

Arkansas Physics

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Featured Physics Department:

The Physics Department at the University of Arkansas at Fayetteville has begun a series of features dealing with high school physics departments the state. In this newsletter we will examine the Physics department at the Arkansas School for Mathematics, Science, and the Arts, in Hot Springs. Please send us a suggestion for another physics department to be featured in our fall newsletter.

The ASMSA Physics Department has three instructors, Dr. Brian Monson, Wilhelm Richter, and Shane Thompson. Brian has a PhD from the University of Arkansas at Fayetteville in non-linear optics, has taught at the Oklahoma School for Science and Mathematics, and is the ASMSA Science Department head. He also is an AP Consultant giving the APPB and APPC session at the UofA@F this summer (<http://www.uark.edu/depts/ap/>), working on a lab manual for astronomy, and is coordinator for the Regional Science Fair at ASMSA. Wilhelm has had the longest tenure at ASMSA and has a MS degree. He coordinates the Regional Physics Teachers Alliance and has the Astronomy Club. Shane is the newest instructor in the department and has the responsibility of the Science Days project.

ASMSA offers the following physics related courses: AP Physics C (with one semester being Mechanics, and the second semester E/M), AP Physics B (obtained by adding a third semester course to the general physics class), Optics, Astronomy (semester), Astrophysics (semester), American Folk Music and Acoustics, Art & Science of Photography, Introduction to Engineering, Fundamentals in Research Methods for Juniors and for Seniors (FIRM), Biomedical Physics, Science of Art, Advanced Topics in Physics, and General Physics. Students meet three times a week, generally. One day for 55 minutes, one for 75 and one for 90) The 90 minute session is usually used for labs. They also have a Friday afternoon lab session every three weeks.

The department is well equipped with most of the PASCO probes. About 50% of their labs use the data collection aspects of the probeware. All ASMSA students are required to take a year of physics to graduate. All seniors at ASMSA are required to do a research project and many evolve into science fair projects and Junior Academy presentations.

Besides the use of research and frequent labs, they use the Modeling philosophy from ASU (Arizona) in some classes and the students are required to prepare short lessons to use with the Science Days program. This program is for students in grades 4-8 and involves a series of student-created and directed investigations in the sciences. Shane Thompson (thompsos@asms1x.dsc.k12.ar.us) coordinates this and if you know of teachers who would like to bring their classes to this at ASMSA, please contact him.

Additionally the ASMSA Physics department takes part in the West Point Bridge Building Contest (<http://bridgecontest.usma.edu/>), hosts the UALR AP Conference (<http://arkapctr.ualr.edu/>), presents and host conferences such as most recently presenting at the AGATE conference and working with the ASMSA Mathematics Department as they held a Regional T³ Conference last year, works with Dr. Lacy's IDEAS remote telescope project, is planning with UALR and other schools on the NSF Mathematics and Science Partnerships (MSP), and regularly competes in the PhysicsBowl.

ASMSA has just recently joined the University of Arkansas system and added the Arts to their mandate. How these changes will impact the physics department is to be determined.

For additional information about ASMSA's Physics program contact Brian Monson at MonsonB@ASMS1X.DSC.K12.AR.US, or visit the ASMSA WebPage at: <http://asmsa.net>

PhysTEC TIR:

As the University of Arkansas at Fayetteville finishes their 3rd year of the PhysTEC program, we are looking for a teacher to serve as the Teacher In Residence (TIR04). If you are interested in being a TIR for the 2004-2005

school year, or in the future, please contact David or Dr. Gay Stewart at the UofA@F. More information about the project may be found at <http://www.uark.edu/depts/physinfo/phystec/home.html>, or <http://comp.uark.edu/~dyoung7/>

WOULD YOU LIKE TO SWING ON A STAR ... by Claud H. Sandberg Lacy.

URSA is a web-based robotic telescope on the Fayetteville campus that we use for teaching and research purposes. More than a thousand students have used it for small research projects over the last couple of years, and the telescope is still very under-utilized for teaching (it is extremely efficient). We have visions of extending some of our astronomy education ideas into the public school classrooms. To do this successfully, we will need some funding, but also some new ideas from teachers. The Space Science Telescope Institute (the one that administers the Hubble Space Telescope) has a grants program they run for NASA called IDEAS (ideas.stsci.edu). It is aimed at "creative education and public outreach projects that feature active collaboration between astronomers/space scientists and formal education/informal education professionals ... promoting partnerships that explore new ways to translate astronomy and space science into contexts that will educate and stimulate the interests of students, teachers and the general public." I am working in a collaboration with Al Grauer of the Univ. of Arkansas at Little Rock, Wilhelm Richter of the ASMS, and Bill Neely of the NF Observatory in New Mexico to create a larger, more capable version of the URSA WebScope (ursa.uark.edu) I run on top of Kimpel Hall on campus. See www.nfo.edu for the latest progress on the new observatory. I went out to Silver City, NM in November to help with the commissioning of the new WebScope. We expect it to become operational possibly sometime later this year. Our collaboration is very interested in the use of our WebScopes for

education of students and the public. The telescopes are very easy to use. You just have to go to a web site (ursa.uark.edu), log on (you have to have a user name and password - let me know if you want one and I'll set you up), and then fill out a web page specifying what you want to observe. When the system has obtained your observations, it sends you an email, and then you go back to the ursa site to retrieve the images. We have a number of student exercises available at ursa.uark.edu for downloading. There are also a number of measuring tools for the Macintosh computers there. These include a couple of "virtual measuring engines" for automatically measuring the brightness of variable stars at the rate of about 2 images per second. URSA is in regular use by over 200 students per semester. It could easily handle many more users. We are thinking we might be able to develop a proposal for this grant program, which could be funded for a 2-year period beginning next year. We are interested in developing ideas for the use of our WebScopes for education of public school and general public audiences about astronomical topics. We are hoping you might be interested in participating in the proposal, and we would like to learn of your ideas for using our WebScopes in your classroom. The proposal could have funds for, for example, acquisition of a number of Macintosh computers for your office and classroom to use my measurement tools. The proposal is not due until next October, so we have plenty of time to refine our proposal. Please let me know if you are interested in pursuing this opportunity with us. We are very much interested in your ideas.

High School Physics Day Registration Form

Teacher's Name _____ School _____

School Address _____ Teacher e-mail(s): _____

City/State/Zip/Phone _____

We are PreRegistering _____ students @ \$2.00 each for a total amount of \$ _____

Make checks payable to the UofA@F Physics Department by March 22, 2004. Check each Contest your school will compete in and indicate the number of teams you will have for each event. Please print student names on the back of this form if known. Check the High School Physics webpage for updates on the contest <http://www.uark.edu/depts/physics/highsch.html>:

- | | |
|---|---|
| <input type="checkbox"/> Water Rockets, # of Teams:_____; | <input type="checkbox"/> Photography, # of Teams:_____; |
| <input type="checkbox"/> Egg Drop, # of Teams:_____ | <input type="checkbox"/> Physics Quiz Bowl; |
| <input type="checkbox"/> Archimedes Boat, # of Teams:_____; | <input type="checkbox"/> Physics Demonstrations, # of Teams:_____ |

Arkansas High School Physics Teachers Alliance: We now have about 130 teachers on the ARPHYSICS listserve. Thanks to Lynn Hehr for setting this up for us, and the UofA@F for hosting the list. Our first alliance meeting this year was at ACT 2003 in Little Rock in November. Doug Reed hosted a meeting of the alliance in his room at Pulaski Academy in Little Rock in December. Plans are for an Alliance Meeting on February 16, 2004 in Michelle Blackley's room at Jonesboro High School. We will meet from 4 to 6 pm. Then on February 28, 2004 ASMSA will host their Regional Alliance meeting from 8:40 am until Noon in Hot Springs. Contact Wilhelm Richter (richtew@asms1x.dsc.k12.ar.us) for more information.

Resources and Other Information:

AP Summer Institute: The UofA@F Honors Program will host this series of workshops July 12-16, 2004. More information - <http://www.uark.edu/depts/ap/>
AAPT AOK Sectional Meeting: October 29-30, 2004 at UALR. Contact Al Adams at ajadams@ualr.edu for more information.

Super Science Saturdays: The Center for Math and Science Education and the Arkansas NASA Educator Resource Center at 107 Ozark Hall, UA Campus will host three sessions from 9:00am to 3:30pm for teachers in Grades 4-9th. The dates and topics: Saturday, February 28: The Physics of LEGOs and Discover the FUN damentals of structures with AIMS Brick Layers. Saturday, April 17: The Race to Space, Build and launch kites, hot air balloons, Wright Brothers plane & rockets, and Saturday, May 15: Chemistry Matters. Explore the properties of matter using AIMS and GEMS teacher guides. For registration and other information contact Lynn Hehr at lhehr@uark.edu.

We are in search of hosts for meetings in Southeast Arkansas, Southwest Arkansas, and Northwest Arkansas. We are planning on meetings in March, April and then May to finish the year. If you might want to host, in your classroom, an alliance meeting, let David know. If you would like to join the alliance or get on the listserve, email David (dyoung7@uark.edu) or visit the Alliance WebPage (<http://comp.uark.edu/~dyoung7/Alliance.htm>) for more information. We are also trying to update our list of teachers of physics in Arkansas, so send us any names of teachers you know, and/or correct our snail and email addresses for you. Hope to see you at an alliance meeting this year!

Professional Membership: Don't forget to join AAPT (<http://aapt.org/>), NSTA (<http://www.nsta.org/>), SSMA (<http://www.ssma.org/>) and ASTA (<http://www.aristotle.net/~asta/>). See the AAPT web for grants and contests.
ACT 2004: Don't forget to apply to present at this conference set for the fall (November 4-5, 2004). Deadline is March 12, 2004. More info can be had at: http://www.uark.edu/~k12info/ACT_2004/ACT_2004_Home_page.htm
Dates:
University DAY: February 20, 2004
OM: Regional: March 6, 2004, State: April 3, 2004, World: May 29-June 1, 04
PhysicsBowl: April 8-21, 2004 - <http://www.aapt.org/Contests/physicsbowl.cfm>
APPC and APPB Exams: May 10, 2004 PM
Important Deadline: March 1, 2004 is the deadline for Physics scholarship applications. See <http://www.uark.edu/depts/physics/undrgrad/scholar2.html>.

HIGH SCHOOL PHYSICS DAY

The University of Arkansas Department of Physics will host its annual High School Physics Day on **FRIDAY March 26, 2004**. The faculty and members of SPS (Society of Physics Students) invite students and teachers from your high school to participate. Note that a small registration fee is required, which includes a pizza lunch, 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. Please submit a list of names of your students when you send in the Registration Form (print them on the back, or on a separate sheet) if possible. Let us know the names of the kids on your teams as soon as possible. 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.

SCHEDULE OF EVENTS AND RULES

8:30 - 8:45	Registration (1st Floor Lobby)	11:30 - 12:30	Lunch provided by SPS (1st Floor Lobby)
8:45 - 9:00	Introduction and Welcome (PHYS 133)	12:30 - 1:30	Boat Contest (SCEN 110 & 111)
9:00 - 10:00	Rocket Launch (Old Main Lawn Near Ozark Hall)	1:30 - 2:30	Physics Quiz Bowl (PHYS 133)
10:00 - 11:30	Demonstration Contest, Research Labs Tours (PHYS 134)	2:30 - 3:30	Egg Drop (Kimpel Hall Parking Lot)
	(Locations are tentative)	3:30 - 4:00	Physics at U of A, Fayetteville (PHYS 133)
		4:00 - 4:30	Awards Ceremony (PHYS 133)

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/unsprayed chicken eggs. Please bring your own eggs. Containers may be of any material but must fit into a cube 50 cm on each side. Containers that 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.**

PHYSICS DEMONSTRATIONS: Design a demonstration that illustrates physical concepts or phenomena and enter it into the contest. The design must not have been presented or judged previously. It will be judged for originality and fidelity to the physical principles that are being illustrated.

PHYSICS PHOTOGRAPHY CONTEST: Entries are limited to one photograph per person, and must be the work of the entering student. Black and white or color, traditional or digital photographs are allowed. Photos should be submitted as 8" x 10" or 8.5" x 11" prints. An essay of 250 words or less describing the physics in the photo should accompany the submission. The essay should have a title and must be written by the student.

PHYSICS QUIZ BOWL: Each school may enter one team with up to four students. The game consists of 7 Toss Up Questions and will follow the AGQBA rules for the 2nd Quarter game that includes the Bonus questions. The exceptions are that we will have exactly 7 Toss Up questions and will offer up to 7 Bonus Rounds with 4-parts. The scoring will be 10 points for each Toss Up and 5 points for each part of the Bonus. Teams will play based on random draw and the point total will determine the final standing. If time permits we will have the top two teams play for 1st place. All other teams will play only one game. Students who watch the contest should listen to the questions, since there may be some repeated questions, or questions based on the same ideas. The rules for AGQBA Quiz Bowl may be had at: <http://fayar.net/east/teacher.web/Math/young/Quiz/AGQBARulesJuly2003.doc> and the Second Quarter Rules are at: <http://comp.uark.edu/~dyoung7/Alliance/PhysicsDAYQBRules.doc>. **Limit 1 team per school.**

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. The angle of the launch and the air pressure used will be the same for each team, and determined by the judges at the launch pad. **Limit 3 entries per school.**

ARCHIMEDES BOAT CONTEST. Each team will construct, on site, a boat using only a 300 mm by 300 mm piece of Aluminum Foil. We will provide the foil and the pennies. Your goal is to make a boat that will carry the most pennies. The boat must float for at least 77 seconds to count as carrying the pennies. Your team will have a limited amount of time to build, float and load your boat. **Limit 3 entries per school.**

HOW TO PARTICIPATE: Please fill out the Registration Form and return it before Monday, March 22, 2004. Awards will be given for first, second, and third place in the six competitions. Entries by **individual** high school students and by **teams of two** members are welcome for all contests except the Quiz Bowl. 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. Teams must registrar their Rocket, Egg Drop Apparatus, Demonstration and Photograph during the registration time in the morning of March 26.

NEWSLETTER
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