

# Arkansas Physics

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**Newsletter Editor:** Gay Stewart. Please contact me with comments and suggestions, Dept. of Physics, University of Arkansas, Fayetteville, AR 72701; [gstewart@uark.edu](mailto:gstewart@uark.edu).

**Important deadline:** March 1, 2005 is the deadline for Physics scholarship applications. Call, write or see our web page for info: <http://www.uark.edu/depts/physics/undrgrad/handbook/scholars>.

The Talent Search is a cool World Year of Physics Event...See back page for even more. Visit our newsletter on the web for each of those titles to be a link, or go to [www.aps.org](http://www.aps.org) and click on the World Year of Physics Logo!

## Featured Physics Department:

We have begun a series of features dealing with high school physics departments in the state. Last newsletter we examined the Physics department at the Arkansas School for Mathematics, Science, and the Arts, in Hot Springs. In this newsletter we would like to feature the Physics program at Pulaski Academy. Please send us a suggestion for another physics department to be featured in our spring newsletter. Pulaski Academy (PA) is a private college-prep school in Little Rock where Doug Reed is THE physics teacher. Doug has a B.S. in Chemistry from the University of Arkansas at Fayetteville, as well as a M.S.E from them. PA offers three physics courses to their students. 1<sup>st</sup> Year Physics uses fun and easy mathematics to introduce the students to the world of physics. The students experience many demonstrations and are engaged with various hands-on investigations throughout the year. They use Holt as the text in this course. AP Physics B is their fast-paced run through all of physics, using Serway. PA also offers the AP Physics C course using Halliday, Resnick, and Walker. This is

**United States Physics Talent Search:** Is one of your students the next Einstein? You never know without trying! To start, why not participate in the WYP 2005 Physics Talent Search? Students can earn Talent Search points by visiting a physics lab (High School Physics Day counts!), making a poster, writing a play, or doing a physics experiment in your school's science fair. If they earn 10 points, they earn the right to be called a "United States Physics Talent." For more points, who knows? They might become one of the United States "Physics Young Ambassadors."

usually a second year course with a prerequisite of the 1st year physics course. They focus in depth on Mechanics with some E&M included. Doug uses PASCO, Vernier and TI lab equipment. He specifically uses the Vernier LabPro with their probes and the PASCO dynamics system. Doug incorporates modules that he has built or received from workshops (APLL UALR and UofA RET program). He administers pre- and post- tests when he can and uses the FCI and TUG-K. He also has a direct current test that is given if and when they study electricity. Doug's teaching style is along the traditional lecture/demonstration/inquiry style, but he would like to learn more about inquiry-based learning so he could apply it in his classes. There are lots of hands-on activities for the students and Doug finds that these help them dispel their misconceptions. Doug works with local colleges when he can. For example, he takes some of his kids to the UALR Engineering DAY and would definitely include U of A Physics DAY if it were closer. (Gay says "for shame, other schools travel further!") Learn about PA at: <http://pulaskiacademy.org/> or email Doug at [doug@pulaskiacademy.org](mailto:doug@pulaskiacademy.org).

**PHYSICS TEACHING RESOURCE AGENTS (PTRA) PROGRAM**-the University of Arkansas, Fayetteville has been selected as an AAPT/PTRA Rural Regional Site (RRS) starting summer of 2005.

**The AAPT/PTRA program seeks to provide sustained professional development to teachers of physics and physical science by maintaining a nationwide cadre of over 100 accomplished high school teacher-leaders trained and updated yearly to conduct extensive series of workshops in their local regions throughout the U.S. These teacher-leaders are certified as PTRAs by AAPT.**

Gay Stewart has been identified as the Rural Regional Coordinator (RRC) for this site. Please contact her for any information. The topics for the first summer (i.e., 2005) and the two follow-up sessions during 2005 - 2006 are: (1)Teaching about Kinematics (2)Teaching about Newton's Second Law.

There will also be a computer technology component for both of these topics using PASCO, TI and/or Vernier equipment. This equipment will be borrowed from the respecting companies.

The Rural AAPT/PTRA program is an initiative to serve isolated and neglected rural teachers. The program provides opportunities for these teachers to grow professionally in physics content, in the use of technology for instruction, and in established teaching strategies.

Additionally these teachers will form the foundation of a professional and supportive network for physics teachers.

Features are introduced to accommodate teachers in a rural environment (e.g., establishment of PTRA Rural Regional Centers at designated colleges/universities, and the appointment of a member of the physics department as a Rural Center Coordinator (RCC). The RCC arranges and hosts all sessions, but PTRAs in the general geographic area conduct the workshops. Rural participants will be able to attend 36 workshop hours per year.

**Non-rural participants may attend for a small fee from their school, or apply for one of two physics department scholarships for the program.**

Potential national PTRAs are selected based on physics content mastery, creativity, successful teaching experience, familiarity with physics education research, and the capacity for professional leadership.

The opportunity for continuity and expansion of training is offered each year at an intense summer institute at which AAPT/PTRA commissioned workshops are developed. What emerges, then, are teachers from within urban districts or rural schools who go out to meet the specific needs in their local area.

The faculty and members of SPS invite students and teachers from your high school to participate in high school physics day. Note that a small registration fee is required, and that a pizza lunch will be provided by SPS, making the fee well worthwhile. Checks may be made payable to "Department of Physics". There will be prizes in every category, and a classroom prize for the best school overall. We hope that this day will encourage the pursuit of physics as a career itself or as a valuable asset to a large number of possible careers by providing an opportunity for detailed projects to be carried out in a light-hearted (and hopefully light-landing) manner. We also hope to give students and teachers from across the state an opportunity to get acquainted, better inform them about our undergraduate physics programs, and show that physics is fun.

## High School Physics Day Registration Form:

Teacher's Name \_\_\_\_\_ School \_\_\_\_\_

School Address \_\_\_\_\_ ***Please print student names***

City/State/Zip/Phone \_\_\_\_\_ ***on back of this form!***

Teacher e-mail: \_\_\_\_\_

Preregistering \_\_\_\_\_ students at \$2.50 each for a total of \$ \_\_\_\_\_ payable to the Physics Department.

Contests(check each your school will be competing in and give the number of teams competing in each):

\_\_\_ Water rockets, Number of Teams: \_\_\_\_\_ Paper Tower, Number of Teams: \_\_\_\_\_

\_\_\_ Egg Drop, Number of Teams: \_\_\_\_\_ Posters, Number of Teams: \_\_\_\_\_

\_\_\_ Einstein Look Alike Contest, Number of Teams: \_\_\_\_\_

**Physics Teacher Education Coalition Update:** PhysTEC is a project to dramatically improve the preparation of physics and physical science teachers nation-wide. (Vol. 6 #2, or visit the web).

A productive Teacher-in-Residence (TIR) program is a major component of this program. The TIR, who brings the knowledge and experience of managing a student-centered science class, assists in revising targeted physics courses and helps team-teach the science methods courses. The TIR provides continuity between science methods courses, physics courses, and activities in the local schools.

The TIR03 and the TIR04 presented a brief summary of their work and the PhysTEC program to the Fall AOK Sectional Meeting of the AAPT at UALR in Little Rock, Arkansas on October 9, 2004.

David A. Young (TIR03) introduced Donna Owen (TIR04) to the group. Both explained the TIR part of PhysTEC and explained what they have done and what they plan to do. They spoke of the need to improve the science instruction at younger grades and the upcoming State Science Assessments to great interest from the group. In addition they shared plans to continue the UAF Teacher of Teachers Luncheon to include

### Classroom Projects

#### Reduced Gravity Experiments: High School Teachers, Research in Freefall with NASA

Climb aboard NASA's flying, reduced-gravity laboratory and run your high school classroom's physics experiment.

#### PhysicsQuest

In celebration of the 100th anniversary of Albert Einstein's 'miraculous year' of 1905, and coincidentally, also the 50th anniversary of his death in 1955, APS invites middle school students from all across the United States to solve a mystery. The solution to that mystery reveals the location of a treasure somewhere in Princeton, NJ where Einstein taught and continued to do research for the last 23 years of his life. Can your class solve the mystery?

#### Measure the Earth with Shadows

Eratosthenes first measured the diameter of the Earth with an ingenious technique using just sticks, shadows and a little mathematics. Now students, collaborating with others in distant schools, will combine their efforts to recreate this experiment on the largest scale ever attempted. **Sign up for the World Year of Physics Newsletter!**

an elementary joint session with Fulbright and College of Education faculty this fall and to repeat the secondary meeting in the spring of 2005 - several professors expressed a desire to have similar meetings at their university. Arrangements were made to share and help plan a similar event at UALR with Al Adams. A third point of interest in the discussion was the new Physics for Elementary Teachers course, a pilot of the San Diego program. The course is designed to let future teachers construct their own physics understanding.

The university, through **PhysTEC** support, reimburses the school district for the cost for the TIR's replacement, while the school district continues to employ the TIR. The TIR consults with pre-service teachers and provides a realistic understanding of what science is being taught and how it is now being taught in the schools. Besides those chosen to be TIR's, the program will benefit in-service teachers. A physics graduate credit class for in-service as well as pre-service HS physics teachers will be taught each summer. Contact Gay Stewart for details for **either** program. See <http://www.uark.edu/depts/physinfo>.



## HIGH SCHOOL PHYSICS DAY

The University of Arkansas Department of Physics will host its annual High School Physics Day on **FRIDAY March 18, 2004**.

### SCHEDULE OF EVENTS AND RULES

8:30 - 8:45	Registration	12:30 - 1:30	Paper tower
8:45 - 9:00	Introduction and welcome	1:30 - 2:30	Einstein Look Alike contest
9:00 - 10:00	Rocket Launch	2:30 - 3:30	Egg Drop
10:00 - 11:30	Demonstrations, tours of research labs	3:30 - 4:00	Physics at U of A, Fayetteville
11:30 - 12:30	Lunch provided by SPS	4:00 - 4:30	Awards ceremony

**EGG DROP:** No restraining devices or aerodynamic devices may be attached to the container. The container itself may not be an aerodynamic device. The maximum height of drop will be 60 to 80 feet. The winner is the container with the most eggs surviving the drop. In the event of a tie, the container with the least volume wins. Each container must hold **two** raw, unfrozen, untreated chicken eggs. Please bring your own. Containers may be of any material but must fit into a cube 50 cm on each side. Containers which may chip the asphalt target will be disqualified. The containers must be opened to check the eggs after the drop. Unbroken eggs will be broken to determine if qualified. **Limit 3 entries per school.**

**EINSTEIN LOOK ALIKE CONTEST:** In honor of the World Year of Physics, celebrating Einstein's "big three" papers submitted in 1905, open to either gender, it is all in the attitude, and the hair. I'm afraid the judging will be subjective.

**POSTER:** They should deal with anything related to physics or astronomy. Posters should be turned in at registration time, and will be judged according to content and artwork. Entries are limited to one poster per person.

**PAPER TOWER:** Construct a free-standing tower of maximum height using a single sheet of 8.5" by 11" photocopier paper and one 50 cm strip of cellophane tape. No other materials may be used. Materials and construction aids will be provided. The tower may not be attached to the floor or any other object. A tower shall be declared free-standing if it remains self-supporting for more than 10 seconds. Height is determined by measuring the perpendicular distance from the highest point on the tower to the supporting surface.

**ROCKET LAUNCH:** Students will modify a 2-liter soda bottle to be launched with a specified amount of water at a specified air pressure. Rockets will be judged for greatest time aloft and originality of design. **Limit 3 entries per school.**

**HOW TO PARTICIPATE:** Please fill out the registration form and return by Monday, March 7. Awards will be given for first, second, and third place in the five competitions. Entries by **individual** high school students and by **teams of two** members are welcome. Provisions will be made so that each team member receives an award. Everyone is encouraged to participate but anyone can come to observe. Judges' decisions are final. In the event of a tie, the points will be split between the teams.

### NEWSLETTER

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