



NJAAAPT

NEWSLETTER

Rowan University
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New Jersey Section American Association of Physics Teachers
Dedicated to the Improvement of Physics Teaching

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Joint NJAAAPT/SEPS Spring Meeting March 12, 13, 1999

Co-sponsored by the Princeton University Physics department, NJAAAPT and SEPS had their joint meeting this year at Princeton's Jadwin Hall on March 12 and 13. On Friday, the 12th, following registration and a welcoming speech by Jessie Blair,, a dinner buffet was served in the Joseph Henry room. This was followed with a wonderful talk by our guest speaker, Jocelyn Bell Burnell, a Visiting Professor at Princeton and a professor of Physics from the Open University of England. Those of you who studied astronomy after the late sixties may recall the description in your text books of how she, while still a graduate student at Cambridge University, discovered pulsars in 1967. Her exciting talk was entitled, "In Pursuit of Pulsars" and pretty much covered the story of her discovery.

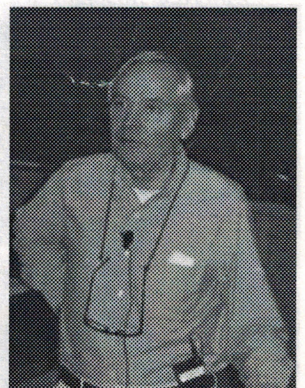


Dr. Jocelyn Bell Burnell

Antony Hewish, an astronomer at Cambridge University wanted to study the "scintillation" of radio sources and built a radio telescope that was able to study rapid variations of faint signals. After building her own radio telescope to search for quasars, Ms. Bell looked through the many charts generated by the observations and noticed a set of especially strong variations in the signal that appeared during the night, when scintillations are usually weak. After much speculation, which included the thought that the signal represented a beacon sent out by extraterrestrial life on another star (resulting in the name LGM for Little Green Men!), it was decided that the regular pulses (1.337 seconds apart) could be attributed to a rotating neutron star. Dr. Burnell illustrated this by rotating a flashlight at the end of a string above her head!



Dr. David Wilkinson at the 12-inch telescope



Dr. David Wilkinson talking about SETI



Professor Lynn Stiles talking about geothermal energy



Dr. David Wilkinson explaining some aspects of the Microwave Anisotropy Probe project

Today
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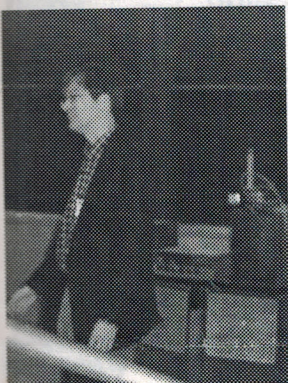
many hundreds of pulsars are known, each with its own signal period.

Before dinner, those of us who wanted, were privileged to a viewing of the 12-inch telescope in a nearby building. Professor David Wilkinson of the Princeton Physics department led the group to the building and described the telescope in detail. On Saturday, the next day, he presented a fascinating talk on the "Search for Extra Terrestrial Life."

Another invited talk on Saturday was one by Lynn Stiles, whose topic was Geothermal Energy

and protecting the environment while saving money

A demonstration show was presented by Stephen Thorsett (assisted by Yea Ma), both of the Princeton University physics department. A small



Stephen Thorsett going through his paces for the demonstrations

amount of time was set aside for talking with the speakers.

Tours of the research labs and of the campus followed, capping off a great day, or rather, a great pair of days!



Visitors admiring the powerful magnet at one of the Princeton Research Labs

1999 NJAAPT Schedule of Events

Date	Event/Location	Contact
Apr. 23, 30, 1999 (Fridays)	Physics Days at Great Adventure Jackson, NJ	Jessie Blair: 732-531-4569 jessie@monmouth.com
May 4, 1999 Tuesday	Earliest Moments of Creation: Dr. Michael Turner, 8 PM, Allison Rd. Aud., Rm 103	Jessie Blair: 732-531-4569 jessie@monmouth.com
May 21, 1999 Friday	Bootstraps 99 Internet & Teaching Physics Montclair St. Univ., Upper Montclair, NJ	Dick Hodson 973-655-7264
Sept. 18, 1999 Saturday	All Day Demos: Dick and Ray Rutgers Physics Lecture Hall; 9:30 AM-3PM	Jessie Blair 732-531-4569 jessie@mon-
Oct. 29, 1999 Friday	Videos of Space Physics on MIR Rutgers Physics Lecture Hall 7-9 PM	Eugenia Etkina: 732-932-7496
Nov. 20, 1999 Saturday	Workshop on Toys in the Science Classroom Edmund Scientific, 8:30 AM-3 PM	Harry Rheam: 609-768-1532 rheam@cyberenet.net
Dec. 11, 1999 Saturday	Holiday Treats! Discovery House, East Brunswick, NJ	Rich Urban: 732-764-9714

Message from Your President By Jessie Blair

After listening to the wonderful speakers at the NJAAPT/SEPS Meeting at Princeton on March 12th and 13th, I really got to thinking about what we are teaching in Physics. One of the things that really impressed me was their ability to convey the message so that I really understood what they were saying. For me this was especially true with Jocelyn Bell Burnell. I really know so little about pulsars and always feel overwhelmed when reading about them in journals. However, Dr. Burnell certainly made clear what the research was about and what new ideas came from the research. Whether it was her topic or Lynn Stiles' talk on "Geothermal Energy: How you Can Save Money and Protect the Environment," or David Wilkinson's talk on the "Search for Extra Terrestrial Life," it was evident to me that we need to prepare our students to do more critical thinking and to be researchers. Contrary to some articles I've read, I don't think it means that we must radically change our curriculum. It does mean we might need to change what we teach and how we teach it. Perhaps this means using more spread sheets, using Active Physics, using Cooperative Learning, and possibly using a program like the Astrophysics Research Program by Rutgers.



Jessie Blair addressing Joint Session

I would challenge you to join me in some research and group thinking in this area. We also need to share our findings with elementary and junior high teachers and help to train them so that they can change their teaching methods. I believe that we as a professional organization could have a profound influence on future physical science and physics programs if we decided to do it! I'm eager to hear from you. I can be reached by e-mail: jessie@monmouth.com. We would also want to

(Continued on page 8, col. 2)

Dumont Sharing Session

By Ray Polomski

The members of the Dumont Sharing Session have been very active this past winter. Meetings were held in January and Febru-

ary, both of which proved to be extremely informative and entertaining.

In January, John Johnston again demonstrated his technique for teaching the principles of reflection from



Ray Polomski

a plane mirror by the use of homemade demonstration equipment. John showed the technique used in producing an image from corner mirrors as well as demonstrating the method of determining the position of a virtual image in a plane mirror. Matt Klemchalk, of Ramsey High School, brought to our attention a website that is a valuable resource when teaching momentum and collisions. The site, called "Dead or Alive," allows the user to select a particular vehicle type and then runs through a simulated crash. Based upon the data entered, i.e., the mass and height of the individual, speed, type of vehicle, and other parameters, the program generates the results of the collision. This program is the same as is sold to the major auto manufacturers, but is available to schools at a very much reduced cost. It can be downloaded and used, but is only available for the PC. The site URL is www.fitzpatrickengineering.com. Check this one out for yourselves to use for one of next year's topics.

I again demonstrated some of the uses of VideoPoint as a means of having students collect and interpret data from digitized movies in the areas of kinematics, projectile motion, and periodic motion.

February's meeting brought together the

largest group this year. Sparked by questions relating to sound phenomena brought to us by Gemma Coccioli, from Union High School in Union City, the group began to discuss and review the concepts of pressure and displacement nodes in sound waves. This led to the testing of various tubes Gemma brought to determine the length of the sound wave and the frequency of the wave produced.

Steve Henning, from Clarkstown South High School in Clarkstown, NY, brought a demonstrator of wave motion, which he used at a New York regional meeting. Comprised of a simple motor, one used with the ripple tank, a wooden disk with a small hole drilled off center, and string. This was all powered by a simple AA battery. Various numbers of wavelengths were shown.

This meeting also brought a new member, Matty Lau, a second year physics, calculus, and sixth grade science teacher at Saddle River Day School. She is an enthusiastic individual with a desire to improve herself. The great advantage she has is that another member of our group, Paul Fried, retired from the New York City schools and took a position at Saddle River Day School as a physics teacher. He brings a wealth of experience to the position and will be an excellent mentor for Matty. We wish both of them much success at the Saddle River Day School.

Congratulations are in order for Joe Spacavento of North Arlington High School for being named the New Jersey Physics Teacher of the Year. Joe was invited to receive his honor at the centennial meeting of the APS in Atlanta. We are awaiting Joe's reactions to the occasion which had one of the keynote speakers, Stephen Hawking!

(Please see page 5, under Obituaries for further comment on Dave Tedesco) ✍

Frederick and Florence Bauder Scholarship

By Harold Lefcourt

Funding, up to \$500, is available from the New Jersey section of the American Association of Physics Teachers, as a result of the generous contribution of Frederick and Florence Bauder and the efforts of the late Achille Capeceletro. This money is to provide scholarship aid to physics teachers who are taking workshops and/or courses designed to enhance their subject knowledge and teaching skills. This would supplement aid from other sources in paying expenses such as tuition and laboratory fees.

For further information please contact: Harold Lefcourt, Morris Knolls High School, 50 Knoll Drive, Rockaway, NJ 07866, 201-989-2750 or by e-mail at lefty@cybernet.net. ✍

Bootstraps 99

By Dick Hodson

On Friday, May 21, 1999, a one-day workshop on the "Internet and the Teaching of Physics" will be held at Montclair State University. The time is scheduled for 8:30 A.M. to 2:30 P.M.

The workshop does not carry university credit and is open only to high school teachers of physics in the State of New Jersey. It is limited to 14 participants to maximize the amount of "hands-on" activity.

The workshop will focus on activities available using the web: tutorials, simulations, collaborative projects, real time data, course reviews, sample problems, and others. Participants are encouraged to add activities they have used.

Presenters will be Joe Spacavento (North Arlington High School), Hank Bartol (Newark Academy in Livingston), and Dick Hodson (Montclair State University).

Attendance at Bootstraps is by prior registration only! Complete the form below and return it with your check (made

(continued on page 7, col. 3)

NJ BISEC Announces New Summer Institutes

By Dr. Gertrude Clarke

The New Jersey BISEC (New Jersey Business/Industry/ Science Education Consortium) has announced the 8th Annual Residential Summer Institute and is accepting applications for the 1999 Residential Summer Institute (RSI) for middle/junior high school teachers. The institute, endorsed by the New Jersey Science Teachers' Association (NJSTA) and the New Jersey "Science Supervisors' Association (NJSSA), will be held at Drew University in Madison, NJ, from August 1 through August 6, 1999.

The RSI is designed to provide opportunities for teachers to visit laboratories and other business and industry facilities at several of the companies that provide support for the institute. While there, teachers observe applications of science and technology concepts in use. The participants interact with scientists and engineers on a one-to-one basis to learn about future job opportunities for their students. They also work in groups to prepare classroom activities based upon what they gleaned from company tours.

Science and technology teachers of grades 6, 7, 8 and/or 9 who are employed full time in any public, private, or parochial school in the state of New Jersey are eligible to apply. Though the deadline for receipt of completed applications was April 9, 1999, there may still be openings to be filled. See page 5 for information.

NJ BISEC has also announced the "Cross-Over Chemistry Teacher Program for which applications were being accepted with a deadline of April 26, 1999. (Similar remarks apply as to the above Summer Institute).

This institute will be held at The College of New Rochelle in New Rochelle, New York, from August 9 through August 13, 1999.

The Cross-Over Chemistry Teacher Program is designed to offer assistance to teachers who have been assigned to teach chemistry even though they have too little background in the subject to teach it well. The program includes an upgrading of the knowledge of chemistry and provides resource materials. Teachers will also have an opportunity to learn some of the very special skills and techniques that characterizes exceptional chemistry teaching.

New Jersey teachers who are required to teach high school chemistry, although their college preparation was for another science discipline, are eligible to apply. Preferences will be given to educators who had as little as one college chemistry course and/or who currently and in the 1999-2000 academic year will be teaching chemistry. Each participant will receive an \$800 stipend, as well as room and board during the one-week program.

Another summer institute for which the deadline has passed (April 23, 1999) is the Sixth Annual Telecommunications Residential Institute (TRI) for 1999. This one is for 4th, 5th, and 6th grade teachers, and will be conducted at Drew University in Madison, NJ, during the weeks of July 12-16, August 1-5, and August 6-10. Each group of teachers will receive one week of initial training. All participants will present results of their students' telecommunications projects at a Showcase in the spring of 2000.

Some highlights include an introduction to on-line services to implement the elementary curriculum; introduction to a variety of search engines; Internet and World Wide Web training; use of AOL to design, post, and manage an on-line project; basic HTML and Web page publishing; and small group development of telecommunications-based classroom projects.

Classroom teachers of grades 4, 5, and/or 6 who are employed full time in New Jer-

sey's public, private, or parochial schools and who possess **basic** computer skills are eligible to apply. Only pairs of teachers from the same school will be considered. All participants must bring a personal computer with modem for evening practice sessions. Each participant will receive a \$500 stipend, as well as room and board during the program. Participants' schools will receive \$500 for monthly phone charges, and/or equipment.


As mentioned above, these programs have passed their deadlines for receipt of applications, but there is a small chance that participants are still needed. For brochures and applications and for more information on the above programs, please contact Gertrude M. Clarke of the NJ BISEC at 201-216-5635. 



Photo of front cover of the December 1990 issue of *The Physics Teacher* magazine showing Jamey Turner making the glasses sing!

Obituaries 1999

It is with deep sorrow that we tell you that Dr. Robert Sears died Wednesday morning, April 24, 1999.

Dr. Sears was the AAPT President Elect and would have become our President next year. He was previously AAPT Treasurer and Chair of the Section Representatives.

He suffered a massive heart attack while using exercise equipment. He was 57 years old.

* * *

Sister Mary Nicholas Farley of the Sisters of Mercy and a long-time associate professor of physics at Georgian Court College died January 20 of a heart attack. She was 86.

Known affectionately to her students at Georgian Court as "Sister Nick," she not only taught physics there, but also was the chairwoman of the physics department for many years, hosted workshops for New Jersey science teachers each summer, and served a stint as president of the NJAAPT. The current chairwoman of the physics department, Beth Schaefer, said that Sister Nick "emphasized hands-on, learning by doing, not just lecturing."

She is survived by a sister, Betty Simzak of Trenton, two nephews and three nieces.

* * *

Some of us from the Dumont sharing session wish to acknowledge a person whom we met at conferences, had good times with, and for whom we had a great deal of respect for his enthusiastic approach to teaching. Dave Tedesco, an industrial arts and technology teacher at Pascack Valley High School in Hillsdale, NJ, died suddenly in late March. He, along with Erik Gundersen, another sharing member, were accompanying their

school's robotic team at NJIT when he died. Dave, along with the late Phil Goodyear, and Erik Gundersen developed the "Physics and Technology" course, which is now in its third year. This curriculum provides the students with the opportunity to learn physics in conjunction with the principle of technology. We who knew him will miss his infectious laughter, his smile, and his warm personality. ☞

Warnings Legislation

From Tom Twardowski

As scientists and concerned citizens, we applaud the recent trend towards legislation which requires the prominent placing of warnings on products that present hazards to the general public. Yet we must also offer the cautionary thought that such warnings, however well-intentioned, merely scratch the surface of what is really necessary in this important area. This is especially true in light of the findings of 20th century physics. We are therefore proposing that, as responsible scientists, we join together in an intensive push for new laws that will mandate the conspicuous placement of suitably informative warnings on the packaging of every product offered for sale in the United States of America. Our suggested list of warnings appears below.

WARNING: This Product Warps Space and Time in Its Vicinity.

WARNING: This Product Attracts Every Other Piece of Matter in the Universe, including the Products of Other Manufacturers, with a Force Proportional to the Product of the Masses and Inversely Proportional to the Distance Between Them.

CAUTION: The Mass of This Product Contains the Energy Equivalent of 85 Million Tons of TNT per Net Ounce of Weight.

HANDLE WITH EXTREME CARE: This Product Contains Minute Electrically Charged Particles Moving at Velocities in Excess of Five Hundred Million Miles Per Hour.

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NJAAPT Web Site Available

By Brian Holton

NJAAAPT now has a web site. Go to www.NJAAPT.org. Comments and critiques are necessary to make the site useful for us all. Anyone who wants to add to the site, please send your material to Brian Holton: holton@hths.mcvsd.k12.nj.us. Particularly needed are links to NJAAPT member pages and links that are of interest to people who teach physics. Maybe we should add a section on physics for the young? Any volunteers? ☞

New North Jersey Sharing Group

By Ed Schweber

The NJAAPT/North Jersey Computer group, a new sharing group, dedicated to the use of computers in high school and college introductory physics classes, now meets the second Wednesday of each month through May, from 5 to 7 P.M. at the Solomon Schechter Day School, 1418 Pleasant Valley Way, West Orange, NJ.

Each meeting is dedicated to the use of one or two software packages or one or two computer interface probes. The eighteen or so members who have attended the first two meetings have found them very informative. What they seem to find most worthwhile is the experiment in small groups with the software and the apparatus and to trade off their ideas for how it can be used in their individual classrooms.

For further information, or directions, contact Ed Schweber at:

973-669-8000, ext.361 (school)

973-335-7672 (home)

973-669-0034 (fax)

edschweb@ix.netcom.com (e-mail)

To obtain free resources for creative teachers, visit:

<http://www.physicsweb.com> ☞

Physics in Orbit
By Eugenia Etkina

Do Newton's laws really work? Can we take a shower flying around the Earth? What would happen if you leave two bat-

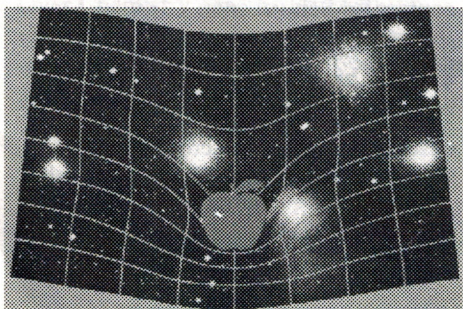
teries close to each other on a space station? If you are interested in these questions, we invite you to watch unique original videotapes, "Lessons from Space," produced on the



"Mir" space station with the help of the astronaut Alexander Serebrov and the Russian Space Agency. The three tapes (20 min each) demonstrate the effects of surface tension, laws of mechanics and electromagnetic effects in the state of free fall.

All experiments are carefully executed and thoroughly explained. Effects are unpredictable even for a very experienced physicist. The absence of apparent weight does wonders for physical phenomena, and though we all expect the laws of physics to work theoretically, the moment we actually see them work is hard to forget!

We invite you to Rutgers University to watch and discuss the tapes on October 29th at 6.30 pm in the Physics Lecture Hall (See Schedule of Events on page 2). Russian text will be translated and we anticipate lively discussion about the incorporation of the ideas of the experiments into physics instruction. ...



NJAAPT MEMBERSHIP FORM

American Association of Physics Teachers
New Jersey Section

To apply for membership in NJAAPT, fill out the form below, enclose a check payable to NJAAPT for \$10.00 (1997 - 1998) or for \$25.00 (1997 - 2000), and Mail to:

Harry Rheam
1122 Beechwood Dr.
Atco, NJ 08004

Your Name _____ Employer's (School) Name _____
Home Address _____ Employer's (School) Address _____
City/St./Zip _____ City/St./Zip _____

Check, as appropriate: Industry _____ 4-yr. Coll./Univ. _____ Comm.Coll. _____
Pre-Coll. _____ Retired _____ Nonprofit Org. _____

Home Phone () _____ Work Phone () _____
E-mail address _____

If you are interested in joining a mini-workshop or a sharing group, check here _____
(Information will be sent to you on how to join or initiate one.)
Please list the names and schools of other teachers who may be interested _____

(Current members: If your address has changed, please fill out the form below.)

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NJAAPT Change of address Form
From the Treasurer

Mail to:
Harry Rheam
1122 Beechwood Drive, Atco, NJ 09004

New Mailing Address:
Street _____
Box _____
City, State, Zip _____
Phone () _____
e-mail address _____

Hell: Exothermic or Endothermic?
From Norman Sanders

A thermodynamics professor had written a take home exam for his graduate students. It had one question: "Is Hell exothermic (gives off heat) or endothermic (absorbs heat)? Support your answer with a proof."

Most of the students wrote proofs of their beliefs using Boyle's Law (gas cools off when it expands and heats up when it is compressed) or some variant thereof. One student, however, wrote the following:

First, we need to know how the mass of Hell is changing in time. So, we need to know the rate that souls are moving into Hell and the rate that they are leaving. I think that we can safely assume that once a soul gets to Hell, it will not leave. Therefore, no souls are leaving. As for how many souls are entering Hell, let's look at the different religions that exist in the world today. Some of these religions state that if you are not a member of that particular religion, you will go to Hell. Since there are more than one of these religions, and since people do not belong to more than one religion, we can project that all people and all souls will go to Hell.

With birth and death rates as they are, we can expect the number of souls in Hell to increase exponentially. Now, when we look at the rate of change of the volume in Hell, because Boyle's Law states that in order for the temperature and pressure in Hell to stay the same, the volume of Hell has to expand as souls are added. This gives two possibilities:

#1. If Hell is expanding at a slower rate than the rate at which souls enter Hell, then the temperature and pressure in Hell will increase until all Hell breaks loose.

#2. Of course, if Hell is expanding at a rate faster than the increase of souls in Hell, then the temperature and pressure will drop until Hell freezes over.

So which is it? If we accept the postulate given to me by Ms. Therese Banyan during my Freshman Year, that "it will be a cold night in Hell before I sleep with you," and take into account the fact that I still have not succeeded, then #2 cannot be true, and so Hell is exothermic.

The student got the only 'A'

(continued from page 6, col. 2)

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payable to AAPT-NJ Section) If you decide you would like to attend, but at a date too late to mail, call Professor Hodson at 973-655-7264.

The cost of this workshop will be \$15 for current members of NJAAPT and \$20 for non-members. No purchase orders, please. Lunch will be provided. We provide coffee, tea and donuts.

The workshop is sponsored by the Physics Program at Montclair State University and the NJAAPT (New Jersey Section of the American Association of Physics Teachers).

Mail to : Prof. Richard Hodson, Mathematical Sciences Dept., Montclair State University, Upper Montclair, NJ 07043.

Name (Last) print (First) print

School Name and Address with zip code print

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Should Another Universe Subsequently Re-emerge, the Existence of This Product in That Universe Cannot Be Guaranteed. ☞

(Continued from page 2, col. 3)

publish some of these findings and new ideas in our newsletter, so you should send such information (or articles) to our editor, Leon Goldberg: LPGold@aol.com

Also, please consider being on our Executive Board and helping us to plan future programs and workshops. Maybe you would like to help with one! Have a good summer and mark your schedule for programs during the next few months. (See schedule of events on page 2.)

Anybody out there have any good ideas for improving this newsletter? Any reasonable suggestion will be implemented. Just send your idea or ideas to the editor by U.S. mail (LPGoldberg, 30 North Riding, Cherry Hill, NJ 08003) or by e-mail (LPGold@aol.com). You may want to call first (609-429-6393). If your idea is used in the newsletter, your picture will be added to your article (if you send one).

NJAAPT NEWSLETTER



Editor: Leon P. Goldberg — Associate Editor: Michael J. Bruno

Contributors: Jessie Blair, Gertrude Clarke, Eugenia Etkina, Richard Hodson, Harold Lefcourt, Ray Polomski, Harry Rheam, Ed Schweber, Norman Sanders, Tom Twardowski

NEW JERSEY SECTION

AMERICAN ASSOCIATION OF PHYSICS TEACHERS

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NJAAPT
Harry Rheam
1122 Beechwood Dr.
Atco, NJ 08004



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