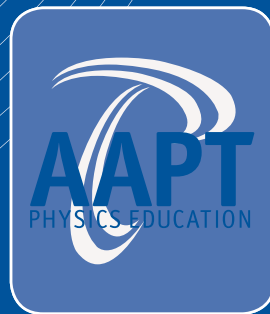
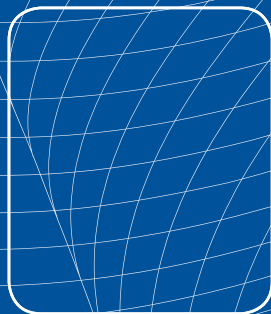


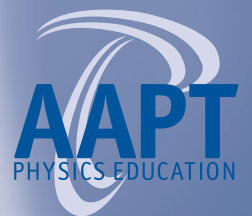
**REVIEW**  
2006 - 2007



# *Advancing* Physics Through *Teaching*

**In the matter of physics, the first lessons should contain nothing but what is experimental and interesting to see.**  
— Albert Einstein

**I find that teaching and the students keep life going.**  
— Richard Feynman





# PASSION FOR PHYSICS.

*P*assionate about physics,  
Committed to teaching and learning,  
They come together as a community.

Physics teachers trained in physics,  
Teachers of physics and physical science  
called upon from other disciplines,  
Faculty and researchers in physics,  
Scholars who study the science  
of teaching and learning,  
Professionals who develop and support  
laboratories and lectures,  
Students of physics, K through infinity ...

They come from across the  
educational continuum,  
From middle schools and high schools,  
From two-year and liberal arts colleges,  
From comprehensive and research universities,  
From government labs and industry.

All curious about the world,  
The micro and the macro, the near and far,  
the cold and hot, the slow and fast moving.  
All wanting to observe, interpret, measure,  
test, simulate, explain ...  
And to share their excitement with others.

Their association embodies AAPT:  
a society of physics teachers and learners.

# COMMITMENT TO TEACHING.

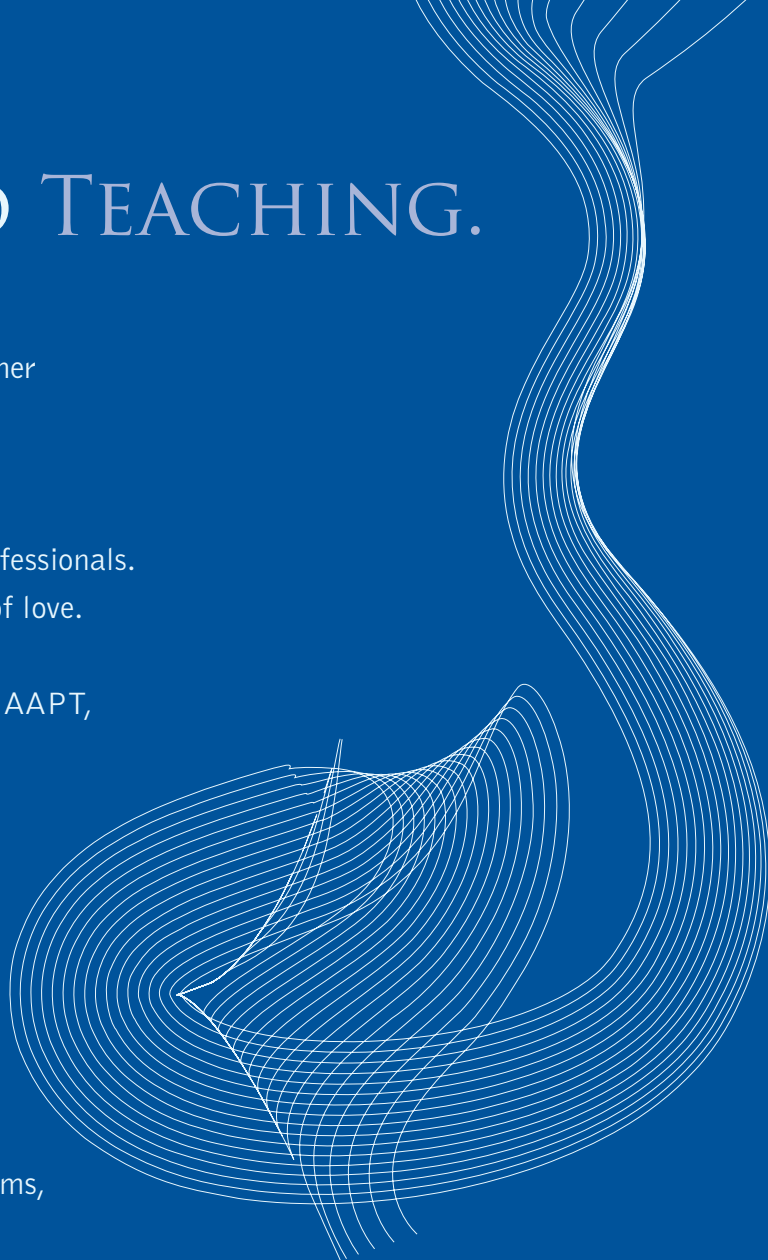
By associating, they teach each other  
and learn from each other,  
Engaging as volunteers in their  
collaborative activity,  
Supported by highly dedicated professionals.  
They consider their work a labor of love.

But their efforts reach far beyond AAPT,  
Into the world of physics and  
science education,  
Into resources and curricula,  
into outreach and public policy.

**T**hey seek to advance physics  
through teaching,  
To make a difference in  
the larger community,  
By way of publications and programs,  
Small conferences and large,  
Targeted workshops, and  
peer-to-peer mentoring.

Driven by the belief that,  
beyond their love of physics,  
Physics stands as the foundation  
of all sciences,  
At the core of technological  
and economic development,  
Critical to improving the human condition.

*This Review highlights their efforts  
across the past 18 months.*





**I**t takes a large community to make the work of AAPT possible.

On behalf of the AAPT Board and the central office staff, the American Association of Physics Teachers conveys deep gratitude to every member of this diverse community.

Our AAPT individual members and our sustaining corporate members

Our donors, funders, and sponsors

Our section representatives and section officers

Our organizational committees, area committees, and review committees' chairs and members

Our grant projects' principal investigators, co-PIs, and advisory group members

Our editors, authors, and reviewers for our journals and magazines...and readers

Our book editor, historian, and associates

Our digital collection editors and designers...and users

Our meeting planners and paper sorters, plenary speakers, and presenters at the invited and contributed sessions...and attendees

Our lead teachers of teachers...and their students

Our workshops and topical conference leaders and presenters... and participants

Our U.S. Physics Team and Bowl Contest examiners, coaches, teachers, and parents...and students

Our High School Photo, Video, and Apparatus contest organizers and judges...and entrants

Our judges at the science and engineering fairs...and participants

Our partners at sister societies and organizations

*And many others...*

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## A TIME OF TRANSITION

*Letter to the AAPT Community from 2006 President Ken Heller*



The past year has been one of transitions. The desire for a national science education policy is emerging, and our society for physics education should guide the way. At the same time, AAPT itself is in the midst of extensive personnel changes and policy reviews.

The National Academy of Sciences study, "Rising above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future,"<sup>1</sup> has inspired Congress and the present administration to recognize that the teaching of science, engineering, and mathematics is essential to our economic survival. New directions have been proposed that will affect physics education in this country from kindergarten through graduate school.

As the sole organization representing teachers of physics from high school through graduate school, AAPT has the duty to shape these policies and actions. Our membership has the experience, expertise, and the desire to guide these policies. However, neither Congress nor local school boards will wait for us: To productively use the national support for our goals, we must press on with our efforts to be a more coordinated, active, and agile organization. We must become stronger by welcoming as members all physicists who value a sound physics education.

We support our own values by being advocates for an educational system that insists on elementary school teachers equipped with a strong background and interest in science and mathematics; high school physics teachers with a

deep knowledge of physics who utilize effective curricula and pedagogy; undergraduate physics instructors who encourage their students to enter the teaching profession and whose teaching reflects effective teaching techniques; and graduate instructors who view effective teaching as one of the important attributes of anyone with an advanced degree in physics. Above all, we must promote the support of teachers so that today's students consider teaching an attractive career choice.

The AAPT organization is undergoing a transition to become more supportive of its members' efforts. On the national scene, we are becoming more involved with our sister organizations (APS, AAS, ACS, AGU, AAAS, NSTA, and ASEE among them) to foster a coordinated effort in support of improved science education. Our central office is also acting to increase our visibility in Congress, the presidential administration, and the general public as the leading organization with expertise in physics education. Of course, the key to fostering effective change is local action that adapts to local conditions. Our Sections fulfill this role. We are in the midst of determining how to strengthen the Sections to improve by allowing them to better coordinate their actions into national efforts while providing them the support they need. We are also working to strengthen the connection among our locally based sections and our nationally based committees on areas of physics education.

The central AAPT office has been in transition for several years. Over the past few years we have lost many valuable staff members to retirement and

---

<sup>1</sup><http://www.nap.edu/catalog/11463.html>


there are more retirements to come. In September 2006, a major transition occurred with the retirement of Bernard Khoury and appointment of Toufic Hakim as our new Executive Officer. Our EO change occurs while the national staff is in a rebuilding phase. Being EO of AAPT is a big job in more placid times, and Toufic certainly will need all of our help and support. Bernie, who has been our EO and the embodiment of AAPT to many of us for more than 15 years, has been active in assuring the smoothest transition possible.

Meanwhile, the normal functions of AAPT continue uninterrupted. Journals get published, meetings are planned, outreach continues, and members' needs are served. Our challenge as AAPT members is to continue the momentum of improving the effectiveness of our organization. Mistakes will be made and glitches will occur. When they do, we need to be helpful and support the central office by giving our new EO and the office staff constructive feedback.

In the midst of these extraordinary transitions occurring nationally and within AAPT, there are ordinary ones. Every January, the terms of several Executive Board members and the President end. When my term came to a close, Harvey Leff became President of AAPT. He also needs our help and support. In addition, approximately half of the chairs of our Area Committees and a third of their membership are new each year and many of our Sections choose new representatives. These changes celebrate our identity as a member-oriented organization. It is this constant movement of members through leadership positions

that gives AAPT its life. We are a diverse organization. We see issues through different eyes. It is this diversity of experience and opinion that guides our organization through its multiple levels in a messy, inelegant, and effective form of democracy. We are physicists and value the lively exchange, and even the clash, of ideas. We understand that the resulting synthesis is often the best path to follow, even if it is not ours. We also know that established ideas need to be continually reexamined. New data from new situations often require a new synthesis.

Only you can cultivate this multidimensional perspective. I urge you to actively add your insights and ideas to the mix: Nominate yourself or others for the Executive Board or Area Committees using the online form available on AAPT.org at <http://www.aapt.org/aboutaapt/nominate.cfm>. Attend your Section meetings and participate in their decisions and actions (Section information is available at <http://www.aapt.org/Sections/Map.cfm>). Challenge your organization to help you improve physics education.

Today there is a confluence of opportunities that happens rarely in each generation. For the next few years we must use the transitions occurring at multiple levels to forge a stronger environment for physics teaching in this country and around the world. 



# DETERMINED TO ENERGIZE PHYSICS TEACHING AND LEARNING

*from Executive Officer Toufic Hakim and President Harvey Leff*



AAPT's primary goal is to enhance physics teaching and learning at all levels, from kindergarten through graduate school, and in informal settings. We have been engaged in this endeavor for 76 years, facilitating the spreading of ideas among practicing teachers in the field through refereed publications and professional programs.

The past year has been particularly exciting and energizing for AAPT. In this first Annual Review, we address significant accomplishments and indicate the beginning of a new era of service and leadership. We are proud that a large and diverse community of caring educators, researchers, and other professionals is responsible for the substantial breadth and scope of AAPT's activities. The many volunteers, together with AAPT staff members, provide supportive programs for all physics educators and students, members and non-members alike. We thank all involved and invite others to join in.

In the pages that follow, we give a general overview of AAPT's activities. We also briefly showcase a number of our collective achievements and the different levels through which AAPT fulfills its mission.

## OUR INTELLECTUAL FORUMS

Our highly popular journals, the *American Journal of Physics* and *The Physics Teacher*, continue to serve high school, college, and university teachers well. Both journals have had increased readership and submissions, especially among international authors, keeping vigorous the global sharing of ideas and innovations in physics teaching.

*Interactions Across Physics and Education*, our new general-interest magazine, addresses today's issues in physics education, from policies to people. Written in an accessible and engaging style, it speaks to those who study and practice physics teaching, and other interested parties, including people who make decisions that influence physics education.

A new listserv and an expanding website support those involved in the teaching of advanced laboratories. Two advanced labs sessions were held at the Greensboro meeting in July, and a topical conference on advanced labs is planned for our 2009 Summer Meeting at the University of Michigan.

Our 2007 Winter Meeting, held jointly with our AAS astronomy colleagues in Seattle, and the recent Summer Meeting in Greensboro were intellectually stimulating and provided a good networking opportunity. The latter attracted record numbers of first-timers, local educators, and international attendees. Sandwiched between productive AAPT conferences on computational physics and physics education research, the Greensboro meeting enjoyed great media attention, sparked by entertaining demo shows and standing-room-only plenary sessions.

AAPT's signature in-service workshops, led by our Physics Teaching Resource Agents (PTRAs), continue to provide professional development opportunities to pre-college teachers of physics and physical science. Now a component of four separate state Math-Science Partnerships, our NSF-funded, 22-year-old PTRA program still displays great passion and momentum.

National Science Foundation-funded partnerships with the American Physical Society, the American Astronomical Society and the American Institute of Physics continue to be productive. The October 2006 New Faculty Workshop in Physics and Astronomy ran at full capacity, and 85 former participants gathered in June 2007 for a 10<sup>th</sup>-year reunion to discuss the value and new directions for these workshops. The PhysTEC teacher preparation project has expanded its demonstration sites to 14; the Physics Teacher Education Coalition, which held a well-attended conference in Boulder in March 2007, now numbers more than 85 committed physics departments. Our digital library resources, available on ComPADRE.org, are steadily growing. The site now has eight collections, with several in development, and is attracting a broadening users' base.

### OUR OUTREACH AND ADVOCACY

We have again administered the high school U.S. Physics Team's selection, training, and participation at the International Physics Olympiad, in partnership with the American Institute of Physics, and on behalf of the physics community. This past summer, the five members of the 2007 U.S. Team competed in Isfahan, Iran, and received two gold and three silver medals. Among 80 participating nations, the U.S. performance was third highest, behind China and Russia. In addition to this outreach program, which had a record-high student participation in the United States, we have successfully sponsored or co-sponsored a number of K-12 outreach activities, including the Physics Bowl, the High School Photo Contest, and the Team America Rocketry Challenge (for which we are the sole education partner).

On the advocacy front, our newly constituted committee on public policy has been busy reviewing letters of support and commentaries on a number of public issues, which we have co-signed or sent on behalf of AAPT to Congress and federal agencies. We will continue to be engaged in this effort and draft a number of new position statements in key areas.


### OUR FACE AND VOICE

We have redesigned our logo to capture, through its letters, who we are and what we value. It now conjures, at the same time, images of forward movement—which describes our state as an organization today—and a sense of fixedness—referring to our core strengths. And as with physics itself, the logo displays a duality of the discrete and continuous.

We have replaced the *Announcer*, our long-standing quarterly, with online *AAPT NEWS*, Section news, and committee reports; and print programs for Annual Meetings, and this new Annual Review—and our transition is not yet complete. These initiatives will ultimately bring more information, in more timely, focused, and searchable ways to members and a potentially larger audience of AAPT friends.

We have used the internet and electronic communication to obtain feedback on ideas relating to AAPT's 76-year-old name and the possibility of initiating a program of Distinguished AAPT Fellows. The quick and valuable feedback provided by AAPT members is extraordinarily helpful in gauging members' reactions to new ideas. We shall continue to use the internet to enhance communications and obtain information, and we will use it wisely to help chart our future course.

### OUR COMMITMENT

This is a snapshot of the recent past, but as we look ahead, the Executive Board and the central office pledge to work closely with our volunteers, members, and broader physics community to advance AAPT as the leading voice for high-quality physics education and the leading resource supporting physics teachers. Together, we thrive to strengthen our community, extend the scope of our intellectual programming, and become proactive in advocacy and public policy. We aim to boost the study of physics across the board, enhance the physics teaching environment in every setting, and play a significant role in promoting and improving pre-service teacher education and teacher readiness. We do so, cognizant of the inherently high value of physics teaching and learning and their positive effect on society. 

## LEADERSHIP & SERVICE

### *mission*

---

By fostering effective teaching at all levels, AAPT's mission is to advance physics learning in service of its members and the public good.

### *values*

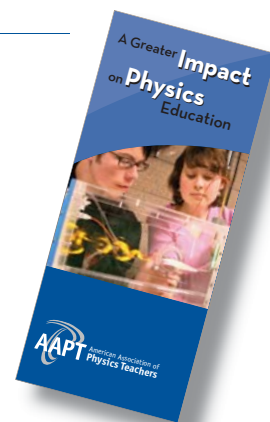
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Embracing the notion that physics understanding is critical to the well-being of society, AAPT is committed to serving its members and the larger community by promoting effectiveness in physics teaching for diverse audiences and in various settings, with the strong belief that successful teaching is based on solid physics content and effective pedagogy; that students of various backgrounds have the capacity to understand physics; and that physics ultimately serves the public good. AAPT highly values collaboration and dialogue among educators of physics at all institutional levels and endeavors to facilitate such interactions.

### *vision*

---

Aspiring to advance the greater good through physics, AAPT strives to be the leading voice, primary resource, advocate of choice and driving force in physics education, serving professionals who teach physics and support physics teaching at all levels.



ADVOCACY  
LEADERSHIP  
COMMUNITY



# REFLECTIONS ON 75<sup>TH</sup> ANNIVERSARY

from Executive Officer Emeritus Bernard V. Khoury

## 1931-2006: Seventy-Five Years of Service

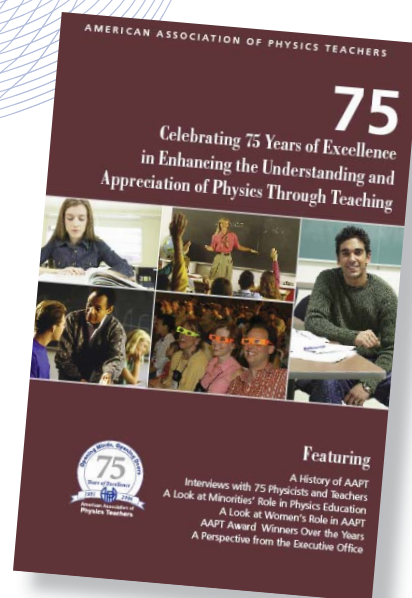
We all live at a point in space-time, at the apex of a light cone, able to look backward, to anticipate the future, and to realize the infinite domain of elsewhere that we will not observe.

The 75th anniversary of AAPT, in 2006, was an apt occasion to reflect on our past, to examine our present, and to anticipate our future. We celebrated with many events, a spectacular 75th Anniversary commemorative book, and the sealing of a time capsule to be opened upon our 100th anniversary.

As our history makes clear, AAPT remains committed to this fundamental mission to “enhance the understanding and appreciation of physics through teaching.” We are anchored in physics, and we use teaching as a means to assure continuing progress in advancing its frontiers.

The year was truly a celebration of physics and of AAPT’s contributions to its understanding, appreciation, and advancement. In revisiting the 75th book recently, the names, photos, and comments from the 75 featured physicists filled me again with a sense of optimism for the future and appreciation for the past. Our 75 contributors represented only a glimpse of the energy and commitment that pervades AAPT, a combination of hope and realism—recognition of much accomplished and even more to be tried.

If you are an AAPT member, take pride in what we and our colleagues accomplished across the first 75 years. If you are a physicist, recognize that our discipline needs both the intense work of scientists and the broader support of a public that understands how we all benefit from scientific advances. If you are a teacher, you know that you are guiding the future of physics and of society. ☺





## Devoted to the Educational and Cultural Aspects of Physics Since 1932

*The American Journal of Physics* offers a unique collection of peer-refereed papers that span the full spectrum of physics. In particular, it fosters an ongoing scholarly exchange among physics educators interested in topics across the undergraduate- and graduate-level curriculum. AJP presents a rich collection of theoretical, numerical and experimental investigations; novel solutions to old problems, and ingenious answers to new questions; as well as historical and philosophical essays. From the esoteric to the applied, AJP's content continues to expand our understanding of, and appreciation for, physics.

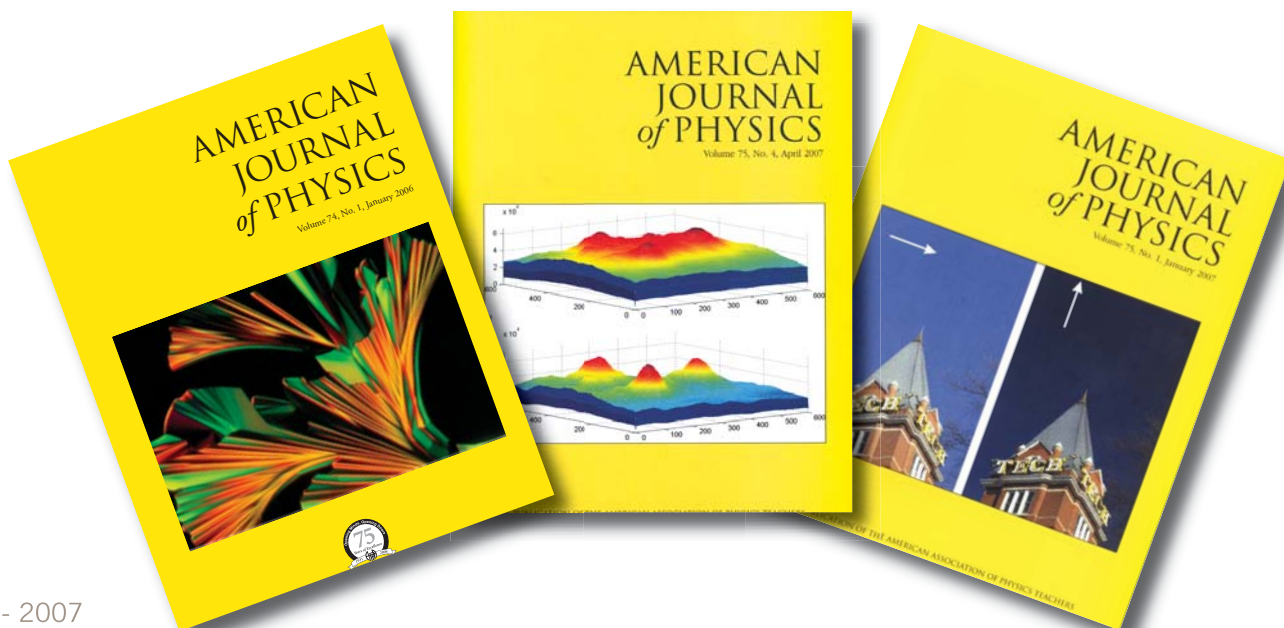
Published papers in 2006 have ranged from jack o'lanterns in Halloween physics, dancing paperclips, and jumping pendula to Bose-Einstein condensates, quantum fractal superlattices, and wavelength multiplexing.

**“It is a distinct honor to have the opportunity to serve AJP as Acting Editor. During my brief tenure, my highest priority is to preserve AJP's effective editorship. Beyond that I would most like to hone our editorial policies and procedures in order to enhance the accessibility and utility of published articles to AJP's core audience. I would also like to promote a livelier online conversation among readers and editorial staff of AJP.”**

—John Mallinckrodt, Acting Editor

### American Journal of Physics

- ✦ 12 monthly issues in 2006, Volume 74
- ✦ 1,150 pages; 150 papers, editorials, and letters to the editor; notes and discussions, apparatus and demonstration notes, resource letters, physics education research papers, book reviews, and special award citations and lectures; 20-25% papers' acceptance rate
- ✦ 78 papers/notes by international authors
- ✦ 4,378 individual subscribers (58% in higher education, 14% in pre-college settings, 16% in industry and government, and 12% students); 1,772 library subscriptions (as of June 30, 2007)
- ✦ 1,052 referees



### Resource Letters

AJP periodically publishes Resource Letters on topics that are treated in introductory or intermediate physics courses to help college and university physicists, astronomers, and other scientists improve their courses or to serve as bridges for those who are moving into new areas of teaching or research. Three were published in 2006:

- *Physical Frontiers in Biology*, E.V. Mielczarek
- *Teaching the Mathematics of General Relativity*, R.B. Wald
- *Particle Beams and Accelerators*, A.W. Chao

### Research in Physics Education

AJP also includes papers that describe findings in the area of physics education research (PER) and are accessible to a broad physics readership. A special section is further devoted to PER papers. In 2006 there were 10 such papers, 5 of which were on curricular development in electricity and magnetism (April, May, and December 2006).

- *Using visualizations to teach electrostatics*, J.M. Casperso and M.C. Linn
- *Teaching about circuits at the introductory levels: An emphasis on potential difference*, S.S. Rosenthal and C. Henderson
- *Restructuring the introductory electricity and magnetism course*, R. Chabay and B. Sherwood
- *Teaching Faraday's law of electromagnetic induction in an introductory physics course*, I. Galili et al.
- *Why is Ampère law so hard? A look at middle-division physics*, C.A. Manogue et al.

Others appeared in May, October, and December 2006:

- *Testing the test: Item response curves and test quality*, G.A. Morris et al.
- *Theoretical comparisons of average normalized gain calculations*, L. Bao
- *Student understanding of symmetry and Gauss's law of electricity*, C. Singh
- *Assessment of difficulties of some conceptual areas from electricity and magnetism using the Conceptual Survey of Electricity and Magnetism*, M. Planinic

### Apparatus and Demonstration Notes

In this section, AJP publishes brief communications reporting new demonstrations, laboratory equipment, techniques, and materials of interest to teachers of physics. In 2006, AJP published 21 such reports.

### Book Reviews

In addition, AJP publishes book reviews regularly, and often in grouped subjects. Twenty-one book reviews appeared in 2006, with themes on computational physics, plasma physics, electrodynamics, laser physics, and introductory physics.

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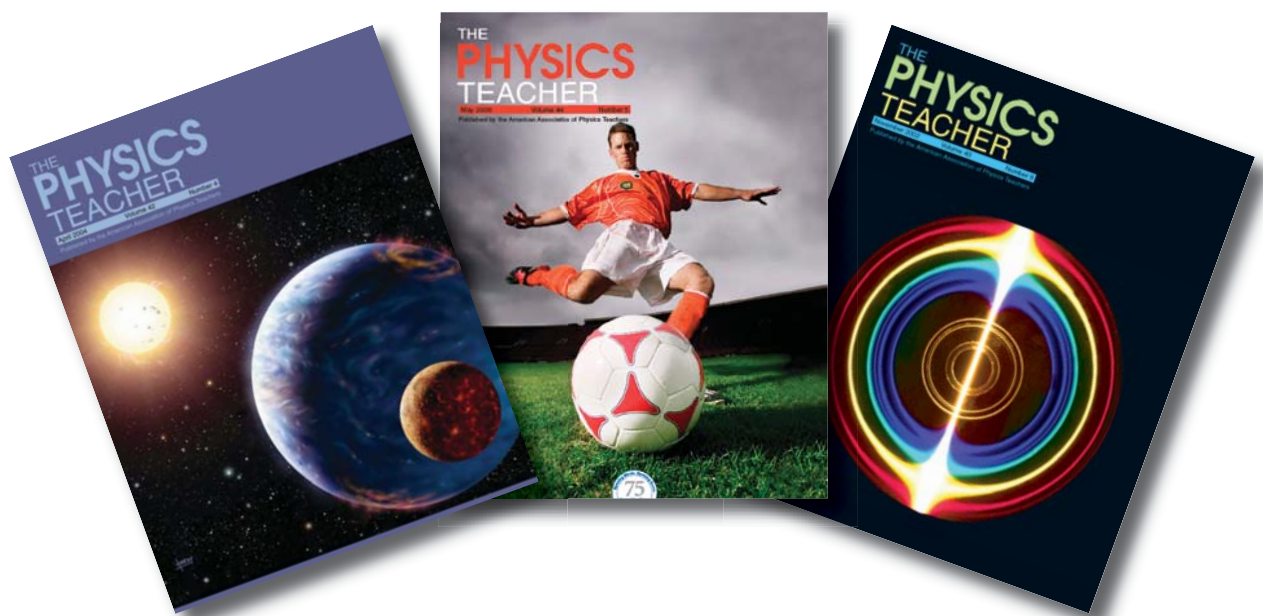
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## Focusing on the world of introductory physics since 1963

*The Physics Teacher* concentrates on the teaching of introductory physics in the pre-college, college, and university settings. This full-color, popular journal features peer-reviewed articles by practicing teachers at all levels on all aspects of teaching. *TPT* is an invaluable source of innovative physics demonstrations, new lab experiments (and new ways of doing old ones), ideas for presenting difficult concepts more clearly, suggestions for implementing newer technology into teaching, and historical insights to enrich any physics class.

The papers are accessible to readers with a basic knowledge of algebra or calculus-based physics, and range from the intriguing to the entertaining. Through its editorials, monthly columns, book reviews, and the shared experiences and commentaries from teachers in the field, *TPT* has become an important source of information for practicing teachers and for all those who find enjoyment in exploring physics. Recent *TPT* papers have covered topics ranging from “Doppler football,” Hollywood heroes, imploding cans, and electric toothbrushes to relativistic effects on GPS satellites, laser measurements of optical errors in the eye, and frozen fractal fractures.





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## The Physics Teacher Statistics

- ✦ 9 issues: January–May, September–December 2006 (Volume 44)
- ✦ 640 pages; 116 papers and 104 contributions to monthly columns (31 international authors and co-authors); 38% papers' acceptance rate
- ✦ 9,983 subscriptions
- ✦ 8,456 individual subscribers (46% in pre-college settings, 40% in higher education, 7% in industry and government, and 7% students); 1,527 library subscriptions (as of June 30, 2007)
- ✦ 221 referees

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“ *Our aim each month is to provide a selection of materials broad enough so that every reader, regardless of his or her specific teaching situation, will find something valuable and thought-provoking.* ”

—Karl C. Mamola, Editor



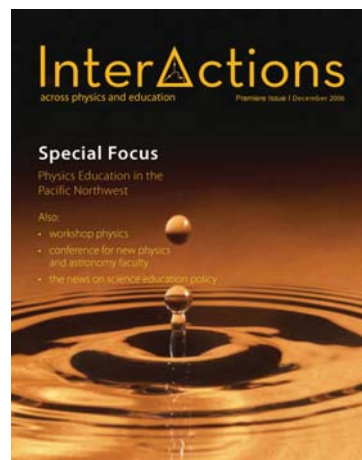
Exploring the “human side” of physics education

# InterActions

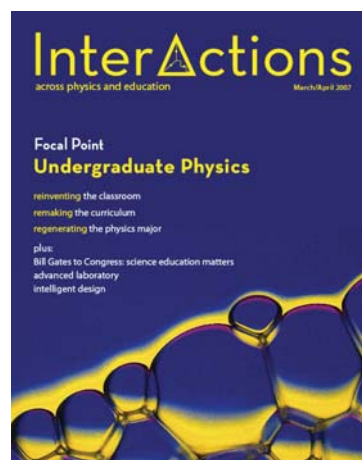
Published by AAPT, *Interactions Across Physics and Education* is a non-technical magazine focusing on the people, places, programs, and policies affecting physics education. The magazine is produced five times a year by a professional staff of editors, writers, and artists and by the generous contributions of expert volunteers drawn mainly from the AAPT membership.

“*The first year has been a unique learning opportunity. We’re continuously improving on the previous effort. We hope that by year’s end, the magazine’s intended personality will emerge. Starting in 2008, our singular purpose will be to shape Interactions into a leading voice promoting a global conversation on physics teaching and learning.*”

—Daryl Malloy, Managing Editor



The *Interactions*' debut took place at the January AAPT Meeting in Seattle, Washington, marking 2007 as the development phase of this new magazine. The focus of the premiere issue was “Physics Education in the Pacific Northwest,” which featured articles on Physics First and innovations in physics education.



Undergraduate Physics was the focal point of the March/April issue and featured articles on reinventing the classroom, remaking the curriculum, and regenerating the physics major.

“*The domain of Interactions is not classroom or lab techniques at the micro-level nor teaching and learning of one student or a group of students; instead, it serves as a platform for discussions on physics education as a sphere of activity that showcases efforts across classrooms, departments, schools, and institutions.*”

—Toufic Hakim, Publisher

### Editorial Advisory Panel

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Bernard Khoury  
AAPT

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Warren Hein  
AAPT

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University of Nebraska

### Editorial Staff

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*Contributing Editors*

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Rachel Ivie

Rachel Safier

Pamela Brown

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Martha Heil

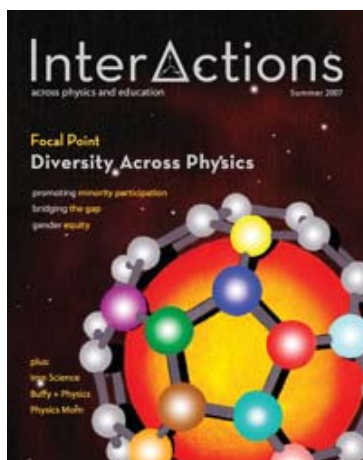
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*Assistant Editor*  
Steve Davolt

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*Art Director*  
Ayah Oweis

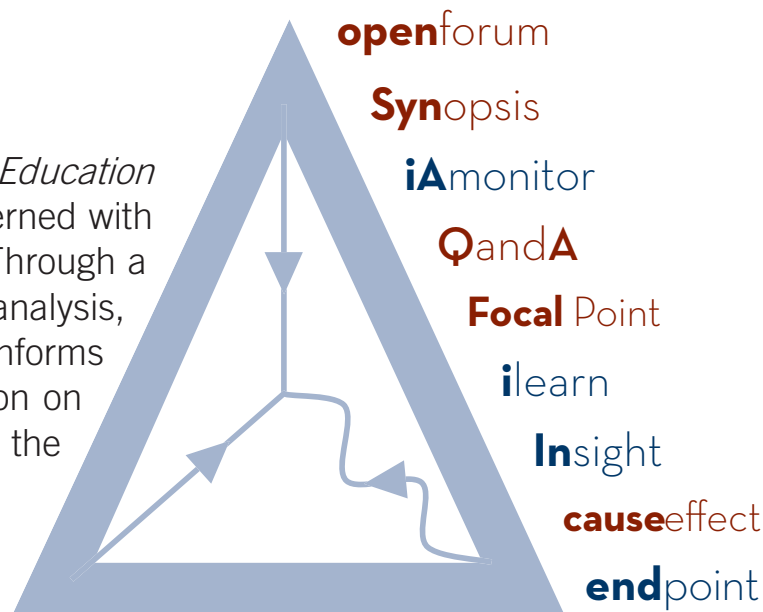
*Graphic Designer*  
Matt Payne



Focusing on Diversity in Physics, the June/July issue explored the problem of under-representation in physics from women to ethnic minorities with interviews of leaders from the National Society of Black Physicists and the National Society of Hispanic Physicists.

Juan Burciaga, Issue Editor

*Interactions Across Physics and Education* is a magazine for everyone concerned with physics and physics education. Through a diverse mix of news, information, analysis, and commentary, the magazine informs and promotes a diverse discussion on the issues and trends affecting the teaching and learning of physics.



# AAPT.org

AAPT's online presence serves as the virtual meeting hub and news outlet for the association's members and friends. With a steady stream of updates about events, meetings, projects, legislation, contests, and groups being posted daily, the site has become a livelier and a more dynamic resource for users.

The business of the organization takes place via the web, from membership services and committee exchanges and reports, to meeting registration and abstract submission, to electronic balloting in the near future.

The site is also an intellectual forum holding AAPT journals and conference proceedings.

Many new additions and improvements were made in 2006-2007. Some highlights follow:

## AAPT News

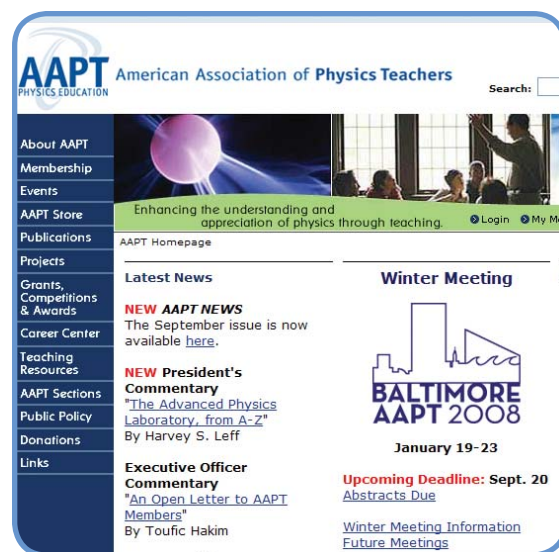
Archived at [www.aapt.org](http://www.aapt.org), AAPT NEWS is published on or about the 15th of each month and is announced to readers by email. It is one of several ways in which content that previously appeared in the *Announcer* is delivered—and in a much timelier manner.

Each issue includes links to:

- ✧ A commentary or two from the AAPT President, President-Elect, or the Executive Officer,
- ✧ Recent announcements,
- ✧ A calendar of upcoming action items and deadlines,
- ✧ News for members,
- ✧ Upcoming events, conferences, and symposiums,
- ✧ Recommended reading from *AJP* and *TPT*,
- ✧ And recent physics and education articles in the media.

### Special Note:

*Transition of the Announcer*  
Content that previously appeared in the *Announcer* now appears on [AAPT.org](http://www.aapt.org). A detailed list appears at [www.aapt.org/Publications/announcer.cfm](http://www.aapt.org/Publications/announcer.cfm)



In June 2007, the news was redesigned for greater readability and began including the entire text and links of the AAPT NEWS in the announcing email.

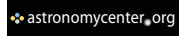
## Giving

The association has reinvigorated its fundraising efforts and options. This revised section clearly outlines many giving options in support of physics education through AAPT, including the General Awards Endowment Fund, the Annual Fund, and Endowments. Within these options, supporters can specifically target areas of interest to them. Also new is the option to donate securities in addition to cash. Visit Donations at [www.aapt.org/donations](http://www.aapt.org/donations).

## Section News

AAPT Sections are accessible from AAPT.org. News from the Sections and meeting minutes are now featured through the Sections Home Page (click on Sections from AAPT.org). Section representatives can email news and events information to [news@aapt.org](mailto:news@aapt.org).





ComPADRE Pathways connects both educators and students to the NSF National Digital Library's educational materials in physics and astronomy. These digital resources include curricular materials, digital libraries, and on-line journals. In addition to its electronic component, comPADRE fosters new collaborative activities of training and outreach. To that end, the project has joined forces with other organizations to host events, workshops, and programs, such as the Science Education Research Center (SERC) Pedagogic Workshop; PTRAs; New Faculty Workshop; Digital Resources and Libraries; and Adopt-A-Physicist.

Launched in 1997 with funding from the APS/AAPT Campaign for Physics and sustained with NSF grants, comPADRE is made up of a partnership among AAPT, lead agency; American Astronomical Society (AAS); American Institute of Physics (AIP); American Physical Society (APS); and the Society of Physics Students (SPS). Other project collaborators include MERLOT (Multimedia Educational Resource for Learning and Online Teaching), Astrophysics Data System (ADS), BQ Learning, Open Source Physics, and Physics Applets for Drawing (PADs).

## Recent Developments in comPADRE:

- ❖ Launched a new collection: PTEC.org, Physics Teacher Education Coalition.
- ❖ Improved the search engine functionality and the user tools for registered users.
- ❖ Developed a wiki for the Modeling Instruction Program, <http://modeling.nsl.org>. (Allows central location for collaborative formation of modeling curriculum materials.)
- ❖ Developed Adopt-a-Physicist Program (<http://www.compadre.org/adopt>), which allows professors and students to interact via comPADRE forum. Headed by Kendra Rand and Jessica Clark of APS.
- ❖ Redeveloped site to be W3C standards compliant and accessible to alternative browsing (screen readers for the blind, etc.).



## comPADRE Statistics

- ❖ Number of Collections in 2004: 4
- ❖ Number of Collections in 2007: 10
- ❖ Number of Unique User Sessions: 1,295,101
- ❖ Avg. Number of User Sessions per Month: 30,836
- ❖ Increase in Traffic (Jan 2006 to Jan 2007): 46%

## Management and Technical Staff

### Principal Investigator

Bruce Mason, AAPT  
The University of Oklahoma

David Donnelly, Nucleus,  
Southwest Texas State University

### Co-Principal Investigators

Warren Hein, AAPT  
Susana Deustua, AAS  
Jack Hehn, AIP  
Ted Hodapp, APS  
Gary White, SPS

Cathy Ezrailson, Physics Front,  
University of South Dakota

Chris Irwin, Astronomy Center,  
American Astronomical Society

H. Vince Kuo, PER-Central,  
Colorado School of Mines

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American Physical Society

Caroline Hall  
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Bruce Mason, Quantum Exchange  
PSRC, The University of Oklahoma

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Taha Mzoughi, Physics Source,  
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John Stewart, PTEC,  
University of Arkansas

### Collection Editors

Greg Comer, Relativity,  
St. Louis University

Ramon Torres-Isea,  
AAPT Advanced Labs



# comPADRE



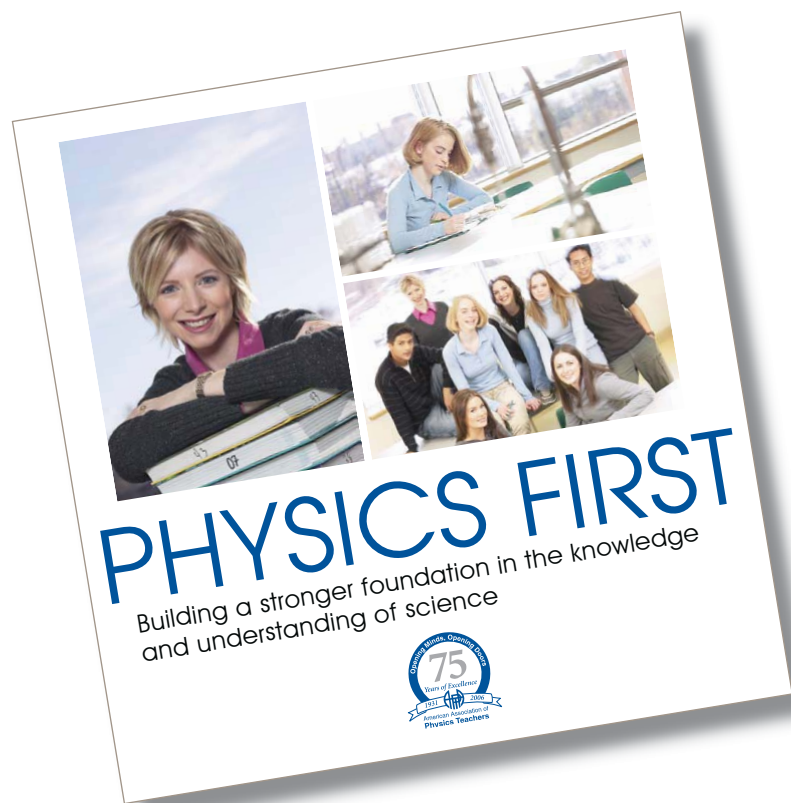
## PHYSICS FIRST

Physics First calls for a re-sequencing of high school science courses so that students study physics before chemistry and biology. In the current order of courses, only 30 percent of U.S. high school students take any course in physics. Teaching physics to students early in their high school education would bring physics to a significantly larger number of students. While the consideration of Physics First requires continuing study and analyses, the approach has the potential to substantially advance AAPT's goal of Physics for All, as well as to lay the foundation for more advanced high school courses in chemistry, biology, or physics.

**“AAPT supports ‘physics for all,’ and we encourage schools, teachers, school districts, and parents to support such an objective. This means that our communities should shift away from any presumption that many students lack the interest or the ability to study and to learn physics.”**

—Bernard Khoury, “Physics First, Physics for All, Physics for the Best,” *Announcer*, Vol. 31, Iss. 4

As the merit of Physics First is debated, AAPT has informed these discussions by producing a booklet, *Physics First: Building a Stronger Foundation in the Knowledge and Understanding of Science*, with support from its High School Committee. The booklet, published in January of 2007, provides basic information and rationale for the curriculum; strategies for implementing Physics First; suggestions for avoiding pitfalls; and additional references and resources.



*Physics First: Building a Stronger Foundation* was produced by:

Patricia Blanton, Assistant Editor, *The Physics Teacher*  
 Gene Ewald, Cuyahoga Falls, OH  
 Barry Feireman, Westtown School, Westtown, PA  
 Paul Hickman, retired, Boston, MA  
 Olga Livanis, Stuyvesant High School, New York, NY  
 Diane Riendeau, Deerfield High School, Deerfield, IL  
 John Roeder, Calhoun School, New York, NY

For more information on Physics First, please visit:  
[aapt.org/policy/physicsfirst.cfm](http://aapt.org/policy/physicsfirst.cfm)

## New Books and Reprints Published in Support of Physics Education

### 2006

AAPT published a new report:

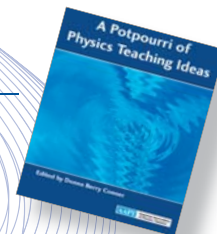
#### Strategic Programs for Innovations in Undergraduate Physics at Two Year Colleges: Best Practices

by Mary Beth Monroe, Thomas L. O'Kuma, and Warren Hein; edited by Melanie J. Norton. Published for SPIN-UP.



#### A Potpourri of Physics Teaching Ideas

edited by Donna Berry Conner



In addition, four popular PTRA manuals and a book were reprinted in 2006:

#### The Role of the Laboratory in Teaching Introductory Physics

by Jim and Jane Nelson



#### The Role of Graphing Calculators in Teaching Physics

by Cheri Bibo Lehman, Linda J. Antinone, and John E. Gastineau.



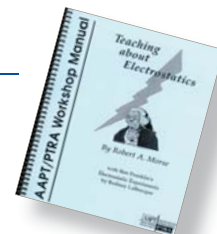
#### Teaching About Impulse and Momentum

by Bill Franklin



#### Teaching About Electrostatics

by Robert A. Morse



### 2007

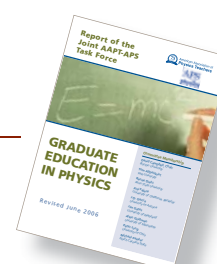
AAPT published its 75th anniversary book:

#### Celebrating 75 Years of Excellence in Enhancing the Understanding and Appreciation of Physics Through Teaching



#### Report of the Joint AAPT-APS Task Force on Graduate Education in Physics

Originally published in October 2005; new revised data added October 2006



### Publications Committee (2006 & 2007)

Mary Beth Monroe, *Chair* (2006)  
Southwest Texas Junior College

A. John Mallinckrodt  
California State Polytechnic  
University, Pomona

Roger Stuewer  
University of Minnesota

Steven Iona, *Chair* (2007)  
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Karl Mamola  
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Rochester Hills, MI

Bruce Mason  
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Toufic M. Hakim  
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Gordon Ramsey  
Loyola University

Bernard V. Khoury  
AAPT, Ex Officio

Juan Burciaga, *Book Editor*  
Whitman College

John Roeder  
Calhoun School, NY

Charles Robertson  
University of Washington

Kenneth Heller  
University of Minnesota

### Burciaga Appointed Book Editor

In May 2006, Juan R. Burciaga, Whitman College, began his role as Book Editor. This new position is responsible for selecting an Editorial Board for reviewing manuscripts, setting criteria for judging the marketability of manuscripts submitted to AAPT, and selecting non-AAPT books for marketing.

Twice annually, AAPT hosts a large gathering of its members, interested students, and physics educators. At these meetings, the association conducts its business (board, section groups, and committees) and engages in intellectual dialogue about physics education through plenary and poster sessions, contributed and invited sessions, exhibits, topical conferences, and social events. Prestigious awards and recognitions are also presented—often with lectures by awardees.

**Summer 2006: July 22-26** *AAPT's 75<sup>th</sup> Anniversary & 50<sup>th</sup> Anniversary of Physics Sciences Study Committee (PSSC)*  
**Syracuse, New York**  
 Hosted by: Syracuse University

### Plenaries

Plenary I: "Nuclear Physics in the 21st Century: The Legacy of Hans Bethe"

President: Peggy McMahan, Lawrence Berkeley National Lab, CA

- ✧ "Frontiers of Nuclear Astrophysics" by Hendrik Shatz, Michigan State University
- ✧ "Making Quark-Gluon Soup at the Relativistic Heavy Ion Collider" by Timothy J. Hallman, Brookhaven National Laboratory, NY
- ✧ "News and Views of the Proton" by Elizabeth Beise, University of Maryland

Plenary II: "Pulsars and Extreme Physics" by Jocelyn Bell Burnell, University of Oxford, UK

Plenary III: "A Curiosity Cabinet of Gedanken Experiments" by Daniel Kleppner, Massachusetts Institute of Technology

### Statistics

Attendees 1,194  
 Sessions 77  
 Workshops 40  
 Posters 243  
 Exhibitors 32

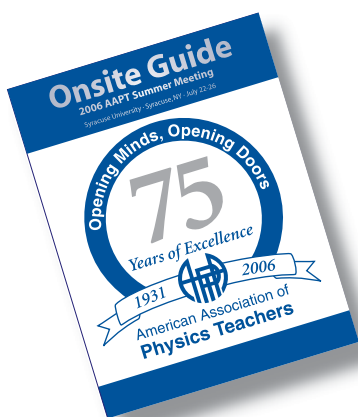
### Awards

Art Hobson, University of Arkansas, Robert A. Millikan Award.  
 Lecture: *Thoughts on Physics Education for the 21<sup>st</sup> Century.*

Lisa Randall, Harvard University, Klopsteg Memorial Award.  
 Lecture: *Warped Passages: Unraveling the Mysteries of the Universe's Hidden Dimensions.*

Steve Ethen, Burnsville High School in Minnesota, Excellence in Pre-College Physics Teaching Award.  
 Lecture: *On the Shoulders of Giants.*

Michael A. Dubson, University of Colorado, Excellence in Undergraduate Physics Teaching Award.  
 Lecture: *Three or Four Golden Rules of Lecturing.*





physics.pedagogy.networking.events.



Winter 2007: January 5-10 *New Attractions in  
Seattle, Washington Physics and Astronomy*

Joint with AAS (American Astronomical Society)



### Plenaries

Plenary I: "Space Flight: A Human Perspective"

Kathryn Thornton, University of Virginia, former NASA Astronaut

Plenary II: "The Coming Revolution in Particle Physics"

Chris Quigg, Fermi National Accelerator Laboratory, IL

### Awards

Alexei V. Filippenko, University of California, Berkeley, Richtmyer Memorial Award.

Lecture: *Evidence from Type Ia Supernovae for an Accelerating Universe and Dark Energy.*

Carl E. Wieman, University of British Columbia, Canada, and University of Colorado, Oersted Medal Award.

Lecture: *Interactive Simulations for Teaching Physics: What Works, What Doesn't, and Why.*

Clifford Swartz, Stony Brook University, Melba Newell Phillips Award.

### Distinguished Service Awards

Robert Beichner, North Carolina State University

John Mallinckrodt, California State Polytechnic University, Pomona

Deborah Rice, Kirkland High School, St. Louis, MO

Paul Stokstad, PASCO scientific, Roseville, CA

David and Christine Vernier, Vernier Software & Technology, Beaverton, OR

### Statistics

Attendees 1,098  
Sessions 64  
Workshops 39  
Posters 138  
Exhibitors 87

### Special Features

- ❖ First Annual Symposium on Physics Education: "Overcoming Gravity: The Critical Force of Physics Education in Boosting National Competitiveness"
- ❖ Unveiling of *Interactions Across Physics and Education*
- ❖ Debut of the Speaker-Ready Room
- ❖ Multicultural Luncheon with Guest Speaker Ben Franklin
- ❖ Special Guest Sessions
  - "1957, The Legacy of Sputnik"
  - "Significant Advances in Low Temperature Physics"
  - "Physics: Something for Everyone" (by APS)



# Summer 2007: July 28-August 1 Greensboro, North Carolina

## *The Accelerating Universe of Physics Education*

Hosted by The University of North Carolina at Greensboro

### Plenaries

Plenary I: Max Dresden Second Memorial Lecture, "The Many Ways To Do Physics"  
Gerald F. Wheeler, Executive Director, National Science Teachers Association, DC

Plenary II: "Racing as Metaphor" Janet Guthrie, President, Guthrie Racing LLC, Aspen, CO;  
first female racer in Indy 500 and Daytona 500

Plenary III: "Dance of the Fertile Universe; Cosmic and Human Evolution"  
George Coyne, University of Arizona, former Director of the Vatican Observatory

### Awards

Neil deGrasse Tyson, American Museum of Natural History, Director of Hayden Planetarium, New York, Klopsteg Memorial Award.

Lecture: *Adventures in Science Illiteracy*.

David Sokoloff, University of Oregon, Robert A. Millikan Award.

Lecture: *Building a New, More Exciting Mousetrap Is Not Enough*.

Jan Mader (Great Falls High School, Montana), Excellence in Pre-College Physics Teaching Award.

Lecture: *Those Who Can Teach*.

Steve Manley (University of Rochester) Excellence in Undergraduate Physics Teaching Award.

Lecture: *Experiences in Collaborative Learning at the University of Rochester—It's All in the Shoes*.

### Statistics:

Attendees 1,285

Sessions 82

Workshops 52

Posters 240

Exhibitors 44

### Media Coverage

❖ 88.5 WFDD National Public Radio  
Interview with Janet Guthrie aired Tuesday, July 31

❖ *Greensboro News & Record* newspaper  
"Physicists shedding stodgy lab coats" ran Tuesday, July 31

❖ WFMY News 2, Greensboro, NC  
Story on Janet Guthrie's plenary session ran on the 11 p.m. broadcast, Tuesday, July 31

❖ WGHP Fox TV 8, Winston-Salem, NC  
Live coverage to promote the physics Evening Demo Show. Spots included physics demonstrations and interviews with AAPT Executive Officer Toufic Hakim and UNCG physics professor Steve Danford; aired throughout the morning show

### New Activities & Enhancements

- ❖ Graduate session in Cutting-Edge Research in Plain English
- ❖ International attendees' breakfast
- ❖ Luncheon for local HBCU faculty
- ❖ Member services booth
- ❖ AAPT's own registration kiosks, digital taping and production of plenaries and award lectures, and speaker-ready room
- ❖ Special program booklets for all award lectures
- ❖ Open forum with AAPT's Executive Officer

### Meetings Committee

Dick Peterson, Chair  
Bethel University

Mario Belloni  
Davidson College

Alex Dickison  
Seminole Community College

Mary Beth Monroe  
Southwest Texas Junior College

Deborah J. Rice  
Kirkwood Senior High  
Kirkwood, MO

Michael Thoennessen  
Michigan State University

Tom O'Kuma  
Lee College

Tiffany Hayes  
AAPT, Ex Officio

### 2006 Program Chair

Harvey Leff  
California State Polytechnic  
University, Pomona

### 2007 Program Chair

Lila Adair  
Piedmont College



AAPT  
**GREENSBORO**  
2007







## The Advanced Laboratory Initiative

A critical component of a physics major's undergraduate education, the advanced physics laboratory coursework is typically intended for a student's junior or senior year.

Seeking to promote strong advanced-lab curricula across undergraduate education, AAPT formed a seven-member AAPT Advanced Lab Task Force in Fall 2005. The Task Force was responsible for identifying ways for AAPT to provide more extensive, ongoing help to upper division laboratory teachers and addressing the advisability and effectiveness of each item in a list of potential courses of action.

Inspired by the Task Force's report, AAPT initiated a number of activities under the leadership of Harvey Leff:

- ✦ Started a listserv in fall 2006 to facilitate communication between advanced lab faculty (the listerv now has a diverse subscriber list of 733 people).
- ✦ Established an advanced laboratory website on which existing successful lab experiments and other relevant information could be posted. The advanced lab website's editor, Ramon Torres-Isea, University of Michigan, is being aided by an editorial board, which selects materials for the site. AAPT web designers have prepared the site that will be supported by the software infrastructure of AAPT's ComPADRE site, which is part of the National Science Digital Library.
- ✦ Arranged invited and contributed sessions on advanced labs at the 2007 Summer Meeting in Greensboro.
- ✦ Began planning a topical conference on advanced labs at the 2009 Summer Meeting, to be held at the University of Michigan.

At Summer Meeting 2007 in Greensboro, Richard Peterson, Bethel University, gave a talk titled, Lighting Fires in Advanced Labs, and Robert DeSerio, University of Florida, spoke on Advanced Physics Laboratory at his school. Five poster presentations followed the invited speakers; the next day, eight contributed papers were presented. Together, these sessions provided a comprehensive view of what can and is being done in advanced lab courses. The plan is to make a tradition of having one or more advanced lab sessions at each AAPT Summer Meeting.

Adapted from the September 2007 President's Commentary at: [www.aapt.org/aboutaapt/reports/pres-September2007.cfm](http://www.aapt.org/aboutaapt/reports/pres-September2007.cfm).

The Task Force's report and advanced labs website are available at:

<http://advlabs.aapt.org/>

The listserv is available at: <http://lists.aapt.org/cgi-bin/lyris.pl?enter=advlabs-l>

*“The bottom line is that advanced physics lab instructors have received a major shot in the arm during the past year. I am truly pleased that AAPT planted the seed that sprouted into all this activity, which is bound to affect the teaching of advanced labs positively. Of course more can, and hopefully will, be done in the future. The beneficiaries are advanced lab teachers and, ultimately, physics students. Amen.”*

—Harvey Leff, AAPT President

## Physics Instructional Resource Association (PIRA)

The people involved in advanced labs include teaching faculty and instructional resource personnel in colleges and universities. Many physics support personnel and faculty are already involved with PIRA, an AAPT affiliate. Established in 1986, PIRA has succeeded in networking people who had little contact with colleagues beyond their local domains prior to PIRA. Notably, its members have conducted Advanced and Intermediate Instructional Laboratories workshops, sponsored by the Apparatus Committee, and popular demo shows, at AAPT Summer Meetings for many years. In addition to involvement with advanced labs, PIRA members focus on introductory and intermediate labs and lecture demonstrations. The PIRA Resource collection, which has been available on CD, is currently being transferred to PIRA's website: [www.pira-online.org](http://www.pira-online.org).

## PIRA Officers

Brian Andersson, President  
University of Minnesota

David Sturm, President Elect  
The University of Maine

Wayne Easterling, Vice President  
Arizona State University

Tom Senior, Secretary  
New Trier High School  
Winnetka, IL

Steve Wonnell, Treasurer  
The Johns Hopkins University

Machele Kindle, Past President  
Arizona State University

Dale Stille, Past Past President  
University of Iowa

overcoming  
gravity

SYMPOSIUM  
on **Physics  
Education**

*The Critical Force of Physics Education  
in Boosting National Competitiveness*

January 10, 2007  
Seattle, Washington

AAPT's first symposium was held in conjunction with the joint AAPT-AAS meeting to discuss issues relating to physics education and the science and engineering workforce. In light of increased national interest in science education sparked by the National Academies' *Rising Above the Gathering Storm* report and the recent increase in physics enrollments at the pre-college and undergraduate levels, panelists met to address a number of interrelated questions:

- ❖ Why have physics enrollments gone up? What is being done and should be done to sustain these increases?
- ❖ What is the expected impact of these increases on the STEM workforce?
- ❖ How do university physics departments contribute to the preparation of the STEM workforce and STEM literacy for all students? What should they be doing?
- ❖ What types of school–university–industry partnerships are needed to build on these increases?

Special AAPT Presidential Citations were presented at the symposium for achieving an exemplary increase in the number of students majoring in undergraduate physics:

- ❖ To the University of Washington Physics Department, accepted by David Boulware, Chair. Physics degrees at Washington increased by 82% since 1997 (to 78 in 2004–2005), the highest in the State of Washington among its peer departments.
- ❖ To the Whitworth College Physics Department, accepted by Richard Stevens, Chair. Physics majors at Whitworth have increased 600 percent in the past 10 years, from 11 majors in 1997 to 60 majors in 2006, the highest in the State of Washington among its peer departments.

Washington and Whitworth's steady increases bucked a national trend from 1997 to 2002, when the number of students majoring in physics in the United States was declining.

*The symposium was supported in part by: M.J. Murdock Charitable Trust and, in kind, by the Microsoft Corporation.*

**Welcome & Introduction**

Toufic Hakim  
Executive Officer, AAPT

**Special Presentations**

*Reading of a Proclamation  
from Washington State  
Governor Chris Gregoire*  
Stamatis Vokos  
President, AAPT  
Washington Section

**AAPT Presidential Citations  
to the Physics Departments of  
the University of Washington  
and Whitworth College**

Kenneth Heller  
President, AAPT

*Science Education and the Nation*

Opening Remarks  
Mary Jean Ryan, Chair,  
Washington State Board of  
Education; Director, the City  
of Seattle's Office of Policy and  
Management; Former Associate  
Deputy Administrator for  
Economic Development for  
the U.S. Small Business  
Administration

*Setting the Context for the  
Symposium and Introducing  
the Panelists*

Jeanne Narum  
Director, Project Kaleidoscope;  
Moderator

*Fueling Innovation—Knowledge  
Creation and Application*

Van Eden  
Director of Academic Programs,  
Microsoft Corporation

*The Count Buildup—Rise in  
Undergraduate Degrees and  
School Enrollments in Physics  
and Announcing the AIP 2005  
Four-Year Report*

Michael Neuschatz  
Senior Research Associate,  
Statistical Research Center,  
American Institute of Physics

*Linking Undergraduate STEM  
Education to the Workforce—  
What Physics Departments  
Have Done, Can, and Should Do*

Kenneth Krane, Professor of  
Physics, Oregon State  
University; co-author of the  
SPIN-UP report

*Focusing on Policy and Local  
Action—What the Federal  
and State Governments Can Do*  
Arthur Bienenstock  
Professor of Materials Science,  
Engineering and Applied  
Physics, Stanford University;  
Former Associate Director of  
Science, White Office of Science  
and Technology Policy; Former  
Director Stanford Synchrotron  
Radiation Laboratory



## *Systemic Change in Physics Teaching at Large Research Universities*

June 2-3, 2006 • American Center for Physics

Significant improvements in physics teaching have been made at a number of leading research universities. Owing to the extensive resources available at “research” physics departments, and because of these departments’ high visibility and the great number of students affected, successful and sustainable change in such departments will have a significant impact on physics learning nationwide.

In order to foster a discussion on how reform in physics teaching can be inspired, managed effectively, and made to persist (not only in a given course but systemically permeating the departmental culture), AAPT organized a workshop on systemic change in physics teaching at research universities.

Fifty physicists from 25 leading research universities and a research institute heeded the call and participated in this 1.5-day workshop. They considered systemic change by looking at curricula, logistics, teaching effectively to large sections of introductory physics, and preparing graduate teaching assistants. They also discussed assessment, and how to engage research faculty from across departments in teaching reform and how to sustain it.

Many posters were presented and case studies were analyzed, followed by several breakout sessions during which participants shared observations and experiences. The last morning of the workshop was dedicated to discussing the interface between general physics on one hand and engineering and life sciences on the other.

### *Physics Chairs’ Conference*

Every other year, chairs of physics departments across colleges and universities attend a one-day conference at the American Center for Physics to discuss latest issues relating to research and education in physics. AAPT and the APS partner in hosting the meeting. The June 2006 Conference, attended by more than 100 chairs, addressed the new graduate education report (by a joint APS-AAPT-AIP task force established earlier), ethics education and the role of departments in improving K-12 physics teaching, and diversity issues. There were nine different breakout sessions during which attendees discussed answers to a number of questions relevant to, among other topics, undergraduate curricula, recruitment of faculty and graduate students, and the management of interdisciplinary research and education. The conferees heard from eight speakers and a keynote address by Norman Augustine, who chaired the Committee that authored the National Academies’ report, *Rising Above the Gathering Storm*.

### Organizing Committee, Presenters, and Moderators

Carl Wieman  
then at University of  
Colorado at Boulder

Gary Gladding  
University of Illinois at  
Urbana-Champaign

John Belcher  
Massachusetts Institute  
of Technology

Robert Beichner  
North Carolina  
State University

Ken Heller  
University of Minnesota

Charles H. Holbrow  
then Senior Staff Physicist,  
AAPT, and lead convener

### Departments represented at the Workshop

Georgia Institute of Technology

University of British Columbia

Johns Hopkins University

University of California, Berkeley

Massachusetts Institute of Technology

University of California, Los Angeles

Michigan State University

University of California, Irvine

North Carolina State University

University of Colorado at Boulder

Ohio State University

University of Illinois

Oregon State University

at Urbana-Champaign

Pennsylvania State University

University of Maryland

Princeton University

University of Michigan

Stony Brook University

University of Minnesota

Texas A&M University

University of North Carolina

The Salk Institute

at Chapel Hill

University of Alabama

University of Wisconsin-Madison

University of Arizona

Yale University

### Chairs’ Conference 2006 Program Committee

Myron Campbell  
University of Michigan

Roger McNeil  
Louisiana State University

Kimberly Coplin  
Denison University

Erick Weinberg  
Columbia University

Alan Dorsey  
University of Florida

Judy Franz  
APS

Andrew Hirsch  
Purdue University

Bernard Khoury  
AAPT

Laurie McNeil  
University of North Carolina  
at Chapel Hill

Ken Cole  
APS  
Lead Administrator

## Physics Teaching Assistants Forum (PTAF)

Under the leadership of Kaća Bradonjić, chair of the organizing committee, 60 physics graduate teaching assistants (TAs) from more than 15 universities in the New England area spent a day at Boston University in April 2006 to discuss their experiences and issues relevant to physics teaching. The forum, the first ever, aimed to advance the TAs' teaching skills and knowledge, and provide a channel of communication among them. PTAF was organized by a committee of 12 TAs. The Forum included ample time for interaction, laboratory demonstrations, and four sessions (each anchored by a professor's 30-minute presentation and papers by TAs) that addressed technology and media in the classroom, teaching methods and best practices, and making teaching a career.

Since the majority of students in physics at large universities are exposed to physics through TAs who conduct recitations and labs, grade, and often teach whole sections, ensuring that TAs are effective teachers is essential. Often, however, TAs get into teaching without much preparation and training. The PTAF is one attempt to remedy the situation. Participants found the Forum valuable and expressed a serious interest in improving their teaching skills. AAPT plans to continue its sponsorship of such regional forums.

**“PTAF is a great opportunity for TAs to learn and grow. Skillful TAs help students learn physics better, and that is as important for our universities as it is for us and the students.”**

—Kaća Bradonjić, graduate student in physics at Boston University

### Speakers (including TAs)

Alan Marscher, Boston University  
*Tips for TAs: Setting and Meeting Goals in Physics and Astronomy Classes*

Prof. Peter Dourmashkin, Massachusetts Institute of Technology  
*What It Takes To Be a Good TA*

John Girash, Derek Bok Center, Harvard University  
Prof. David Pritchard, Massachusetts Institute of Technology  
*Online Homework Administrators and Tutors: What Really Educates?*

Matthew Graham, Brandeis University  
*Translating Questions: What Do They Really Want*

Dimitar Pachov, Brandeis University  
*Getting the Most Out of Laboratories*

Alexander Wissner-Gross, Harvard University  
*Automated Preparation of Physics Reading Lists*

Charlie Holbrow, AAPT  
*TA Forum: Where Do We Go From Here?*

Andreas Ross, University of Massachusetts, Amherst  
*Technology and Multimedia in a Modern Class*

Prof. Emily Maher, Holy Cross  
*Preparing for a Career in Teaching*

Panel: Homer Reid, Mauro Brigante, and Andy Nely, Massachusetts Institute of Technology  
*Talking About TEAL*

Panel: Emily Maher, Holy Cross; Amir Said, Tufts University; Andrew Inglis, Boston University; Laura Nickerson, Tufts University; *Physics Teaching in Demanding Situations*

### Physics Departments with more than one TA attending:

Boston University, 15  
Massachusetts Institute of Technology, 8  
Dartmouth College, 5  
Harvard University, 4  
Brandeis University, 4  
University of Massachusetts Boston, 3  
Yale University, 2  
University of Massachusetts Amherst, 2  
Tufts University, 2  
College of the Holy Cross, 1

### Physics Graduate Director Programs

In conjunction with the 2006 APS March (Baltimore) and April (Dallas) Meetings, AAPT organized two luncheons for faculty representatives from graduate studies in Physics—some of whom traveled long distances specifically for the activity. Lively discussions revolved around graduate education in physics: the curricular core, and the contrasting views of graduate education, breadth versus specialization. These discussions were a precursor to an upcoming joint AAPT-APS conference on graduate education in winter 2008. Between the two luncheons, 12 graduate programs were represented. (Warren Hein and Charlie Holbrow organized the meetings.)

### PTAF Organizing Committee

Kaća Bradonjić  
Boston University

Andrea Ross  
University of Massachusetts, Amherst

Rebecca Batorsky  
Tufts University

Michael Chen  
Brandeis University

Phil Larochelle  
Harvard University

Dan Reeves  
Brandeis University

April Pinnick  
Boston University

Eric Pinnick  
Boston University

## Topical Conferences

AAPT's topical conferences are focused meetings of physics practitioners who gather to share diverse practices, experiences, and perspectives regarding specific areas of teaching, or special curricular issues or trends. Such conferences have limited seating so that all participants can engage in meaningful discussions through posters, presentations, and breakout sessions. Two such AAPT topical conferences were offered in 2006 and 2007: *Teaching General Relativity* and *Computational Physics for Upper-Level Courses*, respectively.

### *Teaching General Relativity*

June 20-21, 2006 • Syracuse University, NY

**Purpose:** To share ways to teach general relativity to undergraduate students and insert general relativity into the undergraduate curriculum.

**Participants:** 45 physicists from 12 liberal arts colleges, 6 comprehensive universities, 14 research universities, an observatory, and an institute; including one international participant.

**Focus:** The emphasis was on gravitational radiation and LIGO (Laser Interferometer Gravitational Wave Observatory), deviations from Newtonian gravitation and GPS, and black holes.

During the two-day conference, attendees discussed how to teach undergraduate physics students basic concepts and the phenomena of general relativity, and how to engage undergraduates in research in this area. There were 19 posters presented, and eight talks in six general sessions that dealt with different teaching approaches, along the three foci, and issues relating to involving students with the subject. In three repeated breakout sessions, groups discussed strategies for inserting general relativity into the curriculum, teaching the pertinent mathematics, and teaching the physics of general relativity first. These discussions led to model syllabi and ideas for novice and experienced teachers. Conference proceedings are available online.

**Sponsorships:** AAPT is grateful for the support of the Center for Gravitational Wave Physics at Pennsylvania State University, the LIGO Project, and the Syracuse University Department of Physics; and for the generosity of Pearson Addison-Wesley and Cambridge University Press, which made a number of important textbooks for teaching general relativity available.

### 2006 Organizing Committee

Michelle Larson, Chair,  
Center for Gravitational Wave Physics  
at Pennsylvania State University

James Hartle  
University of California at Santa Barbara

Charles Holbrow  
AAPT

Dale Ingram  
LIGO-Hanford  
Richland, WA

Richard Price  
University of Texas at Brownsville

Peter Saulson  
Syracuse University

John Thacker  
LIGO-Livingston, LA

Stamatis Vokos  
Seattle Pacific University

### *Computational Physics for Upper-Level Courses*

July 27-28, 2007 • Davidson College, NC

**Purpose:** To identify problems where computation helps students understand key physics concepts and search for ways to integrate computational physics into the undergraduate physics curriculum.

**Participants:** 62 physicists from 15 liberal arts colleges, 14 comprehensive universities, 17 research universities, two centers, and a national laboratory; including four international participants.

**Focus:** The emphasis was on computation across the physics curriculum regarding both content and teaching approach, and on computational physics as a stand-alone subject of study.

The Conference included 20 contributed posters, nine invited talks, and organized discussions on (a) algorithms and curricular material for teaching core subjects such as mechanics, electricity and magnetism, quantum mechanics, and statistical and thermal physics, (b) how inclusion of computational physics into the curriculum can be implemented, and (c) using computation with undergraduate researchers. The conference led to a white paper reporting on a better understanding of the rationale, methods, and strategies that can enhance computational physics education. Conference proceedings are available online.

**Sponsorships:** AAPT is grateful for the co-sponsorship of *Computing in Science and Engineering* (CISE) magazine, and the support of Davidson College, the Shodor Foundation, the TeraGrid project, and NSF grant DUE- 442581.

### 2007 Organizing Committee

Wolfgang Christian  
Davidson College

Norman Chonacky  
Computing in  
Science and Engineering  
Washington, DC

Robert Hilborn  
University of Nebraska-Lincoln

Rubin Landau  
Oregon State University

Jan Tobochnik  
Kalamazoo College



# NEW FACULTY WORKSHOPS IN PHYSICS & ASTRONOMY

The New Faculty Workshop continues to be one of AAPT's biggest success stories. For the past 12 years, the New Faculty Workshop has introduced new physics teachers at colleges and universities to cutting-edge, classroom-proven tools and techniques. Hosted by the association each fall in conjunction with AAS and APS at the American Center for Physics, the program incorporates the latest developments drawn from physics education research.

Funded with grants from the National Science Foundation, each year the workshop covers all expenses except travel for an average of 70 newly appointed tenure-track physics teachers nominated by their departments.

"The New Faculty Workshop and the reunion workshop have been excellent sources for learning effective teaching tools and methods, some of which I have successfully implemented," said Debi Prasad Choudhary, an assistant professor at California State University, Northridge, who attended the workshop in 2004.

In 2006, 77 physics faculty members attended the workshop, held in College Park, Oct. 26-28. Much of the 2006 New Faculty Workshop, focused on interactive instruction and professional development, including the following large group sessions:

- ❖ "Active Learning and Interactive Lectures," Eric Mazur, Harvard University
- ❖ "Interactive Lecture Demonstrations," David Sokoloff, University of Oregon; Ronald Thornton, Tufts University
- ❖ "Practical Advice From the Trenches—How to Survive Academia Without Giving Up Your Career, Your Family, or Your Sanity," Diandra Leslie-Pelecky, University of Nebraska
- ❖ "Making a Difference: Teaching for Retention," Jim Stith, American Institute of Physics

Workshop participants return to the teaching trenches girded with new knowledge and ideas they can immediately put into practice. "As our department was in the process of revamping our undergraduate curriculum, my experiences at the workshop and reunion helped provide input to our process," said Curt Szuberla of the University of Alaska, who attended in 2005.

***"Whether you are a new faculty member or a returning, experienced teacher, everyone learns something new about cutting-edge pedagogy."*** —Charles Sukenik, Old Dominion University

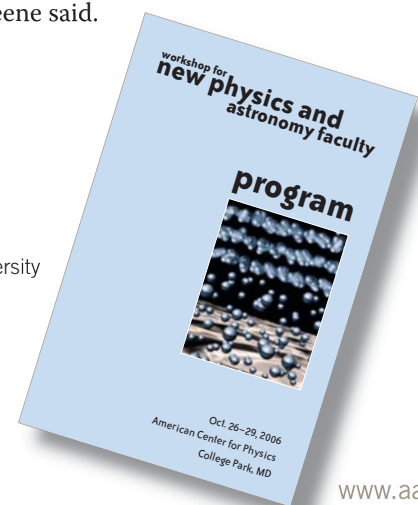
In a program evaluation of the New Faculty Workshop's first 10 years, Charles Henderson of Western Michigan University reported these findings:

- ❖ NFW hosted 759 participants from 344 four-year colleges and universities.
- ❖ The 69 teachers who, on average, attend each year represent roughly 25 percent of all new physics teachers entering the field.
- ❖ After attending the workshop, 93.7 percent of the participants expressed an interest in immediately putting some of the ideas learned in the workshop into action.
- ❖ More than 91 percent of those surveyed recommend the workshop to a colleague in their department.
- ❖ Nearly 66 percent of participants report they have had "a considerable and positive impact" on student learning as a result of the workshop.

Charles Sukenik, associate professor of physics at Old Dominion University in Virginia, attended the NFW in 1998. "Just as important is the opportunity to question colleagues who have developed or used the new techniques. It is extremely valuable to compare notes and find out firsthand what works well and what approaches do not work at all. The few days investment of time can pay years of dividends in improved teaching."

In June 2006, 50 past participants of the New Faculty Workshop gathered for a class reunion workshop at ACP. Returning with various degrees of experience under their belts, reunion attendees gave high marks to the workshop. Participants lauded the reunion programming for covering such state-of-the-art innovations as studio classrooms, interactive Physlet modules, and Just-in-Time Teaching techniques.

Senta Greene, an associate professor of physics at Vanderbilt who attended her initial New Faculty Workshop in 1997, said the reunion did a good job of building on the groundwork laid by the original. "Advanced versions of those first ideas seem to have percolated upwards," Greene said.





## *Physics Education Research (PER) Activities*

Research on physics teaching and learning has matured as a vital and growing sub-field of physics. At present, there are approximately 30 PER groups that train graduate students at PhD-granting physics departments and about 30 more at colleges and universities without graduate programs. It is through AAPT that most of this research has been disseminated, and its findings and applications discussed. AAPT has become a natural professional society for physics education researchers—the AAPT Physics Education Research Topical Group (PERTG) counts 550 members.

The Topical Group has an elected leadership organizing council (PERLOC), which keeps the group engaged in the life of PER, strengthens the sense of community within the group, plans the annual PER conference (PERC), and advocates for new directions in the field. PERC provides an opportunity for those in the field of physics education research and allied fields to share their findings and explore new research methodologies. Sessions at AAPT meetings are also devoted to PER; these sessions and related content are organized by AAPT's Research in Physics Education (RiPE) Committee.

### **PER-Focused Publications**

AAPT-related venues for PER papers include three peer-related publications.

- ✧ General and survey papers appear periodically in AAPT's *American Journal of Physics* (some of them in a special section devoted to PER; Karen Cummings, Southern Connecticut University, Section Editor). Ten were published in 2006. Eight papers are expected to be published in 2007, a 21% acceptance rate.
- ✧ The American Physical Society's new online journal *Physical Review Special Topics: Physics Education Research* (co-sponsored by AAPT and the APS Forum on Education, edited by Bob Beichner, North Carolina State University); has published 20 articles in three online volumes since its inception in 2005; 14 of these were published in 2006, out of 38 manuscripts received (a 33% acceptance rate).
- ✧ Papers from the PER Conference (PERC), which is held at the end of the AAPT Summer meeting, are published in the Proceedings of the *Physics Education Research Conference*. In 2006, under editor Laura McCullough, University of Wisconsin-Stout, the Proceedings published 48 papers (12 invited and 36 of 51 contributed). In 2007, Editor Leon Hsu, University of Minnesota, expects 53 papers to be published (8 invited and 45 of 58 contributed).

## 2006 PER Conference

**Theme:** *Discipline-Based Research in Other STEM Disciplines*

200 attendees

Presentations Included:

“Using Concept Inventories to Identify Misconceptions in Thermal Sciences”

Ronald L. Miller, Colorado School of Mines

“Student Thinking About Rate of Change in Differential Equations”

Chris L. Miller, San Diego State University

“The Effects of Inquiry-Based Instruction on Elementary Teaching Majors’ Chemistry Content Knowledge and Their Views About Teaching Science”

Michael Sanger, Middle Tennessee State University

“Rasch Analysis and the Geoscience Concept Inventory”

Julie Libarkin, Michigan State University; Steven W. Anderson, Black Hills State University

## 2007 PER Conference

**Theme:** *Cognitive Science and Physics Education Research*

250 attendees

Presentations Included:

“Making Physics Learning Inviting—A View from Cognitive Science

Janet Kolodner, Georgia Tech

“Problem Solving and Learning for Physics Education”

Brian Ross, University of Illinois at Urbana-Champaign

“Naïve Physics/Savvy Science: Causal Learning in Very Young Children...and the Rest of Us”

Lauren Schulz, Massachusetts Institute of Technology

“Cognitive Neuroscience Explorations of Cognitive Plasticity & Human Performance”

Art Kramer, Beckman Institute, University of Illinois at Urbana-Champaign

## Organizing Council

PER Leadership Organizing Council is enjoined to undertake whatever leadership and organizing activities are pressing for the community. Among the most pressing of these are the organization of the annual Physics Education Research Conference (PERC) and the publication of a newsletter informing the community of events and news relevant to PER. PERLOC invites members of the community to identify other important issues and is developing channels to facilitate communication between PERLOC and the members of PERTG. PERLOC does not replace the AAPT Committee on Research in Physics Education (RiPE), whose members are appointed by AAPT. PERLOC and RiPE work closely together on matters significant to the AAPT PER community.

### PERLOC Members

Michael Wittmann, Chair  
The University of Maine

Noah Finkelstein  
University of Colorado at Boulder

Charles Henderson  
Western Michigan University

Stephen Kanim  
New Mexico State University

Lillian McDermott  
University of Washington

Valerie Otero  
University of Colorado at Boulder

Joe Redish  
University of Maryland

## THE PHYSTEC PROJECT

For the past six years, AAPT has partnered with the American Physical Society (lead partner) and the American Institute of Physics to increase the number of pre-college physics and physical science teachers in the United States and enhance the overall quality of teaching. This goal addresses the serious shortage of physics teachers in the United States, especially in high schools where only about one-third of teachers in the field have a major or minor in physics. By funding and facilitating major teacher education efforts (currently within 14 physics departments) and by developing a network of physics departments committed to physics teacher preparation (currently close to 90), the partnership is driving significant improvements in physics teacher education.

### *Embracing Teacher Education*

Traditionally, the preparation of teachers has not been the responsibility of physics departments at colleges and universities. As a consequence, physics teacher education curricula have not generally been rich in pedagogical content knowledge. The Physics Teacher Education Coalition (PhysTEC) Project has been addressing this issue head-on by working with physics departments to help them adopt and implement practices that attract and retain higher—and sustainable—numbers of student teachers in physics (who would then choose teaching careers and serve their communities as highly qualified teachers of physics).

### *Taking Action*

Some of these new practices that the PhysTEC university sites have adopted include hosting a teacher in residence; emulating the Colorado Learning Assistants Program (in which talented undergraduates are engaged with teaching and “learning” from their peers in large classes with the aim of making the experience collaborative, student-centered, and interactive); strengthening the linkage between the department, the college of education, and teachers in the field; and engaging faculty from physics and education in curricular transformation and student recruitment, retention, and mentorship issues. Through the PhysTEC sites (which represent less than one percent of the institutions that graduate physics majors), and due in large part to the project’s coordination efforts and support, about seven to eight percent of all new high school physics teachers in the country are produced.

### *Coming Together as a Community*

The PhysTEC Project has led to the formation of a larger and constantly growing community of nearly 90 departments, which have expressed a commitment to improving the preparation of future physics and physical science teachers. This coalition (PTEC) has held conferences for its faculty and teachers to share best practices and is now planning a best-practices compendium (to be edited by David E. Meltzer and Peter Shaffer of the University of Washington). The coalition is steered by a group of physics educators, including Michael Marder, University of Texas at Austin; Paula Heron, University of Washington; Eugenia Etkina, Rutgers University; Gay Stewart, University of Arkansas; and Valerie Otero, University of Colorado at Boulder.

Physics  
Teacher  
Education

Coalition



## 2006-2007 Highlights

### ❖ New Sites Selected

Forty-five departments responded to a call for proposals, 12 of which were invited to submit a second-stage proposal. Four were selected that had high capacity for success and a high level of interest in physics teacher education, low numbers of physics teachers produced, good track record in departmental readiness, and strong plans for sustainability beyond the PhysTEC funding. The selected sites were the University of Minnesota, University of North Carolina at Chapel Hill, Cornell University, and Florida International University.

### ❖ Sites Visited

PhysTEC sites are visited on a regular basis by project managers who meet with the site leaders, faculty, administrators, and students; observe classes; and learn firsthand about new initiatives. All currently funded sites were visited this past year, including: University of Arizona, Ball State University, Seattle Pacific University, University of Arkansas, University of Colorado, Towson University, and Western Michigan University.

### ❖ A National Conference Organized

A two-day national conference on the preparation of physics and physical science teachers was held in Boulder, Colorado (March 3-4, 2007), and organized through the PTEC coalition. The theme was recruitment and retention of student teachers into the physics and physical science arena. There were 132 participants including seven department chairs. The Conference had many components: two pre-conference workshops, two post-conference sessions, a contributed poster session, 22 workshops that focused on interactive pedagogy and successful practices, four discussion sessions, and keynote presentations by Carl Wieman (University of British Columbia); and Cherry Ann Murray (Lawrence Livermore National Laboratory), who was a member of the National Academies Committee that produced the *Rising Above the Gathering Storm* report.

### ❖ A University System-Wide Workshop Held

Following the AAPT Summer Meeting in Greensboro, a one-day conference (August 3, 2007) was held in partnership with the University of North Carolina at Chapel Hill for representatives from the UNC institutions that have teacher preparation programs. The dual goal of the conference was to (a) foster dialogue between physics and education and (b) develop plans of action to improve the preparation of pre-service physics and physical science teachers and to increase the number of certified teachers in the field. Fourteen of the 15 campuses that produce teachers attended the workshop, and are now contributing campus plans to a password-protected ComPADRE site where they can compare notes and make collaborative plans. Future workshops are planned for other large state school systems.

### ❖ A National Blue-Ribbon Panel

A National Task Force on Teacher Preparation is being assembled to assess the state of teacher preparation beyond PhysTEC. This independent task force, to be chaired by Stamatis Vokos, Seattle Pacific University, will recommend strategies for improving the quality of K-12 teaching of physics and physical science, and for increasing the number of teachers in the United States.

## PhysTEC Sites

- ❖ Primary: Ball State University, University of Arizona, University of Arkansas, Western Michigan University
- ❖ Second Phase: California Polytechnic State University, San Louis Obispo; Towson University; University of Colorado at Boulder
- ❖ Newest Institutions: Seattle Pacific University, University of Minnesota, University of North Carolina at Chapel Hill, Cornell University, and Florida International University

## Advisory Committee

George Trilling, Chair  
University of California, Berkeley

Robert Clark  
Brigham Young University

Sandra Harpole  
Mississippi State University

Leonard Jossem  
Ohio State University

Lillian McDermott  
University of Washington

Jill Marshall  
University of Texas

## Program Management Team, Staff, and Consultants

Ted Hodapp  
APS, Lead PI

Paul Hickman  
Consultant

Warren Hein  
AAPT, Co-PI

Gabe Popkin  
Project Manager

Jack Hehn  
AIP, Co-PI

David Meltzer  
Consultant

Monica Plisch  
APS

John Stewart  
PTEC Editor  
University of Arkansas

Mary Fehrs  
Pacific University

*PhysTEC is made possible through funding from the National Science Foundation, the Department of Education Fund for the Improvement of Post-Secondary Education (FIPSE), and the APS Campaign for the 21st Century.*

# AAPT PTRAs

For the past 22 years, AAPT has administered the Physics Teaching Resource Agents (PTRA) Program with the mission of improving the teaching of physics and physical science in middle schools and high schools.

PTRAs are exceptional teachers who have developed their knowledge and skills as professional development providers. The program maintains a nationwide cadre of more than 100 accomplished high school teacher-leaders who are trained and continually involved in professional development. These caring and skilled teacher-leaders are certified as PTRAs by AAPT to lead workshops throughout the country.

## National and Regional Workshops

While PTRAs conduct short workshops at schools and national conferences, the PTRA philosophy (based on research) is that a minimum of 100 hours of professional development is necessary for teachers to master the skills and knowledge requisite for effectiveness in the physics and physical science classroom.

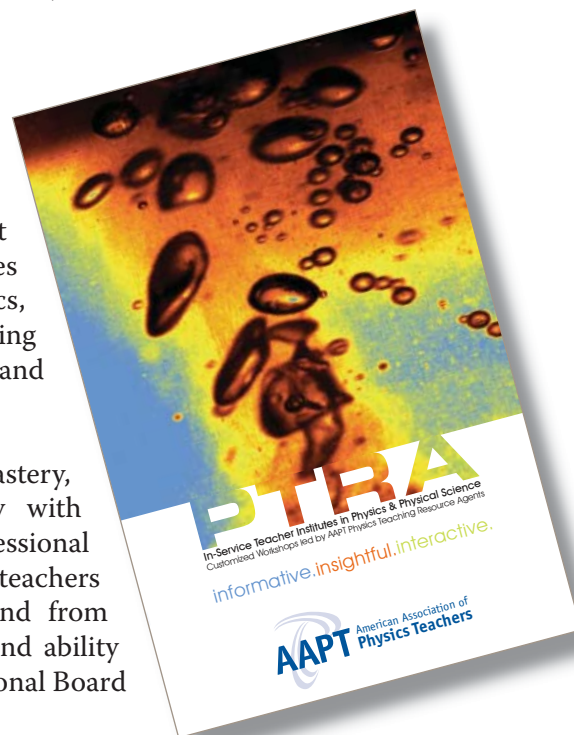
Within this context, one- or two-week summer teacher institutes are offered for three or four years to the same cohort of teachers. In the summers of 2006 and 2007, 23 continuation workshops were offered on rural college and university campuses via the Rural PTRA Program—which has involved more than 30 partnering physics departments. Topics included: impulse and momentum, electricity, geometrical optics, energy, waves and sound, Newton's Laws, and data analysis.

In addition, the AAPT/PTRA Program presented one-day workshops at the March regional NSTA conference (St. Louis, MO) with 56 participants, a Teacher Day at the APS April meeting (Jacksonville, FL) with 25 participants, and at AAPT section meetings.

## National Leadership Institutes

More than 500 experienced PTRAs have participated in national leadership institutes where they have developed their skills on a wide range of topics—to assist their fellow teachers. They become professional development providers in physics and physical science. The institutes consist of a series of workshops on a wide variety of topics, exposing PTRAs to the latest technology and teaching methodologies informed by physics education research and best practices.

National PTRAs are selected based on physics content mastery, creativity, successful teaching experience, familiarity with physics education research, and the capacity for professional leadership. More than 100 of the PTRA high school teachers have been recognized by their states, their peers, and from national organizations for their outstanding teaching and ability to motivate their students (Presidential Awards and National Board Certifications are among such awards).



The PTRAs Program is now partnering with major Math and Science Partnership grant projects in a number of states—Texas, Maryland, Georgia, and North Carolina; and the program also partners on a Toyota-funded project in Virginia.

**The Texas PTRAs Partnership:** Karen Jo Matsler, lead  
**Site:** Lee College, Texas Tech, University of Dallas, Texas A&M  
**Regional Coordinators:** Tom O’Kuma, Richard Olenick  
**Lead PTRAs:** Janie Head, Brian Lamore, and Stacy Gwartney  
 697 teachers trained (187 in 2006; 510 in 2007),  
 a total of 1,500 contact hours  
**Workshop Topics:** Waves, Kinematics, Energy and Momentum

**The Maryland PTRAs Partnership:** Francis Tam, lead  
**Site:** Frostburg State University  
**Lead PTRAs:** Jim and Jane Nelson and Katya Denisova  
 35 teachers in 2007, 106 contact hours per teacher through July  
**Workshop Topics:** Electricity & Magnetism, Kinematics & Dynamics

**The Georgia PTRAs Partnership:** Sharon Kirby, lead  
**Site:** University of West Georgia  
**Regional Coordinator:** Bob Powell  
**Lead PTRAs:** Sharon Kirby, Ann Robinson  
 24 teachers in 2007, 80 contact hours per teacher through July  
**Workshop Topics:** Kinematics and Newton’s Second Law

## AAPT/PTRAs National Advisory Board

Jim Nelson Founding Director, Lead PTRAs (FL)	Toufic Hakim, AAPT Executive Officer (MD)	Jane Nelson Lead PTRAs (FL)
George Amann Co-PI (NY)	Warren Hein Co-PI AAPT, Liaison (MD)	Rosalie Richards Regional Coordinator (GA)
Pat Callahan Lead PTRAs (PA)	Jan Mader Co-PI, Lead PTRAs (MT)	Steve Shropshire Regional Coordinator (ID)
Robert Beck Clark Academic Advisor, Regional Coordinator (UT)	Karen Jo Matsler, Co-PI, Internal Evaluator (TX)	Gay Stewart PER Advisor, Regional Coordinator (AR)

## 2006-2007 Regional Coordinators

Raul Alcalá California State University, Stanislaus	Karim Diff Santa Fe Community College	Frank Koch Bismarck State College	Richard Olenick University of Dallas	Stephen R. Skinner University of Arkansas
James H. Andrews Youngstown State	Rhonda Dvornak Colorado School of Mines	Priscilla Laws Dickinson College	Randolph S. Peterson, The University of the South	Gay Stewart University of Arkansas
Jeffrey Bierman Gonzaga University	Enrique Galvez Colgate University	Lisa Lessard Colby College	Walter Rathkamp Saginaw Valley State University	Francis M. Tam Frostburg State University
Earl Blodgett University of Wisconsin- River Falls	Sandra H. Harpole Mississippi State University	Ken McGill Georgia College & State University	Rosalie A. Richards Georgia College & State University	Maxine Willis Dickinson College
Jerry Cook Eastern Kentucky University	Steven Hoffmaster Gonzaga University	Albert Menard Saginaw Valley State University	Steven Shropshire Idaho State University	Hashim Yousif University of Pittsburgh at Bradford
Steve Danford The University of North Carolina at Greensboro	Michael E. Jabot SUNY	Thomas L. O’Kuma Lee College	Marllin L. Simon Auburn University	

- ✦ Thousands of teachers have benefited from these workshops.
- ✦ More than 500 PTRAs have attended one or more PTRAs Summer Leadership Institute.
- ✦ 74 topics and modules exist for PTRAs certification.
- ✦ More than 1,900 workshops have been offered to date.
- ✦ More than 3,000 yearly workshop hours are invested by teachers who attend the annual Summer National Leadership Institutes.
- ✦ More than 73,500 hours have been invested by teachers who have attended the PTRAs Rural Program (in its fifth year in 2007).
- ✦ 35 universities, four-year colleges, and two-year colleges are currently involved as partners.

## 2006-2007 PTRAs Rural Supporters

George A. Amann	Stacy Gwartney	Duane Merrell
Clarence Bakken	Mary Jane Head	Curt Miller
Richard Borst	Steven Henning	Jim Nelson
Patrick Callahan	Marsha Hobbs	Jane Bray Nelson
Larry Cook	Elizabeth (Tommi) Holsenbeck	Evelyn D. Restivo
Nina Morley Daye	Michael E. Jabot	Ann M. Robinson
Joseph M. Desrosiers	Lars E. Johnson	John L. Roeder
Joseph Drenchko	Mark Kinsey	James Brian Self
Nancy Easterly	Sharon Kirby	Michael G. Sivell
Steven D. Ethen	Robert Loucks	Emma R. Smith
John FitzGibbons	Jan Mader	David Spitzer
Keith F. Forton	Karen Jo Matsler	Robert Stair
Bill Franklin	David McCachren	David A. Taylor
Kimberlee Freudenberg	Jodi McCullough	Albert Thompson
Alan Gibson	Roy McCullough	Joshua Underwood
Scot Gill		Mary Winn

*The PTRAs Program is made possible in part through funding from the National Science Foundation and the APS/AAPT Campaign for Physics.*



# U.S. PHYSICS TEAM

Each year, in collaboration with the American Institute of Physics, AAPT sponsors a competition for high school students and selects a team to represent the United States at the International Physics Olympiad Competition. AAPT has administered this activity for 20 years on behalf of the physics community. Historically, more than 200 of the nation's top-scoring high school students advance to the semifinals for the national team. In 2007, there was a 160% increase in the total number of students trying out for the team through a general  $F_{net} = ma$  test. Based on the results of two qualifying exams, as well as students' school transcripts and letters of recommendation, the 24 members of the U.S. Physics Team (the U.S. Physics Olympians) were chosen in early May 2007. Later in the month, team members traveled to the University of Maryland-College Park for nine days of intense studying, testing, and problem solving at the annual U.S. Physics Team Training Camp (and the opportunity to meet with 22 members of Congress, including Representatives Vern Ehlers and Rush Holt, both physicists). The five students who made up the national Competing Team were chosen at the close of camp. Three additional days of intense laboratory work followed before the students left for the International Olympiad.

## 2007 38<sup>th</sup> International Physics Olympiad (IPhO) July 13-22 • Isfahan, Iran

- ✦ 79 nations, 327 competitors
- ✦ All members of the U.S. team medaled: 2 gold, 3 silver
- ✦ The United States came in third in medal counts
- ✦ This year, the group kept a blog of their journey and the competition:  
[www.aapt-phycstceachers-aapt.blogspot.com/](http://www.aapt-phycstceachers-aapt.blogspot.com/)



### 2007 U.S. Physics Competing Team (from left to right)

Jenny Kwan IPhO Silver Medal San Marcos High School San Marcos, CA Teacher: Jose Fernandez	Haofei Wei IPhO Gold Medal Oklahoma School of Science and Math Oklahoma, OK Teacher: Shayne Johnston	Kenan Diab IPhO Silver Medal Hawken School Gates Mills, OH Teacher: Robert Shurtz	Rui Hu IPhO Silver Medal Charter School of Wil- mington, Wilmington, DE Teacher: David Stover	Jason LaRue IPhO Gold Medal Miami Palmetto Senior High School, Miami, FL Teacher: David Jones
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### 2007 U.S. Physics Team (excluding the competing team above)

Erik Anson Phillips Academy Andover, MA Teacher: J. Peter Watt	Benjamin Connell Charter School of Wil- mington, Wilmington, DE Teacher: David Stover	Sunny Kam Great Neck South HS Great Neck, NY Teacher: Matthew Sckalar	Kynan Rilee Eleanor Roosevelt HS Greenbelt, MD Teacher: Yau-Jong Twu	Philip Tynan Charter School of Wil- mington, Wilmington, DE Teacher: David Stover
Sophie Cai Ridgefield HS Ridgefield, CT Teacher: David Waltmyer	Nicholas Dou South Brunswick HS Monmouth Junction, NJ Teacher: Amrish Garg	Allen Lin Holmdel HS Holmdel, NJ Teacher: Josephine Blaha	Aleksandra Stankiewicz Edina HS Minneapolis, MN Teacher: Mark Laven	James Yang Phillips Academy Andover, MA Teacher: J. Peter Watt
Tucker Chan Princeton HS Princeton, NJ Teacher: Cherry Sprague	YingYu Gao Phillips Exeter Academy Exeter, NH Teacher: Scott Saltman	Andy Lucas Harvard-Westlake School Studio City, CA Teacher: John Feulner	Philip Streich Homeschool Platteville, WI Teacher: Amanda Streich	Danny Zhu Stuyvesant HS New York, NY Teacher: Benjamin Dreyfus
Joseph Chu Lynbrook HS San Jose, CA Teacher: David Taylor	Kenneth Hu William P Clements HS Sugar Land, TX Teacher: Mark Kinsey	Sarah Marzen Thomas Jefferson HS Alexandria, VA Teacher: John Dell	Arvind Thiagarajan Thomas Jefferson HS Alexandria, VA Teacher: John Dell	

# 2006

## 37<sup>th</sup> International Physics Olympiad (IPhO) July 8-17 • Singapore

- ✦ 86 nations, 383 competitors
- ✦ All members of the U.S. team medaled: 4 gold, 1 silver
- ✦ In an unofficial ranking of countries based on total score of the five team members, the United States ranked second

### 2007 U.S. Physics Team Coaches

Robert Shurtz  
Hawken School  
Gates Mills

Boris Zbarsky  
University of Chicago

Paul Stanley  
Dobson Professor  
of Physics  
Beloit College

Elena Udovina  
Harvard University

Andrew Lin  
Stanford University

Warren Turner  
Westfield State College

Shaela Jones,  
University of Maryland



### Media Coverage of 2007 U.S. Physics Team

- ✦ *The Washington Post*
- ✦ *The Daily Oklahoman*
- ✦ *The Miami Herald*
- ✦ *Tulsa Daily*
- ✦ Voice of America  
(broadcast on TV and  
radio in Iran, Europe)
- ✦ WISC, Wisconsin TV
- ✦ National Public Radio
- ✦ *Enid News & Eagle*,  
OK
- ✦ *Christian Science  
Monitor*
- ✦ NewsOK.com
- ✦ *Greenbelt News  
Review*, MD
- ✦ *North County Times*,  
Escondido, CA
- ✦ *Milwaukee Journal  
Sentinel*, WI
- ✦ *Cleveland Plain  
Dealer*
- ✦ *Miami New Times*
- ✦ *News Journal*,  
Wilmington, DE
- ✦ *APS News*
- ✦ *The Wisconsin  
State Journal*
- ✦ *AIP Matters*
- ✦ *ACA RefleXions*
- ✦ *Physics Today*

With special thanks to the AIP Media and Government Relations Department (Alicia Torres, Director) and Nathalie Rioux, AIP Development Officer.

### 2006 U.S. Physics Competing Team

Otis A. Chodosh  
**IPhO Gold Medal**  
Oklahoma School of  
Science and Math  
Oklahoma City, OK  
Teacher: Shayne Johnston

William T. Throwe  
**IPhO Gold Medal**  
Shoreham-Wading River  
Shoreham, NY  
Teacher: Mary Loesing

Henry P. Tung  
**IPhO Gold Medal**  
Torrey Pines HS  
Encinitas, CA  
Teacher: William Harvie

Sherry Gong  
**IPhO Silver Medal**  
Philips Exeter Academy  
Exeter, NH  
Teacher: James Dicarolo

Men Young Lee  
**IPhO Gold Medal**  
Thomas Jefferson HS  
Alexandria, VA  
Teacher: John Dell

Ingmar A. Saberi  
Alternate  
Pullman HS  
Pullman, WA  
Teacher: Barbara Harding  
(not in photo)

### 2006 U.S. Physics Team Coaches

Robert Shurtz  
Hawken School  
Gates Mills, OH

Warren Turner  
Westfield State College

Shaela Jones,  
University of Maryland

Paul Stanley  
Dobson Professor  
of Physics  
Beloit College

Boris Zbarsky  
University of Chicago

Emily Russell  
California Institute  
of Technology

Andrew Lin  
Cambridge, MA

Learning—and love for—physics should also flourish beyond the structured environment of a high school or college classroom. From the world’s largest rocket building contest to a PBS documentary, AAPT is proud to support a variety of programs outside school walls.

### Team America Rocketry Competition (TARC)

Each year, AAPT joins forces with NASA and the United States Department of Defense to serve as the education partner of the annual Team America Rocketry Competition, where high schools compete to design, build, and fly a moderately complex flight vehicle. In the process, the students learn teamwork, physics, engineering, aerodynamics, flight mechanics, stability, and electrical circuitry. After completing local qualification flights, the top 100 U.S.-based teams are invited to The Plains, Virginia, for a national final fly-off.

The 2006 and 2007 America Rocketry Competition teams were tasked with flying a rocket carrying one raw egg as close as possible to an altitude of exactly 850 feet while staying airborne for 45 seconds and returning the egg uncracked. Each year, more than 675 teams from 47 U.S. states and DC participated.

In 2007, AAPT introduced the Rocketry Lesson Plan Competition and invited the teachers and coaches of teams participating in TARC to submit lesson plans describing their team’s activities, planning, and experiments undertaken while preparing for TARC. The top entries clearly explained how their plans 1) addressed the local, state, and national STEM (Science, Technology, Engineering and Mathematics) standards; 2) fostered a cooperative working atmosphere among the team members; 3) and encouraged participation by females and minorities who are underrepresented in STEM disciplines at the professional level.

#### Division I: Formal Instructional Classroom Teams

**1st Place:** James River High School, Midlothian, VA

Physics teacher and head coach Timothy Couillard said, “The lesson plan we submitted was designed to simulate real-world problems in aerospace engineering. This lab activity encourages the students to use the engineering design process to find an optimal yet unique solution to the problems presented. We hope that students are intrigued by the challenges of aerospace and aviation.”

**2nd Place:** Whitefish Bay High School, Whitefish Bay, WI, coach: Guy A. Guglielmi.

**3rd Place:** Hinsdale Central High School, Hinsdale, IL, coach: Jim Vetrone.

#### Division II: Informal Instructional Classroom Teams

**1st Place:** Exploring Program Post 1010, Gaithersburg, MD  
(Only 1st place was awarded in Division II.)

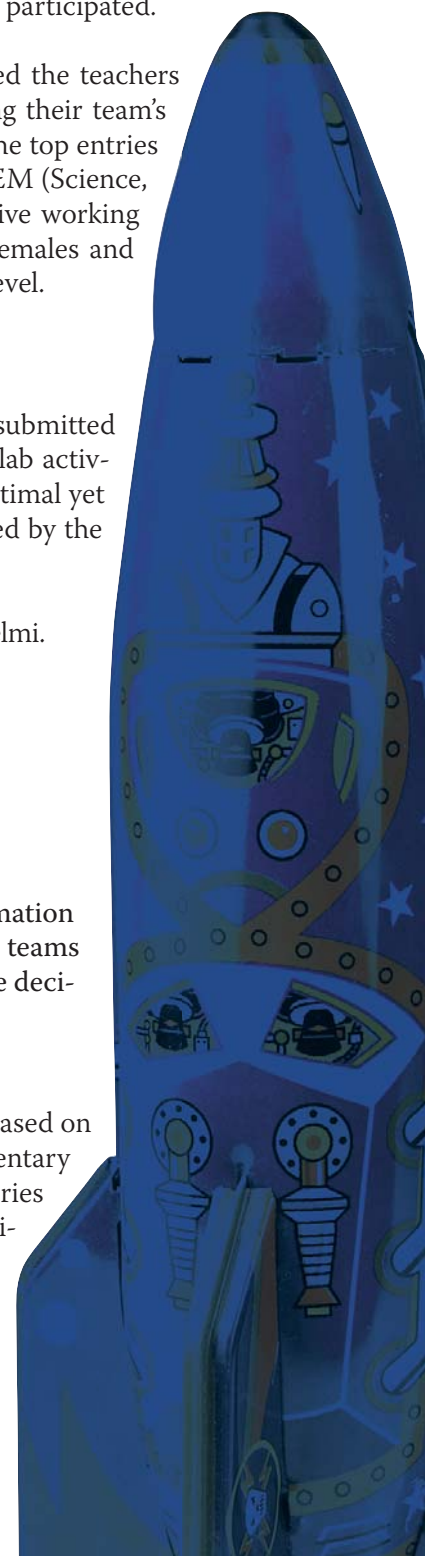
Principal Advisor Robert Ekman said, “The essence of the plan is to use information collected from a flight in the iterative process of improving toward a goal. The teams reviewed the videos, pictures, and flight data after a launch to help them make decisions about the next flight.”

### Absolute Zero

AAPT is a national partner of the two-part PBS documentary Absolute Zero. Based on Tom Shachtman’s book “Absolute Zero and the Conquest of Cold,” the documentary features the struggles of philosophers, scientists, and engineers over four centuries as they attempted to understand the nature of cold—and is a unique blend of science, cultural history, and adventure story. Companion educational guides are designed to help teachers present low-temperature physics.

Absolute Zero airs on PBS. For more information on the campaign, visit [www.absolutezerocampaign.org/index.htm](http://www.absolutezerocampaign.org/index.htm).

SPONSORSHIPS





## Intel International Science and Engineering Fair (ISEF)

Intel ISEF is the world's largest pre-college celebration of science. AAPT and APS partner to recognize participants in ISEF, sponsoring prizes, and providing judges. Held annually in May, the Intel ISEF brings together more than 1,400 students from 40 nations to compete for scholarships, tuition grants, internships, scientific field trips, and the grand prize: a \$50,000 college scholarship. Students first compete in their school or local science fairs. The winners then go on to participate in regional and/or state fairs, and ultimately, the ISEF.

### 2006/2007 ISEF: Albuquerque, NM

Top award winners receive a one-year AAPT and APS student membership, a certificate from both AAPT and APS, as well as subscriptions to AAPT *The Physics Teacher* Journal and other APS journals. Each sponsoring teacher of a student who receives an AAPT and APS award also will receive a certificate.

## 2006 AAPT SPECIAL AWARD WINNERS \*\*\*

### 1st \* Award

\$1,000

Mary Masterman, 16,  
Westmoore High School,  
Oklahoma City, OK  
*Development of an  
Inexpensive Raman System  
and a Littrow Spectrograph*

### 2nd \* Award

\$400

Meredith Ann MacGregor,  
17, Fairview High School  
Boulder, CO  
*Cracking the Brazil  
Nut Effect*

### 3rd \* Award

\$300

Hamsa Padmanabhan, 16,  
Kendriya Vidyalaya  
Ganeshkhind, Pune,  
Maharashtra, India  
*Physics of a Simple  
Prototype for Static  
Magnetic Levitation*

### Certificate of Honorable Mention

David S. Holz, 17,  
Monarch High School,  
Coconut Creek, FL  
*A Compact Approach for the  
Real-time 3D Localization  
of Sounds*

Geoffrey Hubert Woo, 17,  
Palos Verdes Peninsula High  
School, Rolling Hills Estates, CA  
*Detection of Metal Fatigue  
and Defects by Electron  
Work Function Topography  
and Gradient*

Winston Xia Yan, 17,  
Thomas Jefferson High School  
for Science and Technology,  
Alexandria, VA  
*Sensitivity of 1/f Noise to  
Chemical Constituents:  
A Study of Pentacene and  
Its Oxidative Impurity in  
Thin-Film Transistors*

## 2007 AAPT SPECIAL AWARD WINNERS \*\*\*

### 1st \* Award

\$1,200

Thiago David Olson, 17,  
Stoney Creek High School,  
Rochester Hills, MI  
*Neutron Activation  
Analysis Using an Inertial  
Electrostatic Confinement  
Fusion Reactor*

### 2nd \* Award

\$800

Atticus Bergman, 17, Fairview  
High School, Boulder, CO  
*That Flocking Convection*

### 3rd \* Award

\$500

Hamsa Sridhar, 17,  
Kings Park High School,  
Kings Park, NY  
*Development of an  
Inverted Optical Tweezers  
with Full Motional Control*

### Certificate of Honorable Mention

Holly Reid Batchelor, 17,  
The Mary Erskine School,  
Edinburgh, Scotland, UK  
*Cosmic Rain: Investigating  
Particles from Space*

Leslie Ann Spahr, 17,  
Satellite High School,  
Satellite Beach, FL  
*Testing the Mettle of  
Metallic Glass*

Nicholas Elden Allen, 15,  
Northridge High School,  
Layton, UT  
*The Effect of Local  
Topography on the  
Equation of Time*

AAPT would also like to recognize Philip Streich, a 2007 U.S. Physics Team Member who was a Grand Award winner at ISEF this past May.

Grand Award of \$50,000: Philip Vidal Streich, 16, Homeschool, Platteville, WI, *"Determining Carbon Nanotubes' Thermodynamic Solubility: The Missing Link to a Practical Supermaterial?"*

## Apparatus Competition

Sponsored by the AAPT Apparatus Committee and generously sponsored by PASCO scientific, the Apparatus Competition is held during each summer meeting of the AAPT. Competitors (who need neither be AAPT members nor present at the meeting) are invited to enter new or modified apparatus that has pedagogical value in teaching physics—for example, demonstration, introductory labs, advanced labs, high school, or outreach activities. All entries are considered for Unlimited Cost awards; in addition, entries are considered for additional Low Cost awards if they can be constructed for less than \$65 excluding certain commonly available equipment.

### 2007 Apparatus Competition

AAPT 2007 Summer Meeting, Greensboro, NC

#### WINNERS

1st Place (\$1,000)  
*Coupled Oscillations With A Suspension Bridge Model*  
Thomas B. Greenslade, Jr.  
Kenyon College

2nd Place (\$600)  
*Galvanize Your Class*  
Robert A. Morse  
St. Albans School

3rd Place (\$200)  
*Var-I-able Roller*  
Brett Carroll  
Green River  
Community College

Low Cost Winners (\$100)  
*Galileo's Paradox*  
Thomas B. Greenslade, Jr.  
Kenyon College

*Coupled Oscillations with a Suspension Bridge Model*  
Thomas B. Greenslade, Jr.  
Kenyon College

*Galvanize Your Class*  
Robert A. Morse  
St. Albans School

*Var-I-able Roller*  
Brett Carroll  
Green River  
Community College

*Scaling With Bolts*  
Brett Carroll  
Green River  
Community College

*A Candle-Powered Pizza Pan*  
Jim Lehman  
Retired

#### Judges

David Grosnick, Chair  
Ball State University

Antonio Cancio  
Ball State University

Eric Hedin  
Ball State University

Robert Hill  
Ball State University

Ranjith Wijesinghe  
Ball State University

#### Judges

Steven Valone, Chair,  
Los Alamos National  
Laboratory, NM

Gerald Craddock, Co-Chair  
Science Applications  
International Corp., NM

Gregg Franklin, Co-Chair  
New Mexico Cancer  
Center, NM

Daniel Dolan  
Sandia National  
Laboratories, NM

John Kline  
Los Alamos National  
Laboratory, NM

Wenbin Zhu  
University of New  
Mexico

### 2006 Apparatus Competition

AAPT 2006 Summer Meeting, Syracuse, NY

#### WINNERS

1st Place (\$1,000)  
*Bend It Like Bernoulli*  
Gabe Alba and  
Hsu-Chang Lu  
Rutgers University

2nd Place (\$600)  
*A Simple Apparatus to Demonstrate the Energy Stored in a Capacitor*  
A. Tomasch, D. Gerdes, R. Armen, and M. Love  
University of Michigan

3rd Place (\$200)  
*A Simple and Inexpensive Apparatus to Demonstrate the Magnetic Force on a Current-Carrying Wire Segment*  
A. Tomasch, D. Gerdes, and M. Love  
University of Michigan

Low Cost Winners (\$100)  
*Bend It Like Bernoulli*  
Gabe Alba and  
Hsu-Chang Lu  
Rutgers University

*PC Oscilloscope and Spectrum Analyzer*  
Hsu-Chang Lu  
Rutgers University

*Surface Gravity Waves: Resonance in a Fish Tank*  
John J. Lynch  
Wheeling Jesuit University

*Soap Bubble Thin Film Viewer*  
Christian A. Murphy  
Boston University

*Moments of Inertia—What's Inside a Baseball?*  
Harriet Slogoff and  
Bob Smith  
University of Pennsylvania

*Light Ray Focusing Demonstrator*  
John W. Zwart  
Dordt College

## International Physics Young Ambassador Symposium (IPYAS)

The IPYAS, a pilot program positioned as a non-competitive project designed to engage students and their families in physics, exceeded expectations. Participants in 21 countries earned points by completing projects related to physics in each country's Physics Talent Search. The girl and boy in each age group with the most points became "Physics Young Ambassadors," and were invited to attend the International Physics Young Ambassador Symposium in Taiwan. For the first four days of January, 2006, 105 students ages 10-19 convened in Taiwan to conduct physics experiments, tour cultural sites, listen to colloquia by distinguished physicists, and network with each other to forge international ties and friendships. Nobel laureate Douglas Osheroff, Sylvester James Gates Jr., Laura Greene, and Nai Chang Yeh were the distinguished speakers.

Country leaders reported that students who had rarely been involved in physics activities previously participated in—and enjoyed—the Talent Search. The program attracted more girls (nearly 48 percent of participants) and students from rural areas and developing countries than typical physics activities and competitions.

Warren Hein and Beverly Karplus Hartline co-directed the IPYAS. AAPT's involvement was supported by a grant from NSF and a generous donation from Beverly Hartline and her family. Maria Elena Khoury and Roxanne Muller provided most of the administrative and logistical support for travel. Hartline is the Dean of Mathematics, Natural Sciences, and Technology at Delaware State University in Dover.

The United States Talent Search attracted 300 participants. In all, nearly 12,000 students participated, with more than 500 physicists worldwide mentoring them and evaluating their projects. In addition, the Talent Search was the first international physics activity for students that attracted participation from Cameroon, Ghana, Nepal, and Tanzania. The program achieved its goal of creating interest in physics without emphasizing competition and tests. Ghana went on to participate in the IPhO in 2006.

U.S. Physics Young Ambassadors who attended the Physics Young Ambassador Symposium:

Franz Sauer  
High Technology High School  
Lincroft, NJ

Amy Abramowitz  
Myers Park High School  
Charlotte, NC

Alexandra Vinegar  
Chapel Hill High School  
Chapel Hill, NC

Kelsey Duncan  
J.P. McConnell Middle School  
Loganville, GA

Daniel Duncan  
Millburn School  
Wadsworth, IL

## High School Photo Contest

AAPT's annual photo contest, co-sponsored by the Committees on High Schools and Educational Technologies, gives high school students around the world the opportunity to showcase their photography skills and physics knowledge. Students are required to take the photos and complete the descriptions themselves. The work of the 100 finalists in grades 9-12 is displayed at the association's annual Summer Meeting. Attendees are invited to vote for their top five favorite photos in two categories, Natural and Contrived.

According to Photo Contest Coordinator Mary Winn, "The most important aspect of the Photo Contest is that it teaches physics students to learn and think about physics in all areas of their environment. Every year, I am overwhelmed by the talent and creativity these students show as they look at ordinary events and understand the physics concepts involved. The quality of the photographs and the understanding of the concepts shown by the written essay are truly amazing."

### 2007 Contest

- ❖ More than 700 entries
- ❖ Displayed at the 2007 Summer Meeting in Greensboro, NC
- ❖ Winning photos will be available as postcards and will be featured in the 2008 AAPT Physics Photo Contest Calendar and in the 2007 Physics Photo Contest Poster

### 2006 Contest

- ❖ AAPT partnered with Lexmark International, Inc.
- ❖ Displayed at the 2006 Summer Meeting in Syracuse, NY

## 2007 PHOTO CONTEST WINNERS ❁❁❁



### Contrived Category

1<sup>st</sup> Place

#### *Image Inversion*

Phuong Ha  
NUS High School of  
Mathematics and  
Science, Singapore  
Teacher: Yen Ling Lam



2<sup>nd</sup> Place

#### *Bending Attraction*

Megan Kalany  
The Walker School,  
Marietta, GA  
Teacher: Sandra Rhodes



3<sup>rd</sup> Place

#### *Balanced Torques Demonstrated*

Alexander Kithas  
Tamalpais High School,  
Mill Valley, CA  
Teacher: David Lapp



### Natural Category

1<sup>st</sup> Place

#### *A Cornea Acting as a Convex Mirror*

Annacy Wilson  
Tamalpais High School,  
Mill Valley, CA  
Teacher: David Lapp



2<sup>nd</sup> Place

#### *Virtually Floating*

Justin Held  
West Boca Raton High  
School, Boca Raton, FL  
Teacher: Maria Aparicio



3<sup>rd</sup> Place

#### *Small Scale Wave Diffraction*

Colleen FitzGerald  
Amherst Steele High  
School, Amherst, OH  
Teacher: Chaz Deremer

### Honorable Mentions

#### *The Eternal Rose*

Phuong Ha  
Jonathan Walker  
Berkmar High School,  
Lawrenceville, GA  
Teacher: IV Bray

#### *Dancing Liquid*

Levin Nelson  
Roosevelt High School,  
Seattle, WA  
Teacher: Eric Muhs

#### *Pennies Don't Float*

Bobby Kanaly  
Cherry Creek High  
School, Greenwood  
Village, CO  
Teacher: Jessica Olsen

#### *El Reflejo*

Kate Roosa  
Lancaster County Day  
School, Lancaster, PA  
Teacher: Jim Ringlein

#### *Pitcher Picture*

Elizabeth Owens  
Golden West High  
School, Visalia, CA  
Teacher: Christopher  
Phillips

#### *Longitudinal Wave Pattern on a Beach*

Zacharie Peterson  
Ipswich, MA  
Teacher: Don Poranski

#### *Brilliant Balloon*

John Wanberg  
Cherry Creek High  
School, Greenwood  
Village, CO  
Teacher: Jessica Olsen

#### *Billiards & Momentum*

Stefan Stercula  
East High School,  
Glenn Mills, PA  
Teacher: Ron Pedelty

#### *Hurricane Katrina Picture*

Kate Brechtel  
Academy of the Sacred  
Heart, New Orleans, LA  
Teacher: Stephen Collins

#### *Thermographic Photo*

Rachel Yates  
Academy of the Sacred  
Heart, New Orleans, LA  
Teacher: Stephen Collins

#### Special Recognition

#### *Light Up the Night*

Brandon Gloss  
Pickerington, OH  
Teacher: Doug Forrester

## 2006 PHOTO CONTEST WINNERS ❁❁❁



### Contrived Category

1<sup>st</sup> Place

#### *Newton's 1<sup>st</sup> Law of Motion*

Kevin Rosenquist  
West Chicago  
Community High School,  
West Chicago, IL  
Teacher: Annette Rubino



2<sup>nd</sup> Place

#### *"Bending Water"*

Matthew Claspill  
Helias High School  
Jefferson City, MO  
Teacher: Matt Zeitz



3<sup>rd</sup> Place

#### *The Disfigured Chopstick*

Helen He  
North Toronto Collegiate  
Institute, Toronto, ON  
Teacher: Mark Kinoshita



### Natural Category

1<sup>st</sup> Place

#### *A Cornea Acting As a Convex Mirror*

Marina Autina  
Treasure Valley Math &  
Science Center, Boise, ID  
Teacher: DaNel Hogan



2<sup>nd</sup> Place

#### *Virtually Floating*

Eurydice Rice  
Boston Univ. Academy, N.  
Billerica, MA  
Teacher: Gary Garber



3<sup>rd</sup> Place

#### *Small Scale Wave Diffraction*

Nils Rocine  
Tamalpais High School,  
Mill Valley, CA  
Teacher: David R. Lapp

### Honorable Mentions

#### *Sinusoidal Sound Wave*

Kirk Carson  
Olentangy High School  
Lewis Center, OH  
Teacher: Mary Battershell

#### *Painting with Polarized Light*

Leah Reimers  
Treasure Valley Math and  
Science Center, Boise, ID  
Teacher: DaNel Hogan

#### *Teacher: Jonathan Everett Freefall Motion of a Projected Golf Ball*

Aaron Wasserman  
Tamalpais High School  
Mill Valley, CA  
Teacher: David R. Lapp

### Honorable Mentions

#### *The Building in the Drop of Water*

Margaret Koerber  
The Academy of the  
Sacred Heart  
New Orleans, LA  
Teacher: Steven Collins

#### *How Big Is It?*

Rachel Sandler  
John Burroughs School  
St. Louis, MO  
Teacher: Mark Schober

#### *Magic Mirror*

Kellsey Triebees  
Glenbard West High  
School, Glen Ellyn, IL  
Teacher: Bruce Medic

#### *Magnetic Distortions*

Bohao Pan  
Cranbrook Kingswood  
School, Canton, MI  
Teacher: Frank Norton

#### *Wave Behavior in Motion*

Ryan Shea  
Huntingtown High  
School, Huntingtown, MD

#### *Break Wall Diffraction*

Elizabeth Martin  
Prospect High School,  
Mt. Prospect, IL  
Teacher: Keith Bellof

#### *Iced Tea*

Brooke Sneeuwjagt  
Huntingtown High School  
Huntingtown, MD  
Teacher: Jonathan Everett

#### Special Recognition

#### *The Apollo Moon Landing*

Oscar Wasilik  
Bell High School  
Ottawa, ON, Canada  
Teacher: Diana Hall



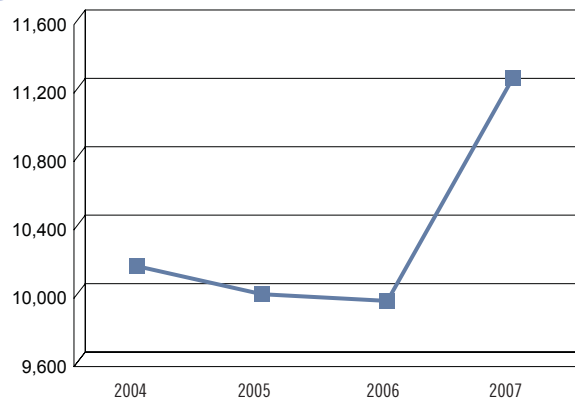
# MEMBERSHIP

AAPT is a society of members who share many common interests and experiences. They are current or former physics teaching practitioners or physics students. They care highly about improving the teaching and learning of physics. They appreciate and promote the value of physics as a science that has improved the quality of living. They have an affinity for physics and the physics community.

The AAPT members' professional settings may be diverse, spanning the educational spectrum from kindergarten to graduate programs and beyond, but they are bound by a love for physics and physics education.

The number of members in AAPT is a moving index, as existing members renew and new ones join. Members join for the valued services, resources, and peers; others join in support of the cause of education. The figures reported below represent the membership profile as of June 30, 2007.

## Membership Trends

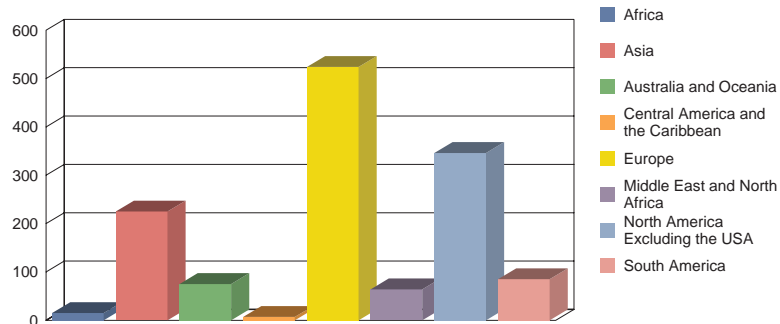


Total Membership:  
11,287

## Location of Members

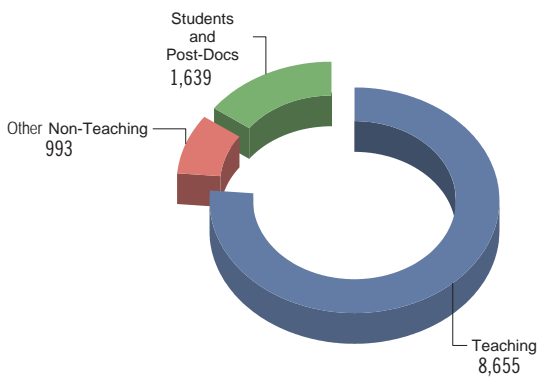
- Members in the US: 9,946 (50 states)
- Non-US Members: 1,341 (75 countries)
- North America: 10,292
  - Canada: 301 (9 provinces)
  - Mexico: 45 (12 states + Federal District)
- Africa: 15
- Asia: 225
- Australia and Oceania: 75
- Central and South America: 92
- Europe: 524
- North Africa and Middle East: 64

## International Membership

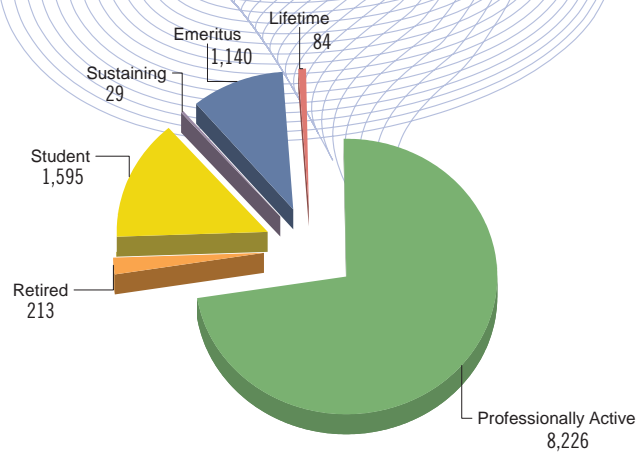


One of the strengths of AAPT is the professional diversity of its members, as illustrated by these charts. Whether teaching or non-teaching, professionally active or emeriti, students or practicing physicists, at schools or in labs, they find value in AAPT's programs and publications, and support the advancement of physics education.

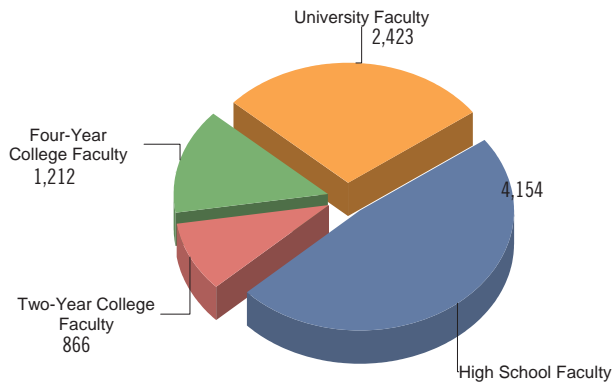
### Membership Overview



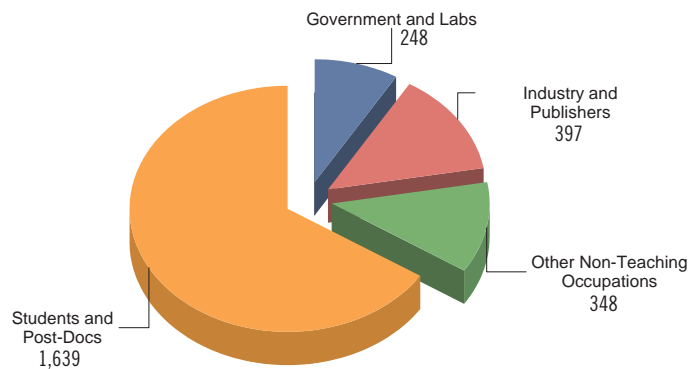
### Membership Type



### Teaching Occupations



### Non-Teaching Occupations



**THE AMERICAN ASSOCIATION OF PHYSICS TEACHERS, INC.**  
**AUDITED STATEMENTS OF FINANCIAL POSITION**  
**December 31, 2006 and 2005**

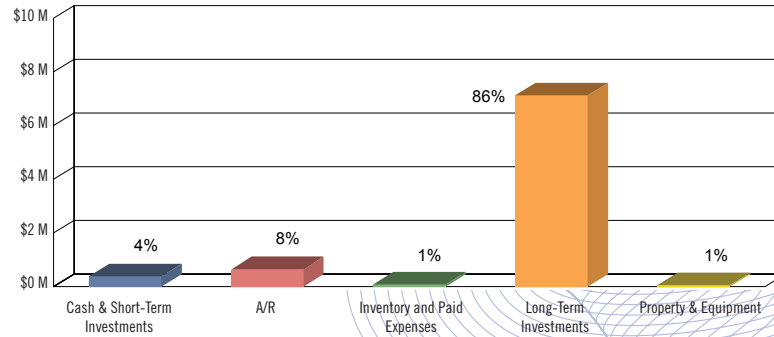
	<u>2006</u>	<u>2005</u>
<b>ASSETS</b>		
Cash and cash equivalents	\$ 345,502	\$ 530,839
Accounts receivable		
Grants	563,554	570,252
Due from affiliate	58,000	74,929
Membership, net of allowance of \$5,300 in 2005	15,714	3,737
Other	9,956	12,535
Short-term investments	45,663	78,776
Inventory	39,628	35,744
Prepaid expenses	45,888	27,105
Total current assets	1,123,905	1,333,917
Property and equipment, net	49,263	53,144
Long-term investments	7,117,495	6,783,311
Total assets	\$ 8,290,663	\$ 8,170,372
<b>LIABILITIES AND NET ASSETS</b>		
Accounts payable and accrued expenses	\$ 496,912	\$ 636,616
Accrued payroll and related liabilities	98,317	85,710
Capital lease obligation	3,911	8,998
Unearned revenue	1,885,930	1,687,143
Total current liabilities	2,485,070	2,418,467
Capital lease obligation, net of current portion		3,911
Investment interest in ACP, Inc.	310,718	378,066
Deferred compensation obligation	63,597	43,466
Accrued post-retirement benefit obligation	129,360	85,185
Total liabilities	2,988,745	2,929,095
Net assets		
Unrestricted		
Undesignated	4,796,841	4,757,636
Board designated	211,628	168,804
Temporarily restricted	70,719	92,107
Permanently restricted	222,730	222,730
Total net assets	5,301,918	5,241,277
Total liabilities and net assets	\$ 8,290,663	8,170,372

“ The health of our long-term reserve is very good. Over the past six years AAPT has been able to increase the value of its reserve from \$3.4 million to \$6.8 million and our total assets have increased from \$6.2 million to \$8.3 million. If I were a politician I would take full credit for both of these increases. ”

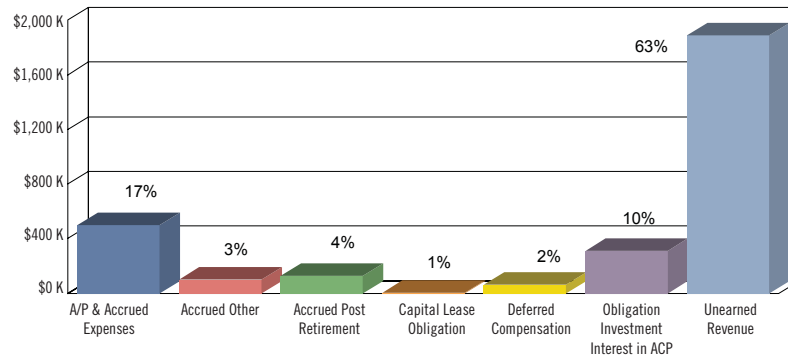
—Chuck Robertson, Treasurer



## Asset Composition, December 31, 2006 (Audited)



## Liability Composition, December 31, 2006 (Audited)



### 2006 Investment Advisory Committee

Charles E. Robertson,  
Chair, University  
of Washington

Alexander K. Dickison  
Seminole Community  
College

Deborah J. Rice  
Kirkwood High School  
St. Louis, MO

Toufic M. Hakim  
(as of Sept. 5, 2006)  
Ex Officio, AAPT

Warren W. Hein  
Ex Officio, AAPT

Bernard Khoury  
Ex Officio, AAPT

Mary Moggee  
California State  
Polytechnic  
University, Pomona

### 2007 Audit Committee

Alan M. Gibson, Chair  
Connect2Science  
Rochester, MI

Dwain M. Desbien  
Estrella Mountain  
Community College

John L. Roeder  
Calhoun School  
New York, NY

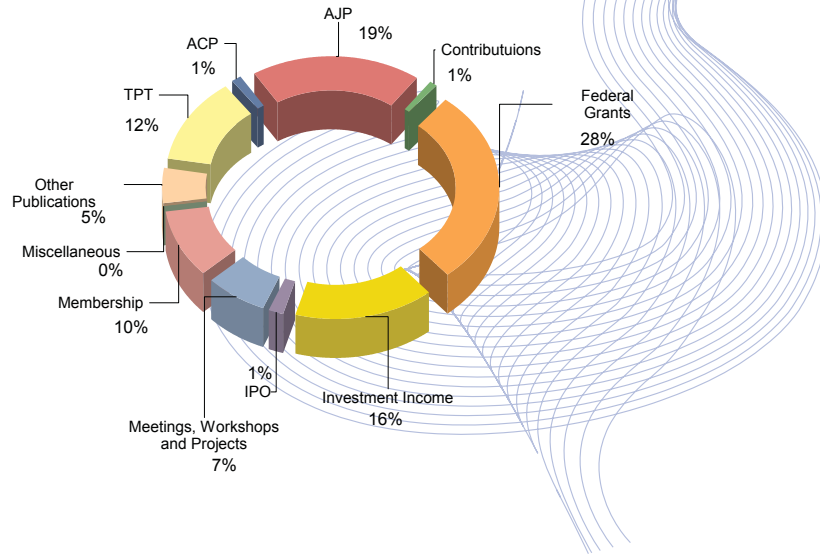
Toufic M. Hakim  
Ex Officio, AAPT

Richard Baccante  
Advisor, AIP

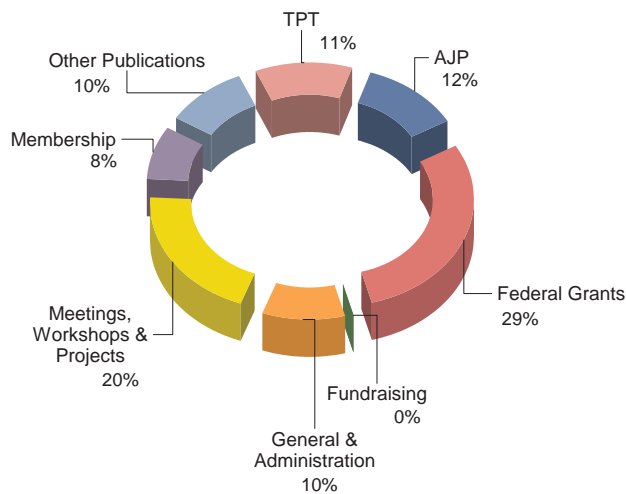
**THE AMERICAN ASSOCIATION OF PHYSICS TEACHERS, INC.**  
**AUDITED STATEMENTS OF ACTIVITIES**  
**Year Ended December 31, 2006 (and 2005)**

	Unrestricted			2006	2005 Total
	Undesignated	Board Designated	Temporarily Restricted		
Support and revenue					
American Journal of Physics	\$ 1,205,141	\$	\$	\$ -	\$ 1,187,728
The Physics Teacher	769,783			-	781,195
Investment income	918,913	50,811	21,268	990,992	406,779
Other publications	326,684	-		326,684	328,983
Meetings, workshops and projects	444,552	-		444,552	469,395
Membership	619,221	-	-	619,221	611,219
Federal grants	1,779,147	-	-	1,779,147	1,811,274
Contributions	34,703	9,654	11,171	-	101,084
International Physics Olympiad	94,240	-	-	94,240	79,775
Share in earnings of investment in ACP, Inc.	67,348	-		-	70,135
Miscellaneous income	1,927	-		-	1,772
Releases from restrictions	71,468	(17,641)	(53,827)	-	-
<b>Total support and revenue</b>	<b>6,333,127</b>	<b>42,824</b>	<b>(21,388)</b>	<b>6,354,563</b>	<b>5,849,339</b>
Expenses					
American Journal of Physics	730,509			730,509	875,361
The Physics Teacher	712,743			712,743	637,718
Other publications	607,734			607,734	486,753
Meetings, workshops and projects	1,267,716			1,267,716	1,136,577
Membership	518,826			518,826	452,449
Federal grants	1,839,419			1,839,419	1,926,378
General and administrative	614,726			614,726	488,529
Fundraising	2,249			2,249	2,706
<b>Total expenses</b>	<b>6,293,922</b>			<b>6,293,922</b>	<b>6,006,471</b>
Change in net assets	39,205	42,824	(21,388)	60,641	(157,132)
Net assets, beginning of year	4,757,636	168,804	92,107	222,730	5,398,409
Net assets, end of year	\$ 4,796,841	\$ 211,628	\$ 70,719	\$ 222,730	\$ 5,241,277

## Revenue Composition, Year Ended December 31, 2006 (Audited)



## Expense Composition, Year Ended December 31, 2006 (Audited)



### 2006 Budget Committee

Charles E. Robertson, Chair  
University of Washington

Ruth W. Chabay  
North Carolina State University

Richard W. Peterson  
Bethel University

Bernard V. Khoury  
Ex Officio, AAPT



The American Association of Physics Teachers is pleased to recognize a group of distinguished award winning physics professionals who embody the AAPT mission:  
**advancing physics through teaching.**

## 2007 Physics Education Awardees



**Neil deGrasse Tyson**  
American Museum of Natural History  
& Director, Hayden Planetarium, NY  
*Klopsteg Memorial Award*  
Summer 2007

Extraordinary accomplishments in communicating the excitement of physics to the general public



**Clifford E. Swartz**  
University of Stony Brook, NY  
*Melba Newell Phillips Award*  
Winter 2007

For creative leadership, dedicated service, and exceptional contributions to the teaching of physics



**Jan Mader**  
Great Falls High School, MT  
*Excellence in Pre-College Physics Teaching Award*  
Summer 2007

In recognition of extraordinary accomplishments in communicating the excitement of physics to her students



**Alex V. Filippenko**  
University of California at Berkeley  
*Richtmyer Memorial Award*  
Winter 2007

For stimulating interest in and knowledge of physics research and broadening its impact on the teaching of physics



**Carl E. Wieman**  
University of Colorado  
*Oersted Award*  
Winter 2007

For notable contributions to the teaching of physics



**David R. Sokoloff**  
University of Oregon  
*Robert A. Millikan Award*  
Summer 2007

In recognition of notable and creative contributions to the teaching of physics



**Steven L. Manly**  
University of Rochester  
*Excellence in Undergraduate Physics Teaching Award*  
Summer 2007

In recognition of extraordinary accomplishments in communicating the excitement of physics to his students

## Distinguished Service Award Winners

### 2007

Robert Beichner  
North Carolina State University

Paul Stokstad  
PASCO scientific

Christine and David Vernier  
Vernier Software

John Mallinckrodt  
California State Polytechnic University

Deborah Rice  
Kirkwood High School,  
St. Louis, MO

### 2006

Mario Belloni  
Davidson College

Andria Erzberger  
Oakland, CA

Steven Iona  
University of Denver

Zigmund Peacock  
University of Utah

Gregory Puskar  
West Virginia University

Frieda Stahl  
California State University, Los Angeles

## Outstanding Teaching Assistants

Each year, AAPT solicits nominations for Outstanding Teaching Assistant Awards. Any college or university department chair may nominate up to five TAs at that institution, and students may be nominated in multiple years. The award includes a certificate and a complimentary one-year student membership in AAPT and the winner's choice of an annual subscription to either the *American Journal of Physics* or *The Physics Teacher*. In 2006, 128 students received the award; in 2007, 165 students were awarded the honor. The complete list of Outstanding Teaching Assistants for 2006 and 2007 can be found at [www.aapt.org/Grants/outstandingta.cfm](http://www.aapt.org/Grants/outstandingta.cfm).

AAPT has taken steps to deepen its level of engagement in public policy and advocacy in physics and science education across the United States. A new public policy committee has been formed to advise on AAPT statements, on joint professional society letters to legislators, and—as AAPT becomes more active in preparing policy statements—on ways to promote these statements and advocate for pertinent legislative action.

Along with partner science and education groups, AAPT co-signed a number of letters in 2006-2007 in support of important legislation, particularly as a member of the STEM Education Coalition:

- ✧ Urging Congress to make investing in STEM Education programs at the NSF and Department of Education a priority in the fiscal year 2007 appropriation bills.
- ✧ Expressing support of HR 524, the Partnerships for Access to Laboratory Science (PALS) Act to help create a pilot program at the NSF that will help explore the best ways to improve high school science laboratory facilities in the most high-need schools.
- ✧ Thanking authors of HR 362, the “10,000 Teachers, 10 Million Minds, Science and Math Scholarship Act,” for introducing it. AAPT believes this legislation will have a great impact on teacher preparation, will strengthen and expand the STEM teacher workforce, and attract more of our best and brightest students into the STEM fields.
- ✧ Expressing support for several key STEM education policy priorities related to the reauthorization of the No Child Left Behind Act, including strengthening math and science partnerships, establishing P-16 STEM Councils and dedicating funding for teacher professional development.
- ✧ Expressing support of the Administration’s request of \$6.43 billion in fiscal year 2008 for the National Science Foundation.
- ✧ Urging Congress to provide \$450 million in funding for the Math and Science Partnership (MSP) at the U.S. Department of Education (Title IIB) in fiscal year 2008. AAPT believes innovative teacher training professional development programs like the MSP are critical to meet the challenges posed by the globally competitive economy of the 21st Century.
- ✧ Commending Congressman Silveste Reyes for his leadership in establishing a new Diversity and Innovation Caucus in the House of Representatives that will focus much-needed attention on the field of increasing the participation of underrepresented groups in the STEM fields.



AAPT has prepared a white paper making the case to the National Academy of Sciences' Board of Physics and Astronomy for a decadal study on physics education.

AAPT supports funding designed to advance K-20 science and math education, expand professional development opportunities, and strengthen teacher preparation. Members are urged to make their voices heard via the Legislative Action Center available through [AAPT.org](http://AAPT.org).

Solely, AAPT also

- ❖ Expressed its support for amending the No Child Left Behind Act to require the inclusion of state science assessments in the annual calculation of Adequate Yearly Progress, noting the concern about standardized testing.
- ❖ Urged Congress to consider bill language that would encourage states to adopt flexibility in assessing student performance, skill, and knowledge in the sciences.
- ❖ Commented on National Science Board draft report, *A National Action for Addressing the Critical Needs of the U.S. Science, Technology, and Mathematics Education System* by encouraging steps to strengthen STEM education and raise its public profile; supporting substantial increases in the funding of STEM education programs and STEM education research, as well as an increase to overall NSF funding levels; and supporting the establishment of strong credentials for teachers. In addition, AAPT counseled the NSB that the STEM education system cannot produce excellent, coherent education unless schools have adequate staff and scientific equipment to support the teachers in their mission.

## Legislative Action Center

Policies supported by AAPT include various initiatives related to science, technology, engineering, and math (STEM) education, both within the National Science Foundation's Education and Human Resources Directorate and at the Department of Education.

AAPT encourages members to actively engage with local, state, and national legislators to promote STEM education. The Association's Legislative Action Center helps motivated members reach Congress so they can stress the importance of strengthening education efforts to meet growing needs. AAPT's Legislative Action Center is a policy action website providing members with the ability to not only access contact information for congressional representatives, but to also write, or edit, letters and emails to Congress in support of AAPT-related policies.

## Public Policy Advisory Committee Members

Ruth Howes, Professor and Chair  
Physics Department  
Marquette University

Michael Lach, Director of Science  
Office of Math and Science  
Chicago Public Schools

Noah Finkelstein, Assistant Professor  
Physics Education Research  
Department of Physics  
University of Colorado at Boulder

Apriel Hodari, Researcher  
CNA Corporation

Lee Hirsch, Physics Department  
Thomas S. Wooten High School,  
Rockville, MD

Alicia Torres, Director of Media  
and Government Relations  
AIP

Toufic Hakim  
AAPT, Convener



## Looking Ahead and Keeping Upward Momentum

The AAPT Executive Board met quarterly to exercise its fiduciary responsibility on behalf of the Association. The elected Board oversees planning and evaluates the status and progress of AAPT activities, including meetings, programs, and publications. At its meetings, the Board reviews and acts on various reports from task forces, committees, and the AAPT Executive Office. The Board also acts closely with the Executive Officer on a wide variety of issues to advance the mission of AAPT. Members of the Board, all who serve as volunteers, serve on various Board committees, including Budget, Investment Advisory, Publications, Awards, Meetings, Membership & Stewardship, and the Executive Officer Review.

Across 2006 and 2007, the Board had full agendas at every one of its meetings. The following is a selection of actions that the Board took since its October 2006 meeting, as well as related progress notes and initiatives that the Board and the association will be addressing in the upcoming year:

### Teacher Preparation

Enthusiastically expressed support for the establishment of a National Task Force on the Preparation of K-12 Physics and Physical Science Teachers as proposed by the AAPT Committee on Teacher Preparation. The task force, which will review the state of teacher preparation, evaluate best practices and make policy recommendations, will be formed and begin its study and deliberation in 2007-2008.

### Undergraduate Education

Endorsed the mission statement regarding a Doubling Initiative (*the AAPT Board advocates doubling the number of bachelor degrees in physics to address critical national needs, including K-12 education, economic competitiveness, energy, security, and an informed electorate*) and encouraged the development of action plans and timelines involving AAPT, APS, and AIP to fulfill that goal.

### Conference Sponsorships

Approved financial support for new pre-college teacher workshops offered in local AAPT Sections and presented by PTRAs; for participants in Tanzania, Brazil, and Mexico to attend a series of UNESCO-led workshops in developing countries on optics and photonics; and for four graduate students and two international participants to participate in the 2008 Gordon Conference on Computational Physics.

### Academic Programming

Endorsed the concept of Senior Physics Fellows. Senior Fellows are leading physicists and physics educators who will work with the national office on special projects. The appointments will occur on a regular basis and could be annual, renewable arrangements, sabbaticals, or summer appointments.

### Online Resources

Appointed a committee to launch the search for an Editor-in-Chief of Online Publications, to oversee all scholarly content across AAPT's websites.

## Development & Fundraising

Acknowledged and appreciated the efforts and work of the Fundraising Advisory Committee (FRAC), which made valuable recommendations on next steps in establishing fundraising, recommended guidelines for memorial gifts, suggested improvements in the awards program, and was instrumental in launching fundraising efforts for the Excellence in Physics Education Awards Endowment Fund. (Members of FRAC included John Layman, Chair; Alex Dickison; Rod Grant; Steve Iona; Mary Mogge; Bernard Khoury; Dick Peterson; and Howard Voss.)

## Awards

Authorized several changes in the awards program including changes in the description of the major awards offered and expansion of the number and types of awards offered.

## Resolutions

Approved resolutions to sincerely thank Dr. F. James Rutherford and applaud his thoughtful support giving AAPT exclusive rights to distribute a DVD featuring original footage of Enrico Fermi and leading scientists of his era (this gift will help support AAPT's efforts to recruit new members and advance its fundraising efforts on behalf of physics education); to recognize the 16 years of Bernard Khoury's leadership as Executive Officer; and to congratulate the U.S. Physics Team for its resounding success at the International Physics Olympiad.

## Planning

Began a planning process to develop a strategic framework that would set AAPT's future directions and guide its decisions. The Board also acknowledged the work of the Planning Action Group (PAG), whose members advised the Executive Officer during the process. The process has led to impact goals that are currently in review by the Board. PAG members were Ruth Chabay, Dwain Desbien, Alan Gibson, Warren Hein, Dick Peterson, Karen Johnston (advisor), and Toufic Hakim (convener).

## New Committees

Appointed a new Meetings Committee charged with advising the central office on logistical plans for upcoming meetings and long-term site identification and review (and adopted criteria for the selection of sites for AAPT Summer and Winter Meetings); formed a Public Policy Committee to counsel the Executive Officer on issues of public policy in which AAPT should be engaged and how to be effectively engaged and engage the members; approved that the Committee for the Interests of Senior Physicists become a permanent area committee; and formed a new Governance Review Committee to review and update the Officers' Handbook and Board policy documents and to examine the overall governance and structure of the association.

## Governance

Charged Section Representatives and Area Chairs to study how best the committees, sections, and the central office can be mutually supportive and work collaboratively to advance the mission of the association. This process is evolving, with a planning group leading the way (see note on governance at right), whose members include Mario Belloni, Ernie Behringer, Karim Diff, Alan Gibson, Charles Henderson, Steve Iona, Todd Leif, Mary Mogge, Marina Milner-Bolotin, Ingrid Novodvorsky, Marie Plumb, Greg Puskar, and Rachel Scherr.

## A Note on Governance

Looking inward, AAPT is taking a critical look at its governance structure, which consists of the Executive Board, standing committees (among them 18 Area Committees), and the AAPT Council—whose members constitute 47 Section Representatives and the Executive Board. At a May 2007 retreat for AAPT Section Representatives and Area Committee chairs, the group assessed how AAPT's operations could be improved via changes in the committee and local structure, and increased central office support. The retreat brought lively, imaginative ideas by a group that has never met in this way before.

One measure of the retreat's success is that many Section Representatives and area chairs have already expressed a desire to make this kind of meeting an ongoing practice. Their report is now being fine tuned by an Area Chairs-Section Representatives Planning Group and will be submitted to the Executive Board for its consideration.

Based on retreat discussions, the group is to examine and develop models that increase the effectiveness of the various constituents in responding to issues affecting physics education, increase involvement of local physics educators, expand membership options, and increase communication with the Central Office.

It is exciting to imagine how ideas generated by the membership might improve AAPT's internal operations and its impacts across the physics teaching community and beyond.



## Endowments and Funds

AAPT currently administers a number of funds that support future physics teachers as well as established members of the profession. The generosity and commitment of AAPT members and supporters make these funds and their goals possible.

The **Harold Q and Charlotte Mae Fuller Fund** provides AAPT membership to physics teachers in developing countries. In his 30 years as a professor at the University of Missouri at Rolla (formerly the Missouri Schools of Mines and Metallurgy), Harold, along with his wife Charlotte, took great pleasure in entertaining the school's many international students. After Charlotte's death in 1985, the couple's sons Robert, an emeritus professor of physics at the University of Nebraska, and Richard, an emeritus professor of physics at Gustavus Adolphus College—both long-time active members of AAPT—felt that a fund assisting those in foreign countries would be a fitting memorial to their parents. The awardees are chosen by the International Education Committee.

### Grantees

#### 2007

Eduardo Molto-Gil  
Pedagogical University  
Havana City, Cuba

Revaz Zaridze  
Tbilisi State University  
Tbilisi, Georgia

Kelana Jaya  
Selangor, Malaysia

Leong B. Lan  
Monash University

Paulo Henrique Cruz  
ETEP-Faculdades,  
San Jose Dos Campos,  
Brazil

Rafael Rosa  
Quark Science Club  
San Jose Dos  
Campos, Brazil

Baylie Damtie  
Bahir Dar University  
Bahir Dar, Ethiopia

Marlon Caetano  
Ramos Pessanha  
Universidade Estadual  
De Norte Fluminense,  
Campos Dos  
Goytacazes, Brazil

#### 2006

Salvador Gil  
University of San Martin  
San Martin Buenos  
Aires, Argentina

Leong B. Lan  
Monash University  
Kelana Jaya,  
Selangor, Malaysia

Paulo Henrique Cruz  
EETP-Faculdades,  
San Jose Dos  
Campos, Brazil

Rafael Rosa  
Quark Science Club  
San Jose Dos  
Campos, Brazil

Baylie Damtie  
Bahir Dar University  
Bahir Dar, Ethiopia

The **Venture Fund** is a resource for AAPT members, created to promote the development and marketing of innovative teaching products and services for physics and other sciences. Providing up to 18 months and \$25,000 in support per project, the Fund is not an alternative to funding from federal agencies, such as NSF, which do not typically provide funds to bring products from the research and development stage to the teaching market.

### Grantees

#### 2006

Cindy Swartz  
Small World Books  
*Just Enough Physics...for K-5 Teachers*

### High School Physics Teacher Grant

AAPT believes that, as teaching practice improves, physics enrollment and excitement among students increase. In that spirit, AAPT awards the High School Physics Teacher Grant to encourage high school teachers to experiment and improve on their teaching practices.

2007: Mary Jo Parker, Academy for Science & Health-Conroe ISD, Conroe, TX

The **Barbara Lotze Scholarship** is given annually to a student who plans to teach physics. It exists because of the generosity of Barbara Lotze, a longtime AAPT member and retired professor of physics from Allegheny College in Meadville, Pennsylvania.

The **Frederick and Florence Bauder Endowment** provides support for teachers who want to develop or disseminate physics demonstrations and exhibits that inform students. It was created through the generosity of Frederick and Florence Bauder.

### Grantees

#### 2007

Stan Micklavazina  
University of Oregon

Patti Sievert  
Northern Illinois  
University

Brian Andersson  
on behalf of PIRA

#### 2006

Dale Stille and  
Usha Mallick  
University of Iowa

Stan Micklavazina  
University of Oregon

Brian Andersson  
on behalf of PIRA

David Sturm  
University of Maine

Sudha Swaminathan  
Worcester State  
University

**Excellence in Physics Education Awards Endowment Fund** is designed to reward physics educators who embody the AAPT values and ideals of excellence in the teaching of physics. This endowment seeks to fund AAPT's seven major awards at perpetuity: the Oersted award, the Millikan award, the Klopsteg Lecture award, the Richtmyer Lecture award, the Melba Newell Phillips Award, and the Excellence in Pre-College and Undergraduate Teaching awards.

### Rewarding Achieving Student Teachers

Thanks to the generosity of Barbara Lotze, AAPT has administered the Barbara Lotze Scholarship for Future Teachers since 1997. Applicants must declare their intent to prepare for and engage in a career in physics teaching at the high school level and must, at the time the scholarship funds are received by the student, be

- ✦ Enrolled in an accredited two-year college, four-year college, or a university or a high school senior accepted for such enrollment
- ✦ Pursuing, or planning to pursue, a course of study leading toward a career in physics teaching in the high schools
- ✦ Showing promise of success in their studies
- ✦ A citizen of the United States

**"I've always wanted to become a teacher,"** Logan Kimberly says. He loved physics immediately. When he realized others had difficulty, **"that's when I knew I wanted to become a high school physics teacher."**

#### 2007 Scholarship Winners

Alex Silverman  
Georgia Institute of Technology

Brianne Boland  
Marquette University

Logan Kimberly  
University of Wisconsin-  
Stevens Point

#### 2006 Scholarship Winners

Emily Mae Zeringue  
Louisiana State University

Michael D. Zitolo  
New York University

When her mother asked why she liked physics, Brianne Boland responded, **"Because it explains everything."**

DONATIONS

## AAPT 2006 BENEFACTORS

Hundreds of members and friends of AAPT have invested in programs, scholarships, and initiatives designed to support physics education. They did so by giving to AAPT (there were 16% more donors in 2006 than in the previous year, and a 41% increase in donations). The beneficiaries of these efforts and opportunities join AAPT in offering their deepest gratitude to AAPT's benefactors. In recognition of individual giving, honorific donor societies have been established.

### The Ellipse of Friends

- |                             |                         |                             |                           |
|-----------------------------|-------------------------|-----------------------------|---------------------------|
| Wallace Aas                 | Robert J. Dukes, Jr.    | Paul D. Lane                | Franklin J. Sazama        |
| David J. Abeshouse          | Dale A. Eding           | Franceline C. Leary         | Francis L. Schmitz        |
| Joseph C. Amato             | Daniel M. Ekstein       | Mackie Leigh                | John B. Schutt            |
| Charles E. Armentrout       | Marcia Feters           | Harold Leinbach             | Hugh L. Scott, Jr.        |
| E C. Ash, Jr.               | Aurino Ribeiro Filho    | Arnold D. Levine            | Stephen B. Sears          |
| Gene Atkinson               | Gaston Fischer          | Edwin A.S. Lewis            | Wesley L. Shanholtzer     |
| Lawrence J. Badar           | Kurt Fisher             | Maria L. Ligatto-Slobodrian | Giles F. Shepherd, III    |
| Grady C. Bailey             | Luciano Fleischfresser  | Richard W. Lindquist        | Joel F. Sherman           |
| Jorge L. Ballester          | Kenneth A. Flowers      | Jeffrey L. Mackey           | Carl W. Shinnors          |
| R. Edward Barker, Jr.       | Gustave C. Fralick      | Paul C. Mangelsdorf, Jr.    | Keith S. Simon            |
| Edward A. Barnhardt         | Richard M. Fuller       | Myron A. Mann               | David R. Smith            |
| David F. Bartlett           | Ronald V. Furia         | Bradley K. McCoy            | Richard James Smith       |
| John E. Beam                | Dionigi Galletto        | Darrell Megli               | David Stein               |
| Frederick D. Becchetti, Jr. | L. S. Garcia-Colin      | Walter R. Mellen            | Gyda Ann Otten Stoner     |
| Fred L. Boos, Jr.           | Carl G. Gardner         | Kenneth E. Mellendorf       | Olga P. Strickland        |
| Richard C. Bradley          | John S. Garrett         | Eugen Merzbacher            | Robert A. Swanson         |
| Marianne Breinig            | Zvi Geller              | William R. Miller           | Joanne D. Taraskiewicz    |
| Laird C. Brodie             | Robert P. Godwin        | Dornis C. Morin, Jr.        | James Taylor              |
| Burton A. Brody             | Paul M. Gordon          | Clement J. Moses            | R. David Taylor, III      |
| Jonathan O. Brooks          | Stephen R. Gottesman    | Brian A. Nagy               | David R. Thiessen         |
| Ronald A. Brown             | Laurence I. Gould       | Shoichi Nasu                | Andrew H. Toman           |
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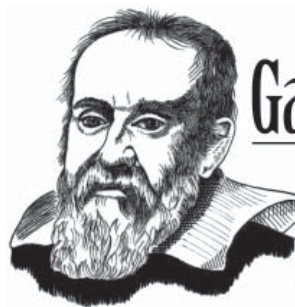


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The work of AAPT is conducted in close partnership with a number of sister societies, to which it is grateful. These include:

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## advancing physics education locally

Besides AAPT's efforts globally, it is at the local level that its work becomes most significant. There are 47 local AAPT Sections across the United States and Canada; AAPT seeks to support and sustain high activity within its Sections, and expand its Sections within and beyond North America. Sections vary in size and type of activity. All Sections have officers and representatives, the latter serving with the AAPT Board on the AAPT Council. Representatives and officers conduct business meetings twice annually in conjunction with AAPT's summer and winter meetings. Local AAPT members gather in their Sections a couple of times every year and organize local meetings for groups of high school teachers, for college professors, or for both—bringing both groups together is one of the unique strengths of AAPT. Meetings often include keynote addresses and workshops, demonstration shows, socials, and dinner banquets.

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“AAPT depends on the efforts of its Section Representatives. Section Representatives provide the major link between AAPT and its local members. As a group, they facilitate the flow of information and good practices among their Sections. We greatly appreciate their contributions.”

—Alan Gibson, Chair, Section Representatives, Michigan

Committees have always been essential to the functioning of AAPT. In addition to committees that advise and oversee operations, like Publications, Awards, and Budget, there are those that focus on areas of significance within physics education. There are currently 18 Area Committees, each with nine members who hold staggered three-year terms: One new member is appointed each year by the Nominating Committee, and two are appointed by the incoming president. Their responsibilities range from developing academic content for the meetings to acting as stewards for their area.

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as of September 30, 2007

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