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

February 6, 1991

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

Dear Mike,

I'm not certain when the next edition of The Dialog is due on the stands. I assume you and Bill Dollhopf are planning one soon due to the mid-April meeting at Ohio University. Here are three articles relating to the October 13th meeting at OCAS.

The "Fall, 1990 Meeting Notes" and the "Minutes of the Executive Committee..." should be printed as regular articles. The speakers were promised that their abstracts would be published in The Dialog but they obviously can't be printed in full type - can you reduce them before printing (to save many pages)?

I have printed everything in 40 characters / column format. If you would like another format please call me (office: 556-4872, home: 662-9560). All of the articles have gone through a spelling checker and are on a disk (Apple - sorry, Mike) so it won't be hard for me to change if you want it done.

When this issue is run, please run twenty (20) extra copies so I can be certain that each speaker gets one. Thank you, Mike.

Sincerely,

James F. Sullivan

FALL, 1990 MEETING NOTES

For those who missed the October 13th meeting of the Southern Ohio Section of the American Association of Physics Teachers, here is a brief outline of the day's events. The meeting was held at the OMI College of Applied Science of the University of Cincinnati. The abstracts of all papers are printed elsewhere in this edition of The Dialog.

8:30 am - 4 pm COMMERCIAL EXHIBITS & REFRESHMENTS

9 - 10 am CONTRIBUTED PAPERS SESSION A and SESSION B

10:02 - 11 am TRI-STATE PHYSICS TEACHERS SESSION,

11:02 - 11:45 am G. Aubrecht (OSU), USING THE GREENHOUSE EFFECT TO TEACH PHYSICS

11:47 - 12:30 pm PARALLEL TALKS:

J.Marquardt (OCAS) - IF YOU FIND THAT MATHEMATICS IS DRUDGERY, TRY DERIVE (TM), A MATHEMATICAL ASSISTANT

J.Everly (OCAS) - SUNSPOTS, SOLAR FLARES, AND GEOMAGNETIC STORMS

D.Blackman (U. Cal, Berkeley) - SPLIT BRAIN FUNCTION AND ITS IMPLICATIONS FOR CURRICULUM DEVELOPMENT

12:30 - 1:30 pm LUNCH.

12:35 - 1:30 pm EXECUTIVE SESSION OF SOS/AAPT OFFICERS.

1:30 - 2:10 LECTURE DEMONSTRATION SESSION, R.Harris (UC) & K.Trefz (OSU)

2:12 - 2:45 R.Rollins (OU), BASIC CHAOS: AN INTRODUCTION WITH COMPUTER SIMULATIONS

2:47 - 3:00 SOS/AAPT MEETING (door prizes)

3:02 - 5:00 PARALLEL SESSIONS - WORKSHOPS and TOUR:

G. Aubrecht (OSU) - COMPUTERS IN THE CLASSROOM

W. Ploughe (OSU) and K. Trefz (OSU) - USING VIDEOTAPES IN LECTURES AND LABS

K. Metz (OCAS) - TOUR OF OMI COLLEGE OF APPLIED SCIENCE

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

OMI College of Applied Science
University of Cincinnati
Cincinnati, Ohio
Saturday October 13, 1990

The Executive Committee of the Southern Ohio Section of the American Association of Physics Teachers (SOS/AAPT) met at 12:35 pm in the dining room of the OMI College of Applied Science. Those present were R. Cunningham, W. Dollhopf, W. Kuhlman, D. Portman, J. Poth, J. Sullivan, B. Taylor, D. Traxler, and S. Yerian.

The minutes of the previous executive committee were approved.

J. Sullivan will create a meeting packet to assist those who host future SOS/AAPT meetings.

D. Traxler gave the treasurer's report. The section must increase its membership.

The Section Representative report was given:

The (national) AAPT is considering a move to the planned American Institute of Physics (AIP) building in the Washington, DC area. Current plans call for retention of the current Dodge building if such a move takes place.

The national AAPT is considering the possibility of sponsoring regional section officer retreats across the country.

There are now three (3) national meetings scheduled per year through 1993.

Sectional dues check off through the national AAPT was not on the agenda at the summer, 1990 meeting.

The SOS/AAPT elections will be at the spring meeting. This year the Vice President for Two Year Colleges is up for election along with those offices which are elected each year (President-elect, Secretary, and Treasurer).

S. Yerian requested that lecture series which occur in or near the section be publicized in The Dialog. He also requested that a special session (forum) be held (at a future meeting?) on curriculum revision.

W. Dollhopf reported that we had received a thank you note from a recipient of one of the physics prizes at last year's Ohio State science fair.

It was decided that a liaison should be appointed to work with Ohio University in organizing the (joint) spring meeting.

The general subject of attempting to achieve more active meeting participation was discussed and the following was discussed. It was suggested that a "free meeting card" be given to anyone who joins the section for the first time. A committee was appointed to set future meetings. This committee consisted of the Vice President for High Schools and the Vice president for Two Year Colleges. It was decided that March was much better than April for the spring meeting. President W. Dollhopf will make arrangements so the section can offer CEUs at the SOS/AAPT spring meeting. It was suggested that a box always appear in The Dialog giving dates and locations of future meetings. It was suggested that the fall meetings be later - after fall sports are completed.

Spring, 1992

In the ~~Fall, 1991~~ the SOS/AAPT will hold a joint meeting with the Ohio Section / AAPT. Exact location had not been decided.

Officers are attempting to devise a written job description for each office in the section.

The Section representative reported that there is an attempt to change the name of the national AAPT.

The next executive meeting will be at Wittenberg University in early February.

Respectfully Submitted,
James F. Sullivan,
Secretary

ABSTRACTS OF PAPERS
SOUTHERN OHIO SECTION
of the
AMERICAN ASSOCIATION OF PHYSICS TEACHERS

SATURDAY OCTOBER 13, 1990

OMI COLLEGE OF APPLIED SCIENCE
of the
UNIVERSITY OF CINCINNATI

9:00 am to 10:00 am. Session A. CONTRIBUTED PAPERS. Presiding: WILLIAM KUHLMAN, St. Xavier High School.

A1. Physics - 1850s Style. MARION A. BROWN, OMI College of Applied Science, University of Cincinnati. - In the nineteenth century, according to science historian J. D. Bernal, the application of science grew much more rapidly than science itself. In essence, mechanics and technicians created mechanical systems to accommodate the developing industrial complex without understanding the scientific principles that governed them. For example, even though these workmen did not understand the physics and chemistry of steam, they fashioned engines that harnessed its power years before Lord Kelvin's 1852 publication of the definitive work on thermodynamics. And even when Kelvin's work was available, his theories did not overturn the way technicians approached their tasks; they continued to improve their machines through observation and trial and error. Evidence of this relationship between scientific knowledge and its application emerged at a meeting of the members of the Ohio Mechanics Institute in Cincinnati in 1851. Six men with varying degrees of technical sophistication tried to unravel the mysteries of why steam boilers and steam valves exploded. Their arguments provide a glimpse of the state of mid-nineteenth century physics.

A2. Koosh Ball Kinematics. BARRY L. BROWNE, Lakeland High School.- The objective is to introduce physics students to motion, forces (including the four fundamental forces), Newton's Laws of Motion, and Hooke's Law using a $5 Koosh ball and Socratic dialog. This has been successfully used with 4th grade students and up to introduce basic force and motion concepts.

A Koosh ball can be a very useful manipulative for a physics/science teacher. Being made of rubber band material wound around a core, the individual "hairs" of the Koosh ball give the Koosh unique properties. When a teacher brings a Koosh to class one of the first questions is: "What is that?" You now have the attention of all the students. The rest is left up to your imagination and pedagogical style.

Utilizing a Socratic dialog, the Koosh ball has been used to introduce the concept of forces acting on an object, gravity, the four fundamental forces, Newton's Laws of Motion (with emphasis on first and third), and Hooke's Law. Concepts involving momentum, energy, and thermodynamics are envisioned as other possible subjects. If time permits, an example of opening dialog will be given to show how the Koosh ball can be used.

A3. Objective Exams Prepared With a Word Processor - An Update. Robert W. Cunningham, Tuscarawas Campus, Kent State University - It was previously reported by the author that a word processor can be used as an objective style exam generator[1]. The technique described was essentially that of a form fill-in procedure. An improved technique which uses the macro and merge features of WordPerfect[2] has been developed to simplify and make more automatic the exam generation process. The current implementation and examples will be discussed and displayed.

[1]R. W. Cunningham, SOS/AAPT meeting October 15, 1988

[2]WordPerfect is a product of WordPerfect Corporation, 1555 N. Technology Way, Orem, UT 84057

A4. Static Forces Prescribed by the Model Building Codes to Simulate Real Earthquake Forces. HERBERT L. BILL, JR., OMI College of Applied Science of the University of Cincinnati. - The design of building structures to safely resist the lateral forces caused by ground acceleration is not based solely on the principles of conservative physics. For reasons of economics, the building structure is permitted to respond in a "nonconservative" manner. The focus, for the design of buildings located in an "earthquake region", is "life-safety." That is, there may be significant structural damage (demolition may be required) but there can be no loss of life. This paper will present the simple harmonic oscillator which is used as a basis for the prescriptions of the building codes. The future directions of code writing and building construction will be discussed.

9:00 am to 10:00 am. Session B. CONTRIBUTED PAPERS. Presiding: Edward Sunderhaus, Cincinnati Technical College

B1. Technical Physics Laboratory Courses at the OMI College of Applied Science. JAMES F. SULLIVAN, OMI College of Applied Science of the University of Cincinnati. - The general physics laboratory courses at the OMI College of Applied Science are taken by students at various times in their freshmen and sophomore years depending on their majors. Often three different laboratory courses are offered in the same laboratory at different times during the same day. In each of these sessions, up to four different student experiments are performed simultaneously by up to 12 groups of 2 students. A system has been developed to solve the associated problems such as student preparation, rapid equipment setup (and storage), and (of course) high equipment costs. The solution involves a laboratory manual, scheduling charts, videotape shows in the college library, and organized storage of student equipment.

B2. Mathematics United with Physics. DWIGHT J. PORTMAN, Greenhills High School. - GTE Grant Fellows Tim Tilton and Dwight Portman of Greenhills High School, Cincinnati, Ohio, are teaching a Pre-Calculus math course combined with a first year Physics course using a graphing approach to problem solving. New TI-81 graphing calculators were purchased for each student in the class. A two class period block of time has been scheduled for students taking these two courses. The rationale for merging of Physics and Pre-Calculus is based on the need to encourage the students to recognize the inter-relationship between mathematics and physics and help them realize how dependent each is on the other discipline.

B3. Equipment and Selected Demonstrations from "The Rutgers/Industry National Leadership Institute for Teachers of Physics". THOMAS MILLS, Montgomery County Joint Vocational School. - A number of demonstration devices were constructed during the four week workshop in July, 1990. Several demonstrations will be performed to show principles in optical communications, magnetism and magnetic recording devices, and resonance.

B4. Solving the Laboratory Equipment Problem Chinese Style. Kenneth A. METZ, OMI College of Applied Science, University of Cincinnati. - At the invitation of the China Physical Society a delegation of sixteen physics educators, under the auspices of the Citizen Ambassador People to People Program, visited eleven major universities in the Peoples' Republic of China. The tour, oriented toward the mutual improvement of physics education, included facilities inspections, as well as formal presentations and extensive discussion with Chinese faculty and students. While the quality and quantity of undergraduate laboratory equipment was generally good, it did vary substantially. A limited availability and emphasis on computers was also evident. Slides will be shown to depict the current situation. The concept of the "University Factory" will be explained as a means of producing high quality Chinese equipment in an entrepreneur fashion.

10:02 am to 11:00 am Session C. TRI-STATE PHYSICS TEACHERS SESSION. Presiding: Terrence Toepker, Xavier University, Cincinnati, Ohio.

11:02 am to 11:45 am. Session D. Using the Greenhouse Effect to Teach Physics. GORDON J. AUBRECHT II, The Ohio State University. - The greenhouse effect and postulated consequences allow students to relate stories in the news to what they often consider "useless" knowledge of physics. Examples are chosen from topics that can be discussed in physics courses at various levels.

11:47 am to 12:30 pm. Session E. If You Find that Mathematics Is Drudgery, Try DERIVE (TM), A Mathematical Assistant. James F. Marquardt Senior, OMI College of Applied Science, University of Cincinnati. - Computer Algebra Systems (CAS) have been available for mainframe computers for many years. In fact, CAS has been available on micro-computers for several years. The inconvenience caused by multiple users and batch processing - submit your problem and wait and wait ... has discouraged their use for all but exceptional problems. Some of these same programs are now available for the personal computer but require large amounts of memory and storage space. DERIVE (TM) requires only 512K of memory and is contained on one (that's 1) 360K diskette and does not even require a hard disk drive! To take advantage of the graphic capabilities requires a graphic adapter. It is true that the performance is improved as the computer is up graded, but even on the slower machines the performance is surprisingly good. The goal of this presentation is to demonstrate the capabilities of DERIVE (TM) including factoring, differentiating, integrating, solving equations, and graphing. DERIVE (TM) is available from its distributor: MathWare, 604 E. Mimford, Urbana, IL 61801 or its publisher: Soft Warehouse, Inc., 3615 Harding Avenue, Suite 505, Honolulu, HI 96816-3735, U.S.A.

11:47 am to 12:30 pm. SESSION F. Sun Spots, Solar Cycles, and Geomagnetic Storms. JAMES O. EVERLY, OMI College of Applied Science, University of Cincinnati. - This presentation will discuss the formation of sunspots to include figures of merit used to indicate their strength through a solar cycle. Historical data for twenty-two solar cycles will be presented. Ionized layers above the earth's surface produced by ultraviolet radiation from the sun will be shown to provide outstanding long range high frequency communications. Disturbances on the sun, known as solar flares, will be discussed in detail. Solar flares which can produce several transient fluctuations in the earth's magnetic field are known as geomagnetic storms. Visual evidence of geomagnetic storms are known more commonly as the aurora borealis in the northern hemisphere, and the aurora australis in the southern hemisphere.

Detrimental effects of geomagnetic storms on long line telegraph systems were observed as early as the mid-1800's and the effects on electric utility systems were first noted in the early 1940's. Present day electric power systems are more susceptible to serious effects from geomagnetic storms because of extended transmission lines, and the dependency on interconnected systems. The blackout of the entire Hydro Quebec power system caused by the geomagnetic storms of march 13, 1989, will be presented as an example illustrating the possible devastating consequences of these storms.

11:47 am to 12:30 pm. Session G. Split Brain Function and Its Implications for Curriculum Development. DAVID BLACKMAN, UNiversity of California at Berkeley. - Since the early 60's, it has been known that the brain has an inherent division of labor between right and left hemispheres. This division of labor explains correlations between personality factors. Those personality factors associated with left brain dominance are found in the vast majority of the population and have been incorporated into the curriculum as an educational standard. There are two consequences of this majority standard: the development of the bohemian subculture, and the discounting of visual skills. Recent developments in Conceptual Physics Curriculum has demonstrated the functional relationship between right brain curriculum and intuition building. At present, there are two physics curriculums in circulation: 1) verbal/analytical Physics taught to science majors, 2) conceptual physics for artists. The logical synthesis of these two curriculum is an integrated curriculum that pampers neither right nor left brain. Development of this integrated curriculum (The Multitasking Curriculum) will be discussed at the technique level.

1:30 pm to 2:10 pm. Session H. Demonstration Session. RICHARD HARRIS, University of Cincinnati and KELVIN TREFZ, The Ohio State University - Favorite demonstrations of these renowned demonstrators will be shown.

2:12 pm to 2:45 pm. Session I. Basic Chaos: An Introduction with Computer Simulations. R. W. ROLLINS, Ohio University. - A wide variety of physical systems (examples are the periodically driven damped plane pendulum or mass attached to a nonlinear spring, chemical systems, simple nonlinear electrical circuits, a dripping faucet, etc.) can show apparently random behavior without any random driving forces. Many real systems can be modeled by simple nonlinear deterministic equations but are predictable for only a short time. Under these conditions they are said to exhibit "deterministic chaos". This will be a descriptive and intuitive presentation concentrating on a few key ideas from the new field of Chaotic Dynamics. The sensitive dependence on initial conditions will be discussed and the fractal nature of 'strange', or chaotic, attractors will be illustrated. These concepts will be demonstrated with live computer simulations.

3:02 pm to 5:00 pm. Session K. Workshop. Computers in the Classroom. GORDON J. AUBRECHT II, The Ohio State University. - This workshop deals with hypercard scripting on the MacIntosh computer. Hypercard 2.0 will be discussed.

3:02 pm to 5:00 pm. Session L. Workshop. Using Videotape in Lectures and Labs. WILLIAM D. PLOUGHE, The Ohio State University and KELVIN E. TREFZ, The Ohio State University. - Many phenomena can be studied in the physics class through the use of video tapes and laserdiscs. The action can be taped live for immediate playback and analysis or, for those things too dangerous or expensive, brought in on prerecorded tapes or laserdiscs. The use of short segments from these materials can demonstrate such diverse phenomena as speed, acceleration, conservation laws, collisions and diffraction. The materials and the minimum and desired features of the equipment will be discussed. Examples from student and commercially available sources illustrating specific physics content will be shown. Precision, geometrical considerations and other possible limitations will be discussed as time permits.

3:02 pm to 5:00 pm. Session M. Tour of The OMI College of Applied Science. Kenneth A. Metz, OMI College of Applied Science of the University of Cincinnati. - The tour will show the Edgecliff campus of the OMI College of Applied Science which is the technical college of the University of Cincinnati. Emphasis will be placed on the technical laboratories and problems associated with the construction of this facility.

wittenberg
UNIVERSITY

Ward Street at North Wittenberg Avenue
Post Office Box 720
Springfield, Ohio 45501
513-327-6231

February 4, 1991

Dr. James F. Sullivan
OMI College of Applied Science
2220 Victory Parkway
Cincinnati, Ohio 45206

Dear Jim:

It would be very helpful if we could have an executive meeting soon, and Sunday, **February 17** seems to be a good time. I will host it here at **Wittenberg** at **3:30** in the afternoon in **Room 304** of the **Science Building**, which is located at the corner of Plum and Bill Edwards Drive. We should be able to complete our business in about two hours.

These are the major items which we should consider:

1. Meetings
    a. The spring meeting of this year at Ohio University
    b. The fall meeting next year at Wright State and AFIT
    c. A joint meeting with OS/AAPT (I met with them last Friday.)
    d. Subsequent Meetings (It looks like we will not be meeting with OS/APS for quite awhile after this fall.)
2. A slate of Officers for the year 91-92
    This includes: President Elect
    Secretary (if necessary)
    Treasurer (if necessary)
    Vice President for Two Year Colleges
3. Judging at the State Science Fair this spring
4. Joining with the OS/AAPT in sponsoring a booth at the SECO convention

There may be several other items as well.

I assume you plan to continue as secretary this year. Things seem to have gone well, and if you wish to continue, let me encourage you to do so. You have done an excellent job with all your suggestions and planning. By the way, could you send me the minutes from the last meeting?

If you can't make it to the meeting, please call and let me know. My office number is (513) 327-7822 and my home phone is (513) 399-3504

With best regards,

Bill

Bill Dollhopf, President
SOS/AAPT

AGENDA

SOS/AAPT Executive Committee Meeting

3:30, February 17, 1991
Wittenberg

I. Call to order

II. Reports of officers

III. Officers for the year 91-92
This includes: President Elect
Secretary (if necessary)
Treasurer (if necessary)
Vice President for Two Year Colleges

IV. Spring meeting at O.U. (April 19-20, 1991)
A. Arrangements to date. (Name List) (Meetings - 12:00, 1:00)
B. Special arrangements with Appalachian Section?
C. Additional concerns? (Special sessions, call for papers)

V. Subsequent meetings
A. Fall '91 - WSU/AFIT
1. Liaison? Sessions?
B. Spring '92 with OS/AAPT
2. Details: Ohio State?
March 14
Form & Content
C. Future OS/APS Meetings:
1. Spring '92 - U. Cincinnati; Fall '92 - Behrend College ,PSU
Spring '93 - Kent State; Fall '93 - John Carrol
Spring '94 - Case Western Reserve
D. Possible SOS/AAPT meetings:
1. Carol Damian, Dublin H.S. (Spring '93)
Need some support
2. Fred Thomas, Sinclair Community College (Fall '92?)

VI. Judging at the State Science Fair this spring
1. April 20, 1991 - PROBLEM!

VII. Job descriptions

IX. Joining with the OS/AAPT in sponsoring a booth at the SECO convention

X. Old Business
1. Physics Prize
2. CEU's

XI. New Business

XII. Adjournment

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

Wittenberg University
Springfield, Ohio
Sunday February 17, 1991

The Executive Committee of the Southern Ohio Section of the American Association of Physics Teachers (SOS/AAPT) met in room 304 of the Science Building at Wittenberg University. Those present were M. Grote, W. Dollhopf, R. Monnier, J. Poth, J. Sullivan, D. Traxler, and S. Yerian.

One mistake was noted in the minutes of the executive committee meeting of October 13, 1990 - the Spring, 1992 meeting (not the Fall, 1991 meeting) will be a joint meeting with the Ohio Section / AAPT. After this correction was made the minutes of the previous executive committee were approved.

D. Traxler gave the treasurer's report. Only forty-two persons had paid their 1991 dues at this time. The mailing list will be streamlined for this spring's mailings.

Secretary J. Sullivan will attempt to get mailing labels for all high schools in our geographical area from the Ohio Department of Education. These will be used for the fall, 1991 mailing.

J. Poth gave the Section Representative report:

The national AAPT winter meeting will be in San Antonio, TX.

The first national AAPT spring meeting is this April in Washington, DC. Recall this is part of the new three meeting per year system of the national AAPT.

The national AAPT building plans are proceeding. The Section representatives gave their approval to the plan which moves the AAPT to the planned American Institute of Physics (AIP) building in the Washington, DC area.

A proposal to extend the Physics Teacher Resource Agent (PTRA) program has been submitted.

The SOS/AAPT Section Representative has been working with the new AAPT Executive Officer in an attempt to get section dues checked off at the national level.

The section must request the dues payments from those persons who are delinquent.

It is recommended that future section meetings be planned well in advance.

M. Grote reported that he is now using computers to prepare The Dialog and articles may be transmitted electronically to him. Please contact him for acceptable formats.

S. Yerian requested that the section promote local lecture series (e.g. the Smith lecture at OSU).

W. Dollhopf will finalize plans for the section meeting at Ohio University (Athens, OH) on April 19-20, 1991. The executive session is planned for 12:00 noon to 12:30 pm and the meeting is scheduled for the afternoon (both on Saturday April 20th). One problem is that the Ohio State Science Fair is also on Saturday April 20th.

W. Dollhopf also noted that the Ohio Section / American Physical Society (OS/APS) will meet at the University of Cincinnati in the spring of 1992.

Future section meetings were discussed:

Spring, 1991 - with OS/APS and Appalachian Section / AAPT (AS/AAPT). Ohio University, Athens, OH. April 19-20, 1991

Fall, 1991 - with OS/APS. Wright State University (WSU) and Air Force Institute of Technology (AFIT), Dayton, OH. October 11-12, 1991. Contact persons: Merrill Andrews (WSU) and Robert Henghold (AFIT). A coordinator for the SOS/AAPT will be appointed by President W. Dollhopf. Special topics may include university physics curriculum and review sessions.

Spring, 1992 - with Ohio Section / AAPT (OS/AAPT) at Ohio State University (OSU), Columbus, OH. This is a joint PTRA venture.

It was agreed to support the Science Education Council of Ohio (SECO) meeting in Cincinnati on February 14 - 16, 1992. We will need workers. Our contact is G. Easter of Ohio Section / AAPT.

Respectfully Submitted,
James F. Sullivan,
Secretary

American Association of Physics Teachers

5112 Berwyn Road
College Park, MD 20740-4100
(301)345-4200 • FAX (301)345-1857

Bernard V. Khoury, Executive Officer

Rec'd MAR 7, 91
No chance for reply

February 19, 1991

Dear Section Secretary or Section Representative:

Don't let the March 1 Announcer deadline take you by surprise!

As usual, I am writing to remind you of the copy deadline for the next *Announcer*. Please be aware that the deadline for the May *Announcer* is March 1—just a few days away! Feel free to fax information to me (FAX: 301/345-1857) or call the office if you are concerned about missing the deadline. Thank you for all your help.

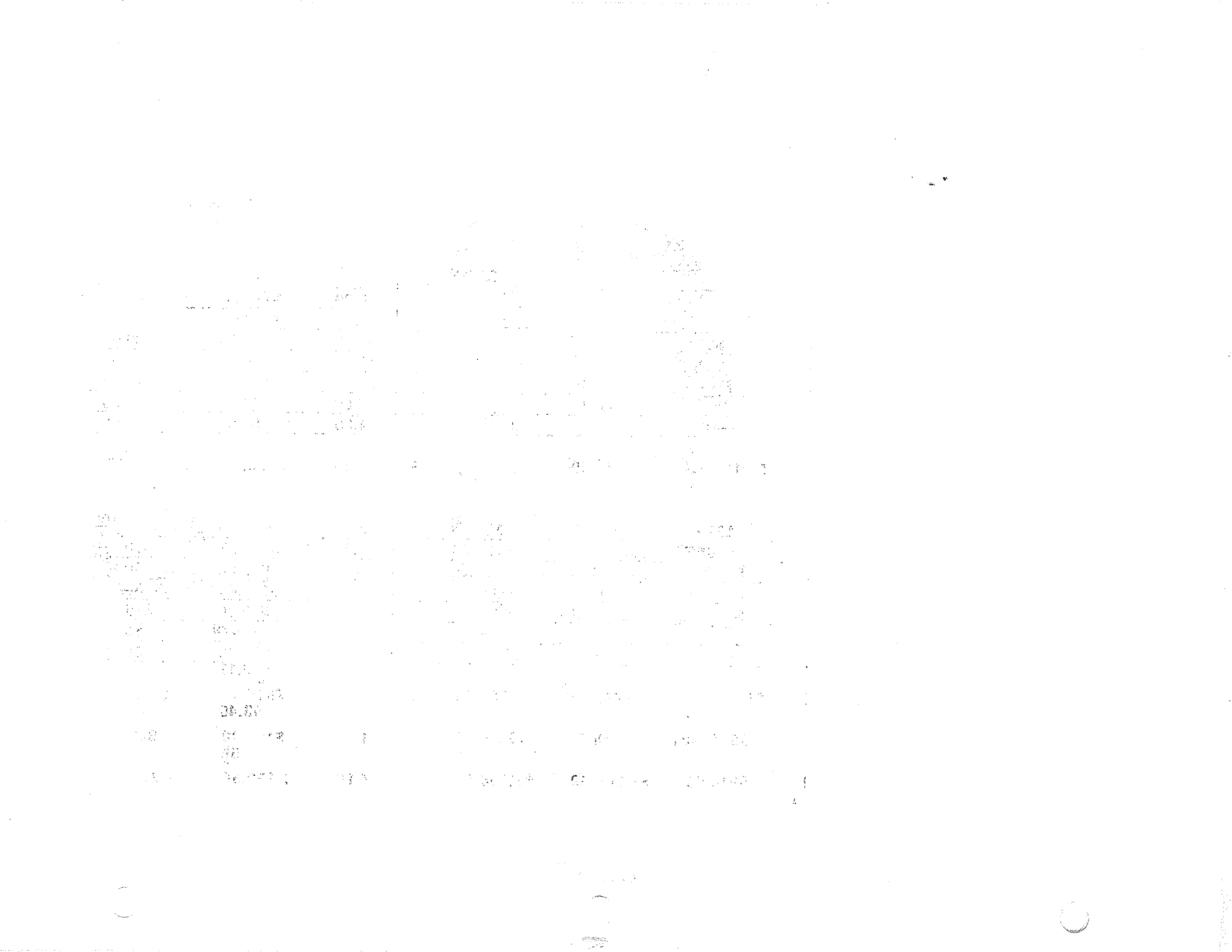
Sincerely,

Donna Willis

Donna Willis
Director of Publications

1991 AAPT Summer Meeting
University of British Columbia
Vancouver, BC, Canada
June 24-29, 1991

1992 AAPT Winter Meeting
Clarion Hotel
Orlando, FL
January 6-9, 1992



SOS/AAPT
Statement of Revenues and Expenses

	1985	1986	1987 through Nov. 13	1987/88	1988/89	1989/90	1990/91 through April 19,91
Revenues:							
Contributions	$52.00	$0.00	$0.00	$0.00	$165.10	$0.00	$280.00
Dues (regular membership)	$680.00	$600.00	$590.00	$470.00	$565.00	$395.00	$2.00
Dues (student membership)	$8.00	$6.00	$2.00	$4.00	$2.00	$0.00	$0.00
Dues (retired membership)	$12.00	$0.00	$7.00	$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	$212.00	$361.82	$100.50	$167.50	$0.00	$170.50	$0.00
State Science Day income	—	—	—	—	$300.00	$250.00	$0.00
Workshop registration	$415.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Advertizing income	$25.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Conference registration	$98.00	$76.00	$86.00	$100.00	$88.00	$114.00	$0.00
Misc. conference income	$0.00	$136.50	$87.50	$31.50	$0.00	$43.07	$0.00
Conference meals income	—	—	—	$131.25	$54.25	$0.00	$0.00
Total Revenues:	**$1,502.00**	**$1,180.32**	**$873.00**	**$904.25**	**$1,174.35**	**$972.57**	**$282.00**
Expenses:							
Misc. supplies	$55.55	$27.81	$25.76	$37.93	$15.43	$37.09	$27.34
Conference expense	$630.49	$636.88	$131.50	$127.50	$263.20	$169.57	$0.00
Physics Prize expenses	$65.00	$517.61	$154.68	$0.00	$0.00	$73.82	$0.00
Postage	$57.76	$214.00	$192.57	$93.36	$412.41	$118.69	$109.78
Printing	$480.00	$124.00	$275.00	$395.00	$245.00	$70.00	$75.00
Building fund	—	—	—	$50.00	$0.00	$0.00	$0.00
State Science Day Prizes	—	—	—	$100.00	$350.00	$350.00	$0.00
Total Expenses:	**$1,288.80**	**$1,520.30**	**$779.51**	**$803.79**	**$1,286.04**	**$819.17**	**$212.12**
Net Income:	**$213.20**	**($339.98)**	**$93.49**	**$100.46**	**($111.69)**	**$153.40**	**$69.88**
Cash balance:	**$1,254.88**	**$914.90**	**$1,008.39**	**$1,108.85**	**$997.16**	**$1,150.56**	**$1,220.44**

AGENDA

SOS/AAPT Executive Committee Meeting

April 20, 1991 at Ohio University

I. Call to order

II. Reports of officers

A. Secretary	Jim Sullivan
B. Treasure	Dave Traxler
C. Section Representative	Jim Poth
D. V.P. High Schools	Dwight Portman
E. V.P. Two Year Colleges	Bob Cunningham
F. V.P. Colleges	Steve Yerian

III. Presidential Remarks
- A. Status of the State Science Fair
- B. Slate of officers

IV. Fall meeting (WSU/AFIT; October 11-12, 1991)
- A. Liaison - Paul Wolfe
- B. How can we encourage some active participation?

V. Future Meetings
- A. Spring '92; OS/AAPT Ohio State
  1. Need to develop a theme
- B. Subsequent meetings??

OS/APS is out of the area until after Spring of '94

Sinclair Community College (Fred Thomas)

Dublin High School (Carol Damian)

Some where in Cincinnati?

Need for a meeting support group

VI. Job descriptions

VII. Old Business
- A. Physics Competition
- B. Membership

IX. New Business

X. Adjournment

American Association of Physics Teachers

5112 Berwyn Road
College Park, MD 20740-4100
(301)345-4200 • FAX (301)345-1857

Bernard V. Khoury, Executive Officer

1991 AAPT Summer Meeting
University of British Columbia
Vancouver, BC, Canada
June 24-29, 1991

1992 AAPT Winter Meeting
Clarion Hotel
Orlando, FL
January 6-9, 1992

Memo to: Section Secretary
From: Nicole Wagschal Nicole Wagschal
Announcer
Date: June 5, 1991
RE: September Announcer Deadline

School is out and summer is here, but it is never too soon to start thinking about September. The Announcer deadline is quickly approaching so I thought I would take this opportunity to remind you that July 2 is the last day for copy to be submitted. If you have section news or other information that you would like to be included in the September issue, please send it to my attention at the AAPT Executive Office.

Your Section Representative has been sent a copy of the 1991 Section Officer Directory which will be printed in the September Announcer. If you are in possession of the updated officer list for your section, please forward this list to your Section Representative immediately so it can be corrected for publication.

Thank you for your help.

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

June 28, 1991

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

Dear Ms. Wagschal.

In response to your memo of June 5th, I've enclosed a current list of the officers of the Southern Ohio Section / AAPT (SOS/AAPT). Also please find an abbreviated (believe it or not) description of our recent spring meeting.

The fall, 1991 meeting of the SOS/AAPT Will be a joint meeting with the Ohio Section / American Physical Society. The meeting will be jointly hosted by Wright State University and the Air Force Institute of Technology and will be on October 11-12, 1991 at Wright State University. The contact person at Wright State for the SOS/AAPT is Prof. Paul J. Wolfe (Department of Physics, Wright State University, Dayton OH 45435, 513/873-2990).

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 in early March (7th or 14th) but the exact campus and date has not yet been determined.

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
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April 20, 1991

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(term Expires spring, 1994)

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

The Southern Ohio Section (SOS/AAPT) met on Friday April 19th and Saturday 20th at Ohio University in Athens, Ohio. This was a joint meeting with the Appalachian Section / AAPT, the Ohio Section of the American Physical Society, and the Ohio Chapter of the American Vacuum Society. The theme of the meeting was surface imaging.

The invited speakers (and their papers) were:

Dr. Peter P. Pronko, Universal Energy systems, Inc. (Ion Beam Analysis of Materials and Surfaces -- Close encounters of Several Kinds)

Dr. Ruud M. Tromp, IBM Yorktown Heights (In Situ Studies of Si-Ge Interface Formation)

Dr. Francis P. Bundy, Retired G.E. Research and Development (Diamond Synthesis)

Dr. Robert L. Park, University of maryland and APS (What's New)

Dr. Authur T. Hubbard, University of Cincinnati (Imaging Atomic Structure by Means of Auger Electrons)

Dr. Heinrich Rohrer, IBM-Zurich (Scanning Tunneling Microscopy -- a Road to Atoms and Molecules)

Dr. David Winch, Kalamazoo College (National Interactive Media Project)

Dr. Scott Stevens, Carnegie Mellon University (A Glimpse in the Future in Interactive Digital Video)

Dr. Roger Rollins, Ohio University (Chaos with Demonstrations)

One hundred and two (102) contributed papers were presented in the Saturday morning sessions. Those presented by SOS / AAPT members included:

D.W. Elsaesser, J.E. Colon, Y.K. Yeo, and R.L. Henghold, Air Force Institute of Technology, and G.S. Pomrenke, Air Force Office of Scientific Research (Electrical Measurements of $AlGa_1$-As:Er)

S. Mahajan, R.L. Cappelletti, and R.W. Rollins, Ohio University (Orientation-Dependent Vibrating Sample Magnetometry Studies of Thin Films of $Y_1Ba_2Cu_3O_7$)

T.D. Steiner, R.L. Henghold, and Y.K. Yeo, Air Force Institute of Technology, and G.S. Pomrenke, Air Force Office of Scientific Research, T.A. Kennedy, D. Godbey, and E.R. Glaser, Naval Research Laboratory, and K.L. Wang UCLA (Photoluminescence from Si_1-Ge/Si Strained Layer Superlattices)

J.E. Colin, D.W. Elsaesser, Y.K. Yeo, and R.L. Henghold, Air Force Institute of Technology, K.R. Evans and C.E. Stutz, Electronic Technology Directorate WPAFB, and G.S. Pomrenke, Air Force Office of Scientific Research (Photoluminescence Study of the Intra-4f Emissions from AlGaAs:Er)

Y.K. Yeo, T.D. Steiner, B.L. Shaffer, and R.L. Henghold, Air Force Institute of Technology (Effects of Space Radiation on GaAs and CdSe Semiconductors)

J.L. Blackshire and P.P. Yaney, University of Dayton (Raman Microprobe Studies of Mechanically Stressed SiN Ceramics)

M.W. Millard and P.P. Yaney, University of Dayton (Spatial Temperature Profiles of Nitrogen in a Compact DC Discharge Using Coherent Anti-Stokes Raman Spectroscopy)

B.M. Minor. C.D. Holmberg, and W. F. Bailey, Air Force Institute of Technology (Computer Simulation of the Two Stream Instability: A shared Educational Experience in Dealing with Interactive Media)

C.W. Holmberg, B.M. Minor, and W. F. Bailey, Air Force Institute of Technology (Beam-Cyclotron Instability Analysis: A Marriage of Mathematica and ESl)

P.D. Scholten, Miami University, OH (Application of the Wolff Algorithm to the 4-State Clock Model)

P. Parmananda, H. Dewald, and R.W. Rollins (Periodic Oscillations Found During Anodic Dissolution of Copper)

H.N. Frase and P.A. Macklin, Miami University, OH (Projectile Motion - How Wide the Well?)

F. Thomas. Sinclair Community College (Teaching Multi-Cultural Physics)

R.W. Cunningham, Kent State University - Tuscarawas (Theory of Fit Parameter Uncertainties for the Marquardt Compromise)

E.M. Brownstein. Sheridan High School (The Exploratory Method of Teaching High School Physics)

J.F. Sullivan and B.G. Fabo, OMI College of Applied Science, Univ of Cincinnati (Experimenting with the $YBa_2Cu_3O_7$ Superconductor)

J. Oostens. University of Cincinnati (Hands-on Quiz in the Introductory Physics Lab)

E. Adelson and N. Vlasko, The Ohio State University (Improving Student Performance in Remedial Physics Courses)

W. Ploughe and K. Trefz, The Ohio State University (Hollywood in the Classroom)

K. Trefz and W. Ploughe, The Ohio State University (Okay, It Looks Good, but how...)

G.M. Julian. J.W. Snider, and J. Priest, Miami University, OH (A Contemporary Physics Laboratory)

T. Howald, Miami University, OH (Interfacing IBM Compatible Computers to Physics Experiments)

B. Bayer. The Ohio State University (Using Online Searching as a Research Tool)

G. Aubrecht. The Ohio State University at Marion (Using Powerful Symbolic Algebra Software to Teach Undergraduate Physics)

Special thanks to Professors Sergio E. Ulloa and Louis E. Wright of Ohio University For Organizing such a fine meeting.

James F. Sullivan

James F. Sullivan
Secretary SOS/AAPT

University of Cincinnati

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July 5, 1991

Mr. Ronald J. Monnier
Physics Teacher
Western Hills High School
2144 Ferguson Road
Cincinnati. OH 45238

Dear Ron,

I tried to call you a couple of times but was not successful. Enclosed are some materials which I have sent to Mike Grote for the next edition of The Dialog.

Please send me a note saying whether you appointed Dave Traxler as Associate Treasurer and Bob cunningham as Associate Secretary. I'll put your letter in the Secretary's files for the record and, frankly, I have a task for Bob - if you decide to appoint him.

If You haven't already, you might want to get in touch with Paul Wolfe at Wright State about the fall meeting (513 873-2990). Such things as dates times. costs. copy for The Dialog (e.g. meeting registration form including SOS/AAPT dues, map, articles describing the meeting. etc.). times for SOS/AAPT meetings and/or workshops (ending time for OS/APS meeting ?). internal accounting. etc. will have to be settled rather quickly.

You will probably want to call an Executive Committee meeting soon to discuss these things before they are finalized. The usual meeting location has been the Dayton area - possibly Sinclair State will host it this summer. Oh yes. at the spring meeting Erica Brownstein of Sheridan High School expressed a desire to be invited to the next Executive Committee meeting. Her home address is

Erica Brownstein
1255 Neil Ave.
Columbus. OH 43201
(614) 294-9050.

See you soon. Ron. If you want to get in touch my private office line is (513) 556-4872 and my home phone is (513) 662-9560.

Best Regards,

Jim Sullivan

James F. Sullivan
Secretary SOS/AAPT

University of Cincinnati

OMI College of Applied Science

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July 5, 1991

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

Dear Mike,

I don't know when you and Ron Monnier are planning the next edition of The Dialog but enclosed are four items for it. They are:

List of SOS/AAPT Officers
Minutes of the Executive Committee meeting of 4/20/91
Minutes of the Business meeting of 4/20/91
Papers given in the Spring, 1991 meeting (including abstracts of SOS/AAPT contributed papers)

The fall, 1991 meeting will be coming up quickly so I presume that The Dialog will be coming off the presses soon. I assume Ron Monnier has been in touch with Paul Wolfe at Wright State University to get descriptive articles for The Dialog about the meeting, the exact registration form to be printed, maps, etc. Possibly you should contact Ron to be certain these details are attended to.

When you do run it, could you send one extra copy - I will put it in the secretary's files. Thank you very much.

Best Regards,

Jim Sullivan

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. Monnier

SOUTHERN OHIO SECTION
AMERICAN ASSOCIATION OF PHYSICS TEACHERS
OFFICERS
April 20, 1991

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New Philadelphia, OH 44663
(216) 339-3391

*Subject to appointment by President Monnier

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

Ohio University
Athens, Ohio
Saturday April 20, 1991

The Executive Committee of the Southern Ohio Section of the American Association of Physics Teachers (SOS/AAPT) met in room 254 of the Clippinger Laboratory Building at Ohio University. Those present were G. Aubrecht, R. Cunningham, W. Dollhopf, W. Ploughe, J. Poth, J. Sullivan, F. Thomas, and S. Yerian.

The minutes of the Executive Committee meeting of February 17, 1991 were approved.

The treasurer's report was given. 1991 membership is down slightly. Pending the election at the regular meeting (next hour) R. Teese will serve as the official treasurer with D. Traxler assisting. It was suggested that the $100 received from life memberships be put in an interest-bearing account to more accurately reflect the state of the section's finances.

Section Representative J. Poth gave the Section Representative report:

The Physics Teacher Resource Agent (PTRA) proposal has not yet been funded.

The national AAPT building plans are proceeding. The project manager and architect have been hired.

Suggest a letter be sent to former members asking them to consider rejoining the section.

President W. Dollhopf noted that the Ohio State Science Fair is occurring on this day. Next year ('92) this will not be a problem since the SOS/AAPT is meeting earlier in the spring.

Vice-president S. Yerian reported that much effort must be expended by a group attempting to offer Comprehensive Education Units (CEU's). Since there is uncertain demand for them at this time it was suggested that the SOS/AAPT not offer them now. The Smith Lectures at OSU have just been announced for May 6, 1991. S. Yerian will announce this at the regular meeting.

W. Dollhopf reported that the contact person for the SOS/AAPT at the Fall, 1991 meeting at Wright State is Prof. Paul Wolfe. The fall, 1991 meeting will be on October 11-12. The spring, 1992 meeting will be a joint meeting with the Ohio Section / American Association of Physics Teachers (OS/APS) on March 7th or 14th in the central Ohio Area. The proposed theme of this meeting (Spring, 92) will be new physics curricula. A tentative schedule of future meetings is

Fall, 1992 Sinclair Community College, Dayton
Spring, 1993 Cincinnati area ?

Fall, 1993 Dublin, OH ?
Spring, 1994 South Central Ohio
President Dollhopf also requested the job descriptions from all officers.

Respectfully Submitted,
James F. Sullivan,
Secretary

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

Ohio University
Athens, Ohio
Saturday April 20, 1991

The meeting of Southern Ohio Section of the American Association of Physics Teachers (SOS/AAPT) was called to order by President W. Dollhopf on Saturday April 20, 1991 on the campus of Ohio University in Athens, Ohio.

The minutes of the October 13, 1990 business meeting were approved as published in The Dialog.

The treasurer's report was distributed to the members.

Section Representative J. Poth gave the Section Representative report:

The AAPT will be a partner in the new (national) physics building. The site has been selected and an architect has been chosen.

The (national) three meeting/year model is now in operation. Some future national meetings are

Washington, DC, April 22-25, 1991
Univ of British Columbia, Vancouver, BC, June 24-29, 1991
Orlando, Florida, January 6-9, 1992
Washington, DC, April 20-23, 1992 This will be the first time the AAPT is full partners with the APS in the spring meeting.
Univ of Maine, Orano, Maine, August 10-15, 1992
New Orleans, Louisiana, January 4-7, 1993
Boise, Idaho, Summer, 1993

The Physics Teacher Resource Agent Plus (PTRA+) proposal, if renewed, will extend the PTRA program.

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

G. Aubrecht moved and S. Yerian seconded the following motion. "The members of the Southern Ohio Section / AAPT recommend that President Monnier appoint D. Traxler as Associate Treasurer for a one-year trial period." After a very brief discussion the motion passed unanimously.

W. Ploughe moved and P. Hagedorn seconded the following motion. "The members of the Southern Ohio Section / AAPT recommend that President Monnier appoint R.Cunningham as Associate Secretary for a one-year trial period." The motion passed unanimously.

The announcement was made that a person can be an SOS/AAPT member

without being a national AAPT member.

A motion to adjourn was made by G. Aubrecht and seconded by E. Brownstein. The motion passed unanimously and the meeting adjourned at 1:25 PM.

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

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

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Dr. Roger Rollins, Ohio University (Chaos with Demonstrations)

One hundred and two (102) contributed papers were presented in the Saturday morning sessions. Those presented by SOS / AAPT members included:

Mike - I've typed the 24 abstracts so you can rearrange them any way you like

C3-1 Electrical Measurements of $Al_xGa_{1-x}As$:Er, D. W. ELSAESSER, J. E. COLON, 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, Bolling AFB, Washington D.C.,--We report the effect of Er doping on the deep level concentration of GaAs and $Al_xGa_{1-x}As$, for x=0.1, 0.2, 0.3, and 0.4. Three micron thick layers of GaAs or $Al_xGa_{1-x}As$, grown by MOCVD, were implanted with Er ions at an energy of 1 MeV and a dose of $10^{13}/cm^2$. The n-type GaAs samples showed strong donor gettering by the Er, while little or no donor gettering was observed for all $Al_xGa_{1-x}As$ samples. Furthermore, DLTS measurements revealed two prominent hole traps in GaAs:Er, having activation energies of 0.08 and 0.321 eV above the valence band. These traps were also observed in $Al_xGa_{1-x}As$, but with energies shifted to 0.068 and 0.462 eV, respectively. For higher Al mole fractions, it appears that both of these deep levels disappear. Measurement of these deep levels, especially the latter, is complicated by the presence of the DX center which has a large concentration for x=0.3 & 0.4.

C4-5 Orientation-Dependent Vibrating Sample Magnetometry Studies of Thin Films of $Y_1Ba_2Cu_3O_{7-x}$. SUKESH MAHAJAN, R. L. CAPPELLETTI and R. W. ROLLINS, Ohio Univ.— We report orientation-dependent magnetic properties of c-axis oriented superconducting films of $Y_1Ba_2Cu_3O_{7-x}$ (YBC). The films were deposited epitaxially on $SrTiO_3$ (100) single crystal substrates by laser ablation. The measurements were made using a PAR 150 vibrating sample magnetometer. The sample was field cooled (or zero field cooled) at an angle ϕ to the c-axis (direction of the film normal) to low temperatures. The field was then switched off(or applied) and the remanent magnetization (M_{rem}) was measured as a function of the orientation of the film with respect to the sensing coils. The results indicated that the trapped flux was always directed perpendicular to the film and along the c-axis. Above a certain critical field dependent on angle ϕ the magnitude of M_{rem} was always found to be the same. An analysis based on the Bean critical state model and on the fact that magnetic penetration depth is comparable to the thickness of film will be presented.

C5-1 Photoluminescence from $Si_{1-x}Ge_x/Si$ Strained Layer Superlattices, T.D. STEINER, R.L. HENGEHOLD, and Y.K. YEO, Air Force Institute of Technology, Wright-Patterson AFB, OH, G.S. POMRENKE, Air Force Office of Scientific Research, Washington D.C., T.A. KENNEDY, D. Godbey, and E.R. GLASER, Naval Research Laboratory, Washington D.C., and K.L. WANG, UCLA, Los Angeles, CA.--Photoluminescence from strained superlattice layers of $Si_{1-x}Ge_x/Si$ grown on Si(100) by molecular beam epitaxy has been observed for various superlattice periods, sublayer thicknesses, and different $Si_{1-x}Ge_x$ alloy concentrations. The PL spectra show very complicated structures which contain peaks from the silicon substrate and the MBE grown Si buffer layer, as well as those from the intrinsic superlattice. The peak energies of superlattice related photoluminescence are compared to the values predicted from the Kronig-Penney model for the superlattice potential.

C5-2 Photoluminescence Study of the Intra-4f Emissions from AlGaAs:Er. J.E. COLON, D.W. ELSAESSER, Y.K. YEO, R.L. HENGEHOLD, Air Force Institute of Technology, Wright-Patterson AFB, OH, K.R. EVANS and C.E. STUTZ, Electronic Technology Directorate, Wright-Patterson AFB, OH, G.S. POMRENKE, Air Force Office of Scientific Research, Bolling AFB, Washington D.C.--Erbium doped III-V semiconductors have strong, sharp optical emissions near 1.54 μm, which is close to the wavelength of minimum attenuation in silica based fiber optics. Thus, these materials could prove to be useful for new opto-electronic sources for fiber optic communications. We have studied the Er characteristic emissions from ion implanted and MBE grown $Al_xGa_{1-x}As$:Er as a function of the aluminum mole fraction, x, and, in the case of ion implanted samples, of the substrate conductivity. The intensity of the Er emissions increased with increasing x. For the ion implanted samples, the Er emissions from p-type substrates were stronger than those from SI- or n-type substrates. The MBE grown $Al_xGa_{1-x}As$:Er samples with x=.5 and .7 showed a new group of sharp, strong emissions near 1.56 μm.

C5-3 Effects of Space Radiation on GaAs and CdSe Semiconductors. Y.K. YEO, T.D. STEINER, B.L. SHAFFER, and R.L. HENGEHOLD, Air Force Institute of Technology, Wright-Patterson AFB, OH.--We have examined the effects of space radiation on GaAs and CdSe semiconductor samples using photoluminescence (PL) and cathodoluminescence (CL) techniques. The semiconductor samples were placed aboard the Long Duration Exposure Facility (LDEF) satellite in a 28.5 degree inclination, 480 km altitude, near-circular orbit and exposed to a direct space environment for a period of 11 months and shielded by a 0.313 inch thick aluminum plate for another 58 months. The PL and CL spectra were obtained in various wavelength regions from 0.5 to 1.8 μm for both the exposed samples as well as unexposed control samples. Changes were detected in some of the sample pairs which could be attributed to radiation induced effects. These changes primarily manifested themselves in three different categories: (1) decrease or increase of luminescent intensity; (2) shifts in PL peak locations; and (3) quenching of PL peaks.

C6-2 Raman Microprobe Studies of Mechanically Stressed Si_3N_4 Ceramics, J. L. BLACKSHIRE,* and P. P. YANEY, U. of Dayton** -- A Raman Microprobe was used to study the behavior of Si_3N_4 advanced ceramics under a variety of mechanical load conditions. The Si_3N_4 test bars were 50mm long by 3mmX4mm rectangular cross section. They were mechanically stressed using a four-point bend fixture, and were simultaneously probed with the Raman microprobe. The Raman microprobe, which utilized cylindrical laser beam optics for illumination of the specimen, and a CCD detector for collection of the scattered Raman light, provided spectral resolution of .33 cm^{-1}, and spatial resolution on the specimen of 2 um. The Raman spectra obtained provide information on changes in the bonding characteristics of the stressed materials, and help in understanding the interaction between the ceramic's microstructure and mechanical behavior.

* In partial fulfillment of the requirements for the M.S. degree in Electro-Optics.

** Supported by DOE/Martin Marietta Energy Sys.

C6-3 Spatial Temperature Profiles of Nitrogen in a Compact DC Glow Discharge Using Coherent Anti-Stokes Raman Spectroscopy. M. W. Millard* and P. P. YANEY, U. of Dayton** -- Vibrational and rotational temperatures have been derived from CARS spectra of the Q-branch in a nearly wall-less nitrogen discharge established between parallel, flat molybdenum electrodes at a spacing of 14 mm, a pressure of 30 Torr and a current of 20 mA. The discharge was spatially constrained by a Macor cap covering the cathode with a 9 mm aperture in the center of the cap. The nitrogen flow rate through the chamber was 85 sccm. The three laser beams were in the folded-BOXCARS geometry which gave a spatial resolution of approximately 50 um by 1 mm. The temperature plots show a continuous temperature profile across the discharge but with a narrowing at the 7 mm position.
* In partial fulfillment of the requirements for the M.S. degree in Electro-Optics.
** Supported by USAF Contract F33615-90-C-2036.

C6-4 Computer Simulation of the Two Stream Instability: A Shared Educational Experience in Dealing with Interactive Media. B. M. Minor, C. D. Holmberg, and Wm. F. Bailey, Air Force Institute of Technology, WPAFB OH.--The availability of outstanding software has brought new excitement to the study of plasma dynamics. We have integrated the study of plasma instabilities with the use of ES1[1], an interactive particle simulation code. As an example, we report the interplay between an analytic treatment of the two stream instability and a computer simulation. Analytically derived thresholds and growth rates, based on a linearized, perturbation analysis of the fluid equations, are compared with the results of the computer simulation. In the linear growth regime, agreement within 2% is observed. The restrictions and failure of the analytical treatment are then exposed and explored in the non-linear regime.

[1] Verboncoeur, J.P., Vahedi, V., and Birdsall, C.K., ES1, Electrostatic 1 Dimensional Code, University of California, (1989).

C6-5 Beam-Cyclotron Instability Analysis: A Marriage of Mathematica and ES1[1]. C.D. Holmberg, B.M. Minor, and Wm. F. Bailey, Air Force Institute of Technology, WPAFB OH.--Theoretical studies of instabilities in magnetized plasmas often center on the beam-cyclotron instability. The analysis required is usually deemed too demanding for incorporation into standard course material. We have revisited this problem as a classroom exercise in the use of interactive media. A perturbation approach has been applied to the linearized fluid equations to develop the dispersion relation. The complex root solving and tabling functions of Mathematica were employed to solve the dispersion relation for the unstable roots and identify the instability threshold and growth rates. The instability was then simulated using ES1. A comparison of the analytical and simulation derived growth rates showed agreement within 5% over a broad range of normalized wavenumber.

[1] Verboncoeur, J.P., Vahedi, V., and Birdsall, C.K., ES1, Electrostatic 1 Dimensional Code, University of California, (1989).

C6-8 Application of the Wolff Algorithm to the 4-State Clock Model. P. D. Scholten, Miami University, Oxford, OH. -- Wolff's algorithm[1] for generating spin configurations for Monte Carlo studies of phase transitions has been applied to the 4-state clock model. The advantage of this algorithm over the standard Metropolis procedure is the great reduction of the problem of critical slowing down. Using Wolff dynamics time constants for the decay of the energy-energy correlation function have been obtained for 2-d square lattices of sizes L=10, 14, 20, 40, 60 and for 3-d cubic lattices of sizes L=8, 10, and 14. From these data the values of the dynamic exponent z are 0.51 ± 0.02 and 1.36 ± 0.10 for the 2-d and 3-d systems, respectively. Results of the Metropolis algorithm are presented for comparison.

[1] Ulli Wolff, Phys. Rev. Lett. 62, 361 (1989).

C8-2 **Periodic Oscillations Found During Anodic Dissolution of Copper.*** P. PARMANANDA[1], H. DEWALD[2] and R. W. ROLLINS[1], Condensed Matter and Surface Sciences Program, Department of Physics[1] and Department of Chemistry[2], Ohio University. — Oscillations have been observed during electrochemical dissolution of various metals. We report periodic oscillations in anodic current during the dissolution of copper in an acetate buffer. These current oscillations were observed under potentiostatic conditions using a rotating copper disc as the anode. The dependence of the oscillatory behavior on control parameters such as the pH of the electrolyte solution, disc potential and rotation rates was examined. The oscillation frequency and amplitude were correlated to these parameters.

*Supported by EPRI Research Project Grant RP2426-25 and a grant from the Ohio Supercomputer Center.

C8-8 Projectile Motion- How Wide the Well? HEATHER N. FRASE and PHILIP A. MACKLIN, Department of Physics, Miami University, Oxford, Ohio 45056. When a projectile is fired from the bottom of a well, the maximum range on horizontal ground is achieved at a firing angle greater than 45 degrees. Knowing the depth of the well and the parametric equations for the envelope (P. A. Macklin, Am. J. Phys. vol. 55, p.947, 1987) of all projectile trajectories, we were able to calculate the angle for maximum range, arctan [v/((v**2 -2gh)**(1/2))]. Based on the implicit assumption that the projectile, in its path, misses the lip of the well, we were then able to calculate the minimum width (w) as a function of well depth (d). It is w=2d((l-d)**(1/2))/(2-d), with w and d in units of (v**2)/(2g). In those units the largest width necessary is 0.6006 corresponding to a well depth of 0.7639 and a firing angle of 64.09 degrees. An analytic solution together with relevant (computer generated) graphics will be presented.

C9-1 Teaching Multi-Cultural Physics. F. Thomas, Sinclair Community College. Physics and astronomy are clearly among the most "universal" of all forms of knowledge, yet we have had surprisingly little success in attracting and retaining students who reflect the full racial and cultural diversity of the U.S. population. Classroom strategies will be suggested for teaching all students (including white males of European heritage) about the strengths and difficulties of viewing science from different cultural perspectives. Examples will be included from a March 1991 Chautauqua course on Mayan Astronomy, as well as from ancient and modern China, from Africa, and from pre-Columbian Ohio.

C9-2 Theory of Fit Parameter Uncertainties for the Marquardt Compromise. R.W. Cunningham, Kent State University, Tuscarawas Campus-Monte Carlo techniques have been combined with analytical analysis to study the uncertainties of fit parameters obtained from the Marquardt compromise. Each parameter uncertainty was found to be proportional to the spread of the data and independent of the weighting scheme and weight spread. Uncertainty estimates obtained from the error matrix and the propagation of errors techniques were always equal and the equality stems from the form of the curvature matrix used in the Marquardt compromise. These two estimates depend on the weighting scheme and may be orders of magnitude larger or smaller than the Monte Carlo estimates. All three estimation results can be derived from the theory of the Marquardt compromise. Since the chi square merit function enters some of the analysis, it was also studied and found to depend quadratically on the ratio of the data spread to the weight spread. This work indicates that reliable fit parameter uncertainty estimates should be obtained by Monte Carlo techniques and that chi square is not a reliable goodness of fit indicator.

C9-4 The Exploratory Method in Teaching High School Physics. ERICA M. BROWNSTEIN, Sheridan High School.--We have all known of physics students that can perform well on tests, but in reality leave a physics course with many of the misconceptions they had originally. One way of addressing this is to use the Exploratory Method. The Exploratory Method consists of three parts: Exploration, concept development, and application. The Exploration step is accomplished by having the student perform an activity on a subject *before* it is covered in class. This helps to bring misconceptions that individuals have to the surface and those misconceptions can be addressed during the presentation of the idea. The concept development step consists of labs that are designed to help a student to understand a concept and the application step is a new way of applying the information. This approach is utilized by Paul Hewett in his Conceptual Physics textbook and is also used in the workshop called PRISMS. One exploratory activity will be presented and information will be shared.

C9-6 Experimenting with the $YBa_2Cu_3O_7$ Superconductor. JAMES F. SULLIVAN and BRIAN G. FABO, OMI College of Applied Science of the University of Cincinnati. - Superconductivity, while theoretically interesting, is truly a concept that is best encountered with a hands-on approach. The $YBa_2Cu_3O_7$ superconductor is ideal for demonstrations because it is able to be fabricated and experimented with in a fairly simple laboratory environment. Based on experiences gained in a recently-offered honors course the authors will describe the process of manufacturing and experimenting with the superconductor that can be utilized in a classroom setting, allowing for visual hands-on experiences in superconductivity.

C9-7 Hands-on Quiz in the Introductory Physics Lab. Jean OOSTENS, Physics Dept., University of Cincinnati, Cincinnati, Ohio 45221.-- For the sake of smooth operation of a large introductory Physics lab, experiments have to be kept close to a cookbook format, leaving as a definite possibility for the students to go through the motions without learning much. To get away from that trend, a Lab Exam, or Hands-On Quiz has been scheduled at the end of every other quarter. The test is administered to each student individually (the rest of the quarter, students work in pairs) and the only reference material allowed is the student's lab notebooks. Each student is assigned two briefly stated questions picked at random out of 15 to 20 different ones, to be answered in about one hour. The questions asked probe analytical skills (statistical analysis, graphing,...), understanding of circuits hook-up, of measurement methods and concepts, all applied in a context different from the original one. Some questions are quantitative extensions of demonstrations shown earlier in the lab. Representative examples will be presented in some details. The logistic for administering the test to 100 to 200 students over a one-week period will be discussed. Even though the test counts for only 10% of the total grade, it induces a large percentage of the students to show up for practice sessions held the week preceding the test.

C9-8 Improving Student Performance in Remedial Physics Courses. E. Adelson, N. Vlasko, Ohio State University. Modifications in our approach to students have led to significant improvement in student performance in a pre-engineering physics course. The improvements appear to be independent of teacher experience. These modifications occurred in four areas: 1) individual meetings of students with recitation instructors at crucial points in the course have contributed to improved student motivation: 2) student participation in the lecture was encouraged; 3) homework problem solving in groups of an appropriate size was required in recitation: and 4) each week additional class time for problem-solving with the help of the lecturer was made available to students on a voluntary basis.

C10-2 Hollywood in the Classroom. WILLIAM D. PLOUGHE, KELVIN E. TREFZ, Physics Department, The Ohio State University.-- Teachers have used media in the classroom for years. Recent developments allow teachers to combine still pictures and segments of video in the desired sequence along with appropriate text and graphics. Multimedia presentations can be used in lectures, small groups, and individually as tutors, quizzes, tests and/or simulations. Most multimedia presentations use an authoring system to present or prepare the presentation. AmigaVision by Commodore is one such system. This talk will describe the Amiga software and hardware needed for multimedia production. Examples will be shown.

C10-3 Okay, it looks good. But how...?. KELVIN E. TREFZ, WILLIAM D. PLOUGHE, Physics Department, The Ohio State University.-- Multimedia presentations look good, but how does one make them? A presentation can be made from digitized pictures, graphics, text, and video images. A demonstration on the construction of a multimedia presentation from various inputs and media forms will be given. Hot spots or hit zones can be incorporated for user control. The ease of construction of these presentations makes them a useful classroom tool.

C10-6 A Contemporary Physics Laboratory. GLENN M. JULIAN, JOHN W. SNIDER, and JOSEPH PRIEST, Miami U., Ohio. -- At Miami we are implementing a one-semester "Contemporary Physics" (CP) lecture/laboratory course, which builds on our IUPP-inspired two-semester introductory course, and which showcases recent research results. The CP course contains a core of introductory atomic and solid state physics, and nuclear and elementary particle physics, which forms the basis for understanding recent results: this can be adapted to introduce the latest discoveries. Showcased this year are the STM, high T_c superconductivity, and quarks and intermediate vector bosons. This paper describes the experiments we are using in the weekly laboratory sessions.

C10-7 Interfacing IBM PC compatible computers to physics experiments. Terrance Howald, Physics Department, Miami University. Laboratory exercises designed to present the principles of interfacing physics apparatus to an Apple IIe computer are generalized to other personal computers. An IBM PC compatible computer with a commercial data acquisition board plugged into one of the expansion slots is used to interface some 25 physics experiments. Each experiment requires the construction of electronic apparatus suitable for recording analog measurements. Software is written to use the commercial data acquisition board to digitize and store the information for computer analysis. Data analysis, graphing, and testing of mathematical models are done with an electronic spreadsheet.

C10-8 Using Online Searching as a Research Tool. BERNARD BAYER, Ohio State University--Online searching of databases is too good a tool to be restricted to quick and comprehensive literature searches and to finding a specific paper when only fragments of a title are known. For example, the "hottest" areas of research during much of last year has been high-temperature superconductors. The determination was made by ScienceWatch, not based on sending out questionnaires to, or calling, physicists, but rather by tracking the number of times papers were cited in the literature. Through your own terminal, you can use the power of online systems to determine growth areas through counts of number of articles published. By searching the online file that included Physics Abstracts you would find that the number of articles published annually on superconductivity increased by 600% between 1969 to 1989, and that most of the increase came in the last five years. Online searches can be used as a research tool at early stages of investigation to identify fruitful and productive areas of research.

C10-9 Using Powerful Symbolic Algebra Software to Teach Undergraduate Physics. GORDON J. AUBRECHT, II†, Department of Physics, Ohio State University at Marion.—The NSF-sponsored summer 1990 workshop "Transforming Physics Content Using New Technologies," focused on the use of powerful mathematical software tools developed for physicists with the aim of using them in beginning and advanced undergraduate instruction. I was one of three members of a group that developed a "lesson" that we thought would be useful in introductory physics courses as well as in upper division E&M courses (*i.e.*, we aimed at multiple audiences). The group considered the problem of a parallel plate capacitor with a sinusoidal voltage across it. We used Maxwell's Equations to solve the problem by the method of successive approximations. This exposed students to ideas of approximation and demonstrated how rapidly the asymptotic limit is reached. I will demonstrate the results of our work and describe our experiences using *Mathematica*™.

† Work supported in part by the U.S. Department of Education under FIPSE grant #P116B01237.

Special thanks to Professors Sergio E. Ulloa and Louis E. Wright of Ohio University For Organizing such a fine meeting.

James F. Sullivan
Secretary SOS/AAPT

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April 20, 1991

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*Subject to appointment by President Monnier

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June 28, 1991

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

Dear Ms. Wagschal.

In response to your memo of June 5th, I've enclosed a current list of the officers of the Southern Ohio Section / AAPT (SOS/AAPT). Also please find an abbreviated (believe it or not) description of our recent spring meeting.

The fall, 1991 meeting of the SOS/AAPT Will be a joint meeting with the Ohio Section / American Physical Society. The meeting will be jointly hosted by Wright State University and the Air Force Institute of Technology and will be on October 11-12, 1991 at Wright State University. The contact person at Wright State for the SOS/AAPT is Prof. Paul J. Wolfe (Department of Physics, Wright State University, Dayton OH 45435, 513/873-2990).

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 in early March (7th or 14th) but the exact campus and date have not yet been determined.

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

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April 20, 1991

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

The Southern Ohio Section (SOS/AAPT) met on Friday April 19th and Saturday 20th at Ohio University in Athens, Ohio. This was a joint meeting with the Appalachian Section / AAPT, the Ohio Section of the American Physical Society, and the Ohio Chapter of the American Vacuum Society. The theme of the meeting was surface imaging.

The invited speakers (and their papers) were:

Dr. Peter P. Pronko, Universal Energy systems, Inc. (Ion Beam Analysis of Materials and Surfaces -- Close encounters of Several Kinds)

Dr. Ruud M. Tromp, IBM Yorktown Heights (In Situ Studies of Si-Ge Interface Formation)

Dr. Francis P. Bundy, Retired G.E. Research and Development (Diamond Synthesis)

Dr. Robert L. Park, University of maryland and APS (What's New)

Dr. Authur T. Hubbard, University of Cincinnati (Imaging Atomic Structure by Means of Auger Electrons)

Dr. Heinrich Rohrer, IBM-Zurich (Scanning Tunneling Microscopy -- a Road to Atoms and Molecules)

Dr. David Winch, Kalamazoo College (National Interactive Media Project)

Dr. Scott Stevens, Carnegie Mellon University (A Glimpse in the Future in Interactive Digital Video)

Dr. Roger Rollins, Ohio University (Chaos with Demonstrations)

One hundred and two (102) contributed papers were presented in the Saturday morning sessions. Those presented by SOS / AAPT members included:

D.W. Elsaesser, J.E. Colon, Y.K. Yeo, and R.L. Henghold, Air Force Institute of Technology, and G.S. Pomrenke, Air Force Office of Scientific Research (Electrical Measurements of $AlGa_1$-As:Er)

S. Mahajan, R.L. Cappelletti, and R.W. Rollins, Ohio University (Orientation-Dependent Vibrating Sample Magnetometry Studies of Thin Films of $Y_1Ba_2Cu_3O_7$)

T.D. Steiner, R.L. Henghold, and Y.K. Yeo, Air Force Institute of Technology, and G.S. Pomrenke, Air Force Office of Scientific Research, T.A. Kennedy, D. Godbey, and E.R. Glaser, Naval Research Laboratory, and K.L. Wang UCLA (Photoluminescence from Si_1-Ge/Si Strained Layer Superlattices)

J.E. Colin, D.W. Elsaesser, Y.K. Yeo, and R.L. Henghold, Air Force Institute of Technology, K.R. Evans and C.E. Stutz, Electronic Technology Directorate WPAFB, and G.S. Pomrenke, Air Force Office of Scientific Research (Photoluminescence Study of the Intra-4f Emissions from AlGaAs:Er)

Y.K. Yeo, T.D. Steiner, B.L. Shaffer, and R.L. Henghold, Air Force Institute of Technology (Effects of Space Radiation on GaAs and CdSe Semiconductors)

J.L. Blackshire and P.P. Yaney, University of Dayton (Raman Microprobe Studies of Mechanically Stressed SiN Ceramics)

M.W. Millard and P.P. Yaney, University of Dayton (Spatial Temperature Profiles of Nitrogen in a Compact DC Discharge Using Coherent Anti-Stokes Raman Spectroscopy)

B.M. Minor. C.D. Holmberg, and W. F. Bailey, Air Force Institute of Technology (Computer Simulation of the Two Stream Instability: A shared Educational Experience in Dealing with Interactive Media)

C.W. Holmberg, B.M. Minor, and W. F. Bailey, Air Force Institute of Technology (Beam-Cyclotron Instability Analysis: A Marriage of Mathematica and ESl)

P.D. Scholten, Miami University, OH (Application of the Wolff Algorithm to the 4-State Clock Model)

P. Parmananda, H. Dewald, and R.W. Rollins (Periodic Oscillations Found During Anodic Dissolution of Copper)

H.N. Frase and P.A. Macklin, Miami University, OH (Projectile Motion - How Wide the Well?)

F. Thomas. Sinclair Community College (Teaching Multi-Cultural Physics)

R.W. Cunningham, Kent State University - Tuscarawas (Theory of Fit Parameter Uncertainties for the Marquardt Compromise)

E.M. Brownstein. Sheridan High School (The Exploratory Method of Teaching High School Physics)

J.F. Sullivan and B.G. Fabo, OMI College of Applied Science, Univ of Cincinnati (Experimenting with the $YBa_2Cu_3O_7$ Superconductor)

J. Oostens. University of Cincinnati (Hands-on Quiz in the Introductory Physics Lab)

E. Adelson and N. Vlasko, The Ohio State University (Improving Student Performance in Remedial Physics Courses)

W. Ploughe and K. Trefz, The Ohio State University (Hollywood in the Classroom)

K. Trefz and W. Ploughe, The Ohio State University (Okay, It Looks Good, but how...)

G.M. Julian. J.W. Snider, and J. Priest, Miami University, OH (A Contemporary Physics Laboratory)

T. Howald, Miami University, OH (Interfacing IBM Compatible Computers to Physics Experiments)

B. Bayer. The Ohio State University (Using Online Searching as a Research Tool)

G. Aubrecht. The Ohio State University at Marion (Using Powerful Symbolic Algebra Software to Teach Undergraduate Physics)

Special thanks to Professors Sergio E. Ulloa and Louis E. Wright of Ohio University For Organizing such a fine meeting.

James F. Sullivan

James F. Sullivan
Secretary SOS/AAPT

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July 16, 1991

Mr. Ronald J. Monnier
President, SOS/AAPT
2250 Hess Ave.
Cincinnati, OH 45211

Dear Ron,

You mentioned that you would be out of town this week so I thought I better send this note while the thought is still fresh. Carol Damian of Dublin High School (near Columbus) offered to host a future SOS/AAPT meeting. It would probably be a good idea to invite her to the executive committee meetings so she will be prepared. The addresses that I have for her are:

Carol Damian

School:
Instructor of Physics
Dublin High School
6780 Coffman Rd.
Dublin OH 43017
(614) 889-2548

Home:
4391 Sawmill Rd.
Columbus OH 43220
(614) 451-7987

Both addresses are (possibly) dated. If you have any trouble I'm certain Bill Ploughe at OSU has good data. Hope you had a good trip and, again, let me know if I can help (home: 662-9560, office 556-4872)

Best Regards,

James F. Sullivan
Secretary SOS/AAPT

Rec'd 9/22/91

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July 17, 1991

Dr. Robert W. Cunningham
Department of Physics
Kent State University - Tuscarawas
University Drive N.E.
New Philadelphia, OH 44663

Dear Bob,

SOS/AAPT President Ron Monnier has told me that he has indeed appointed you as Associate Secretary of the section (recall the spring meeting at OU).

I have been negligent in one task that was given to me earlier in the year and I was hoping you might take over for me. The task was to contact the State Board of Education (in Columbus, I presume) and get mailing labels for all the high schools in our section. I would suspect that you will have to give them the names of the appropriate Ohio counties. We were going to have a mailing in the fall encouraging physics teachers to (re)join the section. Please let me know if you will be able to take on this project.

My phone numbers are: office (513) 556-4872, home (513) 662-9560. Hope you are having a good summer.

Best Regards,

James F. Sullivan
Secretary SOS/AAPT

cc R. Monnier

American Association of Physics Teachers

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Bernard V. Khoury, Executive Officer

1991 AAPT Summer Meeting
University of British Columbia
Vancouver, BC, Canada
June 24-29, 1991

1992 AAPT Winter Meeting
Clarion Hotel
Orlando, FL
January 6-9, 1992

Memo to: Section Secretaries
From: Nicole Wagschal
Announcer
Date: September 9, 1991
RE: December *Announcer* Copy

Dear Section Secretaries:

Well, summer is over and it's school time once again. I hope that you all had an enjoyable vacation and that many of you were able to attend the Summer Meeting in Vancouver. With that highly successful meeting behind us, we are now looking forward to the Winter Meeting to be held in Orlando, Florida. If you haven't already, make your plans now to attend!

We are currently preparing the December *Announcer*, the Winter Meeting issue. The deadline has been advanced to **September 20**, so if you have any current section news that you would like to submit or any future calendar news, please forward the information on to us as soon as possible. The calendar section will include all meeting information through the Fall of 1992. Please note this early deadline and feel free to submit any section information you would like included in the next *Announcer*.

Don't forget the early deadline. I look forward to hearing from you soon! Thanks again.

Sincerely,

Nicole Wagschal

Nicole Wagschal
Publications Coordinator

SOS/AAPT Meetings

Spring 1992
March, 14, 1992
The Ohio State University
Columbus, OH
Contact Person: William D. Ploughe (614) 292-8841

Fall, 1992
Sinclair Community College
Dayton Ohio
Contact Person: Fred Thomas (513) 226-2531

Phoned to Nichole Wagschal 9/23/91

The Dialog

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

September, 1991

Fall Meeting October 11-12

The Fall, 1991 Meeting of the SOS/AAPT will be a joint meeting with the Ohio Section of the American Physical Society. The meeting is being co-hosted by the Department of Engineering Physics of the Air Force Institute of Technology and the Department of Physics of Wright State University. The meeting will be held at Wright State. A registration form and map appear elsewhere in The Dialog.

If you cannot attend both days, you can attend one day. SOS/AAPT members are especially encouraged to submit papers for the contributed paper sessions on Saturday morning.

Contributed papers dealing with original research, the teaching of physics, or physics and society are solicited. Ten minute oral presentations will be scheduled in parallel sessions from 8:00 to 10:00 am on Saturday morning, October 12. A poster session will be arranged from 4:30 to 5:30 pm on Friday. If you are interested in presenting a paper, send your abstract in camera-ready, APS format to Merrill L. Andrews, Department of Physics, Wright State University, Dayton, OH 45435. Abstracts must be in by 3:00 pm, Friday, September 27, 1991 for inclusion in the program.

The theme of the program is fusion.

Schedule of Major Presentations

Friday

Dr. John Sheffield, Director Fusion Energy Division, Oak Ridge Labs, Magnetic Confinement Fusion: Present Status and Future Technical Problems

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

Marjorie G. Bardeen, Program Manager, Fermilab Education Office, Collaboration of Fermilab Physicists in Science Education Reform.

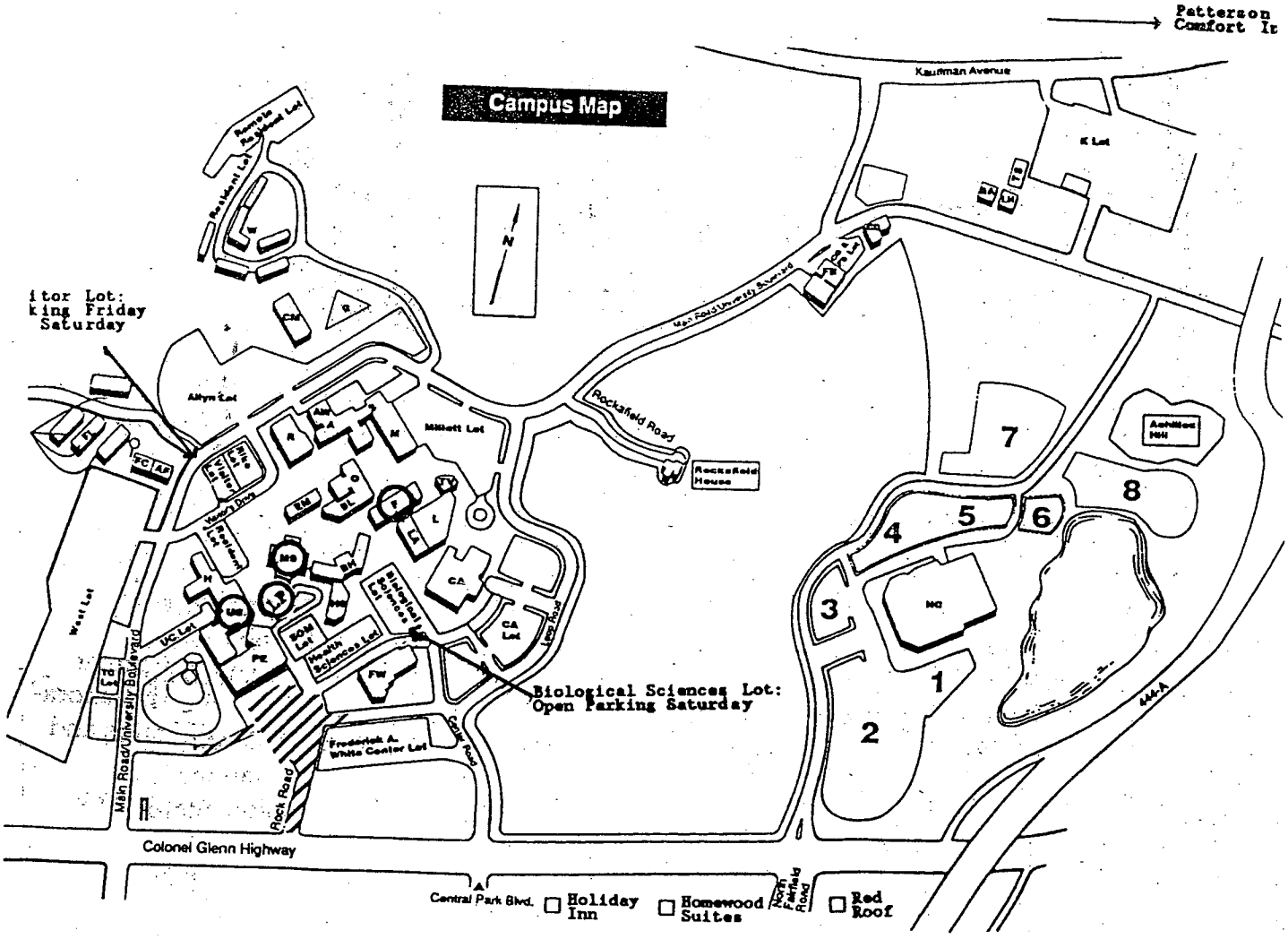
Saturday

Dr. Ronald Parker, Director, Plasma Fusion Center, MIT, Tokamak Reactors: Physics, Diagnostics, Status

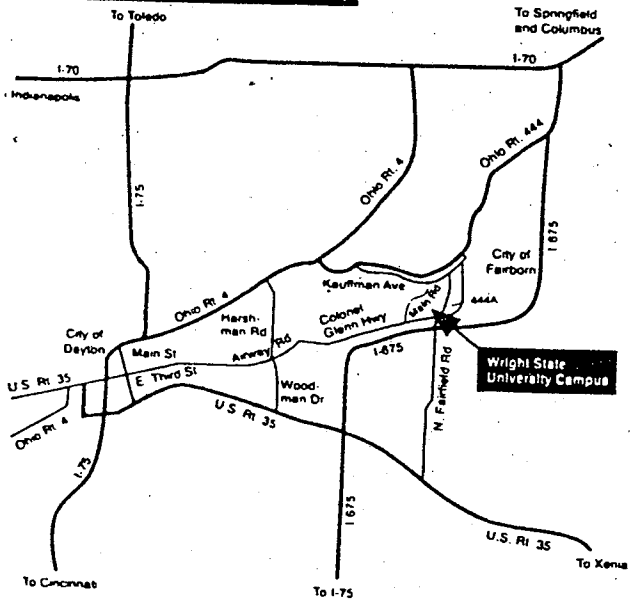
Dr. Robert McRory, Director, Laboratory for Laser Energetics, University of Rochester, Omega Reactor: Physics and Diagnostics

A special planetarium trip is planned for Friday Evening to view the new Digistar Display at the Dayton Museum of Natural History. Be sure to register in advance if you are interested in this field trip.

There will also be a poster session, open house, banquet, and social hour. See the registration form for costs. Many motels are nearby. Mention the APS meeting for special rates.



Principal Routes to Wright State University



From most directions, the easiest route to WSU is via I-675. Using the North Fairfield Rd. exit, simply turn north on that road about one block which brings you to Col.-Glenn Hwy. Turn left on Col.-Glenn Hwy. and right at the second light entering the campus for Friday parking

See map for designated parking.

(F) Fawcett Hall

(UC) University Center
Dining Room and Hearth Lounge

(MS) Medical School
Auditorium for After Banquet Speake

(LP) Loading Point for Bus Transportation to Planetarium

ADVANCE REGISTRATION FORM
JOINT OS/APS AND SOS/AAPT FALL MEETING
AIR FORCE INSTITUTE OF TECHNOLOGY AND WRIGHT STATE UNIVERSITY
AT
WRIGHT STATE UNIVERSITY
DAYTON, OHIO 45435
OCTOBER 11 & 12, 1991

Name:_____ Affiliation: _____

PLEASE CIRCLE: STUDENT FACULTY INDUSTRY GOVERNMENT

PLEASE CIRCLE: APS MEMBER AAPT MEMBER

Address: _____ Telephone: _____

City, State, Zip: _____

Member - Full Registration including banquet	@ $22.00	$_____
Retired Member - Registration including banquet	@ $12.00	$_____
Full Time Student - Registration including banquet	@ $12.00	$_____
Member - Meeting Registration only	@ $10.00	$_____
Student - Meeting Registration only	NO FEE	
Retired Member - Meeting Registration only	NO FEE	
Banquet Tickets only (guest)	@ $12.00	$_____
Abstract Fee (**Abstracts due by Sep 27**)	@ $40.00	$_____
OS/APS Annual Dues (if not already paid)	@ $ 5.00	$_____
SOS/AAPT Annual Dues (if not already paid)	@ $ 5.00	$_____
TOTAL PAYMENT ENCLOSED		$_____

Please check line below which applies:
_____OS/APS paid through National Dues _____OS/APS Local Dues already paid

Meeting registration after September 27, 1991, will be $12.00. Banquet reservations must be made no later than September 27, 1991.

Please make checks payable to: WSU Physics - OS/APS, and return to Merrill L. Andrews, Department of Physics, Wright State University, Dayton OH 45435.

Please indicate below if you wish to attend the Planetarium Digistar Display.

____ I wish to attend the Digistar Display

____ I do not wish to attend the Digistar Display

Annual Summer Meeting Held in Vancouver

by James Poth, Section Representative

The 1991 AAPT Summer Meeting was held June 24-29 in Vancouver, British Columbia, a city that certainly deserves its reputation as the "Crown Jewel of the West." THe meeting was hosted in outstanding facilities by the University of British Columbia on a beautiful campus surrounded by water and forest. This is the first time that the Summer Meeting has been held in Canada, and the Vancouver temperatures were a welcome relief.

The Summer Meeting continues to grow in popularity, and new records were set by the registration of over 1200 and the total number of papers. As has been the practice in recent years, the two days before the start of the contributed papers were used primarily for workshops. The extremely wide range of topics available in nearly 40 workshops would have been reason enough to attend this meeting. Tours of the Tri-University Meson Facility (TRIUMF) were also available.

The continuing sessions entitled The Evening Demonstration Show and Old Demonstrations for New Teachers VI were again very popular. The Plenary Sessions provided an array of informative presentations on the The New Generation of Super Accelerators, The Most Powerful Light in the World, and the Sudbury Neutrino Observatory. At the annual Ceremonial Session, the Millikan Award was presented to none other than Mr. Wizard, alias Don Herbert, and the Klopsteg Memorial Lecture was given by Paul Hansman of UC Santa Barbara on Seeing Atoms with the New Generation of Microscopes.

News from the Section Representative meeting-Plans for the American Center for Physics, the new home of AAPT, APS, and AIP are progressing nicely, and negotiations to obtain a 24-acre property neat the netro line in College Park, Maryland, are in the final stages. An architectual firm has been engaged to design the new building, whcih will initially occupy half the property. The AAPT space in the new building will be a 50% increase, and the current plan is to rent rather than sell the Dodge Building.

An upcoming program, called Campaign for Physics, will support the new Center for Teaching Physics, which will be housed in the new building and serve as a national focus for improving the quality of physics teaching. AAPT headquarters is no planning for an upgrade of the computer system, and the Executive Director is looking into the possibility of incorporating a Section Dues check-off in the new system. A new high school curriculum under consideration, known as **Just Physics**, is a joint project of AAPT and AIP. The new PTRA Plus program has recently been funded by NSF and will provide 25 new PTRA's per year for three years, with training prior to the Summer Meeting. After three years, workshop fees are to be used to support the PTRA program.

Report on the Spring, 1991 Meeting

by Jim Sullivan

The Southern Ohio Section (SOS/AAPT) met on Friday April 19th and Saturday 20th at Ohio University in Athens, Ohio. This was a joint meeting with the Appalachian Section/AAPT, the Ohio Section of the American Physical Society, and the Ohio Chapter of the American Vacuum Society. The theme of the meeting was surface imaging.

The invited speakers (and their papers) were:

Dr. Peter P. Pronko, Universal Energy Systems, Inc. (Ion Beam Analysis of Materials and Surfaces-Close Encounters of Several Kinds)

Dr. Ruud M. Tromp, IBM Yorktown Heights (In Situ Studies of Si-Ge Interface FOrmation)

Dr. Francis P. Bundy, Retired G.E. Research and Development (Diamond Synthesis)

Dr. RObert L. Park, University of Maryland and APS (What's New)

Dr. Authur T. Hubbard, University of Cincinnati (Imaging Atomic Structure by Means of Auger Electrons)

Dr. Heinrich Rohrer, IBM-Zurich (Scanning Tunneling Microscopy-a Road to Atoms and Molecules)

Dr. David WInch, Kalamazoo College (National Interactive Media Project)

Dr. Scott Stevens, Carnegie Mellon University (A Glimpse in the Future in Interactive Digital Video)

Dr. Roger Rollins, Ohio University (Chaos with Demonstrations)

Special thanks to Professors Sergio E. Uloa and Louis E. Wright of Ohio University for organizing such a fine meeting.

One hundred and two (102) contributed papers were presented in the Saturday morning sessions. Those presented by SOS/AAPT members are listed in this issue of The Dialog.

Minutes of the Executive Committee, Ohio University, Athens, Ohio, Saturday, April 20, 1991.

by Jim Sullivan, Secretary

The executive committee of the Southern Ohio Section of the AAPT met in room 254 of the Clippinger Laboratory Building at Ohio University. Those present were G. Aubrecht, R. Cunningham, W. Dollhopf, W. Ploughe, J. Poth, J. Sullivan, F. Thomas, and S. Yerian.

The minutes of the executive committee meeting of February 17, 1991 were approved.

The treasurer's report was given. 1991 membership is down slightly. Pending the election at the regular meeting (next hour) R. Teese will serve as the official treasurer with D. Traxler assisting. It was suggested that the $100 received from life memberships be put in an interest bearing account to more accurately reflect the state of the section's finances.

Section Representative J. Poth gave the Section Representative report:

The Physics Teacher Resource Agent (PTRA) proposal has not yet been funded.

The national AAPT building plans are proceeding. The project manager and architect have been hired.

Suggest a letter be sent to former members asking them to consider rejoining the section.

President W. Dollhopf noted that the Ohio State Science Fair is occurring on this day. Next year ('92) this will not be a problem since SOS/AAPT is meeting earlier in the spring.

Vice President S. Yerian reported that much effort must be expended by a group attempting to offer Comprehensive Education Units (CEU's). Since there is uncertain demand for them at this time it was suggested that the SOS/AAPT not offer them now. The Smith Lectures at OSU have just been announced for May 6, 1991. S. Yerian will announce this at the regular meeting.

W. Dollhopf reported that the contact person for the SOS/AAPT at the Fall, 1991 meeting at Wright State is Prof. Paul Wolfe. The fall, 1991 meeting will be on October 11-12. The spring, 1992 meeting will be a joint meeting with the Ohio Section/American Association of Physics Teachers on March 7th or 14th in the central Ohio area. The proposed theme of this meeting (Spring, 1992) will be new physics curricula. A tentative schedule of future meetings is

Fall, 1992: Sinclair Community College, Dayton
Spring ,1993 Cincinnati Area?
Fall, 1993 Dublin, Ohio ?
Spring, 1994 South Central Ohio

President Dollhopf also requested the job descriptions form all officers.

Minutes of the Business Meeting SOS/AAPT Ohio University Athens, Ohio Saturday April 20, 1991

by Jim Sullivan, Secretary

The meeting of the SOS/AAPT was called to order by President W. Dollhopf on Saturday April 20, 1991 on the campus of Ohio University in Athens, Ohio.

The minutes of the October 13, 1990 business meeting were approved as published in The Dialog.

The treasurer's report was distributed to the members.

Section Representative J. Poth gave the Section Representative report:

The AAPT will be a partner in the new (national) physics building. The site has been selected and an architect has been chosen.

The national three meeting/year model is now in operation. Some future meetings are:

Washington, D.C., April 22-25
University of British Columbia, Vancouver, BC, June 24-29, 1991
Orlando, Florida, January 6-9, 1992
Washington, D.C., April 20-23, 1992. This will be the first time the AAPT is full partner with the APS in the spring meeting.
University of Maine, Orano, Maine, August 10-15, 1993
New Orleans, Louisiana, January 4-7, 1993
Boise, Idaho, Summer, 1993

The Physics Teacher Resource Agent Plus (PTRA+) proposal, if renewed, will extend the PTRA program.

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

G. Aubrecht moved and S. Yerian seconded the following motion: "The members of the Southern Ohio Section/ AAPT recommend that President Monnier appoint D. Traxler as Associate Treasurer for a one-year trial period." After a very brief discussion the motion passed unanimously.

W. Ploughe moved and P. Hagedorn seconded the following motion: "The members of the Southern Ohio Section/AAPT recommend that President Monnier appoint R. Cunningham as Associate Secretary for a one-year trial period." The motion passed unanimously.

The announcement was made that a person can be an SOS/AAPT member without being a national AAPT member.

A motion to adjourn was made by G. Aubrecht and seconded by E. Brownstein. The motion passes unanimously and the meeting adjourned at 1:25 PM.

Research Matters...To the Science Teacher

Encouraging Student/Student Interaction

Roger T. Johnson; David W. Johnson

How should students interact with one another in science class? This question has been neglected by those studying teaching. While science teachers are encouraged to plan carefully the interactions between students and material (specific curriculum, specific content) and there is growing concern about teacher/student interaction, the peer culture of the classroom remains relatively unexplored. Perhaps because we tend to overestimate our own influence on learning as teachers, we have grossly underestimated the power of appropriate student/student interaction on a range of learning outcomes.

There are three basic ways that students can interact with each other. Students can compete with each other to see who are the best students in the class; students can work individually on their own toward an established criterion; or students can work together, cooperatively, taking responsibility for each other's learning as well as their own. Many students in the United States tend to see school as a competitive place where it is important that you do better than the other students. Over the last fifteen years, teachers have been encouraged to structure individualized learning in which students work alone at their own pace.

Reports on over 600 research studies, dating back to the 1800's, which compare learning in cooperative, competitive, and individualistic goal structures have been collected at the Cooperative Learning Center at the University of Minnesota. From these studies it has been concluded that having students work together cooperatively is much more powerful than having students work alone, competitively or indiviudally. Some of the findings include:

1. More students learn more material when they work together cooperatively, talking through the material with each other and making sure that all group members understand, than when students compete with one another or work alone, individually.
2. More students are motivated to learn the material when they work together, cooperatively, than when students compete or work alone, individually (and the motivation tends to be more intrinsic).
3. Students have more positive attitudes when they work together cooperatively than when they compete or work alone, individualistically. Students are more positive about the subject being studied, the teacher, themselves as learners in that class, and are more accepting of each other (male or female, handicapped or not, bright or struggling, or from different ethnic backgrounds) when they work together cooperatively.

The positive effects of cooperative learning in science fo beyond the immediate gains in achievement, motivation, self-esteem and acceptance of differences. Students learning in a cooperative goal structure also develop skills in communication, leadership, and conflict resolution that are basic to productive, working teams.

There is more to cooperative learning than a seating arrangement or sharing lab equipment. Cooperation requires a sense of positive interdependence with a "sink or swim together" perception, where one person's contributions are celebrated by all group members. A shared group goal and often a shared group reward (bonus points for group success) is essential to encourage cooperation. Individual accountability is also important in cooperative learning groups. All group members need to understand the material and be able to explain the group's answers.

It is clear that many students do not have basic skills in interacting with other people in a work group. These collaborative skills need to be taught (i.e. active listening, checking other group members for understanding, etc.) Current research on student/student interaction is focused more on internal dynamics of cooperative froups and less on comparisons with competitive and individualistic goal structures. A few findings from these studies are summarized here.

1. It appears that constructive argument is important to a cooperative group and enhances learning. The use of controversy, disagreement, and discussion in groups is encouraged.
2. There is increasing evidence that students who "talk through" material with peers learn it in a more effective way than students who just read or listen to material.
3. A number of studies focus on the effects of positive interdependence on learning of groups. It appears that the stronger the "we sink or swim together" feeling in a group, the more likely the group will be successful and that all members will master the material.
4. A number of current studies indicate that sending students to the computer in small groups that "cannot touch the key until they all agree" is more a powerful way to learn at the computer than having each student working alone at his or her own computer.
5. It appears that retention of information is enhanced in the cooperative setting and that students who work in cooperative relationships are more likely to have a conscious strategy for how they got to the answer. It would appear that initial strategies for problem solving are often intuitive when seeking an answer and are invented when students try to explain to each other the rationale for their answers.

The implications for science teachers from this research area would be to structure much of the science class cooperatively with the teacher teaching only enough to get the groups operating and then monitoring and interacting with small (2 to 4 students) cooperative groups. It may be useful to encourage all the students to verbalize significant content in the groups and to encourage constructive argument. Teachers should "mix" the class members in heterogeneous groups (male/female, handicapped/nonhandicapped, different ethnic backgrounds, etc), so that students get beyond their initial stereotypes and are able to treat each other as "other science students" and fellow group members. Such grouping should improve the attitudes toward science of student populations not presently positive about science.

We need to acknowledge the academic influence students have with each other, and enlist the help of students to set norms in schools so students will encourage each other to learn in science. In this way, the classroom will become a place where students care about each other's learning and are successful.

Produced by the National Association for Research in Science Teaching, an organization that seeks to improve science teaching through research. Executive Director: John Staver, 219 Bluemont Hall, Kansas State University, Manhattan, KS 66506

Notes from the Editor

by Mike Grote

I have recently come across several books which I have found interesting and useful. I will use my column this month to pass them on to you.

Cooperative learning has been around for a few years. Although it has been big on the elementary and junior high school scene, it has not had a lot of publicity in the high schools. Some research shows remarkable gains for students using cooperative learning, while other research shows little difference between traditional approaches and cooperative learning. Part of the problem with the research is that it is not clear what is cooperative learning and what is not. Is a typical lab group an example of cooperative learning, for example?

Robert Slavin's **Cooperative Learning** (1990, Prentice Hall, Englewood Cliffs, New Jersey, 07632) does a good job of spelling out practical schemes to make cooperative learning successful. I am currently trying the *Student Teams-Achievement Divisions* or STAD, which Slavin recommends to teachers who are trying cooperative learning for the first time.

The teacher makes a worksheet, worksheet answer sheet, and a quiz for each unit (3-5 days of instruction). Students in the class are assigned to 4-person teams representative of the makeup of the classroom. In my classroom, that would be 2 boys, 2 girls, 1 high achiever, 1 low achiever, 2 average.

The lesson is taught. Students then work on worksheets in their teams to master the material. No one is finished studying until everyone have mastered the material. Students take individual quizzes on the material. There is recognition for teams that show improvement. It is also possible to make a small portion of each team members grade dependent on the *improvement* of team members' scores.

The book has several other structures which encourage students to teach each other. It also has chapters which discuss the research and give advice. If you have been interested in giving cooperative larning a try, this book has step-by step instructions for a practical approach. I have also included in this issue of The Dialog a copy of the research summary on cooperative learning prepared by the National Association for Research in Science Teaching.

Science in Cinema (Dubeck, Moshier, Boss, 1988, Teacher College Press, Columbia University, New York, NY 10027) gives a detailed analysis of 10 science fiction classics plus brief descriptions of another couple of dozen films.

Each of the detailed analyses provides a synopsis, scientific principles related to the film, scientific commentary, classroom activities, topics for further discussion, literary commentary, and a bibliography. Although the in-depth treatments are of films that are relatively old, there may be advantages in using these older films. They would all probably get G or PG ratings and most students haven't already seen them. Most of the films are available on video tapes at rock bottom prices (less than $20) and many are available for rent at the larger video stores.

Like most of you, I couldn't afford to give up several periods of class to watch a Sci-Fi movie, but I do think they can be entertainng and educational at the same time. I bought several of the films. Students may borrow them from me. They, in return, have to agree to gather 3-4 friends to watch the film with them. They also get a sheet with 10 questions about the physics in the film. For example, in *When Worlds Collide* it gives the speed of Bellus and Zyra (a sun and its planet) as they move toward the earth. Using the speed and initial position, students calculate how long would it take them to reach the earth ignoring any acceleration which might be caused by our sun. There are also questions which generate more discussion such as "How does the spaceship change its orientation in outer space? In reality, could the change of a spaceship's orientation be accomplished as depicted in the film? Why or why not? The students must turn in a single sheet with their agreed-upon answers which fosters lively discussion.

The films are used to get students talking about physics outside the classroom in a social setting. It gives an association of physics with some fun. Although I have no evidence to support a positive effect, I think everything we can do to make physics relevant and get students using it outside of class has to help our cause. I plan on presenting a contributed paper on this topic at the Fall meeting if you are interested in more examples and specifics.

A History of Ideas in Science Education (DeBoer, George, 1991, Teachers College Press, Columbia University, New York, NY 10027) will be interesting reading if you have ever wondered how we got where we are. Science was not a part of secondary curriculum until the end of the last century! It is also interesting to read how physics earned its last-place slot in the curriculum. (A person counted the number of times physics, chemistry, and biology concepts were mentioned in newspapers and magazines. Biological references came up most frequently, so it was placed first. Seems like a weak reason to me.) For a while, it was recommended that physics be taught first.

The other interesting thing is how cyclical some of our ideas about teaching science are. In 1900 there are calls to make science experiences and labs a larger part of teaching science with less dependence on lectures, for example.

Abstracts from the Spring, 1991 Meeting, SOS/AAPT

3-1 Electrical Measurements of $Al_xGa_{1-x}As$:Er, D. W. ELSAESSER, J. E. COLON, 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, Bolling AFB, Washington D.C.,--We report the effect of Er doping on the deep level concentration of GaAs and $Al_xGa_{1-x}As$, for x=0.1, 0.2, 0.3, and 0.4. Three micron thick layers of GaAs or $Al_xGa_{1-x}As$, grown by MOCVD, were implanted with Er ions at an energy of 1 MeV and a dose of $10^{13}/cm^2$. The n-type GaAs samples showed strong donor gettering by the Er, while little or no donor gettering was observed for all $Al_xGa_{1-x}As$ samples. Furthermore, DLTS measurements revealed two prominent hole traps in GaAs:Er, having activation energies of 0.08 and 0.321 eV above the valence band. These traps were also observed in $Al_xGa_{1-x}As$, but with energies shifted to 0.068 and 0.462 eV, respectively. For higher Al mole fractions, it appears that both of these deep levels disappear. Measurement of these deep levels, especially the latter, is complicated by the presence of the DX center which has a large concentration for x=0.3 & 0.4.

C4-5 Orientation-Dependent Vibrating Sample Magnetometry Studies of Thin Films of $Y_1Ba_2Cu_3O_{7-x}$. SUKESH MAHAJAN, R. L. CAPPELLETTI and R. W. ROLLINS, Ohio Univ.— We report orientation-dependent magnetic properties of c-axis oriented superconducting films of $Y_1Ba_2Cu_3O_{7-x}$ (YBC). The films were deposited epitaxially on $SrTiO_3$ (100) single crystal substrates by laser ablation. The measurements were made using a PAR 150 vibrating sample magnetometer. The sample was field cooled (or zero field cooled) at an angle ϕ to the c-axis (direction of the film normal) to low temperatures. The field was then switched off(or applied) and the remanent magnetization (M_{rem}) was measured as a function of the orientation of the film with respect to the sensing coils. The results indicated that the trapped flux was always directed perpendicular to the film and along the c-axis. Above a certain critical field dependent on angle ϕ the magnitude of M_{rem} was always found to be the same. An analysis based on the Bean critical state model and on the fact that magnetic penetration depth is comparable to the thickness of film will be presented.

C5-1 Photoluminescence from $Si_{1-x}Ge_x$/Si Strained Layer Superlattices, T.D. STEINER, R.L. HENGEHOLD, and Y.K. YEO, Air Force Institute of Technology, Wright-Patterson AFB, OH, G.S. POMRENKE, Air Force Office of Scientific Research, Washington D.C., T.A. KENNEDY, D. Godbey, and E.R. GLASER, Naval Research Laboratory, Washington D.C., and K.L. WANG, UCLA, Los Angeles, CA.,--Photoluminescence from strained superlattice layers of $Si_{1-x}Ge_x$/Si grown on Si(100) by molecular beam epitaxy has been observed for various superlattice periods, sublayer thicknesses, and different $Si_{1-x}Ge_x$ alloy concentrations. The PL spectra show very complicated structures which contain peaks from the silicon substrate and the MBE grown Si buffer layer, as well as those from the intrinsic superlattice. The peak energies of superlattice related photoluminescence are compared to the values predicted from the Kronig-Penney model for the superlattice potential.

C5-2 Photoluminescence Study of the Intra-4f Emissions from AlGaAs:Er, J.E. COLON, D.W. ELSAESSER, Y.K. YEO, R.L. HENGEHOLD, Air Force Institute of Technology, Wright-Patterson AFB, OH, K.R. EVANS and C.E. STUTZ, Electronic Technology Directorate, Wright-Patterson AFB, OH, G.S. POMRENKE, Air Force Office of Scientific Research, Bolling AFB, Washington D.C.,--Erbium doped III-V semiconductors have strong, sharp optical emissions near 1.54 μm, which is close to the wavelength of minimum attenuation in silica based fiber optics. Thus, these materials could prove to be useful for new opto-electronic sources for fiber optic communications. We have studied the Er characteristic emissions from ion implanted and MBE grown $Al_xGa_{1-x}As$:Er as a function of the aluminum mole fraction, x, and, in the case of ion implanted samples, of the substrate conductivity. The intensity of the Er emissions increased with increasing x. For the ion implanted samples, the Er emissions from p-type substrates were stronger than those from SI- or n-type substrates. The MBE grown $Al_xGa_{1-x}As$:Er samples with x=.5 and .7 showed a new group of sharp, strong emissions near 1.56 μm.

C5-3 Effects of Space Radiation on GaAs and CdSe Semiconductors, Y.K. YEO, T.D. STEINER, B.L. SHAFFER, and R.L. HENGEHOLD, Air Force Institute of Technology, Wright-Patterson AFB, OH,--We have examined the effects of space radiation on GaAs and CdSe semiconductor samples using photoluminescence (PL) and cathodoluminescence (CL) techniques. The semiconductor samples were placed aboard the Long Duration Exposure Facility (LDEF) satellite in a 28.5 degree inclination, 480 km altitude, near-circular orbit and exposed to a direct space environment for a period of 11 months and shielded by a 0.313 inch thick aluminum plate for another 58 months. The PL and CL spectra were obtained in various wavelength regions from 0.5 to 1.8 μm for both the exposed samples as well as unexposed control samples. Changes were detected in some of the sample pairs which could be attributed to radiation induced effects. These changes primarily manifested themselves in three different categories: (1) decrease or increase of luminescent intensity; (2) shifts in PL peak locations; and (3) quenching of PL peaks.

C6-2 Raman Microprobe Studies of Mechanically Stressed Si_3N_4 Ceramics, J. L. BLACKSHIRE,* and P. P. YANEY, U. of Dayton** -- A Raman Microprobe was used to study the behavior of Si_3N_4 advanced ceramics under a variety of mechanical load conditions. The Si_3N_4 test bars were 50mm long by 3mmX4mm rectangular cross section. They were mechanically stressed using a four-point bend fixture, and were simultaneously probed with the Raman microprobe. The Raman microprobe, which utilized cylindrical laser beam optics for illumination of the specimen, and a CCD detector for collection of the scattered Raman light, provided spectral resolution of .33 cm^{-1}, and spatial resolution on the specimen of 2 μm. The Raman spectra obtained provide information on changes in the bonding characteristics of the stressed materials, and help in understanding the interaction between the ceramic's microstructure and mechanical behavior.

* In partial fulfillment of the requirements for the M.S. degree in Electro-Optics.

** Supported by DOE/Martin Marietta Energy Sys.

C6-3 Spatial Temperature Profiles of Nitrogen in a Compact DC Glow Discharge Using Coherent Anti-Stokes Raman Spectroscopy. M. W. Millard* and P. P. YANEY, U. of Dayton** -- Vibrational and rotational temperatures have been derived from CARS spectra of the Q-branch in a nearly wall-less nitrogen discharge established between parallel, flat molybdenum electrodes at a spacing of 14 mm, a pressure of 30 Torr and a current of 20 mA. The discharge was spatially constrained by a Macor cap covering the cathode with a 9 mm aperture in the center of the cap. The nitrogen flow rate through the chamber was 85 sccm. The three laser beams were in the folded-BOXCARS geometry which gave a spatial resolution of approximately 50 μm by 1 mm. The temperature plots show a continuous temperature profile across the discharge but with a narrowing at the 7 mm position.
* In partial fulfillment of the requirements for the M.S. degree in Electro-Optics.
** Supported by USAF Contract F33615-90-C-2036.

C6-4 Computer Simulation of the Two Stream Instability: A Shared Educational Experience in Dealing with Interactive Media. B. M. Minor, C. D. Holmberg, and Wm. F. Bailey, Air Force Institute of Technology, WPAFB OH.--The availability of outstanding software has brought new excitement to the study of plasma dynamics. We have integrated the study of plasma instabilities with the use of ES1[1], an interactive particle simulation code. As an example, we report the interplay between an analytic treatment of the two stream instability and a computer simulation. Analytically derived thresholds and growth rates, based on a linearized, perturbation analysis of the fluid equations, are compared with the results of the computer simulation. In the linear growth regime, agreement within 2% is observed. The restrictions and failure of the analytical treatment are then exposed and explored in the non-linear regime.

[1]Verboncoeur, J.P., Vahedi, V., and Birdsall, C.K., ES1, Electrostatic 1 Dimensional Code, University of California, (1989).

C6-5 Beam-Cyclotron Instability Analysis: A Marriage of Mathematica and ES1[1]. C.D. Holmberg, B.M. Minor, and Wm. F. Bailey, Air Force Institute of Technology, WPAFB OH.--Theoretical studies of instabilities in magnetized plasmas often center on the beam-cyclotron instability. The analysis required is usually deemed too demanding for incorporation into standard course material. We have revisited this problem as a classroom exercise in the use of interactive media. A perturbation approach has been applied to the linearized fluid equations to develop the dispersion relation. The complex root solving and tabling functions of Mathematica were employed to solve the dispersion relation for the unstable roots and identify the instability threshold and growth rates. The instability was then simulated using ES1. A comparison of the analytical and simulation derived growth rates showed agreement within 5% over a broad range of normalized wavenumber.

[1]Verboncoeur, J.P., Vahedi, V., and Birdsall, C.K., ES1, Electrostatic 1 Dimensional Code, University of California, (1989).

C6-8 Application of the Wolff Algorithm to the 4-State Clock Model. P. D. Scholten, Miami University, Oxford, OH. -- Wolff's algorithm for generating spin configurations for Monte Carlo studies of phase transitions has been applied to the 4-state clock model. The advantage of this algorithm over the standard Metropolis procedure is the great reduction of the problem of critical slowing down. Using Wolff dynamics time constants for the decay of the energy-energy correlation function have been obtained for 2-d square lattices of sizes L=10, 14, 20, 40, 60 and for 3-d cubic lattices of sizes L=8, 10, and 14. From these data the values of the dynamic exponent z are 0.51 ± 0.02 and 1.36 ± 0.10 for the 2-d and 3-d systems, respectively. Results of the Metropolis algorithm are presented for comparison.

[1]Ulli Wolff, Phys. Rev. Lett. 62, 361 (1989).

C8-2 Periodic Oscillations Found During Anodic Dissolution of Copper.* P. PARMANANDA[1], H. DEWALD[2] and R. W. ROLLINS[1], Condensed Matter and Surface Sciences Program, Department of Physics[1] and Department of Chemistry[2], Ohio University. — Oscillations have been observed during electrochemical dissolution of various metals. We report periodic oscillations in anodic current during the dissolution of copper in an acetate buffer. These current oscillations were observed under potentiostatic conditions using a rotating copper disc as the anode. The dependence of the oscillatory behavior on control parameters such as the pH of the electrolyte solution, disc potential and rotation rates was examined. The oscillation frequency and amplitude were correlated to these parameters.

*Supported by EPRI Research Project Grant RP2426-25 and a grant from the Ohio Supercomputer Center.

C8-8 Projectile Motion- How Wide the Well? HEATHER N. FRASE and PHILIP A. MACKLIN, Department of Physics, Miami University, Oxford, Ohio 45056. When a projectile is fired from the bottom of a well, the maximum range on horizontal ground is achieved at a firing angle greater than 45 degrees. Knowing the depth of the well and the parametric equations for the envelope (P. A. Macklin, Am. J. Phys. vol. 55, p.947, 1987) of all projectile trajectories, we were able to calculate the angle for maximum range, arctan [v/((v**2 -2gh)**(1/2))]. Based on the implicit assumption that the projectile, in its path, misses the lip of the well, we were then able to calculate the minimum width (w) as a function of well depth (d). It is w=2d((l-d)**(1/2))/(2-d), with w and d in units of (v**2)/(2g). In those units the largest width necessary is 0.6006 corresponding to a well depth of 0.7639 and a firing angle of 64.09 degrees. An analytic solution together with relevant (computer generated) graphics will be presented.

C9-1 Teaching Multi-Cultural Physics. F. Thomas, Sinclair Community College. Physics and astronomy are clearly among the most universal of all forms of knowledge, yet we have had surprisingly little success in attracting and retaining students who reflect the full racial and cultural diversity of the U.S. population. Classroom strategies will be suggested for teaching all students (including white males of European heritage) about the strengths and difficulties of viewing science from different cultural perspectives. Examples will be included from a March 1991 Chautauqua course on Mayan Astronomy, as well as from ancient and modern China, from Africa, and from pre-Columbian Ohio.

C9-2 Theory of Fit Parameter Uncertainties for the Marquardt Compromise. R.W. Cunningham, Kent State University, Tuscarawas Campus--Monte Carlo techniques have been combined with analytical analysis to study the uncertainties of fit parameters obtained from the Marquardt compromise. Each parameter uncertainty was found to be proportional to the spread of the data and independent of the weighting scheme and weight spread. Uncertainty estimates obtained from the error matrix and the propagation of errors techniques were always equal and the equality stems from the form of the curvature matrix used in the Marquardt compromise. These two estimates depend on the weighting scheme and may be orders of magnitude larger or smaller than the Monte Carlo estimates. All three estimation results can be derived from the theory of the Marquardt compromise. Since the chi square merit function enters some of the analysis, it was also studied and found to depend quadratically on the ratio of the data spread to the weight spread. This work indicates that reliable fit parameter uncertainty estimates should be obtained by Monte Carlo techniques and that chi square is not a reliable goodness of fit indicator.

C9-4 The Exploratory Method in Teaching High School Physics. ERICA M. BROWNSTEIN, Sheridan High School.--We have all known of physics students that can perform well on tests, but in reality leave a physics course with many of the misconceptions they had originally. One way of addressing this is to use the Exploratory Method. The Exploratory Method consists of three parts: Exploration, concept development, and application. The Exploration step is accomplished by having the student perform an activity on a subject before it is covered in class. This helps to bring misconceptions that individuals have to the surface and those misconceptions can be addressed during the presentation of the idea. The concept development step consists of labs that are designed to help a student to understand a concept and the application step is a new way of applying the information. This approach is utilized by Paul Hewett in his Conceptual Physics textbook and is also used in the workshop called PRISMS. One exploratory activity will be presented and information will be shared.

C9-6 Experimenting with the $YBa_2Cu_3O_7$ Superconductor. JAMES F. SULLIVAN and BRIAN G. FABO, OMI College of Applied Science of the University of Cincinnati.--Superconductivity, while theoretically interesting, is truly a concept that is best encountered with a hands-on approach. The $YBa_2Cu_3O_7$ superconductor is ideal for demonstrations because it is able to be fabricated and experimented with in a fairly simple laboratory environment. Based on experiences gained in a recently-offered honors course the authors will describe the process of manufacturing and experimenting with the superconductor that can be utilized in a classroom setting, allowing for visual hands-on experiences in superconductivity.

C9-7 Hands-on Quiz in the Introductory Physics Lab. Jean OOSTENS, Physics Dept. University of Cincinnati, Cincinnati, Ohio 45221.-- For the sake of smooth operation of a large introductory Physics lab, experiments have to be kept close to a cookbook format, leaving as a definite possibility for the students to go through the motions without learning much. To get away from that trend, a Lab Exam, or Hands-On Quiz has been scheduled at the end of every other quarter. The test is administered to each student individually (the rest of the quarter, students work in pairs) and the only reference material allowed is the student's lab notebooks. Each student is assigned two briefly stated questions picked at random out of 15 to 20 different ones, to be answered in about one hour. The questions asked probe analytical skills (statistical analysis, graphing...), understanding of circuits hook-up, of measurement methods and concepts, all applied in a context different from the original one. Some questions are quantitative extensions of demonstrations shown earlier in the lab. Representative examples will be presented in some details. The logistic for administering the test to 100 to 200 students over a one-week period will be discussed. Even though the test counts for only 10% of the total grade, it induces a large percentage of the students to show up for practice sessions held the week preceding the test.

C9-8 Improving Student Performance in Remedial Physics Courses. E. Adelson, N. Vlasko, Ohio State University. Modifications in our approach to students have led to significant improvement in student performance in a pre-engineering physics course. The improvements appear to be independent of teacher experience. These modifications occurred in four areas: 1) individual meetings of students with recitation instructors at crucial points in the course have contributed to improved student motivation; 2) student participation in the lecture was encouraged; 3) homework problem solving in groups of an appropriate size was required in recitation; and 4) each week additional class time for problem-solving with the help of the lecturer was made available to students on a voluntary basis.

C10-2 Hollywood in the Classroom. WILLIAM D. PLOUGHE, KELVIN E. TREFZ, Physics Department, The Ohio State University.--Teachers have used media in the classroom for years. Recent developments allow teachers to combine still pictures and segments of video in the desired sequence along with appropriate text and graphics. Multimedia presentations can be used in lectures, small groups, and individually as tutors, quizzes, tests and/or simulations. Most multimedia presentations use an authoring system to present or prepare the presentation. AmigaVision by Commodore is one such system. This talk will describe the Amiga software and hardware needed for multimedia production. Examples will be shown.

C10-3 Okay, it looks good. But how...? KELVIN E. TREFZ, WILLIAM D. PLOUGHE, Physics Department, The Ohio State University.--Multimedia presentations look good, but how does one make them? A presentation can be made from digitized pictures, graphics, text, and video images. A demonstration on the construction of a multimedia presentation from various inputs and media forms will be given. Hot spots or hit zones can be incorporated for user control. The ease of construction of these presentations makes them a useful classroom tool.

C10-6 A Contemporary Physics Laboratory. GLENN M. JULIAN, JOHN W. SNIDER, and JOSEPH PRIEST, Miami U., Ohio. -- At Miami we are implementing a one-semester "Contemporary Physics" (CP) lecture/laboratory course, which builds on our IUPP-inspired two-semester introductory course, and which showcases recent research results. The CP course contains a core of introductory atomic and solid state physics, and nuclear and elementary particle physics, which forms the basis for understanding recent results; this can be adapted to introduce the latest discoveries. Showcased this year are the STM, high T_c superconductivity, and quarks and intermediate vector bosons. This paper describes the experiments we are using in the weekly laboratory sessions.

C10-7 Interfacing IBM PC compatible computers to physics experiments. Terrance Howald, Physics Department, Miami University. Laboratory exercises designed to present the principles of interfacing physics apparatus to an Apple IIe computer are generalized to other personal computers. An IBM PC compatible computer with a commercial data acquisition board plugged into one of the expansion slots is used to interface some 25 physics experiments. Each experiment requires the construction of electronic apparatus suitable for recording analog measurements. Software is written to use the commercial data acquisition board to digitize and store the information for computer analysis. Data analysis, graphing, and testing of mathematical models are done with an electronic spreadsheet.

C10-8 Using Online Searching as a Research Tool. BERNARD BAYER. Ohio State University--Online searching of databases is too good a tool to be restricted to quick and comprehensive literature searches and to finding a specific paper when only fragments of a title are known. For example, the hottest areas of research during much of last year has been high-temperature superconductors. The determination was made by ScienceWatch, not based on sending out questionnaires to, or calling, physicists, but rather by tracking the number of times papers were cited in the literature. Through your own terminal, you can use the power of online systems to determine growth areas through counts of number of articles published. By searching the online file that included Physics Abstracts you would find that the number of articles published annually on superconductivity increased by 600% between 1969 to 1989, and that most of the increase came in the last five years. Online searches can be used as a research tool at r stages of investigation to identify rtul and productive areas of research.

C10-9 Using Powerful Symbolic Algebra Software to Teach Undergraduate Physics. GORDON J. AUBRECHT, II†. Department of Physics, Ohio State University at Marion.—The NSF-sponsored summer 1990 workshop "Transforming Physics Content Using New Technologies," focused on the use of powerful mathematical software tools developed for physicists with the aim of using them in beginning and advanced undergraduate instruction. I was one of three members of a group that developed a lesson that we thought would be useful in introductory physics courses as well as in upper division E&M courses (i.e., we aimed at multiple audiences). The group considered the problem of a parallel plate capacitor with a sinusoidal voltage across it. We used Maxwell's Equations to solve the problem by the method of successive approximations. This exposed students to ideas of approximation and demonstrated how rapidly the asymptotic limit is reached. I will demonstrate the results of our work and describe our experiences using *Mathematica*™.

† Work supported in part by the U.S. Department of Education under FIPSE grant #P116B01237.

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Membership Form
Southern Ohio Section/AAPT

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Check one:

___New ($5) ___Student ($2)

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Mike Grote, Editor
The Dialog
Mariemont High School
3812 Pocahontas Avenue
Cincinnati, OH 45227

Got a new idea about teaching physics that really works?

Share it with your colleagues by sending your demo, teaching technique, etc. summarized in 200 words or less if possible, to the Editor. For your contribution, we'll send you a handsome certificate of appreciation. If you show this to your principal or dean, who knows what could happen! He/she might even buy you a soda! Send your contribution to: Mike Grote, Mariemont High School, 3812 Pocahontas Avenue, Cincinnati, Ohio 45227.

Has your membership expired? Where else can you get *anything* for $5? We'll give you newsletters, meetings, and contact with other physics teachers for only $5 a year. *(Some executive board members wanted to raise the price, but we talked 'em out of it. Show your support for the $5 membership by sending in your renewal TODAY!)* Use the handy form to the left.

T · H · E
OHIO
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Department of Physics

174 West 18th Avenue
Columbus, OH 43210-1106
Phone 614-292-5713

July 19, 1991

Prof. Edward F. Redish
Department of Physics and Astronomy
University of Maryland
College Park, MD 29742

Dear Joe:

As I mentioned in Vancouver, the Ohio Section and the Southern Ohio Section of AAPT are having a joint meeting at Ohio State on Saturday, March 14, 1992. The theme of the meeting is to be Physics Education: New Physics Curricula. We would like to invite you to participate as one of our featured speakers.

We expect about 50 people, about half high school teachers, to attend. We would like you to tell us about the CUPLE and M.U.P.P.E.T. projects. Most of the attendees will probably not have heard of much of your work. Let me know what computer systems and peripherals you will need and we will probably be able to supply them locally.

As usual we are willing to cover reasonable travel expenses.

I shall be looking forward to your being able to be here.

Sincerely,

Bill Ploughe

William D. Ploughe

cc: William E. Reitz, OS/AAPT
Ronald J. Monnier, SOS/AAPT

James F. Sullivan
5435 Cloverleaf Dr.
Cincinnati, OH 45239

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

Dear Mike;

I presume you and Ron Monnier are planning the next edition of The Dialog in the very near future

I have two items for it.

Minutes of the Business meeting of 10/12/91
Abstracts of SOS/AAPT contributed papers given in the Spring, 1991 meeting

Unfortunately, I do not have a copying machine at home and therefore can't physically separate the SOS/AAPT abstracts for you as I did last time (unless I wait a few more days). The abstracts given by persons from the SOS/AAPT area are CP-1, CP-3, CP-6, CP-11, C1-1, C1-2, C1-3, C1-8, C2-2, C2-5, C2-6, C3-4, C3-5, C4-1, C4-2, C4-3, C4-4, C4-6, C4-7, C4-8, C4-9, C4-10, C5-3, C5-4, C5-9, C5-10, C6-2, C6-3, C6-4, C6-7, C6-8, C6-9, and C6-10. I've enclosed the complete list.

I know Ron Monnier will have an article requesting helpers at a booth at a national meeting which is scheduled in the near future in Cincinnati. I'm certain Bill Ploughe will have several contributions dealing with the March 14th meeting at OSU. Possibly Fred Thomas of Sinclair State has an initial article on the Fall, 1992 meeting.

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. Monnier
W.Ploughe
F.Thomas

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

Wright State University
Dayton, Ohio
Saturday October 12, 1991

The meeting of 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. Monnier 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 had 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.

Spring, 1992 - March 14, 1992, The Ohio State University, Columbus, Ohio. Contact person is W. Ploughe. Prof. Edward F. Redish of the University of Maryland has been invited to speak.

Fall, 1992 - Sinclair Community College, Dayton, Ohio. Contact person is F.Thomas.

Spring, 1993 - Dublin High School, Dublin, Ohio. Contact person is C. Damian.

Fall, 1993 - Possibly in Cincinnati area?

Future meeting - Possibly in Portsmouth area?

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.

The members were asked to remember that judges were needed for the Physics Awards at the Ohio State Science Fair in Delaware, Ohio in April.

The next Executive Committee meeting has been called for Saturday January 25, 1992 at Wittenberg University in Springfield, Ohio at 2:00pm. President Monnier will send directions to all officers and other interested persons.

The meeting adjourned at 12:44 pm.

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

AGENDA

SOS/AAPT Executive Committee Meeting

October ~~15~~ 12, 1991 at Wright State University

I. Call to order.

II. Reports of officers

A.	President (status of)	
B.	Secretary	Jim Sullivan-Bob Cunningham
C.	Treasurer	Bob Teese-Dave Traxler
D.	Section Representative	Jim Poth
E.	V.P. High Schools	Dwight Portman
F.	V.P. Two Year Colleges	Fred Thomas
G.	V.P. Colleges	Steve Yerian

III. Meetings

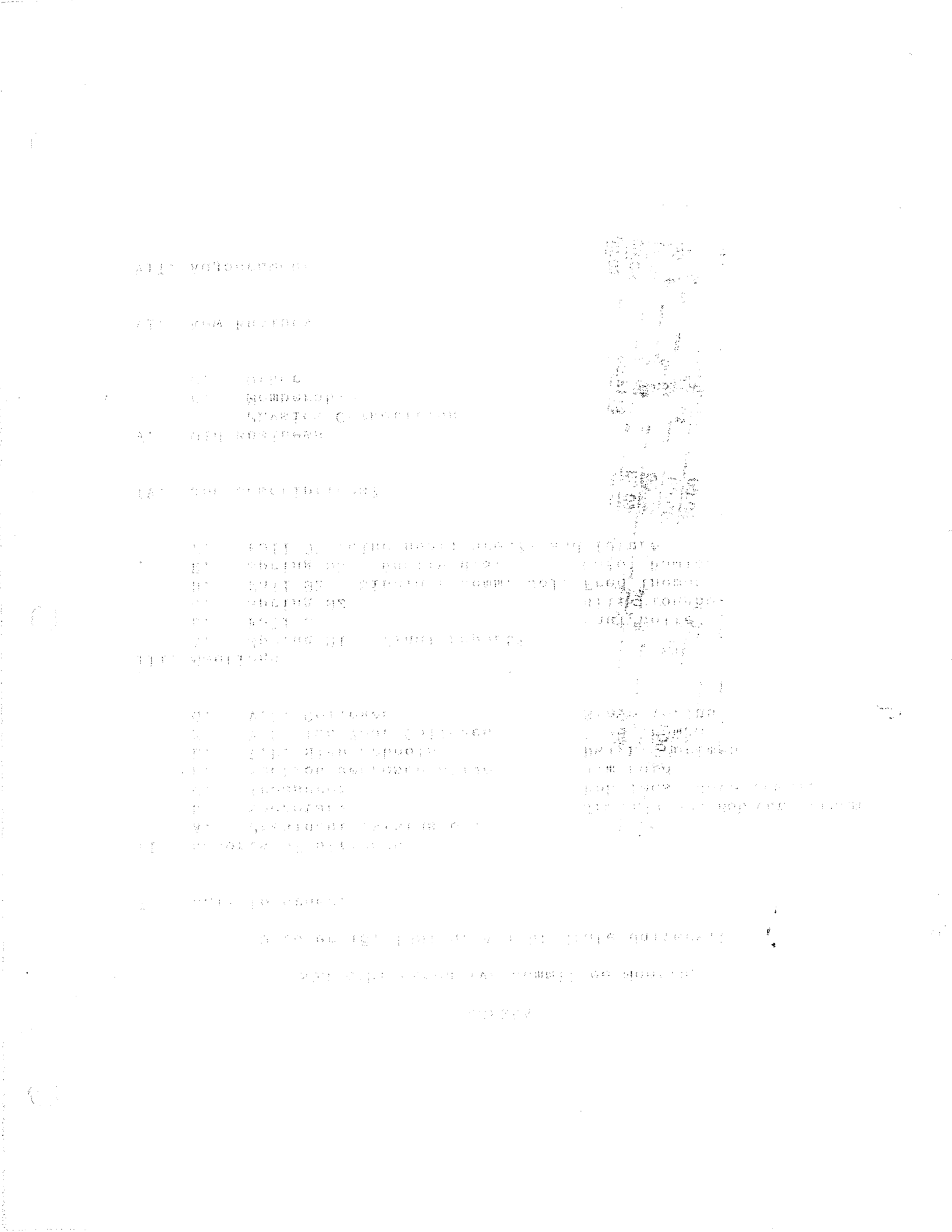
A.	Spring 91 - final report?	
B.	Fall 91	Paul Wolfe
C.	Spring 92	Bill Ploughe
D.	Fall 92 - Sinclair Comm. Col.	Fred Thomas
E.	Spring 93 - Dublin H.S.	Carol Damian
F.	Fall 93 (Cincinnati area?) and future	

IV. Job descriptions?

V. Old Business
   A. Physics Competition
   B. Membership
   C. Other

VI. New Business

VII. Adjournment



SOS/AAPT
Statement of Revenues and Expenses

	1985	1986	1987 through Nov. 13	1987/88	1988/89	1989/90	1990/91
Revenues:							
Contributions	$52.00	$0.00	$0.00	$0.00	$165.10	$0.00	$0.00
Dues (regular membership)	$680.00	$600.00	$590.00	$470.00	$565.00	$395.00	$502.00
Dues (student membership)	$8.00	$6.00	$2.00	$4.00	$2.00	$0.00	$2.00
Dues (retired membership)	$12.00	$0.00	$7.00	$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	$212.00	$361.82	$100.50	$167.50	$0.00	$170.50	$62.00
State Science Day income	—	—	—	—	$300.00	$250.00	$0.00
Workshop registration	$415.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Advertizing income	$25.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Conference registration	$98.00	$76.00	$86.00	$100.00	$88.00	$114.00	$0.00
Misc. conference income	$0.00	$136.50	$87.50	$31.50	$0.00	$43.07	$0.00
Conference meals income	—	—	—	$131.25	$54.25	$0.00	$0.00
Total Revenues:	**$1,502.00**	**$1,180.32**	**$873.00**	**$904.25**	**$1,174.35**	**$972.57**	**$566.00**
Expenses:							
Misc. supplies	$55.55	$27.81	$25.76	$37.93	$15.43	$37.09	$56.36
Conference expense	$630.49	$636.88	$131.50	$127.50	$263.20	$169.57	$0.00
Physics Prize expenses	$65.00	$517.61	$154.68	$0.00	$0.00	$73.82	$0.00
Postage	$57.76	$214.00	$192.57	$93.36	$412.41	$118.69	$203.38
Printing	$480.00	$124.00	$275.00	$395.00	$245.00	$70.00	$165.00
Building fund	—	—	—	$50.00	$0.00	$0.00	$0.00
State Science Day Prizes	—	—	—	$100.00	$350.00	$350.00	$350.00
Total Expenses:	**$1,288.80**	**$1,520.30**	**$779.51**	**$803.79**	**$1,286.04**	**$819.17**	**$774.74**
Net Income:	**$213.20**	**($339.98)**	**$93.49**	**$100.46**	**($111.69)**	**$153.40**	**($208.74)**
Cash balance:	**$1,254.88**	**$914.90**	**$1,008.39**	**$1,108.85**	**$997.16**	**$1,150.56**	**$941.82**

American Association of Physics Teachers

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Bernard V. Khoury, Executive Officer

Memo to: Section Representatives/Secretaries
From: Nicole Wagschal
Announcer
Date: December 2, 1991
RE: March *Announcer* Copy

Dear Section Representatives/Secretaries:

Happy Holidays!! The winter holidays will soon be upon us with the AAPT Winter Meeting following close behind. I hope that many of you will be attending the Orlando meeting or even making plans for Maine in August. Looking ahead to August, we are preparing to begin production of the March *Announcer* and we need your help.

The deadline for all copy for the March issue is **January 17**, so send us your current section news or any future calendar news as soon as possible. The calendar section has been redesigned to include all planned meeting dates, so send us everything you have.

For those of you that will be attending the Orlando meeting, feel free to stop by at the AAPT exhibit booth and give Donna any of your section copy. I look forward to hearing from you soon! Thanks again.

Sincerely,

Nicole Wagschal

Nicole Wagschal
Publications Coordinator