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Maurer Lecture 2003

Nobel Laureate Leon Lederman will deliver the 2003 Robert D. Maurer Lecture. The lecture series, sponsored by the Physics Department, Fulbright College of Arts and Sciences, and the Arkansas Space Grant Consortium, is named after alumnus Dr. Robert D. Maurer who co-invented the first telecommunications grade optical fiber. The Lecture will be held in Giffels Auditorium, Old Main at 7:30 PM on Thursday, March 13, 2003. The lecture is free and open to the public. A reception will follow the lecture.

Lederman, internationally renowned specialist in high-energy physics, is director emeritus of Fermi National Accelerator Laboratory in Batavia, Illinois. Since 1998, he holds the position of Resident Scholar at the Illinois Mathematics and Science Academy and since 1993, Pritzker Professor of Science at the Illinois Institute of Technology in Chicago. Lederman, a member of the National Academy of Sciences has received numerous awards, including the National Medal of Science (1965), and the Nobel Prize in Physics (1988).

Lederman has worked tirelessly to improve science education. He was instrumental in founding the Illinois Mathematics and Science Academy (IMSA), a residential high school for the gifted, and the Teachers Academy for Math and Science (TAMS), which provides professional development for primary school teachers in Chicago. The "hands-on" pedagogue has been applied in France, Brazil, China and Malaysia. He has been an outspoken advocate for new approaches to secondary science that emphasize a coherent three-year science curriculum beginning with physics.

On Friday, March 14, 2003 Prof. Lederman will deliver a colloquium in the Physics Department at 4:00 PM in the Paul Sharrah Lecture Hall.

Gay Stewart named Arkansas Professor of the Year

The large round table in her office is always filled with students working. High school teachers praise her creative approaches to teaching physics and the physical sciences. Her peers call her an outstanding national leader in reforming physics education from grade school through graduate school.

No one who has ever watched her teach was surprised when Gay Stewart, associate professor of physics, was named the Arkansas Professor of the Year by the Carnegie Foundation for the Advancement of Teaching and the Council for Advancement and Support of Education. Since 1981, the U.S. Professors of the Year Program has rewarded outstanding professors for their dedication to teaching, commitment to students, and innovative instructional methods. It is the only national program to recognize college and university professors for their teaching skills.

"Dr. Stewart has been a leader in helping the physics department dramatically increase the number of majors it graduates. This success comes at a time when most physics departments are graduating declining numbers of majors and makes the department at the University of Arkansas a national model," said colleague Ruth Howes, the George and Frances Ball Distinguished Professor of Physics and Astronomy at Ball State University.

Stewart has not only developed new hands-on approaches for teaching undergraduate courses but has also led the effort to develop an intensive training program for graduate students who plan careers in teaching. The "Activity Guide for University Physics" she prepared has been requested by numerous universities both in the United States and abroad.

Under Stewart's leadership, the University of Arkansas was chosen as one of only six in the United States to be a Primary Program Institution for the Physics Teacher Education Coalition (PhysTEC), a program funded by the National Science Foundation. The goal is to improve primary and secondary physics education in the United States by building strong coalitions among various institutions of higher education and the states and communities they serve.

She describes her teaching method as leading the student from concrete hands-on examples to conceptual understanding through group discussion, using an "idea first, name afterward" approach.

"To verify concepts, I use qualitative as well as quantitative experiments," said Stewart. "I strive to relate concepts to everyday phenomena familiar to the students, who are taught how to think about physics problems the way scientists actually think about them. I also encourage cooperative learning, which has been found to improve retention of female and minority students."

"She saw a potential in me that I had never even looked for myself," said former student Ryan Coffee, now studying for a doctorate in physics at the University of Connecticut. "Her confidence in that potential pushed me though the physics curriculum at breakneck speed, resulting in a very well-trained and highly motivated physicist. Not only had she unlocked a new passion, but also she materialized the opportunity to turn that passion into a career."

On November 21, Stewart traveled to Washington, D.C., to receive her award, joining four national winners and the other state winners at an awards luncheon held at the National Press Club and at an evening reception on Capitol Hill.

"By capturing the imagination of students, Dr. Stewart leads them to knowledge and a mastery of the material," said Fulbright College Interim Dean Donald Bobbitt. "She has transformed our physics department and in the process, gained the admiration and respect of her colleagues here and around the country. I can think of no more worthy candidate for the Professor of the Year Award on this campus or any other."

For information on other national and state winners, visit the CASE web site at http://www.case.org/poy.

NASA Announces Explorer Schools Program

Reaffirming its commitment to education, NASA is announcing the new NASA Explorer Schools (NES) program, which replaces its existing NASA Educational Workshops (NEW).

Administered by NSTA, the Explorer Schools program encourages teams of 4–5 science, mathematics, and technology educators from a school or district to apply for a three-year partnership with NASA. Educators will receive NASA-unique scientific content, advanced technological tools, and sustained professional development to develop rich learning opportunities in mathematics, science, and technology. An exciting component of the program will engage students and parents. Fifty school teams will be selected for the 2003 program. For details and an application, visit http://explorerschools.nasa.gov. Deadline for entries is April 4.

High School Physics Day Registration Form:

Teacher's Name_____**School**_____

School Address _____e-mail:_____

City/State/Zip/Phone_____

Preregistering ____ students at **$2.00 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):

__Rocket Launch Number of Teams:___ __Egg Drop Number of Teams:___

__Paper Tower Number of Teams:___ __Physics Demonstrations Number of Teams:___

__Photography Number of Teams:__

WEBSTUFF

The NTEN Mission: Professional Development
Created by Montana State University - Bozeman and funded by the National Science Foundation, the National Teachers Enhancement Network (NTEN) delivers quality teaching resources and professional development opportunities through the Internet directly to K-12 science teachers. http://www.scienceteacher.org

Intuitor Strikes a Blow for Decency in Movie Physics! An irreverent look at the physics of movies.
http://www.intuitor.com/moviephysics/

Giant Can Crush Demo
Did you ever crush a duplicating fluid or soda can with air pressure? Here's the large scale version.
http://www.delta.edu/slime/cancrush.html

A Private Universe Project
A questionnaire and lesson ideas on frequently misunderstood topics in basic astronomy: moon phases and seasons.
http://www.learner.org/teacherslab/pup/index.html

HIGH SCHOOL PHYSICS DAY

The University of Arkansas Department of Physics will host its annual High School Physics Day on **FRIDAY March 28, 2003.** 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. 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 fysics is phun.

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	Demonstration 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/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 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.**

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 .

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 any amount of water at a specified air pressure. Students may choose their angle of launch. Rockets will be judged for greatest time aloft and originality of design. Nothing combustible or judged to be dangerous will be allowed to launch. **Limit 3 entries per school.**

HOW TO PARTICIPATE: Please fill out the registration form and return before Monday, March 24. 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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