



Physics Tempo

The Newsletter of The St. Louis Area Physics Teachers
an affiliate of the American Association of Physics Teachers
April 1992

Vol. 2 No. 5

Notes and News from the March 1992 Meeting at Parkway Central High School

by Paul Discher

The March meeting of the St. Louis Area Physics Teachers convened at 8:30 a.m. Saturday, March 14, 1992, at Parkway Central High School. Bill Brinkhorst and Val Michael were our hosts. Fifteen teachers were present for this program which began with an informal business meeting called to order by Rex Rice.

Events of interest to teachers scheduled for April 1992 were announced. These items were not announced in time for publishing in the *Physics Tempo*. Val Michael reminded all attendees of next month's meeting at Parkway West, in which David Bross will be our host, and he will be showing the Union Electric Radiation Demonstration Apparatus, as well as facilitating a member sharing session.

A short discussion followed the financial report submitted by Paul Discher. The members were all in agreement regarding the mailing of the newsletter. *Physics Tempo* could no longer be mailed to teachers free.

The St. Louis Area Physics Teachers will now be requesting \$10.00 annually to cover the costs of printing and mailing the newsletter. We will no longer mail to unpaid subscribers unless we receive stipulated funding to do so. The April 1992 mailing will be the last mailing for the academic 91-92 school year. Inside this issue will be a form for address correction. We are again requesting that you complete and return the enclosed form with your contribution of \$10.00. This amount will solely be used to cover the cost of the 1992-1993 academic school year mailing and printing of *Physics Tempo*. Please Make the checks payable to: Paul L. Discher.

After the business meeting Bill Brinkhorst and Val Michael allowed the teachers to examine various ingenious laboratory experiments used at Parkway Central. This included the \$50 substitute air table shown by Bill Brinkhorst. The item, a child's air hockey table, indeed functioned quietly. The air table was so quiet it had been left on the entire time of our meeting unnoticed. The air hockey table, a video camera and video tape recorder constituted a method for the quantitative study of collisions in two dimensions, conservation of momentum, and conservation of energy.

Val Michael also had an assembled and tested Vernier Speed of Sound apparatus set up for demonstration. Gail Haynes (*Hazelwood West H.S.*) used the time to assemble the Vernier Software Speed



**Gail Haynes (*Hazelwood West H.S.*)
assembling the Vernier Software
Speed of Sound apparatus at
Parkway Central H. S.**

of Sound apparatus in the adjacent classroom. This allowed her to take advantage of the special offer from Vernier as well as consulting with teachers that already assembled the equipment. Vernier Software had extended a special offer for members of the St. Louis Area Physics Teachers for this meeting. Select Vernier hardware and software was available to teachers / districts at a reduced price when the shipping was consolidated. Val Michael coordinated the special effort for this program.

April 4, 1992 Meeting: UNION ELECTRIC Radiation Demonstration Apparatus at Parkway West High School

by Paul Discher

Twenty-Two teachers attending the April meeting of the St. Louis Area Physics Teachers assembled at 8:30 a.m., Saturday, April 4, 1992 at Parkway West High School. David Bross was our host. The program began with a short business meeting conducted by our out-going officer, Debbie Rice. Both Debbie Rice and Rex Rice conclude their year of service to the St. Louis Area Physics Teachers. Many thanks to Debbie and Rex for their tireless efforts this year in planning and moderating our meetings and activities.



Gary Shepak

Superior, and continues to teach Physics and Chemistry at Belleville Area College. Gary recently hosted our Optical Communications

The major business of this meeting, was the election of new officers. Frank Cange and Gary Shepak were nominated. The nominations were unanimously closed and both Gary and Frank were voted into office by acclamation.

Gary Shepak, a graduate of Emporia State University, Emporia Kansas, has served for 20-years as a Physics and Chemistry teacher for Belleville West Senior High School. He additionally obtained his masters degree from The University of Wisconsin at

workshop at Vianney High School, February 8, 1992. Gary originally made his contact with other members of the St. Louis Area Physics Teachers by attending The Woodrow Wilson National Fellowship Foundation Physics I and II reunion meetings in February 1988 and 1989.



Frank Cange

Frank Cange, has been teaching Physics and Chemistry at Belleville Area College for the last 3-years. He obtained both his Bachelors and Masters Degree from SIU-Edwardsville. Frank additionally taught 8-years at Gibault High School in Waterloo, Illinois and 2-years at Belleville West Senior High School. Frank Cange was an original attendee of the August 1987 Woodrow Wilson National Fellowship Foundation's Physics I Outreach Program at UM-St. Louis. The St. Louis Area

Physics Teachers is proud to welcome our new officers for our 1992-1993 academic year.

More business was discussed including the planning for a June Social, and the last meeting as SIU-Edwardsville in early May. More on these items later in the newsletter.

Following the business meeting there were short sharing sessions. Linda Kralina (*Hazelwood Central*) introduced several concepts she has tested for student motivation and discovery. One concept detailed the assembly of advanced physics design teams. The student teams were given a choice of science and engineering projects that they must complete with specific emphasis on task distribution and project management. The results of one student design team was shown. A portable inflatable planetarium was constructed with sheets of black plastic film and inflated with the air from a box fan. An interior make-shift planetarium projector illuminated star charts on the ceiling. Linda also detailed a number of other motivational items including, my favorite, a book titled, "A Whack On The Side Of The Head", by Roger Von Oe. This book is a light-hearted study of what constitutes "human creativity" citing examples and methods of some of the worlds greatest scientists and inventors. A handbook on creativity, "A Whack..." gives insight in the mechanics of human creativity through the concept of following and breaking "rules".

Bill Brinkhorst described a modified method for using the optical smoke tank for the demonstration of virtual images. Construction of the optical smoke tank demonstration apparatus was published in the October 1991 issue of *Physics Tempo*. Bill's method used images focused on the side of the tank, and reiterated the question from students. If lenses have a focal point, how come the light from an image is not focused into one point? By using a single beam laser in conjunction with the virtual image, Bill demonstrated that the focal point still existed.

Paul Discher showed and raffled two solderless breadboarding systems built on video tape boxes. The idea of using video tape boxes presented a method of simultaneous mounting of the solderless breadboarding strips for electronic experiments, and provision of an enclosure for mounting any of the necessary switches, batteries, or connectors that could conceivably be used in this sort of demonstration or experiment. The solderless fixtures shown, allow a platform for the assembly of electronic experiments at a comparatively lower cost than commercially assembled fixtures. The plastic video tape boxes are easy to obtain and can be tooled with knives and small low-power drills. The solderless breadboarding systems will be used next year in another optical communications workshop still to be planned. Paul also distributed a multi-page compendium of articles on Optical Communications, Lasers, and Fiber Optics, written by Forrest Mimms III.



Bill McConnell (*Webster University*) and Dr. Fred Zurheide (*SIU-Edwardsville*) testing the UE Radiation Apparatus at Parkway West

Louis, Missouri 63166, telephone 314-554-3258. The kit is available for loan in 1-week increments, please call Krista to schedule your loan in advance. David Bross had us all read and perform a number of the prepared experiment guides modified from Union Electric's handouts.

David Bross

then took charge to show the equipment on loan from Union Electric. The Union Electric Radiation Investigation Apparatus Kit includes a carrying case for the scaler ratemeter, Geiger tube, radiation sources, (1-alpha, 1-beta, and 1-gamma), and a set of radiation shields (3-lead, 3-plastic). The kit can be checked out pending availability by contacting Krista Kotur, Union Electric Corporate Communications, P.O. Box 149, St.

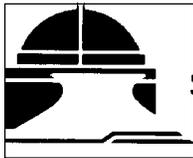
St. Louis University Physics Competition Results, Saturday April 11, 1992

by Frank Cange

St. Louis University conducted its annual Physics competition on April 11, 1992. This problem solving and conceptual testing competition consisted of a 50 question test. One hundred and eighty physics students from 20 regional high schools participated.

O'fallon Illinois High School.....First Place
Clayton Senior High School.....Second Place

John Burroughs School.....Third Place Tie
Webster Groves High School.



**St. Louis Science Center
Notes & News
Sigma XI & St. Louis
Science Center**

"The Science Seminar Series" co-sponsored by the Monsanto Chapter of Sigma XI and the St. Louis Science Center is planning the following selection of talks through June 1992.

May 13, 1992 St. Louis Science Center **7:30pm**
The Use of DNA Evidence for Identification in Criminal Cases. *Mr. John T. Sylvester, Agent/Attorney, Federal Bureau of Investigation.* This talk will briefly overview the DNA technology used by the FBI and other forensic laboratories in the analysis of crime scene evidence, as well as the legal issues surrounding the evidence as used in criminal courts.

June 10, 1992 St. Louis Science Center **8:00pm**
A Chemical Weapons Treaty, Reduction to Reality *Dr. Will Carpenter, Vice-President Research, Monsanto Agriculture Company*

May 1992 Meeting

SKY NIGHT at SIU-Edwardsville



Date: **Friday May 8, 1992**
Rain Date: **Friday May 15, 1992**
Time: **7:30 p.m.**
Place: **SIU-Edwardsville Sky Lab**
Host: **Dr. Fred Zurheide**

"Sky Night" will be the theme for the astrophysics workshop when the May meeting of the St. Louis Area Physics Teachers will meet on Friday, May 8 or Friday, May 15 (in the event of rain). The program is scheduled for 7:30 p.m. at the SIUE SKY LAB complex located on North University Drive. Indoor activities will be scheduled in the event of bad weather on both nights.

If you plan to attend you must call either of these two numbers on May 8, 1992 in order to get the weather and schedule information. **East Side attendees should call 692-3148 (Dr. Zurheide). Missouri callers should contact 862-2845 (Debbie/Rex Rice).** The telephones will contain recorded messages with the necessary information for the program.

SIU-Edwardsville campus is located Northeast of St. Louis on Illinois Rt. 157. The campus is a few miles east and north of the intersection of Interstate 270 and Interstate 255. Either interstate routes could be used to get to the Illinois 157 exit (north) to the SIU-Edwardsville Campus. Once on the campus proceed north on South University Drive, pass the main campus and Hairpin Drive north to North University Drive. Go pass Tower Lake Road to the Sky Lab complex on the left. If you reach Poag Road, you have gone too far. A map will be enclosed.

June 1992 Meeting

First ever! Social Event!

Date: **Saturday June 6, 1992**
Time: **10:00 a.m. - 2:00 p.m.**
Place: **Laumeier Sculpture Park**
Host: **Rex & Debbie Rice**

The June meeting of the St. Louis Area Physics Teachers will be our first social event. We will be meeting at Laumeier Sculpture Park, June 6 from 10:00A.M.-2:00 P.M. There will be facilities for picnicking, so bring your family and your own food. You will be able to cook out or bring sandwiches—it's up to you. There will be a guided tour of the sculptures at 1:00 for the bargain fee of \$2.00 (children free).

Laumeier Sculpture Park is a 98 acre St. Louis County park, and is located at the intersection of Geyer and Rott Roads in Southwest St. Louis County. This is east of Interstate 270 and south of Interstate 44. For members coming south on Interstate 270, exit east on Watson Road / Interstate 44 east. The outer road will split and allow you to exit directly into Watson Road east. The first traffic light on Watson Road is Geyer Road. Turn right to Laumeier Sculpture Park about 1/4 mile.

If hiking and nature is more to your liking, there is a short trail at Laumeier, however Powder Valley Interpretive Center is a five minute drive from Laumeier Park. Powder Valley is managed by the Missouri Department of Natural Resources and the facility also houses the regional headquarters for that state agency. There is **NO** picnicking space at Powder Valley. There are three paved hiking trails that wind through heavily wooded forest. The trail lengths are: .33 mile, .67 mile and 1.33 miles. Besides the trails, there is a spacious indoor nature display area with many hands on exhibits.

Powder Valley Center is located just across Watson and Highway 44 off Geyer Road. To get there from Laumeier, follow Geyer Road (north), crossing over Watson Road, then Interstate 44 to Craigwold Road, which will be marked with the wooden Powder Valley Center signs. Follow the winding outer road to the entrance on the right about 3/4 mile.

Come join us for our first ever social get together!

**Nifty Computer Generated
Pressure Sensitive Labels**

by Paul Discher

Many teachers have used computers to prepare pressure sensitive labels. *Physics Tempo* uses over 200 computer labels for each mailing of the newsletter. Labels designed for computer imaging are usually attached to a removable coated paper carrier punched for sprocket feed as needed for insertion and registration within a printer mechanism. Computer pin-feed labels are available in a number of different sizes and even colors. There are many applications where neat computer generated labels are useful, such as for organizing supplies in your Science Supply Room or teaching laboratory. However, in order to solve such dynamic labeling problems, one could go broke and crazy trying to buy all of the different kinds of labels that could be useful.

(continued)

I have experimented I successfully with a method for making my own short run pressure sensitive labels without the expense and the medium change problems normally associated with pin feed labels. This method uses double faced 2 1/2" carpet tape to back ordinary paper. The method requires that you simply prepare and print the text and graphics on your ordinary printer paper. Attach the double faced tape after the intended label image has been satisfactorily printed. Cover the entire back area of the image you wish to be contained within the "cut-out" of the label. Use two strips of tape to create large labels if necessary. The process is inexpensive and greatly simplifies the use for your printer for this application. Only the label images you create that are perfect are used for the final label, there is little to no waste.

This solution is specifically useful for short run labels that you would use for such things a name badges, drawer labels, binder labels, and video or audio tape labels as well as others you conceive. The only commodity you need purchase is double faced carpet tape. You may choose to print on any type of paper, including colored stock you may already have on hand. You may also use any type of printer to generate the text or graphics, including laser printers (they make the nicest labels). You can also make your own custom incentive stickers, if you are so inclined to offer these to your students.

Whenever you are faced with the unpleasant task of removing a pressure sensitive label, remember this simple procedure for label removal. Use the gentle heat from a hair dryer to warm the label and the material on which it is attached. As the label becomes warm, the adhesive gets soft. Use a small blade like an X-acto knife to lift the edge of the label. After an edge comes free gently warm the peeling edge of the label with the heat from the hair dryer continuing to soften the adhesive as you are pulling. In most cases

even non-removable labels will come off clean. Be careful not to over heat your item or you could damage it.

Any residual adhesive from a pressure sensitive label should be removed with mineral spirits. Warning: do not use solvents stronger or harsher than mineral spirits, they will usually harm the materials from which you are removing the label. The residue from the mineral spirits can be cleaned up with ammonia and water or your favorite commercial cleaner like Windex.

Mission Statement

Physics *Tempo* is the newsletter of and by the St. Louis Area Physics Teachers, an affiliate of the American Association of Physics Teachers (AAPT), and is intended as an organizational support group for the betterment of Physics and Physical Science teachers throughout St. Louis and Illinois.

Subscription cost is \$10.00 per academic year, September through June. Collected donations are entirely used to print and mail the newsletter. Please make checks payable to Paul L. Discher.

Physics *Tempo* is dedicated to report achievements and announce the activities of the St. Louis Area Physics Teachers. In addition, Physics *Tempo* is intended to help disseminate useful and innovative information for teaching Physics and Physical Science. Physics *Tempo* is your newsletter. Editorial contributions are encouraged and welcomed. No idea is too small. Send articles, as well as subscription requests to: Physics *Tempo*, Editor / Paul Discher, Washington University-Electrical Engineering Campus Box 1127 St. Louis, Missouri 63130-4899. You can also FAX articles or ideas to Washington University- Electrical Engineering Fax Line: 314-935-4842. Please mark your fax mail to the attention of the *Tempo* Newsletter Editor, Paul Discher.

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First Class Mail

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