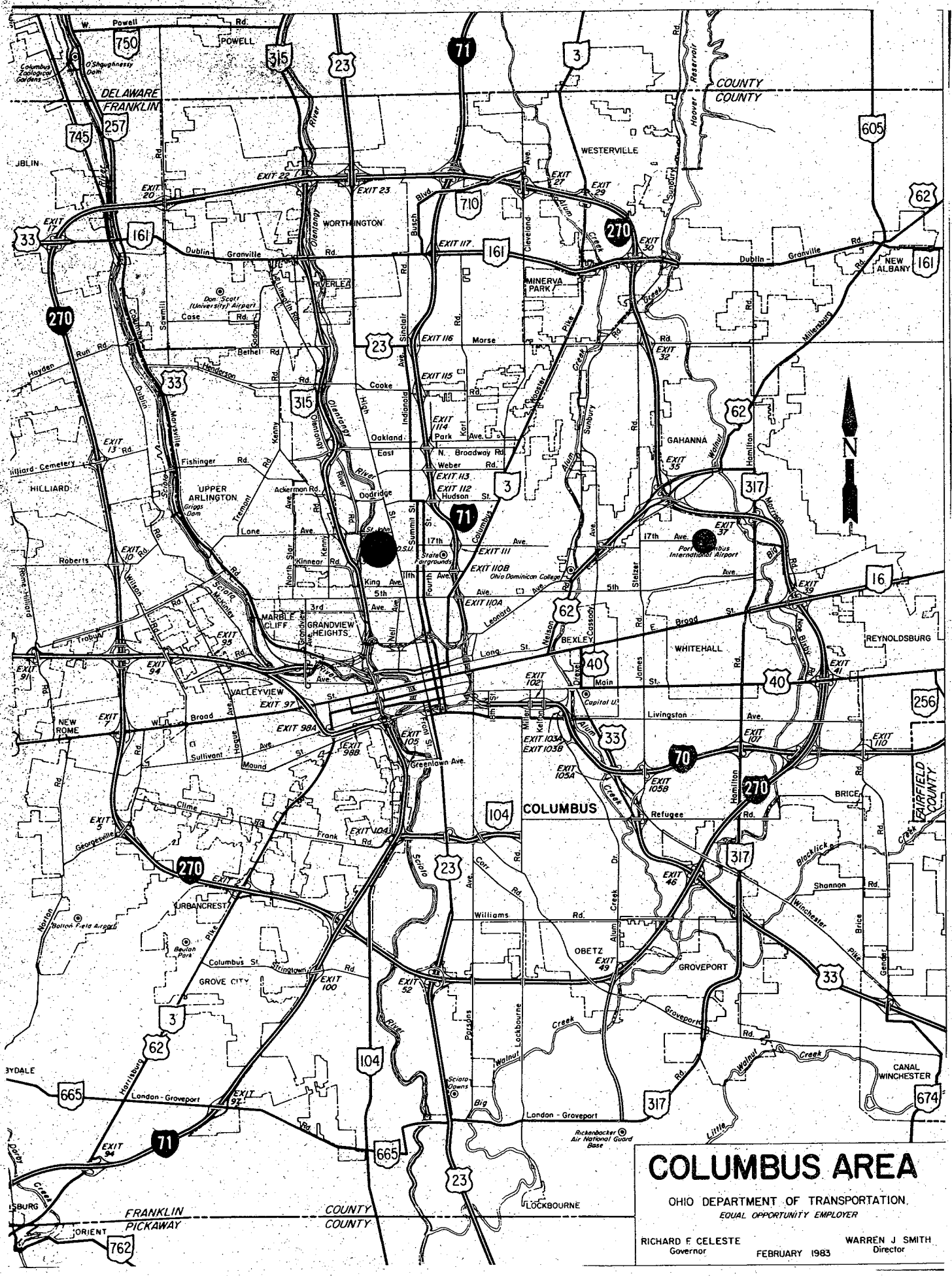
TOTAL..... _____

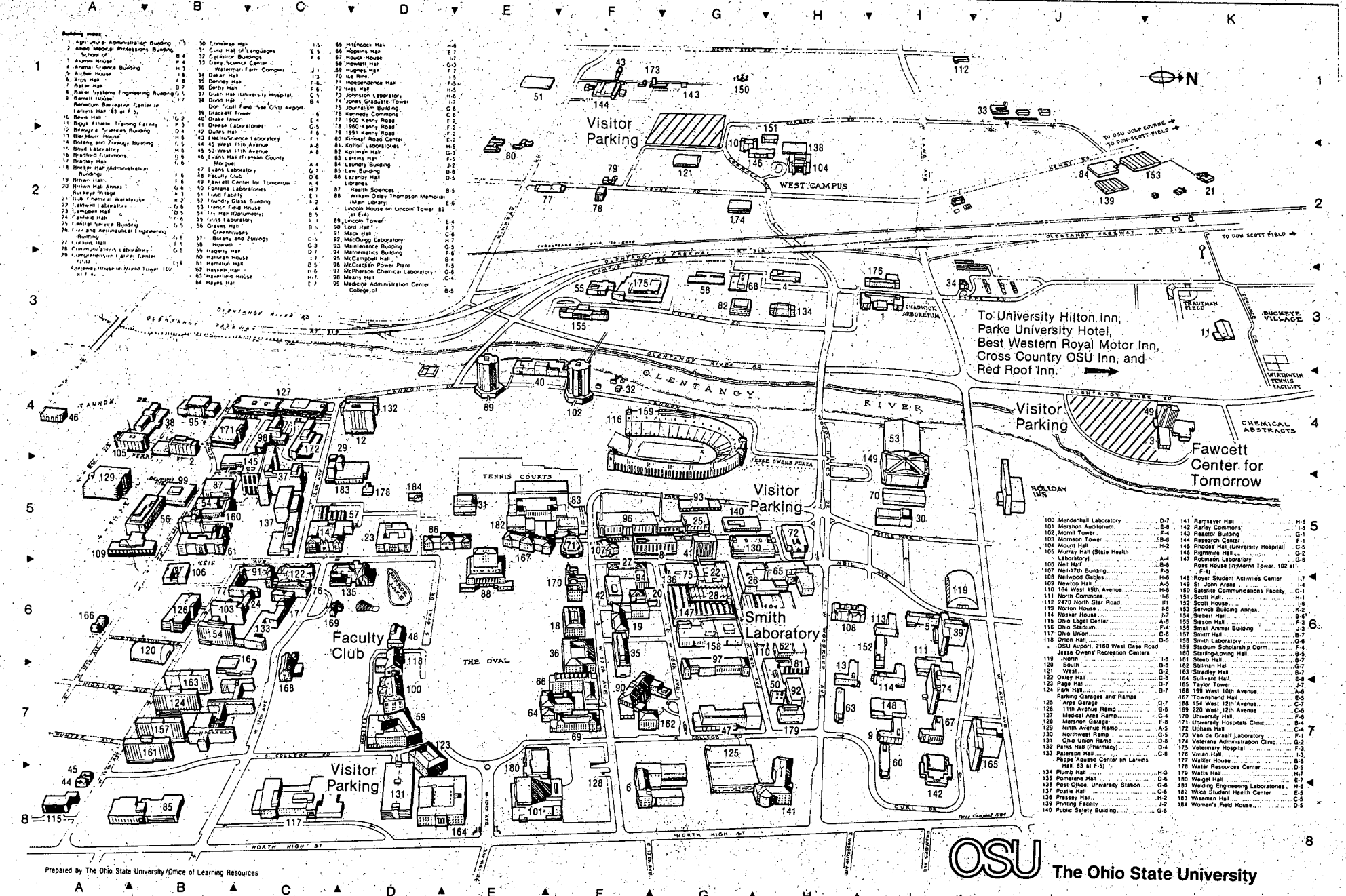
Note 1: Registration for workshops will be on a first registered, first served basis.

Note 2: Participants need to bring along a 35 mm camera capable of manual control, one roll of 400 speed color film and if you have one a Vivitar 283 flash unit or equivalent.

Checks should be made payable to "SOS/AAPT" and returned with this form to:

William D. Ploughe
Department of Physics
Ohio State University
174 W. 18th Avenue
Columbus, Ohio 43210


COLUMBUS
WORTHINGTON
WESTERVILLE
GAHANNA
NEW ALBANY
MINERVA PARK
UPPER ARLINGTON
HILLIARD
GRANDVIEW HEIGHTS
MARBLE CLIFF
VALLEYVIEW
NEW ROME
URBANCREST
GROVE CITY
OBETZ
GROVEPORT
BEXLEY
WHITEHALL
REYNOLDSBURG
BRICE
CANAL WINCHESTER
LOCKBOURNE
ORIENT
DELAWARE COUNTY
FRANKLIN COUNTY
FAIRFIELD COUNTY
FRANKLIN COUNTY
PICKAWAY COUNTY
Ohio State University
Ohio Dominican College
Capital U.
State Fairgrounds
Port Columbus International Airport
Rickenbacker Air National Guard Base
Sciaio Downs
Bolton Field Airport
Beulah Park
Don Scott (University) Airport
Griggs Dam
O'Shaughnessy Dam
Columbus Zoological Gardens
Hoover Reservoir
Scioto River
Alum Creek
Big Walnut Creek
Little Walnut Creek
Blacklick Creek
Darby Creek
Rocky Fork Creek
Olentangy River
Scioto River
Dublin - Granville Rd.
Sawmill Rd.
Henderson Rd.
Cooke Rd.
Morse Rd.
Hayden Run Rd.
Fishinger Rd.
Ackerman Rd.
Lane Ave.
Roberts Rd.
Trabue Rd.
Broad St.
Long St.
Main St.
Livingston Ave.
Refugee Rd.
Shannon Rd.
Williams Rd.
Groveport Rd.
London - Groveport Rd.
Harrisburg Pike
Georgesville Rd.
Clime Rd.
Frank Rd.
Sullivant Ave.
Mound St.
Greenlawn Ave.
Hamilton Rd.
Cleveland Ave.
Sunbury Rd.
Millersburg Rd.
Morse Rd.
Karl Rd.
Indianola
Summit St.
Neil Ave.
Fifth Ave.
Kinnear Rd.
Lane Ave.
Roberts Rd.
Trabue Rd.
Rome Hilliard Rd.
Norton Rd.
Sawmill Rd.
Dublin Rd.
Riverlea
Worthington
Westerville
Gahanna
Bexley
Whitehall
Reynoldsburg
Brice
Canal Winchester
Lockbourne
Orient
Hilliard
Grove City
Urbancrest
Obetz
Groveport
Franklin County
Pickaway County
Fairfield County
Delaware County
Columbus Area
Ohio Department of Transportation
Equal Opportunity Employer
Richard F. Celeste
Governor
Warren J. Smith
Director
February 1983



Prepared by The Ohio State University/Office of Learning Resources

OSU The Ohio State University

Abstracts from the Fall, 1991 Meeting at Wright State

(In case you missed the meeting, here are the abstracts from the contributed papers presented by SOS/AAPT members.)

A New Innovative Course for Undergraduate Physics. GORDON J. AUBRECHT,II, Department of Physics, Ohio State University at Marion. This project, "Retooling University Physics for the 21st Century," supported by FIPSE, to change the introductory course on two campuses of Ohio State was begun in Winter Quarter 1992. We have just finished one complete year of experimentation on the Marion campus and have one quarter of experience in Columbus to report on. Some anecdotal information on student responses to the changes will be shared and the curricular materials will be available.

Analysis of Ion Motion in an Ion Cyclotron Resonance Trap. K. RIEHL, L. PACHTER, D. DETERMAN, and P. HAALAND. Air Force Institute of Technology. Fourier Transform Mass Spectrometry has emerged as an important tool for charaterizing the cross-sections for generation and reaction of charged species. Ions are formed in a cubic trap in a strong magnetic field. Conventional appraoches to the excitation and detection either assume infinite parallel plate boundary conditions or perform a quadrupolar expansion of the electric field. We report here an adaptive multipolar expansion of the trap electric field and the detailed relationship of the rf excitation to the ion trajectories. The spatial boundary conditions are shown to cause motion parallel to the magnetic field axis and a dependence of the final cyclotron radius on the initial ions's axial locations. This axial excitation can change the ion kinetic energy and the image current induced in the detection circuit, both effects which influence measurements of ion-molecule reaction rates and ionization cross sections. Experimental observation of the dependence of ICR signal on excitation voltage confirms the role of axial excitation and ejection. The role of discretized as opposed to continuous wave excitation and the importance of phase modulation in Selected Waveform Inverse Fourier Transform excitation is also explored.

The Suitability of Xenon-Nitrogen Gas Mixtures in Gas Filled Detectors* by Edward L. Patrick, DOnald L. Mosteller Jr., and Merrill L. Andrews, Physics Department, Wright State University and Alan Garscadden, Plasma Research Group, Wright Laboratory. Xenon (Z = 54) has an improved charged particle stopping power compared to Argon (Z=18), however, the electron drift velocity in the pure gas is relatively slow in comparison. Electron drift velocities were measured in pure xenon gas and xenon gas mixtures containing .1%, 1%, and 10% nitrogen additive. THese mixtures were made to produce a non-explosive, non-toxic mixture with higher electron mobility as high as 400% for certain values of electric field to gas number ratio, E/N. A comparison is made between the electron mobility of P-10 (10% CH4 in Ar), a widely used detector gas, and xenon-nitrogen.

Monte Carlo Simulation of Ion Migration in Gases. Warren F. Stubbins, University of Cincinnati - Migration of ionized gas molecules through gases of varying density under an electric field is simulated by Monte Carlo calculations. The number of collisions while migrating a fixed distance is nearly independent of electric field intensity. The number of collisions divided by the gas pressure also is nearly constant. The average energy pain of an ion is proportional to the product of the mean-free-path and voltage, but the ions accumulate little energy because collision transfer the energy to the residual gas molecules. Possible bias in the generation and applications of the random number generator are studied.

The Scaling Behavior and Fractal Dimension of an Electrencephalogram. Elaine Brunsman and John E. Erdei, University of Dayton. -- An electroencephalogram (EEG) is a temporal record of the electrical activity of the brain. In an effort to understand the complexity of a typical EEG, investigators have employed methods from the areas of chaos and fractals. Although many standard techniques from these areas have been used, only a limited amount of work has been directed toward the fractal dimension of a signal. We have applied research analysis to a series of EEG's for normal, awake adults. Results show that these EEG's exhibit two distinct scaling regions, each with its own characteristic dimension. Work supported in part by a Grant-in-Aid from Sigma Xi.

The Isotropic SHO Envelop - Discovery and Confirmation. Bradley D. Paul and Philip A. Macklin, Miami University, Oxford, Ohio 45056. Envelopes of families of curves (trajectories) divide space into accessible and inaccessible regions. These envelopes are in principle discoverable by the calculus paradigm of solving simultaneously the equations describing the family and its derivative with respect to the parameter labeling the family members. In practice, however, the equations are so formidable, or the choice of parameter so infelicitous, that discovery and confirmation of the envelop for the family of ellipses passing through a fixed point with fixed energy under the isotropic simple harmonic oscillator (SHO) central force (1/2)kr2 potential. One of us (BMP) implemented the equations for the family on Mathematica (at the request of PAM), generated graphics showing family members for a variety of firing points, and guessed therefrom an equation for the envelope. The other of us (PAM) then derived an algebraic scheme for confirming the correctness of this guess analytically and BDP implemented the algebra on Mathematica, confirming the correctness of the guess. This envelope is itself an ellipse whose major axis is 1 and whose minor axis is the square root of (1-r2), both in units of the square root of 2E/k, where E is the energy, k is the spring constant and r the distance of the firing point from the force center.

The 1-Dimensional, 3-Body Problem with Finite Square Wells. R. S. Jones, The Ohio State University -- In this paper, the bound states of the one-dimensional, three-body problem are discussed. The three particles are assumed to be identical and non-relativistic. For definiteness, the pair-wise interaction between the particles is assumed to be the finite square-well potential. The Schrodinger equation is numerically solved and the bound states are classified according to the permutational symmetry and the parity.

From QCD to Relativistic Nuclear Physics. R.J. FURNSTAHL, The Ohio State University -- In the Dirac phenomenology of proton-nucleus scattering, nucleons in the nuclear medium are described using a Dirac equation with an optical potential featuring large (several hundred MeV) and cancelling Lorentz scalar and vector components. This phenomenology provides a simple yet quantitatively accurate model of spin observables over a wide range of energies and target nuclei. Analogous models for bound nucleons provide a good description of the ground state properties of nuclei. However, the connection of the phenomenology to QCD and the nature of the cancellation has not been established. We use QCD sum rule techniques to show how large and canceling scalar and vector self-energies can arise naturally in finite density QCD. Corrections to the leadind-order calculations and other applications are discussed. SUpported in part by the U.S. Department of Energy.

Critical Behavior of the Three Dimensional Four-State Clock Model. P.D. Scholten, Miami University, Oxford, Ohio -- Monte Carlo simulation has been used to determine the critical temperature and critical exponents of the three dimensional four-state clock model. Data were collected for simple cubic lattices of sizes L-8, 10, 14, and 20. The cumulant and renormalization techniques of Binder were used to determine the critical parameters. It is concluded that for the two-dimensional systems, the critical temperature of the four-state clock model is one half that of the Ising model and the critical exponents of the two models are the same.

Numerical Calculation of the Massive Schwinger Model. Yizhang Mo and Robert J. Perry, The Ohio State University. -- In this letter, the massive Schwinger model is considered in the light-front field theory. By extending Fock space to the 4-particle secotr

Calculation of the Subband to Continum Photo Absorption Spectrum of GaAs/ AlGaAs Multiple Quantum Wells. J. FERGUSON AND G. BAMBAKIDIS, Wright State University. -- The electric dipole matrix element and absorption coefficient have been calculated for subband-to-continuum transitions for a layered Type I multiple quantum well. A square well potential has been assumed. The motion of the charge carrier in the plane of the layers is described by simple plane wave states. The multiple quantum well parameters appearing inthe model include the number of periods, the well and barrier widths, the band offset and the carrier concentration inthe well. The specific case of electronic transitions in GaAs/AlGaAs is considered here. Phonon broadening of the absorption peak is incorporated via indirect processes. The temperature dependence of the width and position of the absorption peak is calculated and compared with experiment.

Enhancement of the Er3+ Emissions from AlGaAs:Er Co-Doped with Oxygen, J.E.COLON, D.W.ELSAESSER, Y.K.YEO and R.L. HENGEHOLD, Air Force Institute of Technology, Wright-Patterson AFB, OH, and G.S.POMRENKE, Air Force Office of Scientific Research, Washington, D.C. -- Low temperature photoluminescence measurements of AlGaAs co-implanted with Er and O were preformed. Er was implanted into AlxGa1-xAs (x + .1, .2, .3, .4) with an energy of 1 MeV and a dose of 5 s 10 13/cm2. Oxygen was subsequently implanted, at various doses, using an energy of 110 keV. At a low oxygen dose, 10 13/cm2, the PL intensity of the 4f emissions did not change significantly. However, samples implanted with a higher dose, 10 14/cm2, showed a significant increase in the intensity of the main Er emission near 1.538 um. The intensity of the peak was further enhanced upon increasing the 0 dose to 10 15/ cm2. The Er3+ emissions from the co-doped samples can be seen even at room temperature. The enhancement of the 4f emissions in the co-doped samples is possibly due to the formation of an Er-O complex.

Photoluminescence of MBE Grown Gallium Antimonide, J.A.DORIAN, R.L.HENGEHOLD, and Y.K.YEO, Air Force Institute of Technology, Wright Patterson AFB, OH, S.J.EGLASH, Lincoln Laboratory, MIT, and K.J.KEEFER, Phillips Laboratory, Kirtland AFB, NM. -- A low temperature photoluminescence study has been made for Ga Sb samples grown by MBE under different growth conditions. The undoped GaSb showed a native acceptor complex emission peak at 776 MeV, while bound excitations were observed from the emission energy range of 796 to 804 MeV. Sample temperature and laser excitation power dependence studies of the acceptor peak confirmed donor-accepter pair (DAP) transition behavior. A GaSb sample grown with a high Sb background pressure had emissions which were quite broad, as compared to those of a sample grown with a lower V:III flux ratio. A temperature dependence study aided in the identification of the broad emission into three separate emissions. It is believed that they are associated with DAP and free-to-bound transitions. Also, the broad emission was compared with that from Te doped n-type GaSb.

Theoretical Modeling of the Intersubband Transition in an Al03Gao7/GaAs Multiple Quantum Well Structure, T.VAUGHN, F.SZMULOWICZ, University of Dayton Research Institute, M.O.MANASREH, K.R.EVANS, C.E.STUTZ, Solid State Electronics Directorate (WL/EIRA), D.W.FISHER Materials Directorate (WL/MLPO). The absorption spectrum peak energy (hvo) of the intersubband transition (IT) is calculated from a nonparabolic-anisotropic envelope function approximation (NAEFA) method. Temperature dependent effective masses, nonparabolicity, conduction band offsets, the Fermi Level, and lineshape broadening are incorporated in th present NAWFA calculations. The experimentally determined peak position energy (PPE) exhibits a blue-shift as o increases (we will refer to this shift as density blue shift). Single particle calculations of hvo as a function of o exhibit a red shift. However, good agreement between the PPE density blue-shift and hvo is obtained when many body corrections (in particular electron-electron intrasubband exchange and direct Coulomb interaction energies, depolarization, and exciton-like shifts are incorporated in the NAEFA calculations. It is also observed that the experimental PPE shows a blue-shift as T decreases (we refer to this shift as temperature blue-shift). Single particle calculations of hvo as a function of temperature exhibit no shift. Upon the inclusion of many-body effects, however, the theoretical peaks also show a temperature blue-shift in excellent agreement with experimental results.

Broad-Band Photoluminescence from Si-Ge/Si Superlattices, M.M.CHI, T.D.STEINER, Y.K.YEO, R.L.HENGEHOLD, Air Force Institute of Technology, Wright Patterson AFB, OH, D.J. GODBEY AND P.E. THOMPSON, Naval Research Lab, Washington, D.C. and G.S.POMRENKE, Air Force Office of Scientific Research, Washington, D.C. -- A photoluminescence study has been made for Si-Ge/Si superlattice samples with well thicknesses ranging from 10 to 70 angstroms and Ge concentrations from 0.2 to 0.35. These superlattices exhibit a broad, intense photoluminescence band 50-120 MeV below the alloy bandgap. This band is important because of its potential application to Si-Ge light-emitting devices. We believe that the band is due to isoelectronic centers associated with localized fluctuations in Ge content in the alloy composition. The peak is prominent at 1.4 K, increases in intensity up to 20 K, then decreases at higher temperatures. Also, it shows a peak shift to lower energy and a norrowing bandwidth as sample temperature increases. All of these features are consistent with the aloy fluctuation model.

Effects of Annealing on Photoluminescence from Si Ge/Si Superlattices, T.D. STEINER, M.M.CHI, R.L.HENGEHOLD, AND Y.K.YEO, Air FOrce Institute of Technology, Wright-Patterson AFB, OH, D.J.GODBEY and P.E.THOMPSON, Naval Research Lab, Washington, D.C., and G.S. Pomrenke, Air Force Office of Scientific Research, Washington, D.C. -- Si Ge/Si superlattices (SL) grown by MBE at low temperature necessary for pseudomorphic growth are believed to have a high concentration of defects, many that are associated with nonradiative recombination. As-grown samples thus have low luminescent efficiencies that makes identification of photoluminescence features difficult. It is believed that post growth annealing under 650 C can increase PL efficiencies without altering the SL structure. We Have annealed Si Ge/Si SL using RTA at temperatures ranging from 525 to 850 C. Intensities of SL bound exciton lines were increased above those of the as-grown samples. We also see evidence of substantial increases in the broad band emission believed to be due to isoelectronic centers associated with localized fluctuations in Ge content within the Si Ge layers.

High Pressure Study of the Ga Antisite Acceptors in GaAs. A.KANGARLU, B.D. SMITH, University of Dayton, P.W.YU, Wright State University. -- Hydrostatic pressure effect of photoluminescence spectra in Ga-rich p-tpe GaAs was determined at 10 K by using a diamond anvil cell up to 60 kbar. Two low temperature 1.32 and 1.44 eV photoluminescence emission associated with Ga antisite double acceptor shows two different pressure coefficients. The emission were also studied at atmospheric pressure with various temperatures from 2 to 300 K in conjunction with electron irradiation. We find theat the 1.32 eV emission is not due to the Ga-/Ga-- transmission as commonly believed. Instead, we identify that the transition is due to gallium antisite double acceptor-effective mass donor pair complex.

State Science Day Winners

Each Year the SOS/AAPT with the help of the Ohio Section APS present awards to students at State Science Day. Awards are 1st-$100, 2nd-$50, 3rd-$10. In 1991 the awards were presented to:

HIGH SCHOOL

1st, Michael Ruthemeyer, St. Xavier High School, Cincinnati.

2nd, Jayen Madia, Pleasant HS, Marion.

3rd, Mike A. Lewis, Worthington Christian HS, Worthington.

JUNIOR HIGH

1st, Jamie LaCourt, Bishop Flaget School, Chillicothe

2nd, Michelle R. Dunlavy, St. Charles School, Lima

3rd, Laura Chrisman, Springfield Christian, Springfield.

oscillators. The fundamental rate coefficients for vibrational transfer from v'=1 to v'=0 range from 2.2 x 10-13 to 4.8x 10-12 cm3/molecule-sec. Scaling of the vibrational transfer rate with vibrational quantum number is in accordance with the Landau-Teller theory. The observed dependence of the transfer rates on reduced mass of the collision pair is compared to the predictions of the Schwatrz, SLawsky, and Herzfeld (SSH) theory.

Spin Orbit Relaxation in Atomic Bromine, R.F.TATE, G.P. PERRAM and W.B.ROH, Air Force Institute of Technology, Wright Patterson AFB, OH. -- Kinetic rates for deactivation of the spin orbit excited state of atomic bromine, Br(2P1/2), have been investigated using a steady-state photolysis apparatus. An Ar+ laser at 488 nm is used to photo-dissociate molecular bromine which produces about 50% Br(2P1/2). The Br(2P1/2 -- 2P3/2) emission at 2.7 um is detected as a function of buffer gas pressure to determine relative deactivation rate coefficients. The peak signal is observed at a molecualr bromine pressure of about 5 torr. Collision partners studied to date include O2, CO2, N2, Br2, SF6, He, Ne, Ar, Kr, and Xe. Electronic-to-vibrational energy transfer is known to be an efficient mechanism for CO2 collisions and experiments are planned to investigate E-V transfer for other polyatomic partners. Atomic bromine lasers are being considered for military electroptic counter measure missions and the implications for efficient laser development will be addressed.

Corrections to Slowly Varying Amplitude Approximation in ar2 Optical Medium. N.AMARASINGHE and D.S. MOROI Dept. of Physics, Kent State University and D. ZELMON, Materials Directorate (WL/MLPO), Wright Patterson A.F.B. -- Corrections to the solutions obtained earlier using slowly varying amplitude approximation (SVAA) for the coupled amplitude equations, which describe the interactions between the fundamental electromagnetic wave and its second harmonic in a bulk nonlinear x(2) medium have been obtained in complete analytical form using a pertubation method. These solutions have singularities when second harmonic amplitude is minimum and maximum. However, by a suitable choice of integration constants, we could eliminate the singularity when the second harmonic is a maximum. We believe that these solutions are the correct ones, since they behave well away from the boundary and of the order of 10-5 compared with those in SVAA. In the very vicinity of the boundary, however, the SVAA solutions themselves do not satisfy the SVAA condition |dA/dx|<<|kA|, where A is the complex amplitude of the electric field. We are currently attempting to find a solution, valid in the vicinity of the boundary of the medium, which provides a connection formula.

Electron Drift Velocities and Electron Attachment in Argon-Boron Trichloride Gas Mixtures. DONALD L. MOSTELLER JR, EDWARD L PATRICK, AND MERRILL L. ANDREWS, Physics Department, Wright State University and ALAN GARSCADDEN, Plasma Research Group, Wright Laboratory. -- Recent studies of Argon-Boron tricholride gas mixtures stem from its commercial appliation in boron doping, plasma deposition of boron, and plasma etching of aluminum and other III-IV compounds. Electron drift velocities were determined for several gas mixtures ranging from 10 ppm to 1% BCl3 in Argon. It was shown that over a wide range, the electron mobility increased as the E/N (electric field to gas density ratio) decreased. The electron drift velocity determination used in this analysis differs from the traditional approach by identifying the time position of greatest electron flux from the derivative of the current signal. Electron attachment was also observed and measured for these mixtures. Supported by Aero Propulsion and Power Directorate through the Southeastern Center for Electrical Engineering Education.

Investigation of Phase Conjugation Using Fiber Stimulated Brillouin Scattering (SBS) Laser. J.J. Druessel, K.A. WInk, and W.B. Roh, Air Force Institute of Technology, Wright Patterson AFB, OH. Stimulated Brillouin scattering (SBS) laser was demonstrated using a ring cavity containing a multimode optical fiber. The frequency shift of the SBS generated output beam was measured at 33.1 GHz. Pump laser power thresholds for SBS onset were determined for several ring cavity configurations and were compared with theoretical predictions. Optical phase conjugating properties of SBS ring laser with multimode optical fiber were investigated. No phase conjugation of an aberrated pump beam was evident in the Brillouin ring laser output.

Electrical Behavior of Er Doped GaAs by Ion Implantation and during MBE Growth, D.W. Elsaesser, J.E. Colon, Y.K. Yeo, and R.L. Hengehold, Air Force Institute of Technology, Wright-Patterson AFB, OH and K.R. Evans, Wright Laboratory, Wright-Patterson AFB, OH. -- Deep level transient spectroscopy (DLTS) measurements have been performed on a Si doped GaAs substrate doped with erbium by ion implanation (II) as well as by molecular beam epitaxy (MBE). Both the II and MBE samples (4x1019 Er/cm3) show a hole trap around 340 MeV above the balance band. In addition, the II sample has another hole trap at around 85 MeV, not seen, not seen in the MBE material. However, when growing MBE layers with Er at concentrations of approximately 6x10 18/cm3, we have observed room temperature hole concentrations of 4 x 10 16/cm3. Temperature dependent Hall measurements indicate that this conductivity is coming predominantly from an acceptor level with an activation energy of approximately 110 MeV. This data is consistent with Er occupying an As site and acting as a double acceptor.

Hall Measurements on Thin GaAs Layers During Electron Irradiation: Effects of SUrface States. S.M. LINDSAY, B. ZIEBRA, J.W.HEMSKY, D.C.LOOK, Wright State University -- The volume electron or hole concentration in a semiconductor sample can be determined from the Hall Coefficient only if the sample thickness is known. However, in a thin sample the electrical thickness may be considerably smaller than the metallurgical thickness because a fraction of the free electrons or holes are lost to immobile surface or interface states, and thus do not take part in the conduction. A further complication occurs under photon or electron irradiation, because the excess free electrons or holes are lost to immobile surface or interface states, and thus do not take part in the conduction. A further complication occurs under photon or electron irradiation, because the excess free electrons and holes created by the irradiation can neutralize charged surface states. We study this effect while performing Hall-effects measurements on 2500 A layers of n-type molecular beam epiaxial GaAs during 1 MeV, 40-250 nA/cm2 electron bean irradiation. As the beam is turned on, the surface potential energy decreases from the usual 0.70 eV to about 0.31 eV due to the neutralization of negatively-charged surface states. However, as the irradiation proceeds the surface potential energy decreases even more, to about 25 eV at a beam fluence of 6 x 10 16 el/cm2. At the same time, the free electrons concentration in the volume of the sample is also changing, due to the damage created by the 1 MeV electrons. A model for these effects will be discussed.

Deposition of SIlicon Carbide Thin Films by Reactive Ion-Beam Sputtering L.G.SILLS and J.D.TARGOVE, Air Force Institute of Technology, Wright-Patterson AFB, OH. Amorphous hydrogenated silicon carbide (a-SiCx:H) thin films have been deposited by reactive ion-beam sputtering of a silicon target with argon and methan ions. Index of refraction for visible and near IR wavelengths has been shown to vary with beam energy, and were related to Si:C ratio and hydrogen content. The surface structure of the films is featureless, with an average roughness of 5 A. Graphite shielding was added to eliminate metal contamination, with a resulting change in the index-beam energy relationship.

Semiempirical Self-COnsistent Calculations of Surface Restructuring: GaAs, S.G. DAS and B.L. DORSEY, Wright Laboratory, Materials Directorate, WL/MLPO, Wright-Patterson AFB, OH 45433. -- Self-consistent semiempirical Molecular Orbital Programs MOPAC[1] and MOSOL[2] are used for studying the surface restructuring and energetics of gallium arsenide substrates. The total energy calculations of different cluster sizes to determine the binding energy of surface layer arsenic atoms indicate that proper bulk termination of the surface and inclusion of second nearest neighbors is very important. The comparison of our results with ab initio results [3] is encouraging and indicates that potential of this approach for studying surface restructuring in semiconductors.

with an appropriate choice of basis functions, we are able to numerically compute spectra and wavefunctions for the first two states of the theory for arbitrary fermion mass. The known results for the ground state are readily reproduced. Agreement with alternative approaches for the first excited state is obtained for the two extreme cases (i.e. massless and very heavy fermion domains). In the moderate mass domain, the spectrum is obtained and some discussion will be provided. Supported in part by the National Science Foundation.

Gamow-Teller Strength Distributions for SOlar Neutrino Dectors Via the (p.n.) Reaction - S.DELUCIA, B.LUTHER, D.MARCHLENSKI,E.SUGARBAKER. Ohio State University. C.GOODMAN, W.HUANG, Y WANG, A SMITH IUCF. J.RAPAPORT Ohio University., R BYRD, T.TADDEUCCI LANL -- Before the neutrino capture strength for a nucleus can be accurately calculated, it is necessary to know the magnitudes of allowed Fermi and Gomow-Teller transition strengths connecting the detector ground states below the particle emission threshold in the final nucleus. Therefore, the forward angle neutron spectra for 69Ga(p.n.)69Ge, 97Mo(p,n)97Tc, and 127I(p.n.)127Xe at 120 MeV were measured using neutron time of flight techniques at the Indiana University Cyclotron Facility. Work supported by DOE and NSF.

The Maxwellian-Averaged Neutron Capture Cross Section for 16O. R.R.WINTERS, Denison University. 16O can form a significant neutron poison in scenarios of neutron capture nucleosynthesis if the capture cross section is sufficiently large. Earlier estimates of the 16)(n,r) cross section have been large enough to stimulate some effort directed toward estimating the effects. In this paper, it is argued that the early results are probably due to a misassignment of the spin of the resonance at 434 keV in N + 16O and hence that 16O is probably not a significant poison.

Polarimetric and Variable Sample Angle Spectroscopic Measurements of Free Standing Polymeric Films I Experiment. S.J. BAI University of Dayton Research Institute, R.J.SPRY, J.PROMISLOW and C.Y.CLEE, Materials Directorate, Wright Patterson Air Force Base -- Free standing polymeric films were analyzed for refractive index, film thickness, and absorption coefficient. THese films include both isotropic and anisotropic polyethylene-terephthalate (MYLAR) and anisotropic poly-p-phyenylene-benzobisthiazole (PBT). Polarimetric measurements at l=632 nm yielded the Brewester angle and a uniques interference pattern from which the refractive index and film thickness were simply determined. Transmission interference spectra over the range 300,l,2600 nm were obtained using several film tilting angles to determine refractive index dispersion and film thickness. Absorption coefficients were also obtained from the envelop of the interference extrema. The refractive indices of the MYLAR agree with those measured by other methods, while the refractive index of the PBT film was found to be anistropic and greatest along the extrusion direction with a value of 2.36 at l= 632 nm.

Polarimetric and Variable Sample Angle Spectroscopic Measurements of Free Standing Polymeric Films II Theory. T.VAUGHN Wright State University R.J.SPRY Materials Directorate, Wright Patterson Air Force Base, and S.J.BAI University of Dayton Reserach Institute. -- The Abeles matrix method has been used to model the polarimetric reflectivity and spectroscoptic transmittance of free standing polymer films. For both types of experiments, the modeling has been used to determine the accuracy of the experimental scheme in obtaining the refractive index and film thickness, and the range of validity of formulas for these quantities. The modeling of the polarimetric data has allowed the measurement of the absorption coefficient, a result not achievable through application of simple thin film formulas. The extraction of the absorption coefficient from the enveloope of the interference extrema has also been modeled.

Electron Impact Infrared Excitation Functions from Krypton. K.A. RIMKUS, J.D.CLARK, Wright State University and C.A.DEJOSEPH JR. Wright Laboratory WL/POOC-3 Wright Patterson A.F.B. -- Electron impact optical excitation functions of krypton have been measured in the infrared nad near infrared using a commercial Fourier transform spectrometer and an electron gun built in-house. Absolute calibration of the data was accomplished by comparison with measured Xenon optical cross sections which were absolutely calibrated using the Helium 728.1 nm cross section. Krypton transitions have been observed from 4d, 5p, 5p', 5d, 5d', 6s, 6s', and 7s configurations. This work emphasizes the calculations of absolute level cross sections for the levels in the 5p and 5p' configuration. The cascade contribution into these levels have been estimated and are dominated by transitions from the resonant levels in the 4d and 6s configurations. This cascade contribution is a large fraction of the apparent level cross sections and represents nearly 100% for some of the 5p levels. This may explain the pressure dependence of the measured optical excitation functions of the 5p and 5p' levels.

Astigmatism Correction of a Non-Imaging Double Spectrometer Fitted with a 2D Array Detector. P.P. Yaney, S.L. Ernst and J. Blackshire, University of Dayton -- A SPEX 1401 double spectrometer was adapted for a liquid nitrogen cooled CCD detector to permit both spectral and spatial analysis of ceramic specimens in a laser Raman microprobe system. The exit image of the spectrometer suffers from astigmatism due to off-axis spherical mirrors. A cylindrical lens was added before the CCD to correct for astigmatism. The spectrometer and several lenses were modeled using an optical ray tracing program to characterize the astigmatism and to optimize the locations of the lens and detector. THe astigmatism and spot pattern sized determined by the model were in good agreement with the observed performance of the modified spectrometer-detector system. Typical spot patterns fell within the 23 um spare pixel size. Partial support by DOE through Martin Marietta.

Phase-conjugate Twyman-Green Interferometry using a BaTiO crystal, D.A. DETERMAN AND W.B.ROH Air Force Institute of Technology, Wright Patterson AFB, OH. -- Phase conjugate Twyman-green interferometry using a BaTiO crystal has been performed to demonstrate the versatility of the interferometer by testing optical quality of a variety of optical windows, mirrors, and lenses. This interferometer provided a highly sensitive test for collimation. Achieving a collimated beam by measuring the beam diameter at various distances from the origin produced a beam with a 0.254 +- 0.012 coefficient for defocus. The phase-conjugate interferometer allowed adjustments to the collimating lenses that gave a collimated beam with a 0.009 +- 0.006 coefficient for defocus. Configurations for testing optical quality used both divergent and collimated beams.

Temporal Correlation Studies of Gas FLows Using Raman & Rayleigh Scattering in a Two Pulsed Laser Scheme. J.W.PARISH and P.P.YANEY, University of Dayton. -- A two-laser spectroscopic system has been developed to optically probe gas flowfields in air. Data were fitted to the theoretical correlation coefficient of the form exp(-t/tf), where t is the delay time and tf is the integral scale. Plotting tf versus Reynolds number (Re) at axial position x=15D showed an Re-1 dependence. Plotting tf versus x at Re=9140 increased with x. In the second case, tf was lower for measurements using Raleigh scattering (RayS). This may in part be due to different probe volumes. However, it appears that RayS effectively probes the relative unmixedness of the fluid while Raman scattering (RS) probes the dynamics of the fluid motion. Studies of this issue by recording cross-correlations between RS and TayS signals are in progress. Partial support by Ohio Board of Regents.

Vibrational Energy Transfer in Bromine Monofluoride, T.L.THOMPSON, D.W. MELTON, W.B. ROH, AND G.P.PERRAM, Air Force Institute of Technology, Wright Patterson Air Force Base, Ohio. -- Electronic quenching and quantum resolved vibrational energy transfer in the B3II(O+) state of bromine monofluoride have been studied using pulsed, spectrally resolved laser induced fluorescence techniques. Rate coefficeints for state-to-state vibrational transfer were determined from the temporal dependence of observed BrF(B-X) emission in the presence of He, Ne, Ar, Kr, Xe, and CF. The vibrational transfer is rapid and is well characterized by the Montroll-Shuler model for harmonic

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Contributions to the Dialog are always welcome. Address your correspondence to: Mike Grote, Mariemont High School, 3812 Pocahontas Avenue, Cincinnati, Ohio 45227

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SOS-OS/AAPT SPRING MEETING
SATURDAY, MARCH 14, 1992
OHIO STATE UNIVERSITY
PHYSICS DEPARTMENT, SMITH LABORATORY

8 am - noon REGISTRATION, Room 1036

COMMERCIAL EXHIBITS AND REFRESHMENTS, Room 1048

MORNING SESSIONS

9:00 am CONTRIBUTED PAPERS
SESSION I (Room 1042)
SESSION II (Room 1005)
SESSION III (Room 1180)
See CONTRIBUTED PAPERS PROGRAM FOR PRESENTATIONS

10:00 am GENERAL SESSION (Room 1009)
WELCOME by Frank DeLucia, Chairman, Physics Department, OSU

DEMONSTRATIONS FROM VMI
Ray Carpenter and Richard Minnix - Virginia Military Institute

11:00 AM HOW-I-DO-IT SESSION (Room 1005)

LUNCH
Fast Food on High Street (a block away)

AFTERNOON SESSIONS

1:00 pm M.U.P.P.E.T.-COMPUTER ASSISTED PHYSICS PROGRAM (Room 1005)
Edward (Joe) Redish - University of Maryland

2:00 pm BUSINESS MEETINGS FOR INDIVIDUAL SECTIONS
OS/AAPT (Room 1009)
SOS/AAPT (Room 1005)
Door prizes immediately after business sessions (Room 1005)

PARALLEL WORKSHOPS and OPEN HOUSE
(Start immediately after door prize drawing)

Fast Action Flash Photography Workshop - Dick Zitto (Room 2193)
Preregistrants only!

PASCO 6500 Computer Interface Workshop - Joe Gear (Room 2024)

Maclab Open House - Andy Stenger and Staff (Room 2076)

Video Tape, Laser Disc, and CD-ROM Display (Rooms 3081 and 3095)

CONTRIBUTED PAPERS - SESSION I (Room 1048)

Hosting a Meeting of the SOS/AAPT. JAMES F. SULLIVAN, OMI College of Applied Science of the University of Cincinnati - Experiences gained while hosting the October 13, 1990 meeting of the SOS/AAPT will be presented in the hopes that others will volunteer to host future section meetings. Items discussed will include a description of a typical meeting, pre-meeting planning and publicity, meeting finances, and the care and feeding of speakers and vendors. A paper describing the process will be distributed to those present.

Making Cheap and Simple Musical Instruments. DICK HECKATHORN, Educational Consultant, Vermilion, OH - Using 4-1.5 inch PVC pipes of lengths 50.4, 44.5, 39.5 and 33.4 cm in lengths, one can play a song 5 different ways, as well as demonstrate closed and open pipe resonance. Using 1/2 inch metal conduit pipe of lengths 32.32, 30.42, 28.71, 27.90, 26.33, 24.85, 23.46 and 22.79 cm, a tempered musical scale from 1024 to 2048 Hz can be constructed. Learn the mathematics that underlie its behavior.

Operating a Transmitter at the Voice of America Radio Station. JAMES F. SULLIVAN, OMI College of Applied Science of the University of Cincinnati - The Voice of America (VOA) is 50 years old in 1992. As part of the official celebration a group of amateur radio operators was recently permitted to operate radios, in the amateur radio bands, using the facilities at the VOA Bethany Relay Staion (approximately 32 km north of Cincinnati, Ohio). The amateur operation will be described along with a brief history and description of the VOA facility. Photographs of the VOA transmitters and antenna systems will be shown.

Modern Physics Conference Report. ROY McCULLOUGH, Amherst, Ohio - I would like to discuss concepts from my attendance at the Modern Physics Institute this past summer.

SESSION II (Room 1005)

Amusement Park Physics. RON MONNIER, Western Hills High School and ROBERT SPEERS, Bowling Green State University - Each spring hundreds of thousands of high school students conclude their year with a great real-world laboratory experience--a trip to an amusement park. The inducement for the students is grades and fun. The grades result from the the study of physics in an amusement park and completion of assigned exercises. The fun is the great time in the amusement park.

In these days of accountability, joint projects between education and business are highly beneficial. Amusement park physics is a win-win-win activity for the students, the schools and the amusement parks. To be discussed in this talk are the education-business collaboratives that makes Physics Days possible, the instruments used by the students and the planned activity for this year at Cedar Point and Kings Island.

arCHimedeS meets mAndlebrOt: an introduction to chaos. JUDITH JOHNSON, Central State University - Depending on the radius/height ratio, a floating paraboloid will assume one of three positions - (Archimedes). In a simpler case, a floating sphere gives rise to a cubic equation which predicts the depth to which the ball will sink. Values of "x" chosen near a root of the cubic can be shown to converge (through a series of iterations) to a nearby root. However, in certain intervals, 3 values differing by "e" (1.64, 1.65, 1.66) are each attracted in a chaotic manner to a different root. Extreme sensitivity to initial conditions. As smaller values of epsilon are chosen, the phenomen continues. When complex numbers are used for initial values, the attractors continue to be the real roots of the initial equation. Assigning a complex number to each pixel on the screen, then changing it to one of three attractor colors produces Mandlebrotian graphics. A few TI-81's will be available for demonstration purposes.

A Survey of Video Equipment Found on the Retail Market. CAROL DAMIAN and RON HAVLICE, Dublin High School - Types of video equipment/products available on the general (retail) market that are up-dated and make video tape editing easy have been investigated. The equipment includes cameras, VCR's, microphones, sound-over equipment, and other products of this type. We have investigated features, cost, ease of operation and durability.

SESSION III (Room 1180)

A Comparison of the Results from the "Hestenes Force Inventory" Taken by Calculus-Based and Algebra-Based Introductory Physics Classes. FRANK GRIFFIN and GREG TOWNSEND, University of Akron - The Hestenes Force Inventory measures Newtonian ideas vs common sense beliefs about forces for a number of circumstances. The Hestenes test will be described along with the differences and similarities in performance of two introductory physics classes. Possible reasons for the differences in performance on some areas of the test will be presented.

Magnetism for the Middle School Student. REGGIE ROSE, South High School, Columbus, OH - Simple demonstrations and experiments to illustrate magnetic effects to middle school students will be shown. Easily available and inexpensive materials will be used.

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April 9, 1992

Nicole Wagschal
AAPT Announcer
5112 Berwyn Road
College Park, MD 20740-4100

Dear Ms. Wagschal,

I've enclosed a description of the Spring, 1992 meeting of the Southern Ohio Section / AAPT as well as a list of the current SOS/AAPT officers for the next edition of The Announcer.

The Fall, 1992 meeting will be hosted by Sinclair Community College in Dayton, Ohio on Saturday October 17th. Contact person is Fred Thomas (513) 226-2886.

The Spring, 1993 meeting will be at Dublin High School in Dublin, Ohio. The exact date has not yet been set. Contact person is Carol Damian (614) 764-5900.

Please let me know if I can be of additional help to you. My private office number is (513) 556-4872.

Sincerely,

Jim Sullivan

James F. Sullivan
Professor of Physics
Secretary SOS/AAPT

SOUTHERN OHIO SECTION
AMERICAN ASSOCIATION OF PHYSICS TEACHERS
SPRING MEETING, 1992

The Southern Ohio Section (SOS/AAPT) met on Saturday March 14, 1992 in the Smith Laboratory Building at The Ohio State University in Columbus, Ohio. This was a joint meeting with the Ohio Section of the AAPT.

The invited speakers (and their papers) were:
Ray Carpenter and Richard Minnix, Virginia Military Institute (Demonstrations from VMI).
Edward (Joe) Redish, University of Maryland (M.U.P.P.E.T. - Computer Assisted Physics Program)

The contributed speakers (and their papers) were:
James F. Sullivan, OMI College of Applied Science of the University of Cincinnati (Hosting a Meeting of the SOS/AAPT)
Dick Heckathorn, Educational Consultant Vermillion, OH (Making Cheap and Simple Musical Instruments)
James F. Sullivan, OMI College of Applied Science of the University of Cincinnati (Operating a Transmitter at the Voice of America Radio Station)
Roy McCullough, Amherst, Ohio (Modern Physics Conference Report)
Ron Monnier, Western Hills High School (Cincinnati, OH) and Robert Speers, Bowling Green State University (Amusement Park Physics)
Judith Johnson, Central State University (arCHimedeS meets mAndlebrOt: an introduction to chaos)
Carol Damian and Ron Havlice, Dublin High School (Dublin, OH) (A survey of Video Equipment Found on the Retail Market)
Frank Griffin and Greg Townsend, University of Akron (A Comparison of the Results from the "Hestenes Force Inventory" Taken by Calculus-Based and Algebra-Based Introductory Physics Classes)
Reggie Rose, South High School (Columbus, OH) (Magnetism for the Middle School Student)

Approximately ten persons presented ideas in the HOW-I-DO-IT Session in the late morning

In the late afternoon four workshops and open house sessions were offered in parallel:
Dick Zetto (Fast Action Flash Photography Workshop)
Joe Gear (PASCO 6500 Computer Interface Workshop)
Andy Steger and Staff (Maclab Open House)
OSU Physics Department (Video Tape, Laser Disc, and CD-ROM Display)

Throughout the day commercial exhibits and refreshments were available for all participants. Special thanks to William Ploughe for organizing this excellent meeting and to Frank DeLucia, Chair of the Physics Department at OSU, for his support.

Respectfully Submitted,
James F. Sullivan
Secretary, Southern Ohio Section

SOUTHERN OHIO SECTION
AMERICAN ASSOCIATION OF PHYSICS TEACHERS
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March 14, 1992

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April 9, 1992

Michael G. Grote
Physics Teacher
Mariemont High School
3812 Pocahontas Avenue
Cincinnati, OH 45227

Dear Mike,

As I recall an issue of The Dialog is scheduled to be printed in the very near future. Enclosed please find three items: the names and contact information for the current SOS/AAPT officers, the minutes of the March 14th business meeting, and the abstracts of the contributed papers at the March 14th meeting. Due to an embarrassing mental lapse on my part I did not attend the Executive Committee meeting on March 14th, but I understand that Associate Secretary Bob Cunningham took minutes of that meeting.

I presume you will also get materials from Fred Thomas (Sinclair Community College 513-226-2886)- the host of the Fall, 92 meeting and a short item from Carol Damian (Dublin High School 614-764-5900) - the host of the Spring, 93 meeting.

If he has not already done so, Bill Ploughe could supply you with information on future SOS/AAPT meetings.

Let me know if I can help. When you do run the Dialog, could you send one extra copy - I will put it in the secretary's files. Thank you very much - see you on the 25th.

Best Regards,

James F. Sullivan,
Secretary SOS/AAPT

P.S. Mike, please call me when these arrive, so I know they are safe (Office 556-4872, Home 662-9560).

cc R. Cunningham
C. Damian
W.Ploughe
F.Thomas

SOUTHERN OHIO SECTION
AMERICAN ASSOCIATION OF PHYSICS TEACHERS
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March 14, 1992

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Minutes of the Business Meeting
of the
Southern Ohio Section
American Association of Physics Teachers

The Ohio State University
Columbus, Ohio
Saturday March 14, 1992

The meeting of Southern Ohio Section of the American Association of Physics Teachers (SOS/AAPT) was called to order by President R. Monnier at 2:19 PM on Saturday March 14, 1992 in Room 1005 of the Smith Laboratory on the campus of The Ohio State University in Columbus, Ohio.

Vice-President F. Thomas reported that the next regular meeting of the SOS/AAPT will be at Sinclair State College in Dayton, Ohio on Saturday October 17, 1992. Contact person is Fred Thomas (513) 226-2886

Section Representative J. Poth gave the Section Representative report:

Other sections have suggested that the SOS/AAPT hold joint meetings with them, including the Indiana, Western Pennsylvania, and Appalachian Sections.

The (national) AAPT three meeting/year model is now in operation. The joint meeting with the American Physical Society (APS) is always the April meeting in the Washington, DC area. There were approximately 1200 registrants at the AAPT meeting in Orlando, Florida in January, 1992.

New officers of the AAPT: H. Voss (Arizona St.) - Vice President, J. Layman (U. of Maryland) - Secretary, J. Hein - Associate Executive Officer.

The AAPT will be a one-third partner in the new American Center for Physics building. It will be built on a twelve-acre site in College Park, Maryland. The building will have 115,000 ft^2 of which the AAPT will be allocated 11,000 ft^2.

The new Physics Teacher Resource Agent (PTRA) has been awarded a three-year grant. It is being called the PTRA-PLUS program and will include some former as well as some new PTRAs.

The elections were held. The newly-elected officers are listed elsewhere in this issue of The Dialog.

R. Turner requested that the communications be improved for future meetings. Information should include earlier printings of The Dailog, maps, and points of contact.

The treasurer's report was made to the members by Treasurer R. Teese.

W. Dollhopf reminded the membership that the Ohio State Science Fair is on Saturday April 25, 1992. We need judges for the Physics

awards. Contact Bill Dollhopf at (513) 481-2472.

J. Sullivan reminded the membership that the Spring, 1993 meeting will mark the tenth anniversary of the SOS/AAPT. Ideas for the celebration are requested.

President W. Ploughe announced the formation of a Membership Committee. This committee will consist of the SOS/AAPT Vice Presidents, along with Roger Grossenbacke, and Darlene Lein. One of their goals is to determine how to make SOS/AAPT meetings more attractive to high school teachers.

The meeting adjourned and we were joined by the Ohio Section members for the awarding of the door prizes.

Respectfully Submitted,
James F. Sullivan,
SOS/AAPT Secretary

Hosting a Meeting of the SOS/AAPT. JAMES F. SULLIVAN, OMI College of Applied Science of the University of Cincinnati - Experiences gained while hosting the October 13, 1990 meeting of the SOS/AAPT will be presented in the hopes that others will volunteer to host future section meetings. Items discussed will include a description of a typical meeting, pre-meeting planning and publicity, meeting finances, and the care and feeding of speakers and vendors. A paper describing the process will be distributed to those present.

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Bernard V. Khoury, Executive Officer

1992 APS/AAPT Spring Meeting
April • Washington, DC

1992 AAPT Summer Meeting
August • University of Maine

1993 AAPT Winter Meeting
January • New Orleans, LA

Memo to: Section Secretaries
From: Nicole Wagschal, AAPT *Announcer*
Date: May 6, 1992
RE: September *Announcer* copy

Before you pack up your chalk and remove all of your AAPT journals from your shelves for the year, there is just one more thing that we request of you. Since we produce the September issue of the *Announcer* over the summer, I would just like to take this time to remind you that the copy deadline for that issue is **June 24**. Please send me any section news or calendar news that you would like included in the September (back-to-school) issue by this date.

Additionally, your section representative has received a copy of the information we currently have on file for your section to include in the Section Officers' Directory. Please contact your section representative if there are any further amendments you feel necessary to correctly complete the information for your section. The deadline for the directory is **June 1**.

I thank you in advance for your cooperation. Have a great summer!

AMERICAN ASSOCIATION OF PHYSICS TEAC
Executive O
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Bernard V. Khoury, Executive Officer

1992 APS/AAPT Spring Meeting
April • Washington, DC

1992 AAPT Summer Meeting
August • University of Maine

1993 AAPT Winter Meeting
January • New Orleans, LA

August 13, 1992

James F. Sullivan
OMI College of Applied Science
2220 Victory Pkwy
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Dear James:

Although you are probably just returning from the Summer Meeting in Orono, we are already catching our breath and looking ahead to the Winter Meeting to be held in New Orleans in January. The December issue of the Announcer will serve as the meeting issue for New Orleans and therefore will be read by a good portion of the membership. So make sure your copy makes it into this important issue before the **Sept. 18** copy deadline. All invited abstracts are due by Sept. 7 and contributed abstracts by Sept. 14.

Feel free to submit any section news, calendar news, or announcements that you would like to see printed in the Announcer. For production purposes, it would be helpful if each part be received on a different page (e.g. section news, calendar dates, any new section officer information, etc.). Thanks for your continuing help in keeping our sections an integral part of AAPT.

I look forward to hearing from you soon.

Sincerely,

Nicole Wagschal

Nicole Wagschal
Publications Specialist

Spring 93 Meeting March 6, '93 Carol Damian

Fall '93 Meeting

Executive Meeting
SOS AAPT
March 14, 1992

The meeting was held after the formal sessions at the Spring 1992 meeting at Ohio State University. The following items were discussed.

1. The Spring 1993 meeting is tentatively set for Dublin, Ohio March 6 or 13. March 6 is the preferred date.

2. It is suggested that we add a "How I do it" session to our Fall meeting at Dayton. It should continue to be informal.

3. The Fall 1993 meeting site is not certain, but we hope Bill Kuhlman can host us at Cincinnati.

4. The Spring 1994 meeting could be a joint meeting with the Indiana Section, the Appalachian Section, and/or the Western Pennsylvania Section. We need to work this out.

5. Attendance at the March 14, 1992 meeting was 79 or 80.

6. The Fall 1992 executive meeting will be held during the Fall 1992 meeting at Sinclair.

7. The dues checkoff at the national level is being worked on by the executive secretary.

8. Membership and income is critical for our section. We had 37 members from our section at this meeting.

9. Contributions to the *Dialog* might be done via computer disk. This will have to be checked with Mike Grote.

10. We need to have mass mailings to those in our region, those on the national list and those on the SOS list.

Respectfully Submitted

R. W. Cunningham

Minutes of the Executive Committee
of the
Southern Ohio Section
American Association of Physics Teachers

Sinclair Community College
Dayton, Ohio
Saturday October 17, 1992

The Executive Committee of the Southern Ohio Section of the American Association of Physics Teachers (SOS/AAPT) met in room 164 of the Ponitz Sinclair Center at Sinclair Community College. Those present were R. Cunningham, M. Grote, D. Lien, J. Oostens, W. Ploughe, D. Portman, J. Poth, J. Sullivan, R. Teese, F. Thomas, T. Toepker, and S. Yerian.

The meeting was called to order at 12:00 noon by President W. Ploughe. President W. Ploughe distributed an agenda for this meeting (enclosed).

The minutes of the last executive committee meeting (March 14, 1992) were distributed by Associate Secretary R. Cunningham. These minutes were approved as distributed.

Treasurer R. Teese distributed the treasurer's report (enclosed, dated 10/16/92). This report was accepted. The idea of getting a new interest-bearing checking account was discussed. J. Sullivan will seek information on this. It was also determined that the section should recheck its dues updating methods.

Dialog Editor M. Grote reported that the latest edition of The Dialog was Xeroxed for the first time at a cost of $0.12 per copy. He recommended that this process continue.

F. Thomas, the host for this meeting, reported that there were 35 advanced registrations and 25 to 25 walk-in registrations for a total of 55 to 60 participants. He was applauded by the committee.

Section Representative J. Poth reported that the attendance at recent national AAPT meeting in Orano, Maine was 1300. Ground has been broken for the new American Center for Physics. The AAPT's financial obligation in this center is 2.1 M$ of a total cost of 30 M$. Persons interested in the new PTRA plus program (PTRA - Physics Teacher Resource Agents) should contact the national AAPT headquarters. Copies of the national AAPT Newsletter (October, 1992, vol. 1, No. 1) were distributed (enclosed). J. Poth will send a questionnaire back to the national AAPT headquarters regarding this newsletter. The national AAPT is having a membership drive - for every 10 new members the section gets $100 good either for AAPT products or towards a national meeting registration.

A discussion of future meetings followed. The spring, 93 meeting will be in Dublin, OH on March 6, 1993. - Carol Damien is the contact person. The theme of this meeting will be School - Business

Interactions. The fall, 93 meeting could be in Cincinnati, possibly at St. Xavier High School. President Ploughe will contact W. Kuhlmann regarding this meeting. The spring, 94 meeting could be a joint meeting with the W.Pa., and Appalachian Sections - possibly at Kent State University / Tuscarawas. Possible sites for the fall, 94 meeting are Shawnee State University and Xavier University. A possible future meeting with the Indiana Section / AAPT was discussed.

Under old business, D. Lien suggested that letters be sent to the "physics teacher" at all high schools in the section requesting that they join the SOS/AAPT.

D. Portman reported that the high school physics prize contest will again take place in the spring. D. Portman will look into the possibility of using a national exam. The idea of placing a permanent plaque in each participating high school on which the winner's name could be placed each year was discussed. This might be accomplished with industrial support.

Under new business, the Ohio State Science Fair again will need many judges for the physics awards next spring. Team projects will be tried (on a trial basis) in the spring of 1993.

W. Ploughe reported that the Science Education Council of Ohio (SECO) meeting is February 18-20, 1993 in Cleveland. The SOS/AAPT and the Ohio Section /AAPT are jointly sponsoring a booth at this meeting. D. Lien will help.

W. Ploughe announced that the executive committee will meet on Saturday January 23, 1993 in the Dayton area.

M. Grote requested that material for The Dialog be sent to him and asked if the national AAPT Newsletter is available on disk.

The meeting adjourned at 1:43 pm.

Respectfully Submitted,
James F. Sullivan,
Secretary

EXECUTIVE COMMITTEE MEETING AGENDA

1) INTRODUCTIONS

2) SECRETARY'S REPORT — Jim Sullivan

3) TREASURER'S REPORT — Bob Teese

4) DIALOG EDITOR'S REPORT — Mike Grote

5) REPORT OF HOST — Fred Thomas

6) FUTURE MEETINGS
   - Spring 1993 — Carol Damian, Dublin, High School
   - Fall 1993
   - Spring 1994
   - Beyond?

7) OLD BUSINESS
   - Membership Committee
   - Associate Secretary and Associate Treasurer Positions
   - High School Physics Exam

8) NEW BUSINESS
   - SECO Meeting - February 18-20, 1993
   - AAPT Summer Meeting - Boise, Idaho - August 7-12, 1993
   - Other Meetings and Events
   - Nominating Committee
   - Other

9) SECTION REPRESENTATIVE REPORT — Jim Poth

10) ADJOURN

10/17/92
SINCLAIR COMMUNITY COLLEGE
[illegible]

Summary of attendance & receipts for SOS/AAPT 1992 Fall Meeting

	Number	Received	Buffet	Regist.	Membership
Reg. Members	29	$508.45	$98.45	$290.00	$120.00
Students	4	$8.00			$8.00
Retired	1	$5.00			$5.00
SCC faculty	12	$57.90	$17.90		$40.00
Non-members	4	$56.95	$8.95	$48.00	
Guests	8				
	==	=======	=======	=======	=======
Meeting Totals	58	$636.30	$125.30	$338.00	$173.00
Non-attending membership renewal	1	$5.00			$5.00
		=======	=======	=======	=======
Grand Totals		$641.30	$125.30	$338.00	$178.00

SOS/AAPT
Statement of Revenues and Expenses

	1986	1987 through Nov. 13	1987/88	1988/89	1989/90	1990/91	1991/92
Revenues:							
Contributions	$0.00	$0.00	$0.00	$165.10	$0.00	$0.00	$0.00
Dues (regular membership)	$600.00	$590.00	$470.00	$565.00	$395.00	$502.00	$385.00
Dues (student membership)	$6.00	$2.00	$4.00	$2.00	$0.00	$2.00	$0.00
Dues (retired membership)	$0.00	$7.00	$0.00	$0.00	$0.00	$0.00	$0.00
Contributing membership	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Physics Prize income	$361.82	$100.50	$167.50	$0.00	$170.50	$62.00	$38.50
State Science Day income	—	—	—	$300.00	$250.00	$0.00	$500.00
Workshop registration	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$204.00
Advertizing income	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Conference registration	$76.00	$86.00	$100.00	$88.00	$114.00	$0.00	$301.00
Misc. conference income	$136.50	$87.50	$31.50	$0.00	$43.07	$0.00	$0.00
Conference meals income	—	—	$131.25	$54.25	$0.00	$0.00	$0.00
Total Revenues:	**$1,180.32**	**$873.00**	**$904.25**	**$1,174.35**	**$972.57**	**$566.00**	**$1,428.50**
Expenses:							
Misc. supplies	$27.81	$25.76	$37.93	$15.43	$37.09	$56.36	$81.01
Conference expense	$636.88	$131.50	$127.50	$263.20	$169.57	$0.00	$204.00
Physics Prize expenses	$517.61	$154.68	$0.00	$0.00	$73.82	$0.00	$60.58
Postage	$214.00	$192.57	$93.36	$412.41	$118.69	$203.38	$219.46
Printing	$124.00	$275.00	$395.00	$245.00	$70.00	$165.00	$184.49
Building fund	—	—	$50.00	$0.00	$0.00	$0.00	$0.00
State Science Day Prizes	—	—	$100.00	$350.00	$350.00	$350.00	$320.00
Total Expenses:	**$1,520.30**	**$779.51**	**$803.79**	**$1,286.04**	**$819.17**	**$774.74**	**$1,069.54**
Net Income:	**($339.98)**	**$93.49**	**$100.46**	**($111.69)**	**$153.40**	**($208.74)**	**$358.96**
Cash balance:	**$914.90**	**$1,008.39**	**$1,108.85**	**$997.16**	**$1,150.56**	**$941.82**	**$1,300.78**

10/16/92

AAPT Newsletter

American Association of Physics Teachers

October 1992, Vol. 1, No. 1

Why a Newsletter?

The American Association of Physics Teachers (AAPT) is committed to advancing the quality of physics education in the United States and throughout the world. To provide information and services to more physicists and teachers and to establish better lines of communication with the physics community, AAPT is providing this newsletter to its sections. This first newsletter is an experimental venture in communication, primarily for the benefit of section members and guests who are not national AAPT members but who have indicated a sincere interest in physics education.

National and Local

The AAPT has a unique relationship with local sections. Unlike many other scientific and professional societies, an individual may become a member of a local section without becoming a member of the AAPT organization. Likewise, someone may be a member of the AAPT without joining the local section. Each has special opportunities to offer. The sections offer programs, direct contact, and networking with other geographically proximate physics teachers who often share local experiences and may share information about regional resources; while the AAPT offers information, meetings, conferences, products, program involvement, and services with national and international influence and audience.

If you are an AAPT member, you may want to pass this newsletter along to a colleague who is not. If you are not currently a member, you may want to help yourself and your section by joining AAPT today. Please use the enclosed membership application, and be sure to include your section's name where indicated. Your section will then be credited with recruiting a new AAPT member (see page 4).

AAPT Benefits

Members of the AAPT have access to a wide range of resources. A member may choose to subscribe to the *American Journal of Physics* and/or *The Physics Teacher*. Each member receives the *Announcer* (AAPT's news magazine with meeting schedules, product and program updates, and announcements) and *Physics Today*. Members may also purchase AAPT products at a discount, register for any of the three national meetings at a discount, participate in a variety of AAPT activities and programs, and receive guidelines and association position papers. AAPT is a member society of the American Institute of Physics (AIP), which provides services to many scientific societies involved in physics and related topics. AIP represents many interests of the physics community in the national and international academic and political communities and forums.

AAPT has much to offer including conferences, programs, activities, and products. Take advantage of these unique opportunities and join us in our goals of advancing the teaching and learning of physics at all levels and promoting an appreciation of the role of physics in our culture.

If you have any questions, please contact: AAPT, Membership Services, 5112 Berwyn Rd., College Park, MD 20740-4100, 301-345-4200.

Sincerely,

James H. Stith
AAPT President

Sincerely,

Bernard V. Khoury
AAPT Executive Officer

AAPT Executive Officer's Report

Bernard V. Khoury

Workshops

Workshops are a very important part of our national Summer and Winter Meetings. Because they are hands-on sessions, they are limited by resources such as terminals and equipment. Hence, we continue to repeat our advice that early registration for our meetings is imperative if you have clear preferences for a specific workshop. While we regret the need to restrict registrations, there is no practical alternative given the space, equipment, and time constraints.

Special October Mailing

All national AAPT members will receive a special mailing in October with preregistration materials for the New Orleans meeting. The December issue of the *Announcer* will have duplicates of all preregistration materials as well as the full program for the January meeting.

Again, we urge members to use the preregistration materials in the special October mailing and to register early for the meeting.

PTRA-PLUS

About 125 secondary school teachers participated in six days of training and workshops at the 1992 Summer Meeting in Orono. This was the first year of our three-year effort supported by NSF to develop workshop materials and to train teachers to use these materials to conduct a series of workshops around the country.

This pioneering "train the trainers" effort was developed by AAPT several years ago in the original PTRA (Physics Teaching Resource Agents) program. Jim Nelson, Larry Badar, and Robert Beck Clark are playing the lead roles in our current effort to extend the program to more teachers and to develop more workshop materials. One of the objectives is to put in place a system whereby such training activities can continue on a self-support basis.

Applications will soon be available for new participants who may wish to join in the PTRA-PLUS program scheduled for the AAPT Summer Meeting in Boise. Participants receive a nominal stipend, travel expenses, and an opportunity to engage in this exciting program of self-improvement and outreach.

New Building

As anticipated, the American Center for Physics has settled on a 24-acre parcel of property for the new headquarters location of AAPT, The American Physical Society, and the American Institute of Physics. Ground breaking has occurred, architectural design is complete, site preparation is now underway, and a physical structure will soon emerge.

The formal closing of the land settlement was an extraordinary event as we attempted to reach final decisions before a June 30 deadline. Our own team of engineers, attorneys, and consultants conferred for five hours and developed last minute judgments on the evening of June 29. We were then joined by the property owner with attorneys and also various lienholders with their own attorneys. The negotiations and signing of scores of documents occupied the remainder of the night with the final documents not taking shape until dawn on June 30. The seller delivered all residual documentation to us at about noon and the formal recording in the local courthouse took place in mid-afternoon on June 30.

The deliberative process of negotiating for the land and designing the building is now coming to term. The three organizations hope to occupy our new building in about 18 months.

Planning Ahead

While AAPT has had a year full of activities and projects involving hundreds of our members in 1992, current planning suggests that 1993 will provide even more options for members to participate in a variety of projects.

- In 1993 we will continue our three-meeting mode with the Winter Meeting in New Orleans in January, the APS/AAPT Joint April Meeting in Washington, DC, and the Summer Meeting at Boise State University in August.
- We are seeking external support for a conference on teaching laboratories to be held at our Summer Meeting in Boise.
- The 1993 Summer Meeting will also be the occasion of the second year of PTRA-PLUS and its training and workshops for about 125–150 high school teachers.
- The third in a series of U.S.-Japan-China conferences on physics education is scheduled for July 1993 in China. Len Jossem of Ohio State is leading the United States planning for our participation and we are seeking external support to assure a strong U.S. delegation.
- The United States will host the XXIV International Physics Olympiad in July 1993 in Williamsburg, VA. Scores of our members will be involved in preparations and planning for this international event. Arthur Eisenkraft is taking the lead in planning, while Larry Kirkpatrick and Avi Hauser will again direct the training of the U.S. Physics Team.
- Plans are also underway to hold the next in our occasional series of Conferences of Physics Department Chairs. Planning for this effort is headed by Gary Crawley of Michigan State University.
- Jim Stith, our current president, is taking the lead in planning for a 1993 conference on the recruitment and retention of minorities in physics.

Local Section News

1993 Membership Application

For Office Use
Check # _____
Date _____
Amount $ _____

Recruited by the _____ AAPT Section.

TYPES OF MEMBERSHIPS AND RATES (check one): Rates are subject to change without notice.

Regular membership with *American Journal of Physics*	$87.00
Regular membership with *The Physics Teacher*	66.00
Regular membership with both journals	124.00
Student membership with *American Journal of Physics*	44.00
Student membership with *The Physics Teacher*	33.00
Student membership with both journals	62.00
Joint SPS-AAPT student membership w/ *Amer. Journal of Physics*	50.00
Joint SPS-AAPT student membership with *The Physics Teacher*	39.00
Joint SPS-AAPT student membership with both journals	68.00

To be eligible for a student membership, an individual must be a full-time student enrolled in an accredited academic institution. School Name: _____

OPTIONAL AIR MAIL CHARGES, ADD TO MEMBERSHIP RATES:	*AJP*	*TPT*
Domestic & Canada (includes U.S. possessions)	$30.00	$24.00
Mexico, Central America, West Indies	46.00	33.00
South America, Europe, Mediterranean Africa	58.00	39.00
USSR, Near & Middle East, Asia, Pacific, Africa	67.00	50.00
Optional Air Freight Charges	35.00	26.00

Please identify your present occupation by checking one of the following:

___ A. High School Faculty
___ B. Two-Year College Faculty
___ C. Four-Year College Faculty
___ D. University Faculty
___ E. School Administration
___ F. Industry
___ G. Non-Profit Lab
___ H. Government
___ I. Military
___ J. Other:
___ K. Student

Payment Information

Total Amount Enclosed: $_____

Payment must be enclosed and made by check or money order in U.S. dollars drawn on a U.S. bank or an International Money Order payable in U.S. dollars to AAPT. Sorry, but payments not drawn on a U.S. bank will be returned.

PLEASE PRINT CLEARLY.

Name _____

Address _____

City _____ State _____ Zip Code _____

Daytime Phone _____ Evening Phone _____

FAX _____ E-mail # _____

Payment may also be made with Visa or MasterCard by completing the following information. **A $2 service charge will be added to payments made by credit card.** ___ VISA ___ MasterCard

Account Number _____ Expiration Date _____

Signature _____

AAPT memberships are individual memberships. Journals received with memberships are for **personal use only.** All members also receive the *Announcer* (AAPT's news magazine) and *Physics Today*. Return of this application with payment signifies that the applicant acknowledges and complies with this principle. Libraries and other joint-use facilities may subscribe to AAPT journals at the nonmember subscription rates. Contact the Subscriber Services Department for details.

Please return your completed application and payment to: **Membership Department, American Association of Physics Teachers, 5112 Berwyn Road, College Park, MD 20740-4100, 301-345-4200.** *Applications received after September 1, 1993, will be processed for the 1994 member year.*

The President's Page
James H. Stith

Memories of the Summer Meeting at Orono are beginning to fade as we are now hard at work in the classroom. For most of us, summer vacation is only a memory. Our students seem just a little younger than those in previous classes. Our jokes don't get the same laughs they used to. Our students are still, for the most part, enthusiastic and we manage to feed off of their energy. We took good notes in Orono, were exposed to many great ideas, and are determined to try that one idea that worked so well for our colleagues. However, for us, it just doesn't seem to get the same results.

We are reminded by this experience that teaching is hard work. We can't just "show up" in the classroom, talk to our students, and expect to get excellent results. Each class must be approached as if it is the first we've taught. The ideas and practices of our colleagues cannot simply be adopted, they must become a part of our fabric. Based upon that special set of strengths and weaknesses each class brings, we must carefully consider what will work for them. We are compelled to remind ourselves that our students are a set of individuals, and that somehow, no matter what the class size, each must believe that we are addressing his or her individual needs. Additionally, we must keep telling ourselves that "less may be more," remembering that everything we know about the subject cannot be covered in a single lesson or a single course.

These are my thoughts as I start the new semester. My resolution is to improve my teaching, but also to remind and convince my students that the educative process is a shared responsibility. My job is not to make this process painless on their part, but to make it as efficient as possible. If I can also make my course more inclusive, then by semester's end, some measure of success will have been achieved.

In my efforts to keep you informed of progress in national AAPT programs, let me highlight a few.

Physics Olympiad

Had we tried, we could not have written a better script for the 1993 International Physics Olympiad to be held at the College of William and Mary in Williamsburg, Virginia. The success of the 1992 team has given favorable publicity to the Olympiad effort. The 1992 physics team returned from Finland with five medals (two gold, one silver, and two honorable mentions). We congratulate the team for their overwhelming success, along with Larry Kirkpatrick, Avi Hauser, and Ted Vittitoe for their outstanding efforts in preparing the team. The students continue to demonstrate that they can compete with the best in the world. That success must be used to encourage the average physics student to also strive to be among the best.

American Center for Physics (ACP)

AAPT, AIP, and APS recently purchased twenty-four acres of land in College Park, Maryland, to jointly build a new headquarters. This building will be one that I believe we will be proud to call our headquarters. It provides a symbol around which the physics community can rally. As a result of working together closely on land purchase and building design, AAPT, APS, and AIP are already beginning to cooperate in unprecedented ways on other projects. This measure of togetherness can only generate positive results for the physics community. The American Association of Physicists in Medicine (AAPM) will join this collective effort and move its headquarters to the new ACP building. Now, every AIP member society with physics in its name will be housed in the same building. While this union of organizations is not without some risks, the potential for improving the status and quality of physics education far outweighs those risks. I eagerly anticipate the "move-in" in late 1993.

National Standards

Rapid progress is being made by the National Committee on Science Education Standards and Assessment (NCSESA). The inaugural meeting for NCSESA and the three working groups have taken place. The curriculum working group met for a two-week session in mid-June and again in mid-July. The teaching and assessment working groups convened in August. Draft material should become available in early fall for critical evaluation and review by the scientific community. AAPT's evaluation and review will be accomplished by the Task Force on National Science Education Standards chaired by Carol-ann Tripp. NCSESA's goal is to have a set of high-quality standards by the end of 1993.

AAPT members directly involved in the standards process include Arthur Eisenkraft, Fox Lane High School, member of the working group on Curriculum Standards, and James Minstrell, Mercer Island High School, member of the working group on Science Assessment Standards. Carol-ann Tripp chairs the AAPT task force to evaluate and comment on the output of the NCSESA working groups and I continue to represent AAPT on the Chair's Advisory Group. Each of us would appreciate your comments and thoughts.

Much of the discussion within the Chair's Advisory Group focused on ways to minimize detail and trivia. The working principles the Advisory Group has adopted represent a vision that science should become a central part of the school day. We believe that it is crucial that curriculum, teaching, and assessment be treated as integral parts of a whole. Not only should there be standards on content, but we must somehow assess attitudes. We recognize that attitude assessment is difficult, but it is too important to be ignored.

Win For Your Section!

Selected AAPT Products for up to $100 in retail value (excluding videodiscs) or One FREE registration to an AAPT Summer or Winter Meeting

Join the AAPT today and indicate on your membership form the local section of which you are a member. Each section that recruits 10 new national members may choose one of the above incentive prizes. Prizes must be redeemed by the local Section Representative. New members are defined as those who have not been an AAPT member since 1990.

Current AAPT Programs and Activities

National Meetings

- AAPT Winter Meeting, January 2–7, 1993; New Orleans, LA
- APS/AAPT Joint April Meeting, April 12–15, 1993; Washington, DC
- AAPT Summer Meeting, August 7–12, 1993; Boise State University, Boise, ID

Topical Conferences

- The Role of Laboratories in Physics Education
- Minorities and Women in Physics
- Undergraduate Department Chair's Conferences
- United States-Japan-China Conferences
- Inter-American Conference Series
- Conference on Critical Issues in Two-Year College Physics and Astronomy

AAPT Programs

- Innovative High School Teacher Grants
- Physics Teaching Resource Agent (PTRA) Program
- PHYSICS BOWL, a high school academic examination contest
- International Physics Olympiad, an academic competition for pre-university students
- XXIV International Physics Olympiad, to be hosted in the U.S. in 1993 by AAPT

Catalog Items

- Demonstration Handbooks
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Contact AAPT for a free products catalog:
AAPT, 5112 Berwyn Rd.
College Park, MD 20740
301-345-4200

Minutes of the Business Meeting
of the
Southern Ohio Section
American Association of Physics Teachers

Sinclair Community College
Dayton, Ohio
Saturday October 17, 1992

The meeting of Southern Ohio Section of the American Association of Physics Teachers (SOS/AAPT) was called to order by President W. Ploughe at 2:50 PM on Saturday March 14, 1992 in Auditorium A (Room 150) of the Ponitz Sinclair Center on the campus of Sinclair Community College in Dayton, Ohio.

President W. Ploughe thanked our hosts from Sinclair for the excellent meeting.

Door prizes were distributed to those in attendance.

The meeting adjourned after the door prizes were distributed.

Respectfully Submitted,
James F. Sullivan,
SOS/AAPT Secretary