

Michigan Section of the American Association of Physics Teachers

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2004-2005 President



Please join us at our Fall Meeting at Oakland University on Oct. 15-16: "Teaching 20th Century Physics in the 21st Century"

Section News

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Welcome to the inaugural issue of the MIAAPT Newsletter! It is one way that the Michigan Section seeks to keep section members, the community of Michigan physics teachers, and those concerned about physics education informed about all the good work that dedicated people are performing in the State of Michigan.

The first major news item is that Congressman Vern Ehlers (3rd District) delivered an invited talk entitled "Science, Education, and Congress" at the 2004 Spring Meeting. Our section thanks Congressman Ehlers - one of only two physicists in the U.S. Congress - for taking the time to return to his teaching alma mater and for addressing such an important issue.

The second major news item is that Alex Azima of Lansing Community College received the Distinguished Service Award. Congratulations, Alex! For more details about the extensive service that Alex has given to the MIAAPT, please see the MIAAPT Member Spotlight on page 2.

The third major news item is that Kathy Mirakovits of Portage Northern HS was elected Second Vice-President at the 2004 Spring Meeting. After serving as the Second V.P. during the 2004-5 school year, Kathy will become First V.P. during 2005-6 and President during 2006-7. Congratulations, Kathy!



MIAAPT President Steve Rea (top) opens the Spring Meeting. Steve Steenwyk, Chair of the Calvin College Department of Physics and Astronomy, welcomes MIAAPT members.



Spring Meeting Summary

The 2004 MIAAPT Spring Meeting was held on April 17 at Calvin College in Grand Rapids. The MIAAPT thanks David van Baak and the other members of the Calvin College community that made the local room and food arrangements. Thank you!

2003-4 MIAAPT President Steve Rea opened the meeting, followed by welcoming remarks delivered by Steve Steenwyk, Chair of the Calvin College Department of Physics and Astronomy. The final program of the meeting is available on the MIAAPT web site. The meeting consisted of a total of 9 contributed talks, an invited talk by Congressman Ehlers, tours of the Calvin College teaching and research labs, and 3 breakout sessions.

One talk of particular interest for those teaching light and shadow was given by graduate students who teach labs at Western Michigan University: Adriana

Undreiu, Eric Arsznov, and Lisa Marie Malischke. They described a mechanical model that they use to help teachers understand the light pattern that forms when two extended sources are used to illuminate a pinhole. The mechanical model makes use of wooden sticks to represent the extended sources, a pinhole, a screen, and brightly colored fluorescent strings that are attached to the sticks and are threaded through the pinhole. The strings, when taut (and straight), represent light rays, and help the students to draw the resulting light pattern on the screen. This mechanical model has the advantage of very closely mimicking the actual physical situations that students observe, allowing them to more easily understand the analogy between the model and the actual experiment.



MIAAPT President Steve Rea (right) introduces the featured speaker of the Spring Meeting, Congressman Vern Ehlers.

“The U.S. must maintain its pre-eminent position in science to...improve the lives, health, and freedom of all people.”
-Congressman Ehlers



Congressman Ehlers begins his talk (top), and makes a point to Al Gibson (left) and Mike LoPresto (right).



Congressman Ehlers with MIAAPT Distinguished Service Award winners past and present. (L-R) Don Campbell, Dale Freeland, Alex Azima, Al Gibson, Congressman Ehlers, Paul Zitzewitz, Patti Hughey, Paul Holody, and Bob Poel.



Alex Azima (right) receiving the MIAAPT Distinguished Service Award from Paul Zitzewitz.

Invited Talk by Congressman Vern Ehlers

Congressman Vernon J. Ehlers gave an invited talk entitled “Science, Education, and Congress” at the 2004 MIAAPT Spring Meeting. Congressman Ehlers, a former Professor of Physics at Calvin College, oversaw a review of national science policy, beginning with three theses: first, that the existing policy (developed under Vannevar Bush) was outdated; second, that the American public does not fully understand science or its practice; and third, that scientists are politically clueless. (In support of the latter statement, Ehlers and Rush Holt are the only Ph.D. physicists in the Congress.)

Ehlers believes that the U.S. must maintain and improve its pre-eminent position in science to advance human understanding and to improve the lives, health, and freedom of all people. To achieve this, the federal government must provide primary support for basic research. The federal government must also support the connections between basic and applied research, with the private sector providing support for applied research.

Ehlers also stated that the federal government must integrate science with decision making. This seems especially relevant today with the February release of a report on this topic by the Union of Concerned Scientists, and the rebuttal of that report by John Marburger, the Director of the Office of Science and Technology Policy.

MIAAPT Member Spotlight

Alex Azima has served the cause of physics and science education in the State of Michigan for over 33 years. A faculty member of the Science Department at Lansing Community College since 1976, Alex served as MSTA President from 1994 to 1996 and as MIAAPT President during the 2001-2 school year. He is currently serving as the College Division Director of the NSTA and continues to coordinate and present science workshops.

Finally, Ehlers posited that the federal government must improve science education from pre-school to graduate school. As evidence in support of this last point, he presented results from the TIMSS study which showed the United States as having scores that ranked, among developed countries, next to last in math and *last in physics*.

In his talk, Congressman Ehlers addressed many issues, including the “uniquely American” under-representation of women and minorities in science and engineering. He also presented a convincing case that we need to improve science education by improving teacher preparation, recruitment, retention, and professional development; pursuing science education research; developing better curricula, and providing better support.

Ehlers has suggested that we get involved with the political process. A good start would be to steadily inform our representatives that our national security and economic security ultimately depend on the level of public physics education.

To paraphrase a comment by Congressman Ehlers, ‘Physics is one of the liberal arts. It should not be acceptable for an educated person to say “I don’t understand basic physics.”’

Let us work together to ensure that our students understand basic physics!

Because of his exemplary involvement in physics education and his service to the MIAAPT, Alex was presented the 2004 MIAAPT Distinguished Service to Physics Education Award at the Spring Meeting that was held at Calvin College in Grand Rapids on April 17. At the conclusion of the presentation, Azima received a standing ovation from the audience.

The MIAAPT gratefully acknowledges Arbor Scientific for its sponsorship of the Distinguished Service Award.

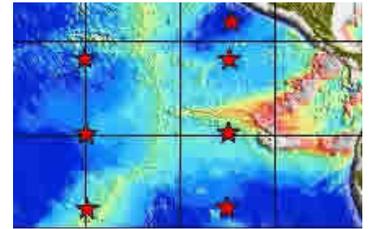
We Hear That...

Mike LoPresto published "Detecting Our Own Solar System From Afar" with student Rachel McKay in the April 2004 issue of *The Physics Teacher*. In that article, they describe how our planet would look to those who would consider Earth to be an extrasolar planet. Rachel has transferred to a four year school and is working on an engineering degree.

Brad Ambrose published "Investigating student understanding of intermediate mechanics: Identifying the need for a tutorial approach to instruction" in the April 2004 issue of the *American Journal*

of Physics. In that article, he describes evidence suggesting students difficulties in upper-level mechanics are often rooted in the introductory concepts, necessitating an approach to directly address these difficulties.

Several members of the MIAAPT attended the Winter 2004 AAPT Meeting in Miami Beach in January. One highlight of the meeting was a plenary talk by Maya Tolstoy of the Lamont Doherty Earth Observatory on the use of sound waves to study geological, biological, and man-made activities in the ocean. (See image at right.)



Location of autonomous hydrophones in the eastern equatorial Pacific Ocean. These are used to monitor sound waves and pinpoint the locations of earthquakes, explosions (e.g., for monitoring compliance with test ban treaties), and migratory calls of a variety of sea animals. (Courtesy NOAA Vents Program.)

Community Service

Four MIAAPT members delivered a PTRA Summer Institute for Teachers in Rural Schools from June 21 - 25 at Saginaw Valley State University (SVSU). Keith Forton (Traverse City HS) and Al Gibson (Adams Rochester HS, ret.), who are PTRA agents, worked with Al Menard and Walter Rathkamp of SVSU to provide an intensive workshop.

Several MIAAPT members participated as judges or event supervisors for

regional science fairs or Science Olympiad Tournaments during the Spring of 2004.

The recently upgraded Henry Ford Community College Planetarium in Dearborn has sponsored 10 free public shows during 2003-4 as well as a record number of field trips. The two-year upgrade involved the installation of an automation system and a new audio-visual system to enhance programming.



New MIAAPT President Mike LoPresto shows students how to make and use a skywheel at Henry Ford Community College. (Courtesy John T. Greilick and *The Detroit News*.)

Resources

Are you starting out as a physics teacher? If so, consider becoming a member of the MIAAPT by attending one of our meetings. The next meeting will be held jointly with the Ohio Section of the American Physical Society (OSAPS) at Oakland University on Friday and Saturday, October 15-16, 2004. For more information, see "Upcoming Events" on the next page.

For New Physics Teachers:

Used Math, by Clifford E. Swartz (AAPT).

Teaching Introductory Physics, by Arnold B. Arons (Wiley).

For the New Teacher, a column in *The Physics Teacher* edited by Patricia Blanton.

psrc.aapt.org, the Physical Science Resource Center website of the AAPT. Contains ideas for lessons, assessment, and more.

www.physicscentral.com, the Physics Central website. Contains up-to-date physics-related news, stories of general interest, and an excellent collection of web links.

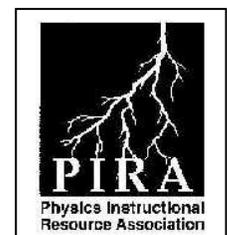
www.physics.ncsu.edu/pira/, the Physics Instructional Resource Association web index of physics demonstrations.



Physical Science Resource Center



physics central



**The Michigan Section of
The American Association of
Physics Teachers**

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Upcoming Events

October 15-16, 2004 (Friday-Saturday)

Joint Fall Meeting of the MIAAPT and the OSAPS at Oakland University. Themes: Physics in Medicine, and Teaching 20th Century Physics in the 21st Century. Invited speakers of particular interest to MIAAPT members are Dean Zollman (Kansas State University), who will describe the Visual Quantum Mechanics materials he has developed for non-science students, and Mario Belloni (Davidson College), who will

describe web-based simulations to aid understanding of modern physics concepts. Please see our website for details.

October 29, 2004 (Friday)

The Southwest Michigan Science Educators Symposium will be held at Portage Northern HS for K-12+ teachers. Registration is due October 15, and more information can be found at the website www.swmses.org.

The World Year of Physics

The International Union of Pure and Applied Physics declared the year 2005 as the World Year of Physics (WYP 2005). WYP 2005 is a worldwide celebration of physics and its importance in our everyday lives. Physics not only plays an important role in the development of science and technology but also has a tremendous impact on our society. WYP aims to raise the worldwide awareness of

physics and physical science.

Why choose 2005 for WYP? Because it marks the 100th anniversary of Albert Einstein's "miraculous year" in which he published three important papers describing ideas that have since influenced all of modern physics. This year provides the opportunity to celebrate Einstein, his great ideas, and his influence on life in the 21st century.

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